

## GEORGETOWN STEAM PLANT INTERIM ACTION

### TECHNICAL MEMORANDUM ON DATA SCREENING RESPONSE TO COMMENTS

This document provides responses to comments on the agency-review draft of the *Technical Memorandum on Data Screening*, dated March 25, 2011 (Integral 2011). Comments were received from Ecology on April 26 (Edens 2011a, pers. comm.) and May 6 (Edens 2011b, pers. comm.), and from SAIC on April 26 (SAIC 2011). Ecology provided additional clarification of their comments on May 18 (Edens 2011c, pers. comm.) and May 31 (Edens 2011d, pers. comm.).

#### RESPONSE TO ECOLOGY COMMENTS

##### RDT1: Section 1

*General comment: Please use consistency of units and numeric displays between figures, Tables and Text. Currently the units go back and forth between milligrams, micrograms and nanograms, and occasionally ug/kg is used for groundwater. There are also frequent changes between standard notations and scientific notation.*

Concentration values in the attached, revised tables have been converted to scientific notation. Soil and groundwater concentration values in all tables have been converted to mg/kg and µg/L, respectively.

##### RDT2: Section 1, paragraph 1

*The stated goal of Seattle City Light is to conduct an equivalent of a complete cleanup on their property. This review was conducted with the stated goal in mind.*

Seattle City Light has modified the goal of the cleanup to be an interim action that minimizes the potential need for additional remediation to the largest extent practicable.

##### EM3: Section 1, paragraph 5

*If indicator hazardous substances (IHS) are used, then the analysis needs to document that the COPCs that are eliminated from consideration will not contribute a significant threat to human health and the environment. Hot spots will also need to be addressed. Even though contaminants may be detected in few locations, if the concentrations are high and if several of them are co-located, then they will need to be addressed. Use of IHS will not preclude the need for compliance monitoring during and following cleanup.*

For each of the soil and groundwater analytes eliminated as a COPC, the justification was one of the following:

- Maximum detected value did not exceed the screening level
- Never detected
- No screening level available.

In the case of eight soil analytes evaluated during Step 2, low frequency of detection was a justification in addition to the maximum detected value below the screening level. In no case was an analyte eliminated solely on the basis of a low frequency of detection. There are no potential hot spots for chemicals that were eliminated as COPCs.

**EM4: Section 2.2, bulleted list in paragraph 2**

*It would be helpful to list the analytes for soil as they are listed for groundwater.*

The preliminary soil COPCs following Step 1 are as follows (Table 2):

- TCDD TEQ
- Metals: arsenic, cadmium, chromium, chromium hexavalent, copper, lead, mercury, nickel, tin, and zinc
- PAHs: acenaphthene, acenaphthylene, anthracene, benzo(g,h,i)perylene, fluoranthene, fluorene, 1- and 2-methylnaphthalene, naphthalene, phenanthrene, pyrene, LPAHs, and BaP TEQ
- Total PCBs
- Petroleum hydrocarbons: DRO, GRO, MO, and TPH
- SVOCs: bis(2-ethylhexyl) phthalate, butylbenzyl phthalate, carbazole, dibenzofuran, dimethyl phthalate, di-n-octyl phthalate, isophorone, pentachlorophenol, and tributyl phosphate
- VOCs: acetone, benzene, ethylbenzene, methylene chloride, phenol, tetrachloroethene, trichloroethene, and vinyl chloride.

**EM5: Section 2.2, reference to Table 2 in paragraph 3**

*Free product (TPH) needs to be added as a COPC here rather than just discussed later in the document.*

The list of preliminary groundwater COPCs following Step 1 has been revised as follows (Table 2):

- Metals: arsenic, cadmium, and nickel
- PAHs: LPAHs
- Total PCBs
- Petroleum: free product
- SVOCs: BEHP
- VOCs: PCE, TCE, and vinyl chloride.

**RDT6: Section 3.1, paragraph 2**

*Slip 4 is part of the LDW superfund site. The LDW site wide COCs need to be considered, not the narrow list of COCs for Slip 4.*

During a meeting between Ecology, SAIC, Boeing, and the City on April 27, 2011, it was agreed that the chemicals considered for protection of sediment can be limited to the COCs for Slip 4 because the cleanup is considered an interim action.

**EM7: Section 3.1, paragraph 3, sentence 1**

*Were soil to groundwater screening levels included in this analysis? If not, they need to be included.*

It was agreed during the April 27 meeting that an empirical demonstration can be used to screen out the leaching pathway for chemicals that do not exceed their screening levels in groundwater.

**RDT8: Section 3.2, bulleted list in paragraph 1**

*What is the 5% value based on? Please supply a reference.*

The reference for the criterion of 5% frequency of detection is the following:

USEPA. 1989. Risk assessment guidance for Superfund, volume I, human health evaluation manual (part A). Interim final. EPA/540/1-89/002. Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington, DC. December.

**EM9: Section 4.1.1, paragraph 2, sentence 2**

*If free product was present, then the TPH and other petroleum analytes associated with the free product should be retained. The lack of detections might be the result of sampling the aquifer too far from the product or at depth below the free product/water table interface.*

In June 2010, Well GTSP-6 was drilled to a depth of 15 ft bgs through layers of sandy silt, sometimes with gravel, and fine to medium sand. From ground surface to 8 ft bgs, no odor, sheen, or staining were detected. At 8 ft bgs a petroleum hydrocarbon odor was

observed, and at 9 ft bgs black staining was observed. Free product (a black, tar-like substance) that cemented the soil grains together was observed between 9.5 and 10 ft bgs and between 11 and 12.5 ft bgs. From 12.5 ft bgs to the bottom of the borehole, there was significant staining. The well was screened between 5 and 15 ft bgs. Results of soil analyses for TPH (summed across DRO, GRO, and MO) were as follows:

- 0–0.5 ft bgs: 289 mg/kg
- 6.5–8 ft bgs: not detected at 3.3 mg/kg
- 8–9.5 ft bgs: 3,100 mg/kg
- 9.5–11 ft bgs: 16,500 mg/kg
- 11–12.5 ft bgs: 15,400 mg/kg
- 12.5–14 ft bgs: 120 mg/kg.

On June 18, 2010, the depth to groundwater in Well GTSP-6 was 7.88 ft below the top of the casing. The well was purged for approximately half an hour using 3.4 gal water. Groundwater was sampled at an intake depth of 11.4 ft below the top of the casing, which corresponds to approximately 12 ft bgs. The depth of the sample intake was adjacent to the second highest soil concentration and within one of the depth ranges where free product was observed in soil. No petroleum hydrocarbons were detected in the groundwater, with a TPH detection limit of 60 µg/L.

In November 2010, Well GTSP-6 could not be sampled due to the presence of a free product layer greater than 6 ft thick. It appears that the well acted as a sump, allowing free product present in the soil to flow into the well casing. The fact that groundwater collected in June at a depth where free product was observed in soil showed no detectable concentrations of TPH indicates that the product is virtually insoluble in water, which supports the elimination of the leaching pathway when deriving the IAL for TPH. However, the City has designated TPH as a COPC based on the presence of free product in the soil.

**RDT10: Section 4.1.2, paragraph 1, sentence 3**

*The earlier comment concerning consideration of the COCS for the entire LDW applies here. As, Cd, & Ni are COCs for the LDW. As is one of the four main risk drivers for the LDW.*

See response to RDT6.

**RDT11: Section 4.1.2, paragraph 2, sentences 1-6**

*If the contaminant concentration exceeded the established criteria, then it should stay as a COC. The locations and concentrations of analytes should determine the extent of the excavation prism rather than having the excavation prism determine if an analyte is a COC.*

The list of soil COCs is revised as follows:

- TCDD TEQ
- Metals: arsenic, copper, lead, nickel, and zinc
- PAHs: BaP TEQ
- SVOCs: BEHP
- Total PCBs
- Petroleum: TPH (includes GRO, DRO, and MO), free product

Cadmium was eliminated as a COC, consistent with comment EM15.

The list of groundwater COCs is revised as follows:

- Metals: arsenic and nickel
- SVOCs: BEPH
- Total PCBs.

**RDT12: Section 4.1.2, paragraph 2, sentence 8**

*Infrequent and scattered are not the only reasons to eliminate these as a COCs at the site. See previous comment about also evaluating analyte concentrations and addressing hot spots.*

See response to comment RDT11.

**RDT13: Section 4.1.2, paragraph 2, sentence 9**

*Is this because they were never detected in the limited GW at the site? Were soil to groundwater screening levels considered for these analytes?*

Copper, lead, and zinc were not selected as preliminary groundwater COPCs following Step 1 because their maximum concentrations were lower than their Step 1 groundwater screening levels. See also response to comment EM7.

**EM14: Section 4.1.2, paragraph 3, sentence 4**

*Is there any data to verify this statement?*

The relevant data are shown in Figures 4-9 and 4-10 of the site characterization report. However, the sentence is deleted because it is not necessary to the argument.

**EM15: Section 4.1.2, paragraph 3, sentence 9**

*This sentence provides some reasonable justifications for excluding cadmium as a COC.*

Comment noted.

**RDT16: Section 4.1.2, paragraph 4, sentences 8-9**

*Nickel should be retained. Just because there is no identifiable source isn't a reason to exclude if it is present. Per previous comment, the COCs should be used to determine where interim actions are needed.*

See response to comment RDT11.

**RDT17: Section 4.1.2, paragraph 5, sentences 12-13**

*Arsenic should not be eliminated, because it is one of the risk drivers for the LDW.*

Arsenic is retained as a COC in both soil and groundwater because maximum soil and groundwater concentrations exceeded their Step 2 screening levels (20 mg/kg and 1.2 µg/L, respectively) (see response to comment RDT11).

**RDT18: Section 4.1.4, paragraph 4**

*Same basic comments as before. There are exceedences. The lack of a known source of the exceedences is not a reason to remove it from the list.*

See response to comment RDT11.

**EM19: Section 4.2.1, paragraph 2, sentence 1**

*This statement will not be accurate if the other analytes are retained as COCs. Please further explain and justify this statement.*

The MTCA definition of "legally applicable requirements" includes the phrase "adopted under state or federal law," while the definition of "relevant and appropriate requirements" includes the phrase "established under state or federal law" (WAC 173-340-710(3) and (4)). Following internal discussion, Ecology agrees that the cleanup levels established for Terminal 117 and Boeing Plant 2 do not need to be used as interim action levels for this interim action. Cleanup levels for the NBF/GTSP site will be established as part of the remedial investigation/feasibility study (RI/FS) work for the site.

**RDT20: Section 4.2.2, paragraph 1, sentences 3-6**

*See the previous comment about never detecting TPH in GW. If the existing soil conditions are protective of ground water on the site, then there should not be free product present on a portion of the site.*

See response to comment EM9.

**RDT21: Section 4.2.3, paragraph 2**

*Section 3.1 explicitly states cleanup levels at T117 do not apply for a variety of reasons. This section says that they do apply. One section contradicts the other.*

*The decision documents approved by EPA didn't set any sort of urban background concentration. Both the EECA dated June 3, 2010, and the EPA Action Memo dated September 30, 2010, contain information and discussions about dioxin at T117.*

*Nationally, urban background is 4-10 ng/kg. 50 ng/kg is the Dept of Health threshold to do a site specific health evaluation. It is not a regulatory standard or considered a background concentration.*

*The stated soil natural background level of 5.2 ng/kg ( $5.2 \times 10^{-6}$  mg/kg) remains pertinent in this case, without being adjusted upward per Ecology Technical Memorandum No. 8:*

<http://www.ecy.wa.gov/biblio/1009053.html>.

The soil IAL for TCDD TEQ is revised as "to be determined" based on the results of the 2011 Ecology urban background study (Table 3).

**EM22: Section 4.2.3, paragraph 4, sentence 3**

*The Tacoma Smelter Plume Map (see*

[http://apps.ecy.wa.gov/website/facsite/viewer.htm?sp\\_area=Tacoma%20Smelter%20Plume](http://apps.ecy.wa.gov/website/facsite/viewer.htm?sp_area=Tacoma%20Smelter%20Plume)) does not indicate that the GTSP is within the area that has As concentrations at 20 mg/kg or greater. Data is needed to establish an area background concentration that exceeds 7 mg/kg.

The GTSP site falls within an area impacted by emissions from the historical Tacoma smelter, where surface concentrations are likely to exceed 20 mg/kg (see Figure I-1 at the web site shown below). Because the GTSP site contains fill and the soils have been extensively reworked, it is reasonable to expect concentrations around 20 mg/kg in soils at depth. The City will use the value of 20 mg/kg from MTCA Table 749-2 as the IAL for arsenic.

Location of Figure I-1:

[http://www.ecy.wa.gov/programs/tcp/area\\_wide/AW/Toolbox\\_chap2\\_figures/Tier2Maps.pdf](http://www.ecy.wa.gov/programs/tcp/area_wide/AW/Toolbox_chap2_figures/Tier2Maps.pdf)

**RDT23: Section 4.2.4, sentence 2**

*The actual words used in the cited WAC is the PQL limit is no greater than 10 times the MDL.*

Although most of the PQLs reported by the analytical laboratory to date for PCBs in water have been 0.010 µg/L, PQLs of 0.015, 0.025, and 0.15 µg/L have been reported for one, two, and one sample(s), respectively. The text is revised as follows: "The Step 2 groundwater screening level of 0.0015 µg/L for PCBs, which is based on the natural background concentration in surface water, was adjusted up to the PQL of 0.01 µg/L or the PQL achievable by the analytical laboratory on a sample-specific basis.<sup>1</sup>"

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<sup>1</sup> PQLs might be higher on a sample-specific basis due to matrix interferences or other analytical issues.

**RDT24: Section 4.2.4, sentence 4**

*Provide a reference for this value.*

The source of the natural background concentration of 0.0015 µg/L for PCBs in surface water is Ecology's table of surface water screening levels for GTSP-NBF (Table A-4).

**RDT25: Section 4.2.5**

*The cPAH removal action level (RvAL) of 0.14 mg/kg TEQ for T-117 was selected based on the MTCA Method B ARAR. Per EPA (2005e) guidance, early life-stage exposure to cPAHs was evaluated for the cPAH RvAL because of the potential for the future exposure of children in areas of the T-117 Upland Study Area that may be made available for public access. cPAHs are the only COCs considered to be mutagenic, so they are the only COCs for which this evaluation may be necessary. Early life-stage exposure parameters were used in the calculation of total risk to evaluate protectiveness under CERCLA for the recreational exposure scenario (Table 4-3 of the T-117 EECA). Additional details of this adjustment to account for early life-stage exposure are provided in Appendix I of the T-117 EECA. Ecology is currently evaluating early life-stage exposure and is considering rule revisions to address this issue. On March 22, 2010, Ecology released a document to the MTCA/SMS Advisory Group with examples of updates to MTCA specifically related to cPAHs and early life-stage exposure (Appendix I of the T-117 EECA). Although early life-stage exposures are not currently incorporated into MTCA, the total risk calculation in Table 4-3 of the T-117 EECA for the MTCA unrestricted-land-use scenario incorporates early life-stage exposure assumptions. Additional details on the adjustment to account for early life-stage exposures are provided in Appendix I of the T-117 EECA. The cPAH soil RvAL may be below natural or anthropogenic background concentrations. Background concentrations have not been evaluated in the T-117 EECA but may be evaluated during remedial design. Ecology's March 22, 2010 document provided a mean background cPAH concentration of 1.8 mg/kg. (T117 EECA, June 3, 2010)*

Section 4.2.5 is eliminated because MTCA does not address adjustments for early life exposures. With the MTCA revision process currently on hold, it is not known whether or how the revised MTCA will address early life exposures.

**RDT26: Section 4.2.6, paragraph 1, sentence 3**

*Remove this sentence. It is not germane to the subject of this section.*

The third sentence of Section 4.2.6 is deleted.

**EM27: Section 4.2.6, paragraph 1, sentence 5**

*If only the direct contact IAL is used for the area of the site outside of the area of PCB-contaminated groundwater, then long-term compliance monitoring will be required to demonstrate that this cleanup was adequate.*



Confirmational groundwater sampling is proposed for the GTSP interim action. Following two quarterly monitoring events, the data will be reported to Ecology along with recommendations for future monitoring.

**RDT28: Section 4.2.6, paragraph 2, sentences 4-7**

*The primary reason to conduct an interim action at this time is the protection of sediments in Slip 4 and by extension the entire LDW. If an IAL of 0.5 mg/kg is used for PCBs in soil in the area of impacted groundwater, then long-term compliance monitoring will be required to demonstrate that this cleanup is adequate to protect groundwater at the property and to protect sediment in Slip 4.*

See response to comment EM27.

**RDT29: Section 4.2.7, paragraph 2, sentence 2**

*Explain why they were not evaluated.*

The additive cancer risk and hazard index were not evaluated for groundwater IALs because none of the IALs for the original list of COCs was risk-based. Now that arsenic and other metals have been added to the list of COCs, additive risks for the IALs might not be within the MTCA targets. The additive risk issue will not be addressed for this interim action because Ecology will develop the final cleanup levels during their RI/FS for the NBF/GTSP site.

**Email Comments from Mark Edens Received May 6, 2011**

*In our recent meeting concerning review of the GTSP data screening technical memorandum, one of the unresolved issues was the appropriate screening level to be used for arsenic. The draft memorandum indicated that a screening level of 20 mg/kg should be used because the GTSP property is in the area that is impacted by the Tacoma Smelter Plume (TSP). Ecology's comment on the draft was that the property does not appear to be within the TSP area that has soil arsenic concentrations at or above 20 mg/kg and that the natural background arsenic concentration of 7 mg/kg should be used for screening.*

*After reviewing maps of surface soil arsenic analyses that were conducted for the TSP analysis, it appears that there are surface soil concentrations of arsenic above 20 mg/kg in the vicinity of the NBF-GTSP property. These samples likely represent undisturbed in-place surface samples that retain the TSP air fall depositional signature. However in addition to reviewing TSP data, Ecology staff and SAIC also reviewed concentrations of arsenic in soil detected during GTSP and NBF property investigations. The majority of arsenic concentrations detected above 7 mg/kg were located at 2 feet or greater below ground surface. Very few samples of any depth contained arsenic at or above 20 mg/kg, and thus the majority of onsite samples do not support a background level of 20 mg/kg. This indicates that releases from TSP did not have a significant impact on soils at the NBF-GTSP property. Since there has been no additional work done to establish an alternative arsenic natural background concentration, the appropriate screening level for arsenic in soil at the NBF-GTSP property should be 7 mg/kg.*

Ecology's statement that *"there are surface soil concentrations of arsenic above 20 mg/kg in the vicinity of the NBF-GTSP property"* is consistent with the City's proposal to use 20 mg/kg as an area-wide background concentration for arsenic. Other portions of the comment are not consistent with the arsenic data set collected at the GTSP site and are discussed below.

*"The majority of arsenic concentrations detected above 7 mg/kg were located at 2 feet or greater below ground surface"* (bgs): The reason for this is that most of the samples analyzed for arsenic were collected at 2 feet or greater bgs. On a fractional basis, more results exceed 7 mg/kg at the top two depths sampled and more results exceed 20 mg/kg at the top depth sampled than at any other depth sampled (table below). Distribution of concentrations exceeding 7 mg/kg or 20 mg/kg can be expected at depth because of the extensive re-working of soil that has occurred on site.

*"Very few samples of any depth contained arsenic at or above 20 mg/kg, and thus the majority of onsite samples do not support a background level of 20 mg/kg"*: If the area-wide background concentration of 20 mg/kg were based on the 90<sup>th</sup> percentile of the data set, consistent with MTCA (WAC 173-340-709(3)), one would expect to see 10 percent of the samples in a data set that is consistent with background to exceed 20 mg/kg. The wording on the Ecology map of the area affected by historical Tacoma smelter emissions indicates that soils in the vicinity of NBF-GTSP "occasionally" exceed 20 mg/kg arsenic, which suggests that an exceedance rate slightly different from 10 percent might be expected. Of 67 soil samples analyzed for arsenic at GTSP, 4 samples (6 percent) exceed 20 mg/kg. This fraction seems consistent with the concept of "occasional" exceedances. It would also be consistent with an area-wide background data set in which 10 percent of results exceed 20 mg/kg. The City acknowledges that the maximum concentration of 140 mg/kg (SYASB04 at 3.5-5 ft bgs) is not consistent with an area-wide background data set. This individual result is likely the only result in the GTSP arsenic data set that is not consistent with an area-wide background data set.

The City considers the arsenic data set for the GTSP site to be consistent with an area-wide background concentration of 20 mg/kg. However, the City will use the value of 20 mg/kg from MTCA Table 749-2 as the IAL for arsenic.

### Summary of Arsenic Results for GTSP

Depth (ft bgs)	No. Samples Analyzed	No. Samples > 7 mg/kg	Fraction of Samples > 7 mg/kg	No. Samples > 20 mg/kg	Fraction of Samples > 20 mg/kg	Maximum Conc. for Depth (mg/kg)
0.5-2	7	4	0.57	2	0.29	30
2-3.5	11	6	0.55	0	0	16
3.5-5	15	4	0.27	1	0.07	140
5-6.5	14	4	0.29	1	0.07	24
6.5-8	15	6	0.40	0	0	20
8-9.5	7	0	0	0	0	0.38 U
All depths	69	24	0.35	4	0.06	140

*Another issue for the interim action was the need to consider COPCs for the LDW and a list of these COPCs was requested by the City of Seattle. Attached are PDF files of Sections 5.5 and 6.5 and Table 5-6 from the LDW Remedial Investigation. This information provides a list COPCs that were detected in LDW sediments at concentrations above SMS criteria, DMMP guidelines or TRVs, and a discussion of the risk drivers. The COPCs and risk drivers should be evaluated for the soil to groundwater to surface water pathway.*

The City thanks Ecology for information related to COPCs for the Lower Duwamish Waterway. At the meeting between Ecology, Boeing, and the City on April 27, 2011, it was agreed that the COPCs for sediment protection could be constrained to the COCs identified for Slip 4 sediments if the GTSP cleanup is considered an interim action. The City has revised the goal of the cleanup to be an interim action that minimizes the potential need for additional remediation to the largest extent practicable, so the list of COPCs for sediment protection will be based on the COCs for Slip 4 (i.e., PCBs, indeno(1,2,3-cd)pyrene, BEHP, mercury, lead, zinc, and dioxin). See response to comment RDT6.

## RESPONSE TO SAIC COMMENTS

### Section 2.1, Second Paragraph

*It would significantly assist the reader's understanding to state in the text and in tables that the Step 1 Screening Levels are derived from the values in the right columns of Table A-3.*

Comment noted.

*The text states that groundwater screening levels consider protection of sediment and, for some chemicals, protection of surface water. However, this is the reverse of that stated in Section 3.1. The text in Section 3.1 appears to be correct.*

The third sentence of the second paragraph of Section 2.1 is revised as follows:  
 “Groundwater screening levels consider protection of surface water and, for some chemicals, protection of sediment.”

### **Section 2.1 and Table B-1**

*As noted in the fourth paragraph of page 2-1, some analytes were not screened because they were not detected and no screening levels were available. However, a number of chemicals listed in Table B-1 that are stated as not having a screening level in fact do have corresponding Method B standard formula values for soil and groundwater listed in the CLARC database. Although these chemicals were not detected at GTSP, the RLs should be screened against these CLARC values to determine if the RLs were adequately low enough. In addition, one detected chemical (bromomethane) also has a Method B value in the CLARC database.*

The non-detected chemicals listed as not having screening levels were reviewed to verify that none has a screening level in Ecology’s media-specific tables of screening levels for GTSP-NBF (Table A-1 through A-4). During the April 27 meeting, it was agreed that detection limits did not need to be screened for chemicals not in Ecology’s media-specific screening tables.

### **Section 2.2, and Tables B-2 and B-3**

*Explain the term “Max MDL.” Is this the maximum non-detected concentration in the entire GTSP data set for that chemical and medium? If so, this number may not be representative of the majority of non-detected values due to one or more cases of sample dilution or interference, resulting in anomalously elevated DLs. Explain what the ratio of Max MDL to Screening Level indicates and how it is used in this screening process.*

Definitions of column headings have been added to the screening tables (Tables B-2, B-3, D-1, and D-2). The “Max MDL” is the maximum MDL for samples classified as nondetected. The “Ratio of Max MDL to Screening Level” is the ratio of the maximum MDL for samples classified as not detected to the Step 2 screening level. It was used on a case-by-case basis, together with the total frequency of exceedance (detected or not) of the Step 2 screening level (“Total Freq Exceed”), to override the elimination of a chemical as a COPC if the chemical appeared to have elevated detection limits (i.e., PCE, TCE, and vinyl chloride, as discussed in Section 3.2 of the technical memorandum on data screening).

*In tables, use consistent units for soil ( $\mu\text{g}/\text{kg}$  in Table B-2 and  $\text{mg}/\text{kg}$  in C-2). Table B-2 uses the value of 100,000  $\mu\text{g}/\text{kg}$  (100  $\text{mg}/\text{kg}$ ) for gasoline range hydrocarbons in soil, assuming benzene is not present onsite. However, benzene has been detected and thus the gasoline value of 30  $\text{mg}/\text{kg}$  should be used, as done in Table C-2.*

Tables have been modified to present soil concentrations in  $\text{mg}/\text{kg}$  and water concentrations in  $\mu\text{g}/\text{L}$ . The soil screening level for GRO in Table B-2 was modified to 30  $\text{mg}/\text{kg}$ .

*In Table B-3, change the groundwater concentration units from µg/kg to µg/L.*

The units have been changed as requested.

### **Section 3.1, Page 3-1**

*In the second paragraph, the assumption is made that only chemicals previously identified as exceeding SQS criteria in Slip 4 are of concern for full protection of sediments when evaluating surface water and groundwater at the site (referencing SAIC 2011, Slip 4 Sediment Recontamination Modeling Report). However, these seven chemicals or chemical groups [PCBs, indeno(1,2,3-cd)pyrene, BEHP, mercury, lead, zinc, dioxin] represent only an initial screening, using solely SMS, in the overall RI/FS process. The list of COPCs in sediment identified in the LDW RI/FS also needs to be considered for protection of sediments.*

See response to comment RDT6.

*In the third paragraph, demonstrate how the use of the three-phase partitioning soil leaching model is protective of all pathways and conditions represented in those many criteria not included (in Table C-5, for most column letters from R to BP).*

Columns R through BP in Table A-1 (Step 1 soil screening levels) show the application of the three-phase partitioning model to each of many potential Step 1 groundwater screening levels. Table C-5 (rationale for derivation of Step 2 soil screening levels) indicates that the three-phase partitioning model was applied to the final Step 2 groundwater screening level derived in Table C-3. It is not necessary to apply the three-phase model to other groundwater values shown in Table C-3 because they are less protective than the final groundwater screening level and would, therefore, produce a less protective leaching screening level.

*In the fourth paragraph, please change Table C-3 to C-4.*

The table reference is revised to C-4.

### **Section 3.1, Page 3-2**

*The first bullet states that Method A groundwater CULs were applied as screening levels for petroleum in surface water, per MTCA, but these levels are not included as such in Table C-4 (although it is included in groundwater).*

The second sentence of the bullet is revised as follows: "The Method A groundwater CULs for petroleum are considered protective of surface water (WAC 173-340-730(3)(b)(iii)(C))."

*The fifth bullet discusses differences between the GTSP site and the Terminal 117 and Boeing Plant 2 sites. Some of the criteria at these two nearby sites might be applicable and need to be considered. Because one site is tidally influenced (and GTSP is not) does not provide adequate*

*justification for excluding criteria developed at these sites. Provide further discussion and examples to explain why criteria from these two sites are not applicable to the GTSP site.*

See response to comment EM19.

### **Tables C-3 and C-6**

*In Step 2, Groundwater Screening Levels in Tables C-3 and C-6, the EPA Tap Water Residential RSLs are not considered applicable to groundwater at this location, but rather apply to water system providers (per Ron Timm). These criteria are listed as "ARARs (Not Applied)" in more recent versions of the Draft LDW ARARs and CULs spreadsheet. Removal of this as an ARAR will affect a number of chemicals for which the most stringent criteria were derived.*

The RSLs for tap water have been removed from the derivation of groundwater screening levels in Tables C-3 and D-2. This modification has resulted in changes to several groundwater screening levels, including the Step 2 screening level for vinyl chloride, but does not ultimately affect the list of COCs or the values of IALs. A revised figure showing comparisons of site concentrations of vinyl chloride to the revised Step 2 screening levels for soil and groundwater is attached.

### **Table C-5**

*Under column letter BJ, this ARAR for soil protective of vapor (direct contact) is excluded due to no values in the column. However, under column letter BK, this ARAR for soil protective of vapor (indoor/ambient exposure) is included, although it also has no values in the column.*

Column BK has been removed from Table C-2 and this action is now noted in Table C-5.

*Under column letters BL and BM, the residential EPA RSL is applied because the "site does not qualify for industrial land use." For the Simplified TEE (Table 749-2, column letters C and E), the site qualifies as a commercial or industrial site but not as unrestricted land use. Please explain this apparent contradiction.*

As noted in the seventh bullet of Section 3.1, the site qualifies for commercial land use according to the definition at WAC 173-340-7490(3)(c). The definition of commercial land use applies to screening levels based on the TEE but not to screening levels based on human health.

*Under column letter BU, for EPA LDW Boeing Plant 2 TMCLs, provide further discussion and examples (here or in text) to show that criteria from this site are not applicable to the GTSP site.*

See response to comment EM19.

**Table C-6**

*Under column letters W and AA, provide further documentation and examples to explain why these potential ARARs are not applicable to the GTSP site.*

See response to comment EM19.

*Under column letters Y and Z, the same comment as above (Section 3.1) applies regarding chemicals or chemical groups of concern in Slip 4.*

See response to comment RDT6.

**Table C-7**

*Under column letters AV and AW, the same comments as above (Section 3.1 and Table C-6) apply regarding Slip 4.*

See response to comment RDT6.

**Table D-1**

*This soil table is somewhat difficult to follow. It would be beneficial to squeeze all columns onto a single page, as done for groundwater. If not, at least repeat the Screening Level on pages 3 and 4 of the table. It is also difficult to compare numbers between certain columns, such as Max Detect or Max MDL to the Screening Level, because some numbers are scientific notation and some are not. Again, the terms "Min MDL" and "Max MDL" and "No. MDL Exceed" and "Freq MDL Exceed" are not intuitively obvious.*

Because of the number of columns, it was not possible to fit Table D-1 to one page width, so screening levels have been repeated on each page. Formatting for concentrations has been changed to scientific notation. Definitions of column headings have been provided at the bottoms of Tables B-2, B-3, D-1, and D-2.

**Table D-2**

*Delete units of µg/kg from the Min MDL and Max MDL columns in this groundwater table.*

The units have been deleted as requested.

**Section 4, General**

*After a careful quantitative evaluation of COPCs and screening levels in previous sections, this section attempts to broadly eliminate many chemicals as COPCs for a variety of reasons, in order to create a final small COC list to evaluate during the interim action. However, this section goes too far in reducing COCs and elevating numeric values of IALs. While some of the COPCs are legitimately not significant factors in Interim Action confirmatory sampling (2-methylnaphthalene, chlorinated*

VOCs), others should be retained. For example, TPH ranges (gasoline, diesel, heavy oil) will still need to be analyzed during/following interim action excavation, and metals should also be considered for analysis.

See response to comment RDT11.

#### **Section 4.1.2**

*This section attempts to explain away all remaining metals (with the partial exception of arsenic), but altogether the COPC exceedances of metals are present and widespread enough onsite, even without a solid understanding of source, to require post-excavation sampling for these metals, in order to confirm removal of significant concentrations. Simply because certain metals in soil at the GTSP site are not found at elevated concentrations in Slip 4 sediments, or because there are no current exposure pathways in groundwater, or concentrations do not appear to extend downgradient off the GTSP property, are not appropriate reasons to eliminate COCs.*

The City disagrees that metals exceedances are widespread, with the exception of arsenic. Furthermore, all of the rationales listed in the last sentence of the comment are considered by the City to be appropriate reasons for eliminating COCs. Nevertheless, most of the metals COPCs, with the exception of cadmium, are retained as COCs. See responses to comments RDT11 and EM15.

*The fate of arsenic as a COC in this section is uncertain. The text states that arsenic was retained as a Step 3 COC in soil but not groundwater, and it is later stated that arsenic was eliminated as a groundwater COC. However, the bulleted list in Section 4.1 (COCs) states that arsenic is a COC for soil and groundwater.*

Arsenic is retained as a COC in soil and groundwater. See response to comment RDT11.

#### **Section 4.2.1**

*Explain further the statement "PCBs are the only soil COC with an ARAR available (TSCA)." A number of potential ARARs are available for soil COCs.*

See response to comment EM19.

#### **Sections 4.1.1 and 4.2.3**

*Petroleum LNAPL observed during site characterization indicates that groundwater is at least locally impacted with significant concentrations of petroleum constituents, even if these constituents were not detected in the locations of groundwater samples. Because groundwater is considered potable, protection of groundwater needs to be taken into account in the Method B soil TPH calculation.*

See response to comment EM9.



### **Section 4.2.3**

*Assuming that because the "GTSP and T-117 sites are located near each other in South Seattle" does not automatically lead to the conclusion that the area near the Malarkey Asphalt operations has similar TCDD "urban background concentrations" in soil as does the area near the GTSP property.*

See response to comment RDT21.

*In this section, the IAL for BaP TEQ was elevated from EPA's residential RSL of 0.015 mg/kg to an "urban background" level of 3.3 mg/kg (Table 3). Although details of the Bradley et al. (1994) study were briefly summarized in the text, the supporting information on the EPA RSL number was not presented. Please provide information as to why this EPA criterion is not considered pertinent to the GTSP site.*

The RSL was considered pertinent to the GTSP site per direction from Mark Edens during a conference call with the City on November 17, 2010. However the IAL was adjusted up to a typical urban concentration.

*In this section, the IAL for arsenic was elevated from the Step 2 soil screening level (natural background) of 7 mg/kg to a Tacoma smelter "area-wide background" level of 20 mg/kg (Table 3). Provide soil data showing that soil in the general vicinity of the GTSP property has a background concentration of approximately 20 mg/kg. Without this data, the default background value of 7 mg/kg will be applied.*

See response to comment EM22.

### **Section 4.2.4**

*MTCA [WAC 173-340-707(2)(a)] states that the PQL is no greater than ten times the MDL. It does not state that the PQL is set at ten times the MDL. For an analysis of PCBs in water with an MDL of 0.0032 µg/L, the PQL is typically 0.010 µg/L (e.g., ARI's PQL). Therefore, the screening level for PCBs should be adjusted up to 0.01 µg/L, not 0.03 µg/L.*

See response to comment RDT23.

### **General Format**

*The header title for the text is different than for the tables and appendices.*

The headers for tables have been updated to be consistent with the text.

## REFERENCES

Edens, M. 2011a. Personal communication (e-mail to J. Goldberg, City of Seattle, B. Day and P. Tomlinson, Integral Consulting Inc., Seattle, WA regarding GTSP arsenic screening and LDW COPCs). Washington State Department of Ecology, Bellevue, WA. April 26.

Edens, M. 2011b. Personal communication (e-mail to C. Bach, The Boeing Company; K. Hendrickson, Landau Associates; J. Goldberg, City of Seattle; and B. Day, Integral Consulting Inc.; Seattle, WA regarding comments on GTSP interim action screening levels). Washington State Department of Ecology, Bellevue, WA. May 6.

Edens, M. 2011c. Personal communication (e-mail to J. Goldberg, City of Seattle; C. Bach, The Boeing Company; K. Hedreickson, Landau and Associates; B. Day, Integral Consulting Inc; and P. Dumaliang, King County; Seattle, WA regarding NBF/GTSP interim action – construction stormwater permit/arsenic interim action level). Washington State Department of Ecology, Bellevue, WA. May 18.

Edens, M. 2011d. Personal communication (e-mail to J. Goldberg, City of Seattle, Seattle, WA regarding GTSP IAWP). Washington State Department of Ecology, Bellevue, WA. May 31.

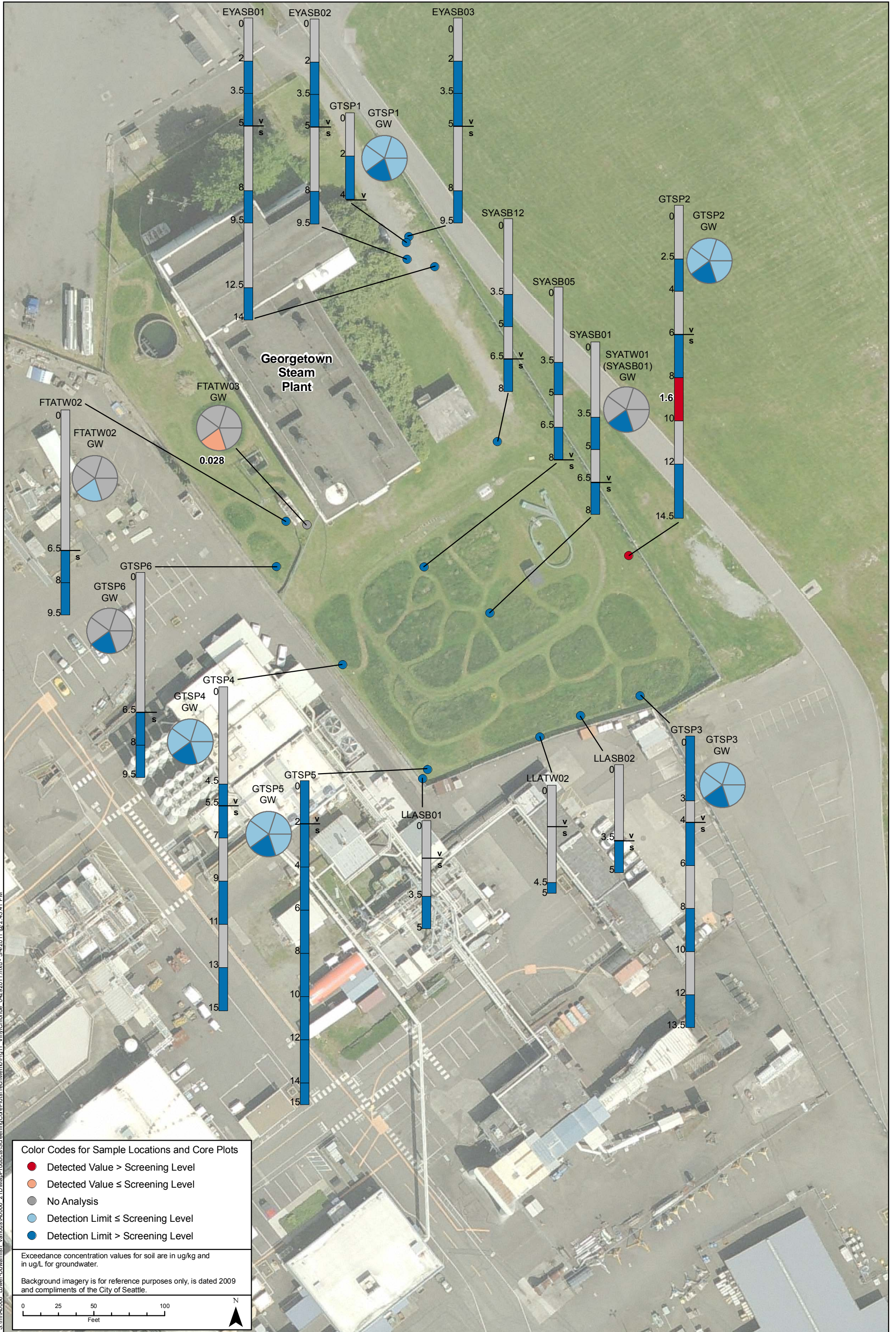
Integral. 2011. Georgetown Steam Plant, interim action, technical memorandum on data screening. Integral Consulting Inc., Seattle, WA. March 25.

SAIC. 2011. SAIC review comments, Georgetown Steam Plan interim action, technical memorandum on data screening (Integral Consulting, March 25, 2011). SAIC, Seattle, WA.

## FIGURE

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**Figure 11.** GTSP Vinyl Chloride Concentrations Compared to Step 2 Screening Levels (Vadose Soil = 0.1, Saturated Soil = 0.0049 ug/kg; Groundwater = 0.029 ug/L)

S:\m\A0006\_LowerDuwamish\_Various\A0006\_2\DM\MapProducts\ScreeningCorePlots\TechMemo\Fig11\_VinylChloride\_04292011.mxd - 5/4/2011 @ 2:43:41 PM



## **TABLES**

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Table 1. Step 1 and Step 2 Screening Levels for Soil and Groundwater

Group	Chemical	Soil Screening Levels (mg/kg)			Groundwater Screening Levels (µg/L)	
		Step 1	Step 2		Step 1	Step 2
			Direct Contact	Leaching - Saturated Zone		
Conventionals	Chloride	NV	NV	NA	2.30E+05	230000
	Sulfate	NV	NV	NA	2.50E+05	2.50E+05
Dioxins/furans	TCDD TEQ (ND = 1/2DL)	3.02E-11	5.20E-06	NA	2.06E-10	2.06E-10
Metals	Arsenic	1.58E-04	7.00E+00	NA	5.83E-02	1.20E+00
	Barium	8.29E-02	1.32E+03	7.00E+00	NV	NV
	Beryllium	3.16E+00	1.60E+02	NA	NV	NV
	Cadmium	1.50E-03	3.60E+01	NA	2.10E-01	2.50E-01
	Chromium	4.20E+01	1.35E+02	1.00E+00	1.00E+02	7.40E+01
	Chromium hexavalent	8.30E-04	1.17E+02	NA	5.80E-01	4.30E-02
	Copper	5.35E-02	5.50E+02	NA	7.30E+00	2.40E+00
	Lead	5.40E+00	2.20E+02	NA	2.50E+00	5.40E-01
	Mercury	2.70E-04	5.60E+00	NA	5.16E-03	5.16E-03
	Nickel	3.26E-01	1.60E+03	NA	8.20E+00	8.20E+00
	Selenium	2.64E-02	8.00E-01	3.80E+01	NV	NV
	Silver	1.32E-02	3.90E+02	NA	NV	NV
	Tin	5.00E+01	4.70E+04	NA	9.60E+03	9.60E+03
PAHs	Zinc	2.03E+00	5.70E+02	NA	3.26E+01	3.26E+01
	Acenaphthene	1.67E-02	3.40E+03	NA	2.61E+00	2.00E+01
	Acenaphthylene	6.91E-02	NV	NA	1.08E+01	NV
	Anthracene	2.23E-01	1.70E+04	NA	1.08E+01	1.99E+02
	Benzo(g,h,i)perylene	3.10E-02	NV	NA	1.16E-02	NV
	Fluoranthene	1.61E-01	2.30E+03	NA	2.26E+00	1.10E+01
	Fluorene	2.36E-02	2.30E+03	NA	2.04E+00	4.52E+01
	1-Methylnaphthalene	1.20E-02	2.20E+01	NA	2.30E+00	2.30E+00
	2-Methylnaphthalene	4.32E-02	3.10E+02	NA	1.82E+01	1.50E+02
	Naphthalene	4.70E-04	3.60E+00	NA	5.38E+01	1.40E-01
	Phenanthrene	1.01E-01	NV	NA	4.81E+00	NV
	Pyrene	6.84E-01	1.70E+03	NA	9.80E+00	9.83E+00
	BaP TEQ	5.19E-06	1.50E-02	NA	6.59E-06	3.20E-03
High Molecular Weight PAH	NV	NV	NA	1.00E-02	NV	
Low Molecular Weight PAH	NV	NV	NA	1.00E-02	NV	
PCBs	Total PCBs	7.14E-10	2.20E-01	NA	2.31E-05	1.53E-03
Pesticides	Aldrin	6.09E-07	2.90E-02	1.20E-04	1.24E-05	1.24E-05
	cis-Chlordane	1.03E-05	1.60E+00	NA	2.00E-03	2.00E-04
	trans-Chlordane	1.03E-05	1.60E+00	NA	2.00E-03	2.00E-04
	4,4'-DDD	3.54E-06	2.00E+00	NA	7.67E-05	7.67E-05
	4,4'-DDE	4.70E-06	1.40E+00	NA	5.42E-05	5.42E-05
	4,4'-DDT	3.67E-05	1.70E+00	NA	5.42E-05	5.42E-05
	Dieldrin	3.41E-07	3.00E-02	NA	1.32E-05	1.32E-05
	alpha-Endosulfan	2.02E-05	3.70E+02	NA	8.70E-03	8.70E-03
	beta-Endosulfan	2.02E-05	3.70E+02	NA	8.70E-03	8.70E-03
	Endosulfan sulfate	2.02E-05	3.70E+02	NA	8.70E-03	8.70E-03
	Endrin	2.25E-05	1.80E+01	NA	2.00E-03	2.00E-03
	Endrin aldehyde	2.25E-05	1.80E+01	NA	2.00E-03	2.00E-03
	Heptachlor	1.92E-07	1.10E-01	NA	1.96E-05	1.96E-05
	Heptachlor epoxide	8.09E-07	5.30E-02	NA	9.69E-06	9.69E-06
	alpha-Hexachlorocyclohexane	2.47E-06	7.70E-02	NA	1.21E-03	1.21E-03
	beta-Hexachlorocyclohexane	1.02E-05	2.70E-01	NA	4.22E-03	4.22E-03
	gamma-Hexachlorocyclohexane	3.56E-07	5.20E-01	NA	2.00E-04	2.00E-04
Toxaphene	5.73E-08	4.40E-01	NA	6.85E-05	6.85E-05	
Total Chlordanes	1.03E-05	1.60E+00	NA	2.00E-04	2.00E-04	
Total DDTs	3.54E-06	1.40E+00	NA	5.42E-05	5.42E-05	

Table 1. Step 1 and Step 2 Screening Levels for Soil and Groundwater

Group	Chemical	Soil Screening Levels (mg/kg)			Groundwater Screening Levels (µg/L)		
		Step 1	Step 2		Step 1	Step 2	
			Direct Contact	Leaching - Saturated Zone			
Petroleum	Diesel Range Hydrocarbons	2.00E+03	2.00E+03	NA	5.00E+02	5.00E+02	
	Gasoline Range Hydrocarbons	3.00E+01	3.00E+01	NA	1.00E+03	1.00E+03	
	Motor oil	2.00E+03	2.00E+03	NA	5.00E+02	5.00E+02	
	TPH	2.00E+03	2.00E+03	NA	5.00E+02	5.00E+02	
SVOCs	Benzoic acid	6.44E-01	2.40E+05	NA	2.24E+03	NV	
	Benzyl alcohol	5.50E-02	6.10E+03	NA	1.82E+02	2.40E+03	
	Bis(2-ethylhexyl) phthalate	4.71E-02	3.50E+01	NA	2.85E-01	2.85E-01	
	Butylbenzyl phthalate	3.95E-03	2.60E+02	3.17E-02	5.24E-01	4.10E-01	
	Carbazole	1.62E-02	5.00E+01	NA	4.40E+00	4.40E+00	
	Dibenzofuran	1.54E-02	7.80E+01	NA	1.33E+00	3.20E+01	
	Dibutyl phthalate	8.14E-02	6.10E+03	NA	4.66E+01	4.66E+01	
	1,2-Dichlorobenzene	3.79E-03	1.90E+03	NA	5.19E+00	3.70E+02	
	1,3-Dichlorobenzene	2.75E-01	NV	NA	6.00E+02	9.60E+02	
	1,4-Dichlorobenzene	4.10E-04	2.40E+00	NA	7.14E+00	7.40E-01	
	Diethyl phthalate	2.00E-01	4.90E+04	NA	4.84E+02	4.24E+03	
	Dimethyl phthalate	4.10E-02	8.00E+01	NA	1.43E+02	1.07E+04	
	2,4-Dimethylphenol	2.03E-03	1.20E+03	NA	2.02E+00	8.24E+01	
	Di-n-octyl phthalate	5.49E-04	1.60E+03	NA	2.96E-01	3.20E+02	
	Hexachlorobenzene	2.43E-07	3.00E-01	NA	1.12E-01	6.62E-05	
	Hexachlorobutadiene	1.28E-03	6.20E+00	NA	9.00E-01	4.22E+00	
	Isophorone	1.53E-02	1.10E+03	NA	4.60E+01	4.60E+01	
	2-Methylphenol	2.69E-03	3.10E+03	NA	7.11E+00	1.80E+03	
	4-Methylphenol	2.21E-02	3.10E+02	NA	7.72E+01	1.80E+02	
	n-Nitrosodi-n-propylamine	2.98E-06	6.90E-02	NA	9.60E-03	9.60E-03	
	n-Nitrosodiphenylamine	9.54E-03	9.90E+01	NA	1.59E+00	1.48E+00	
	Pentachlorophenol	2.56E-03	3.00E+00	NA	7.29E-01	6.98E-01	
	Tributyl phosphate	3.60E-02	5.30E+01	NA	7.30E+00	7.30E+00	
	2,4,6-Trichlorophenol	8.22E-04	4.40E+01	NA	3.00E+00	5.58E-01	
	VOCs	Acetone	2.31E-01	8.00E+03	NA	8.00E+02	8.00E+02
		Benzene	2.10E-04	1.10E+00	NA	7.95E-01	4.10E-01
		Carbon disulfide	2.66E-01	8.20E+02	NA	8.00E+02	8.00E+02
		Carbon tetrachloride	5.36E-04	6.10E-01	NA	2.48E-01	2.00E-01
Chlorobenzene		1.11E-02	2.90E+02	NA	1.00E+02	2.00E+01	
Chloroethane		1.06E-02	1.50E+04	NA	2.10E+04	3.40E+01	
Chloroform		5.30E-05	2.90E-01	NA	4.30E+00	1.90E-01	
Chloromethane		1.01E-03	7.70E+01	NA	3.37E+00	3.37E+00	
1,1-Dichloroethane		6.90E-04	3.30E+00	NA	2.40E+00	2.40E+00	
1,2-Dichloroethane		4.20E-05	4.30E-01	NA	4.80E-01	1.50E-01	
1,1-Dichloroethene		2.35E-04	2.40E+02	NA	7.29E-01	3.20E+00	
cis-1,2-Dichloroethene		2.10E-02	1.60E+02	NA	7.00E+01	7.00E+01	
trans-1,2-Dichloroethene		2.90E-02	1.50E+02	NA	1.00E+02	1.00E+02	
Ethylbenzene		1.70E-03	5.40E+00	NA	7.00E+02	1.50E+00	
Methyl isobutyl ketone		4.50E-01	5.30E+03	NA	6.40E+02	6.40E+02	
Methylene chloride		1.20E-03	1.10E+01	NA	5.00E+00	4.80E+00	
Methylethyl ketone		1.50E+00	2.80E+04	NA	4.80E+03	4.80E+03	
Phenol		2.39E-02	1.80E+04	NA	7.84E+01	3.00E+02	
Styrene		1.17E-03	3.30E+01	NA	1.46E+00	1.46E+00	
Tetrachloroethene		8.11E-06	5.50E-01	NA	2.05E-02	2.06E-02	
Toluene		6.98E-01	5.00E+03	1.10E-05	1.00E+03	1.00E+03	
1,2,4-Trichlorobenzene		4.00E-04	2.20E+01	NA	1.13E+00	2.30E+00	
1,1,1-Trichloroethane		2.00E+00	8.70E+03	NA	2.00E+02	2.00E+02	
1,1,2-Trichloroethane		7.80E-05	1.10E+00	NA	7.68E-01	2.40E-01	

Table 1. Step 1 and Step 2 Screening Levels for Soil and Groundwater

Group	Chemical	Soil Screening Levels (mg/kg)			Groundwater Screening Levels (µg/L)	
		Step 1	Step 2		Step 1	Step 2
			Direct Contact	Leaching - Saturated Zone		
	Trichloroethene	3.90E-05	2.80E+00	NA	4.90E-01	4.90E-01
	1,2,4-Trimethylbenzene	2.10E-02	6.20E+01	1.87E-04	1.50E+01	1.50E+01
	1,3,5-Trimethylbenzene	5.10E-02	7.80E+02	NA	4.50E+01	4.52E+01
	Vinyl chloride	5.60E-06	6.00E-02	NA	1.60E-02	2.90E-02
	m,p-Xylene	2.00E-01	6.30E+02	4.89E-06	1.00E+03	2.00E+02
	o-Xylene	2.00E-01	6.30E+02	NA	1.00E+03	2.00E+02
Notes:				NA		

- BaP = benzo(a)pyrene
- DL = method detection limit
- NA = not applicable; leaching pathway was not evaluated for this chemical
- ND = not detected
- NV = no value as discussed in text Section 2.1
- PAH = polycyclic aromatic hydrocarbon
- TCDD = 2,3,7,8-tetrachlorodibenzo-*p*-dioxin
- TEQ = toxicity equivalent
- TPH = total petroleum hydrocarbon



Table 2. Preliminary and Final Chemicals of Potential Concern

Analyte	Soil			Groundwater	
	Preliminary	Final		Preliminary	Final
		Direct Contact	Leaching		
TCDD TEQ (ND = 1/2DL)	X	X			
Arsenic	X	X	X	X	X
Cadmium	X		X	X	X
Chromium	X				
Chromium hexavalent	X				
Copper	X	X			
Lead	X	X			
Mercury	X				
Nickel	X	X	X	X	X
Tin	X				
Zinc	X	X			
Acenaphthene	X				
Acenaphthylene	X				
Anthracene	X				
Benzo(g,h,i)perylene	X				
Fluoranthene	X				
Fluorene	X				
1-Methylnaphthalene	X				
2-Methylnaphthalene	X	X			
Naphthalene	X				
Phenanthrene	X				
Pyrene	X				
Low Molecular Weight PAH				X	
BaP TEQ	X	X			
Total PCBs	X	X	X	X	X
Diesel Range Hydrocarbons	X	X			
Gasoline Range Hydrocarbons	X	X			
Motor oil	X	X			
TPH	X	X			
Free product	X	X			
Bis(2-ethylhexyl) phthalate	X	X	X	X	X
Butylbenzyl phthalate	X				
Carbazole	X				
Dibenzofuran	X				
Dimethyl phthalate	X				
Di-n-octyl phthalate	X				
Isophorone	X				
Pentachlorophenol	X				

Table 2. Preliminary and Final Chemicals of Potential Concern

Analyte	Soil			Groundwater	
	Preliminary	Final		Preliminary	Final
		Direct Contact	Leaching		
Tributyl phosphate	X				
Acetone	X				
Benzene	X				
Ethylbenzene	X				
Methylene chloride	X				
Phenol	X				
Tetrachloroethene	X		X	X	X
Trichloroethene	X		X	X	X
Vinyl chloride	X		X	X	X

Notes:

- BaP = benzo(a)pyrene
- DL = method detection limit
- PAH = polycyclic aromatic hydrocarbon
- PCB = polychlorinated biphenyl
- TCDD = 2,3,7,8-tetrachlorodibenzo-*p*-dioxin
- TEQ = toxicity equivalent
- TPH = total petroleum hydrocarbon

Table 3. Interim Action Levels for Soil and Groundwater Chemicals of Concern

Chemical of Concern	Soil		Groundwater	
	IAL (mg/kg)	Basis	IAL (µg/L)	Basis
TCDD TEQ	TBD	Awaiting results of Ecology urban background study	--	
Arsenic	20	MTCA Table 749-2	1.2	Natural background in surface water
Copper	550	Terrestrial ecological receptors	--	
Lead	220	Terrestrial ecological receptors	--	
Nickel	38	Leaching pathway	8.2	Protection of marine receptors in surface water
Zinc	570	Terrestrial ecological receptors	--	
BaP TEQ	3.3	Typical urban concentration	--	
Bis(2-ethylhexyl)phthalate	0.032	Leaching pathway	0.28	Protection of sediment
PCBs	0.5 in groundwater-impacted area	Empirical leaching threshold	0.01	Standard PQL of 0.01 or PQL achievable by analytical laboratory on a sample-specific basis
	1 in remainder of site	Direct contact (TSCA)	--	
TPH	3,000 in fuel tank area	Method B direct contact		
	2,000 in remainder of site	Method B direct contact	500	Method A for diesel range
	Remove free product	Residual saturation limitation		

Notes:

- = not a chemical of concern for groundwater
- BaP = benzo(a)pyrene
- IAL = interim action level
- PCB = polychlorinated biphenyl
- PQL = practical quantitation limit
- TBD = to be determined
- TCDD = tetrachlorodibenzo-*p*-dioxin
- TEQ = toxicity equivalent
- TPH = total petroleum hydrocarbon

## **APPENDIX A**

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### **DEVELOPMENT OF STEP 1**

### **SCREENING LEVELS**

Table A-1. Soil Screening Level Deriva

MEDIA - MTCA Standard																
PATHWAYS	Soil to Method B-HH Groundwater Protection - NC, WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 CLARC Database Vadose Soil	Soil to Method B-HH Groundwater Protection -NC , WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 CLARC Database Saturated Soil	Soil to Method B-HH Groundwater Protection - Carc, WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 CLARC Database Vadose Soil	Soil to Method B-HH Groundwater Protection - Carc, WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 CLARC Database Saturated Soil	Soil to Method C-HH Groundwater Protection - NC, WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 Vadose Soil	Soil to Method C-HH Groundwater Protection - NC , WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 Saturated Soil	Soil to Method C-HH Groundwater Protection - Carc, WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 Vadose Soil	Soil to Method C-HH Groundwater Protection - Carc, WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 Saturated Soil	Soil to Sediment Protection Ecology CSL WAC 173-340-740(1)(d) EQ. 747-1/ 747-2 Vadose Soil	Soil to Sediment Protection Ecology SQS WAC 173-340-740(1)(d) EQ. 747-1/ 747-2 Vadose Soil	Soil to Sediment Protection Ecology CSL WAC 173-340-740(1)(d) EQ. 747-1/ 747-2 Saturated Soil	Soil to Sediment Protection Ecology SQS WAC 173-340-740(1)(d) EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Fresh - Acute Vadose Soil	Soil to Surface Water Protection Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Fresh - Acute Saturated Soil	Soil to Surface Water Protection Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Fresh - Chronic Vadose Soil	Soil to Surface Water Protection Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Fresh - Chronic Saturated Soil
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
acetone	3.233947718	0.230918133			7.074260632	0.505133417										
acenaphthene (CAS 83-29-9)	121.4086308	6.15328			265.5813799	13.4603			1.17739349	0.330496418	0.059669935	0.016749455				
acenaphthylene (CAS 208-96-8)									1.363247471	1.363247471	0.069091503	0.069091503				
anthracene	1977.618921	99.296			4532.043361	227.5533333			24.23556118	4.443186216	1.216862745	0.223091503				
benzene	0.246511469	0.014469333	0.006124269	0.000359473	0.539243837	0.031651667	0.061242693	0.003594725								
benzo(g,h,i)perylene							6.422880003	0.3211544	1.560116593	0.620046338	0.078008356	0.031003321				
benzo[a]anthracene			0.102432	0.00512264			1.024320004	0.0512264	5.402532267	2.201031664	0.270181435	0.110073918				
benzo[a]pyrene			0.18888	0.00944504			1.888800004	0.0944504	4.201067626	1.980503309	0.210076512	0.09903607				
benzo[b]fluoranthene			0.192792001	0.00964064			1.927920006	0.0964064	9.002241624	4.601145719	0.450160648	0.230082109				
benzo[k]fluoranthene			0.18888	0.00944504			1.888800005	0.0944504	9.002287194	4.60116901	0.450163914	0.230083778				
bis(2-ethylhexyl) phthalate			20.70000012	1.035541667	2318.400013	115.9806667	207.0000012	10.35541667	1.561890919	0.9411394	0.078135515	0.047081657				
butyl benzyl phthalate	611.7762859	30.86613333			1338.260625	67.51966667			1.30735747	0.100094556	0.065960114	0.005050071				
carbon tetrachloride					0.08888144	0.004124272	0.024352069	0.001129983								
chlorobenzene	1.532878799	0.088746667			3.353172373	0.194133333										
chloroethane (ethyl chloride)																
chloroform (trichloromethane)			0.035570336	0.002306637	0.868174182	0.056298667	0.355703365	0.023066368								
chloromethane			0.016551147	0.001014258			0.165511469	0.010142577								
chrysene			0.056712004	0.00283664	0.567120044	0.0283664	0.567120044	0.0283664	9.207797444	2.201864606	0.460558757	0.110133616				
dibenz[a,h]anthracene			0.629328	0.03146744			6.293280001	0.3146744	0.660050382	0.240018321	0.033003611	0.012001313				
dibenzofuran	7.35408324	0.370453333			16.08705709	0.810366667			1.180620386	0.305332858	0.059471386	0.015380531				
di-butyl phthalate (di-n-butyl phth.)	53.12020532	2.794666667			116.2004491	6.113333333			38.65770658	5.002762027	2.033789954	0.263196347				
dichlorobenzene, 1,2-	9.358649269	0.525432			20.53703589	1.153031333			0.067582619	0.067582619	0.003788337	0.003788337				
dichlorobenzene, 1,3-																
dichlorobenzene, 1,4-							0.23389912	0.013116133	0.267034562	0.091978571	0.0149447	0.005147619				
dichloroethane, 1,1-	4.079396996	0.257365333			8.923680929	0.562986667										
dichloroethane, 1,2-	0.793513525	0.052873067	0.002380541	0.000158619	1.735810836	0.115659833	0.023855	0.001589497								
dichloroethylene, 1,1-	0.471688949	0.02316288			1.035095195	0.050829653	0.004775851	0.000234524								
diethyl phthalate					182.6732133	11.56026667			5.692106968	3.156532046	0.36026455	0.199783069				
dimethyl phthalate					140	10.03333333			1.631429797	1.631429797	0.093952381	0.093952381				
di-n-octyl phthalate					24.741276	1.297566667			90.09184156	1.161183736	4.506581633	0.05808483				
ethylbenzene	11.93174041	0.643573333			26.10068216	1.407816667										
fluoranthene	909.440402	45.52746667			1989.400879	99.59133333			24.06771324	3.209028432	1.204851904	0.160646921				
fluorene	147.076365	7.409066667			321.7295485	16.20733333			1.608019552	0.468157591	0.08100413	0.023583481				
hexachlorobenzene					2.008197333	0.102666667	0.039231569	0.002005667	0.048816479	0.008065331	0.002495069	0.000412229				
hexachlorobutadiene					0.33913196	0.004480583	0.543580084	0.007181735	0.15420161	0.096997787	0.007988062	0.005024748				
indeno[1,2,3-cd]pyrene			0.642288	0.03211544			6.422880003	0.3211544	1.760131344	0.680050747	0.088009413	0.034003637				
MEK (Methyl Ethyl Ketone;2-Butanone)																
methylene chloride (dichloromethane)			0.028229158	0.001809671			0.282291583	0.018096709								
methylnaphthalene, 2-									1.403786411	0.833498182	0.072778309	0.043212121				
MIBK (M-Isobutyl-K;4-M,2-Pentanone)																
naphthalene	6.523391213	0.339786667			14.26991828	0.743283333			3.772891304	2.197154348	0.196485507	0.114423913				

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MEDIA - MTCA Standard																
PATHWAYS HH - Human Health Ecol- Ecological	Soil to Method B-HH Groundwater Protection - NC, WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 CLARC Database Vadose Soil	Soil to Method B-HH Groundwater Protection -NC , WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 CLARC Database Saturated Soil	Soil to Method B-HH Groundwater Protection - Carc, WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 CLARC Database Vadose Soil	Soil to Method B-HH Groundwater Protection - Carc, WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 CLARC Database Saturated Soil	Soil to Method C-HH Groundwater Protection - NC, WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 Vadose Soil	Soil to Method C-HH Groundwater Protection - NC , WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 Saturated Soil	Soil to Method C-HH Groundwater Protection - Carc, WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 Vadose Soil	Soil to Method C-HH Groundwater Protection - Carc, WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 Saturated Soil	Soil to Sediment Protection Ecology CSL WAC 173-340-740(1)(d) EQ. 747-1/ 747-2 Vadose Soil	Soil to Sediment Protection Ecology WAC 173-340-740(1)(d) EQ. 747-1/ 747-2 Vadose Soil	Soil to Sediment Protection Ecology CSL WAC 173-340-740(1)(d) EQ. 747-1/ 747-2 Saturated Soil	Soil to Sediment Protection Ecology WAC 173-340-740(1)(d) EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Fresh - Acute Vadose Soil	Soil to Surface Water Protection Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Fresh - Acute Saturated Soil	Soil to Surface Water Protection Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Fresh - Chronic Vadose Soil	Soil to Surface Water Protection Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Fresh - Chronic Saturated Soil
	UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
nitrosodiphenylamine, N-			0.039618668	0.001984693			0.227473352	0.011528793	0.227829375	0.227829375	0.011561091	0.011561091				
PCB mixtures																
PCB - Aroclor 1016	0.611759881	0.030684267			1.33822474	0.067121833										
PCB - Aroclor 1221																
PCB - Aroclor 1232																
PCB - Aroclor 1242																
PCB - Aroclor 1248									1.305964009	0.241101048	0.06542445	0.01207836				
PCB - Aroclor 1254	0.485382421	0.024296533			1.061774045	0.053148667			1.303463228	0.240639365	0.065246473	0.012045503				
PCB - Aroclor 1260									1.301264831	0.240233507	0.065090016	0.012016618				
phenanthrene									9.692387538	2.019247404	0.486615385	0.101378205				
pyrene	668.256405	33.4544			1461.810886	73.1815			28.08071129	20.05765092	1.405782901	1.004130644				
tetrachloroethylene (perchloroethylene)			0.006341386	0.000337594	1.330360736	0.070824	0.005986623	0.000318708								
trichlorobenzene, 1,2,4-					0.947172333	0.062014167			0.046319164	0.020843624	0.002518663	0.001133398				
trichloroethane, 1,1,1-	44.58415697	2.414208			97.83745558	5.297845333										
trichloroethane, 1,1,2-			0.004156738	0.000272154	0.378869391	0.024805667	0.041567385	0.002721536								
trichloroethylene			0.000665758	3.89803E-05	0.032077425	0.001878143	0.006657579	0.000389803								
trimethylbenzene, 1,3,5-	7.472709863	0.395866667			16.4399617	0.870906667										
toluene	15.56360186	0.887466667			13.61815163	0.776533333										
vinyl chloride (chloroethylene)			0.000186927	9.00179E-06	0.341625378	0.016451553	0.001869271	9.00179E-05								
xylene (dimethylbenzene)	209.4786912	11.67626667			458.2346371	25.54183333										
benzoic acid									9.621710689	9.621710689	0.675472165	0.675472165				
benzyl alcohol	10.35173734	0.725584			22.86008663	1.602331333			1.005317197	0.784973702	0.070465666	0.055021137				
dimethylphenol, 2,4-									0.037082633	0.037082633	0.002029246	0.002029246				
methylphenol, 2- (o-cresol)					10.18514863	0.660916667			0.091443043	0.091443043	0.005188375	0.005188375				
methylphenol, 4- (p-cresol)					0.7	0.050166667			0.978761233	0.978761233	0.055627496	0.055627496				
pentachlorophenol			0.052196401	0.002673	75.18000182	3.85	0.521964013	0.02673	0.73082842	0.381301784	0.037426036	0.019526627				
phenol (total)	20.94028845	1.46288			47.98816103	3.352433333			2.095527666	0.733434683	0.124179104	0.043462687				
styrene (phenylethylene)	23.2815508	1.287146667	0.021244415	0.001174521	50.92839237	2.815633333	0.212444151	0.011745213								
Tributyltin																
Trichlorophenol, 2,4,6-			0.110880737	0.005890667			1.108807373	0.058906667								
Aluminum																
Antimony	5.7856	0.289834667			12.656	0.634013333										
Arsenic (III)																
Arsenic (V)																
Arsenic (total)			0.0340472	0.001707413	6.424	0.322153333	0.340472	0.017074127					210.24	10.5432	110.96	5.564466667
Barium	461.44	23.12053333			5768	289.0066667										
Beryllium	505.728	25.28917333			1106.28	55.32006667										
Cadmium	1.104	0.055893333			2.415	0.122266667			33.67271	25.63146582	1.683926523	1.281794816				
Chromium (VI)	18.432	0.92576			40.32	2.0251							5.76	0.2893	3.84	0.192866667
Chromium, total (or III)									5401.270588	5201.223529	270.0910588	260.0876863				
Cobalt																
Copper	262.848	13.19370667			577.2	28.97266667			780.4933153	780.4933153	39.03535426	39.03535426			5.0616	0.254068
Iron																
Lead									1334.514188	1133.078085	66.72686322	56.65488386			500.01	25.00071667
Manganese					19.6	1.404666667										

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	UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Mercury	5.0112	0.250976			10.962	0.54901			0.591436697	0.410998383	0.029572176	0.020550156	2.1924	0.109802	0.012528	0.00062744
Mercury (organic)																
Molybdenum					0.7	0.050166667										
Nickel	417.28	20.89173333			912.8	45.70066667										
Selenium	8.32	0.422933333			18.2	0.925166667							2.08	0.105733333	0.52	0.026433333
Silver	13.6	0.686933333			29.75	1.502666667			12.206129	12.206129	0.610439245	0.610439245				
Tin																
Thallium	1.59488	0.079841067			3.4888	0.174652333										
Vanadium					0.98	0.070233333										
Zinc	5971.2	298.976			13062	654.01			764.6707895	326.5781497	38.24014829	16.33173			129.376	6.477813333
LPAH																
HPAH																
Total Petroleum Hydrocarbons													0.000832	5.96267E-05		
Gasoline																
Gasoline (w/benzene)																
Diesel																
Heavy Oil																
2,3,7,8-TCDD (Dioxin)			1.6994E-06	8.50203E-08				1.6994E-05	8.50203E-07							
Aldrin	0.2346509	0.0117532	0.00251617	0.00012603	0.513298843	0.025710125	0.025161708	0.0012603					2.444280203	0.122429167	0.001857653	9.30462E-05
alpha-BHC (Benzene HexaChloride)			0.00054501	2.84537E-05			0.005450105	0.000284537								
beta-BHC			0.00227403	0.000117914			0.022740303	0.001179144								
gamma-BHC (Lindane)	0.148996776	0.0078656			0.325930447	0.017206							0.06208199	0.003277333	0.00248328	0.000131093
Chlordane	8.241627595	0.412773333	0.257550862	0.012899167	18.02856036	0.902941667	2.575508623	0.128991667					2.472488278	0.123832	0.004429875	0.000221866
4,4'-DDT	108.5014446	5.425765333	3.490395734	0.174542083	237.3469101	11.86886167	34.90395737	1.745420833					14.91894863	0.746042733	0.013562681	0.000678221
4,4'-DDE			0.445761413	0.022310355			4.457614135	0.223103554					1.905311642	0.095360833	0.001732101	8.66917E-05
4,4'-DDD			0.33541677	0.016802431			3.354167703	0.168024306					1.012000313	0.050695333	0.00092	4.60867E-05
Dieldrin	0.411936858	0.020666133	0.002815975	0.000141272	0.901111878	0.045207167	0.028159746	0.001412724					1.287302682	0.064581667	0.00097835	4.90821E-05
alpha-Endosulfan	4.300876378	0.22336			9.408167076	0.4886							0.009856175	0.000511867	0.002508845	0.000130293
beta-Endosulfan	4.300876378	0.22336			9.408167076	0.4886							0.009856175	0.000511867	0.002508845	0.000130293
Endosulfan Sulfate	4.300876378	0.22336			9.408167076	0.4886							0.009856175	0.000511867	0.002508845	0.000130293
Endrin	1.057058563	0.0532688			2.312315606	0.1165255							0.039639696	0.00199758	0.000506507	2.55246E-05
Endrin Aldehyde	1.057058563	0.0532688			2.312315606	0.1165255							0.039639696	0.00199758	0.000506507	2.55246E-05
Heptachlor	1.55709984	0.078517333	0.003784618	0.000190841	3.4061559	0.171756667	0.037846177	0.001908407					0.10121149	0.005103627	0.000739622	3.72957E-05
Heptachlor Epoxide	0.17347207	0.008682613	0.008019234	0.000401378	0.379470154	0.018993217	0.08019234	0.004013782								
Toxaphene																

Table A-1. Soil Screening Level Deriva

MEDIA - MTCA Standard																
<b>PATHWAYS</b>	Soil to Method B-HH Groundwater Protection - <b>NC</b> , WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 CLARC Database Vadose Soil	Soil to Method B-HH Groundwater Protection - <b>NC</b> , WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 CLARC Database Saturated Soil	Soil to Method B-HH Groundwater Protection - <b>Carc</b> , WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 CLARC Database Vadose Soil	Soil to Method B-HH Groundwater Protection - <b>Carc</b> , WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 CLARC Database Saturated Soil	Soil to Method C-HH Groundwater Protection - <b>NC</b> , WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 Vadose Soil	Soil to Method C-HH Groundwater Protection - <b>NC</b> , WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 Saturated Soil	Soil to Method C-HH Groundwater Protection - <b>Carc</b> , WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 Vadose Soil	Soil to Method C-HH Groundwater Protection - <b>Carc</b> , WAC 173-340-740(3)(b)(iii)(A) EQ. 747-1/ 747-2 Saturated Soil	Soil to Sediment Protection Ecology <b>CSL</b> , WAC 173-340-740(1)(d) EQ. 747-1/ 747-2 Vadose Soil	Soil to Sediment Protection Ecology <b>SQS</b> , WAC 173-340-740(1)(d) EQ. 747-1/ 747-2 Vadose Soil	Soil to Sediment Protection Ecology <b>CSL</b> , WAC 173-340-740(1)(d) EQ. 747-1/ 747-2 Saturated Soil	Soil to Sediment Protection Ecology <b>SQS</b> , WAC 173-340-740(1)(d) EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection Aquatic Life <b>SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA</b> , WAC 173-340-730(2)(b)(i)(A) <b>Fresh - Acute</b> Vadose Soil	Soil to Surface Water Protection Aquatic Life <b>SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA</b> , WAC 173-340-730(2)(b)(i)(A) <b>Fresh - Acute</b> Saturated Soil	Soil to Surface Water Protection Aquatic Life <b>SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA</b> , WAC 173-340-730(2)(b)(i)(A) <b>Fresh - Chronic</b> Vadose Soil	Soil to Surface Water Protection Aquatic Life <b>SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA</b> , WAC 173-340-730(2)(b)(i)(A) <b>Fresh - Chronic</b> Saturated Soil
<b>UNITS</b>	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
<b>Screening Levels Added by Integ</b>																
1,2,4-Trimethylbenzene	NV	NV	NV	NV												
1-Methylnaphthalene	NV	NV	NV	NV												
Carbazole	NV	NV	0.316800005	0.016221333												
Carbon disulfide	5.6	0.266133333	NV	NV												
Chloride	--	--	NV	NV												
cis-1,2-Dichloroethene	0.351026667	0.022586667	NV	NV												
Isophorone	NV	NV	0.227261528	0.015348667												
n-Nitrosodi-n-propylamine	NV	NV	4.30095E-05	2.98E-06												
Sulfate	--	--	NV	NV												
trans-1,2-Dichloroethene	0.5436	0.032466667	NV	NV												
Tributyl phosphate	NV	NV	NV	NV												

Integral's leaching calculations used the final groundwater screening levels, which were based on a variety of ARARs among the different chemicals.



Table A-1. Soil Screening Level Deriva

MEDIA - MTCA Standard		SOIL PATHWAY EVALUATION													
PATHWAYS	Soil to Surface Water Protection Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Marine - Acute Vadose Soil	Soil to Surface Water Protection Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Marine - Acute Saturated Soil	Soil to Surface Water Protection Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Marine - Chronic Vadose Soil	Soil to Surface Water Protection Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Marine - Chronic Saturated Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Saltwater Acute EQ. 747-1/ 747-2 Vadose Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Saltwater Acute EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Saltwater Chronic EQ. 747-1/ 747-2 Vadose Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Saltwater Chronic EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Freshwater Acute EQ. 747-1/ 747-2 Vadose Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Freshwater Acute EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Freshwater Chronic EQ. 747-1/ 747-2 Vadose Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Freshwater Chronic EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC HH-Consumption; Water & Organisms EQ. 747-1/ 747-2 Vadose Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC HH-Consumption; Water & Organisms EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC HH-Consumption EQ. 747-1/ 747-2 Vadose Soil
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
acetone															
acenaphthene (CAS 83-29-9)													84.73310692	4.294476667	125.2026505
acenaphthylene (CAS 208-96-8)															
anthracene													3419.632718	171.6993333	16480.15768
benzene			6.23										0.016947663	0.000994767	0.392877653
benzo(g,h,i)perylene															
benzo[a]anthracene													0.0324368	0.001622169	0.153648001
benzo[a]pyrene													0.059812	0.002990929	0.283320001
benzo[b]fluoranthene													0.0610508	0.003052869	0.289188001
benzo[k]fluoranthene													0.059812	0.002990929	0.283320001
bis(2-ethylhexyl) phthalate													3.974400023	0.198824	7.286400042
butyl benzyl phthalate													286.770134	14.4685	363.2421697
carbon tetrachloride													0.001662011	7.71205E-05	0.011561813
chlorobenzene													1.245464024	0.072106667	15.32878799
chloroethane (ethyl chloride)															
chloroform (trichloromethane)													0.028277673	0.001833728	2.331667802
chloromethane															
chrysene			5.72										0.017958801	0.000898269	0.085068007
dibenz[a,h]anthracene													0.1992872	0.009964689	0.943992
dibenzofuran															
di-butyl phthalate (di-n-butyl phth.)													66.40025665	3.493333333	149.4005775
dichlorobenzene, 1,2-													5.459212073	0.306502	16.89756118
dichlorobenzene, 1,3-													1.28	0.091733333	3.84
dichlorobenzene, 1,4-													0.8096508	0.045402	2.441804
dichloroethane, 1,1-															
dichloroethane, 1,2-													0.001884595	0.000125574	0.183500003
dichloroethylene, 1,1-													2.161907685	0.1061632	46.5137714
diethyl phthalate													110.9087367	7.018733333	287.0579067
dimethyl phthalate													1080	77.4	4400
di-n-octyl phthalate															
ethylbenzene													7.904778025	0.426367333	31.32081859
fluoranthene													184.7300817	9.247766667	198.9400879
fluorene													252.7875024	12.73433333	1217.976148
hexachlorobenzene													2.0082E-05	1.02667E-06	2.07992E-05
hexachlorobutadiene													0.042633732	0.000563273	1.744107221
indeno[1,2,3-cd]pyrene													0.2033912	0.010169889	0.963432
MEK (Methyl Ethyl Ketone;2-Butanone)															
methylene chloride (dichloromethane)													0.022273435	0.001427871	2.856810188
methylnaphthalene, 2-															
MIBK (M-Isobutyl-K;4-M,2-Pentanone)															
naphthalene															

Table A-1. Soil Screening Level Deriva

MEDIA - MTCA Standard		SOIL PATHWAY EVALUATION														
PATHWAYS HH - Human Health Ecol- Ecological	Soil to Surface Water Protection Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Marine - Acute Vadose Soil	Soil to Surface Water Protection Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Marine - Acute Saturated Soil	Soil to Surface Water Protection Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Marine - Chronic Vadose Soil	Soil to Surface Water Protection Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Marine - Chronic Saturated Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Saltwater Acute EQ. 747-1/ 747-2 Vadose Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Saltwater Acute EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Saltwater Chronic EQ. 747-1/ 747-2 Vadose Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Saltwater Chronic EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Freshwater Acute EQ. 747-1/ 747-2 Vadose Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Freshwater Acute EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Freshwater Chronic EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Freshwater Chronic EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC HH-Consumption; Water & Organisms EQ. 747-1/ 747-2 Vadose Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC HH-Consumption; Water & Organisms EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC HH-Consumption Organisms EQ. 747-1/ 747-2 Vadose Soil	
	UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
nitrosodiphenylamine, N-								0.027012728	0.0013532				0.41936428	0.0212542	0.76248051	
PCB mixtures	9.004242667	0.451066667	0.027012728	0.0013532				0.027012728	0.0013532			0.01260594	0.000631493	5.76272E-05	2.88683E-06	5.76272E-05
PCB - Aroclor 1016																
PCB - Aroclor 1221																
PCB - Aroclor 1232																
PCB - Aroclor 1242																
PCB - Aroclor 1248																
PCB - Aroclor 1254																
PCB - Aroclor 1260																
phenanthrene																
pyrene													1155.5267	57.84823333	5568.803375	
tetrachloroethylene (perchloroethylene)													0.005099716	0.000271492	0.024389947	
trichlorobenzene, 1,2,4-													0.189434467	0.012402833	0.378868933	
trichlorethane, 1,1,1-																
trichlorethane, 1,1,2-													0.003193328	0.000209076	0.086598718	
trichloroethylene													0.015130861	0.000885917	0.181570332	
trimethylbenzene, 1,3,5-																
toluene													12.64542651	0.721066667	145.9087675	
vinyl chloride (chloroethylene)													0.000161144	7.76017E-06	0.015469828	
xylene (dimethylbenzene)																
benzoic acid																
benzyl alcohol																
dimethylphenol, 2,4-													6.961625688	0.381013333	15.57205746	
methylphenol, 2- (o-cresol)																
methylphenol, 4- (p-cresol)																
pentachlorophenol	0.930800023	0.047666667	0.565640014	0.028966667	0.930800023	0.047666667	0.565640014	0.028966667	1.360400033	0.069666667	1.074000026	0.055	0.019332	0.00099	0.214800005	
phenol (total)													43.62560094	3.047666667	3751.80168	
styrene (phenylethylene)																
Tributyltin					0.00168	0.0001204	0.0000296	2.12133E-06	0.00184	0.000131867	0.000288	0.00002064				
Trichlorophenol, 2,4,6-													0.038808258	0.002061733	0.066528442	
Aluminum																
Antimony													5.0624	0.253605333	578.56	
Arsenic (III)																
Arsenic (V)																
Arsenic (total)	40.296	2.02078	21.024	1.05432	40.296	2.02078	21.024	1.05432	198.56	9.957466667	87.6	4.393	0.010512	0.00052716	0.08176	
Barium													824	41.28666667		
Beryllium																
Cadmium	5.796	0.29344	1.2834	0.064976	5.52	0.279466667	1.2144	0.061482667	0.276	0.013973333	0.0345	0.001746667				
Chromium (VI)	422.4	21.21533333	19.2	0.964333333	422.4	21.21533333	19.2	0.964333333	6.144	0.308586667	4.224	0.212153333				
Chromium, total (or III)									11402.28	570.1634	1480.296	74.02121333				
Cobalt																
Copper	2.1312	0.106976	1.3764	0.069088667	2.1312	0.106976	1.3764	0.069088667	5.772	0.289726667	3.996	0.20058	577.2	28.97266667		
Iron												4	0.286666667	1.2	0.086	
Lead	42000.84	2100.0602	1620.0324	81.002322	42000.84	2100.0602	1620.0324	81.002322	13000.26	650.0186333	500.01	25.00071667				
Manganese													0.2	0.014333333	0.4	

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Table A-1. Soil Screening Level Deriva

MEDIA - MTCA Standard		SOIL PATHWAY EVALUATION													
PATHWAYS HH - Human Health Ecol- Ecological	Soil to Surface Water Protection Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Marine - Acute Vadose Soil	Soil to Surface Water Protection Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Marine - Acute Saturated Soil	Soil to Surface Water Protection Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Marine - Chronic Vadose Soil	Soil to Surface Water Protection Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Marine - Chronic Saturated Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Saltwater Acute EQ. 747-1/ 747-2 Vadose Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Saltwater Acute EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Saltwater Chronic EQ. 747-1/ 747-2 Vadose Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Saltwater Chronic EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Freshwater Acute EQ. 747-1/ 747-2 Vadose Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Freshwater Acute EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Freshwater Chronic EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Freshwater Chronic EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC HH-Consumption; Water & Organisms EQ. 747-1/ 747-2 Vadose Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC HH-Consumption; Water & Organisms EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC HH-Consumption; Water & Organisms EQ. 747-1/ 747-2 Saturated Soil
	UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Mercury	1.8792	0.094116	0.0261	0.001307167	1.8792	0.094116	0.98136	0.049149467	1.4616	0.073201333	0.80388	0.040260733			
Mercury (organic)															0.0012
Molybdenum															
Nickel	96.496	4.831213333	10.6928	0.535350667	96.496	4.831213333	10.6928	0.535350667	612.88	30.68473333	67.808	3.394906667	795.44	39.82486667	5998.4
Selenium	30.16	1.533133333	7.384	0.375353333	30.16	1.533133333	7.384	0.375353333			0.52	0.026433333	17.68	0.898733333	436.8
Silver	0.323	0.016314667			0.323	0.016314667			0.544	0.027477333					
Tin															
Thallium													0.34176	0.0171088	0.66928
Vanadium															
Zinc	111.96	5.6058	100.764	5.04522	111.96	5.6058	100.764	5.04522	149.28	7.4744	149.28	7.4744	9205.6	460.9213333	32344
LPAH															
HPAH															
Total Petroleum Hydrocarbons															
Gasoline															
Gasoline (w/benzene)															
Diesel															
Heavy Oil															
2,3,7,8-TCDD (Dioxin)													1.465E-08	7.32933E-10	1.4943E-08
Aldrin	0.694175578	0.034769883	0.001857653	9.30462E-05	1.271025706	0.063663167			2.933136244	0.146915			4.79079E-05	2.39961E-06	4.88856E-05
alpha-BHC (Benzene HexaChloride)													0.000102026	5.32653E-06	0.00019228
beta-BHC													0.000425698	2.20736E-05	0.000795261
gamma-BHC (Lindane)	0.004966559	0.000262187			0.004966559	0.000262187			0.029488945	0.001556733			0.030420175	0.001605893	0.055873791
Chlordane	0.09271831	0.0046437	0.004120814	0.000206387	0.09271831	0.0046437	0.004120814	0.000206387	2.472488278	0.123832	0.004429875	0.000221866	0.000824163	4.12773E-05	0.000834465
4,4'-DDT	1.763148475	0.088168687	0.013562681	0.000678221	1.763148475	0.088168687	0.013562681	0.000678221	14.91894863	0.746042733	0.013562681	0.000678221	0.00298379	0.000149209	0.00298379
4,4'-DDE	0.225173194	0.011269917	0.001732101	8.66917E-05									0.000381062	1.90722E-05	0.000381062
4,4'-DDD	0.119600037	0.005991267	0.00092	4.60867E-05									0.0002852	1.42869E-05	0.0002852
Dieldrin	0.365593962	0.018341193	0.00097835	4.90821E-05	0.365593962	0.018341193	0.00097835	4.90821E-05	0.123581058	0.00619984	0.02883558	0.001446629	2.67759E-05	1.3433E-06	2.78057E-05
alpha-Endosulfan	0.001523227	7.91067E-05	0.000389767	0.000020242	0.001523227	7.91067E-05	0.000389767	0.000020242	0.009856175	0.000511867	0.002508845	0.000130293	2.777649327	0.144253333	3.987270808
beta-Endosulfan	0.001523227	7.91067E-05	0.000389767	0.000020242	0.001523227	7.91067E-05	0.000389767	0.000020242	0.009856175	0.000511867	0.002508845	0.000130293	2.777649327	0.144253333	3.987270808
Endosulfan Sulfate	0.001523227	7.91067E-05	0.000389767	0.000020242	0.001523227	7.91067E-05	0.000389767	0.000020242	0.009856175	0.000511867	0.002508845	0.000130293	2.777649327	0.144253333	3.987270808
Endrin	0.00814816	0.000410614	0.000506507	2.55246E-05	0.00814816	0.000410614	0.000506507	2.55246E-05	0.018938966	0.000954399	0.007927939	0.000399516	0.012993011	0.000654762	0.013213232
Endrin Aldehyde	0.00814816	0.000410614	0.000506507	2.55246E-05	0.00814816	0.000410614	0.000506507	2.55246E-05	0.018938966	0.000954399	0.007927939	0.000399516	0.063863955	0.003218323	0.06606616
Heptachlor	0.010315786	0.000520177	0.000700695	3.53328E-05	0.010315786	0.000520177	0.000700695	3.53328E-05	0.10121149	0.005103627	0.000739622	3.72957E-05	1.53764E-05	7.75359E-07	1.53764E-05
Heptachlor Epoxide					0.088404036	0.004424793	0.006004802	0.000300552	0.867360352	0.043413067	0.006338403	0.000317249	6.5052E-05	3.25598E-06	6.5052E-05
Toxaphene					0.00084	0.0000602	0.000008	5.73333E-08	0.00292	0.000209267	0.000008	5.73333E-08	0.00000112	8.02667E-08	0.00000112

Table A-1. Soil Screening Level Deriva

MEDIA - MTCA Standard		SOIL PATHWAY EVALUATION														
<b>PATHWAYS</b>	Soil to Surface Water Protection Aquatic Life <b>SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Marine - Acute Vadose Soil</b>	Soil to Surface Water Protection Aquatic Life <b>SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Marine - Acute Saturated Soil</b>	Soil to Surface Water Protection Aquatic Life <b>SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Marine - Chronic Vadose Soil</b>	Soil to Surface Water Protection Aquatic Life <b>SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Marine - Chronic Saturated Soil</b>	Soil to Surface Water Protection WAC 173-340-740(1)(d) <b>NRWQC Saltwater Acute EQ. 747-1/ 747-2 Vadose Soil</b>	Soil to Surface Water Protection WAC 173-340-740(1)(d) <b>NRWQC Saltwater Acute EQ. 747-1/ 747-2 Saturated Soil</b>	Soil to Surface Water Protection WAC 173-340-740(1)(d) <b>NRWQC Saltwater Chronic EQ. 747-1/ 747-2 Vadose Soil</b>	Soil to Surface Water Protection WAC 173-340-740(1)(d) <b>NRWQC Saltwater Chronic EQ. 747-1/ 747-2 Saturated Soil</b>	Soil to Surface Water Protection WAC 173-340-740(1)(d) <b>NRWQC Freshwater Acute EQ. 747-1/ 747-2 Vadose Soil</b>	Soil to Surface Water Protection WAC 173-340-740(1)(d) <b>NRWQC Freshwater Acute EQ. 747-1/ 747-2 Saturated Soil</b>	Soil to Surface Water Protection WAC 173-340-740(1)(d) <b>NRWQC Freshwater Chronic EQ. 747-1/ 747-2 Vadose Soil</b>	Soil to Surface Water Protection WAC 173-340-740(1)(d) <b>NRWQC Freshwater Chronic EQ. 747-1/ 747-2 Saturated Soil</b>	Soil to Surface Water Protection WAC 173-340-740(1)(d) <b>NRWQC HH-Consumption; Water &amp; Organisms EQ. 747-1/ 747-2 Vadose Soil</b>	Soil to Surface Water Protection WAC 173-340-740(1)(d) <b>NRWQC HH-Consumption; Water &amp; Organisms EQ. 747-1/ 747-2 Saturated Soil</b>	Soil to Surface Water Protection WAC 173-340-740(1)(d) <b>NRWQC HH-Consumption Organisms EQ. 747-1/ 747-2 Vadose Soil</b>	
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
<b>Screening Levels Added by Integ</b>																
1,2,4-Trimethylbenzene																
1-Methylnaphthalene																
Carbazole																
Carbon disulfide																
Chloride																
<i>cis</i> -1,2-Dichloroethene																
Isophorone																
<i>n</i> -Nitrosodi- <i>n</i> -propylamine																
Sulfate																
<i>trans</i> -1,2-Dichloroethene																
Tributyl phosphate																

Table A-1. Soil Screening Level Deriva

MEDIA - MTCA Standard																
PATHWAYS HH - Human Health Ecol- Ecological	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC HH-Consumption Organisms EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection Aquatic Life Fresh/Acute, NTR - 40 CFR 131.36 Vadose Soil	Soil to Surface Water Protection Aquatic Life Fresh/Acute, NTR - 40 CFR 131.36 Saturated Soil	Soil to Surface Water Protection Aquatic Life Fresh/Chronic, NTR - 40 CFR 131.36 Vadose Soil	Soil to Surface Water Protection Aquatic Life Fresh/Chronic, NTR - 40 CFR 131.36 Saturated Soil	Soil to Surface Water Protection Aquatic Life Marine/Acute, NTR - 40 CFR 131.36 Vadose Soil	Soil to Surface Water Protection Aquatic Life Marine/Acute, NTR - 40 CFR 131.36 Saturated Soil	Soil to Surface Water Protection Aquatic Life Marine/Chronic, NTR - 40 CFR 131.36 Vadose Soil	Soil to Surface Water Protection Aquatic Life Marine/Chronic, NTR - 40 CFR 131.36 Saturated Soil	Soil to Surface Water Protection Aquatic Life Marine/Chronic, NTR - 40 CFR 131.36 Saturated Soil	Soil to Surface Water Protection HH - Fresh Water Water & Organism Consumption NTR - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10 <sup>6</sup> Carc Risk Vadose Soil	Soil to Surface Water Protection HH - Fresh Water Water & Organism Consumption NTR - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10 <sup>6</sup> Carc Risk Saturated Soil	Soil to Surface Water Protection HH - Fresh Water Organism Consumption Only NTR - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10 <sup>6</sup> Carc Risk Vadose Soil	Soil to Surface Water Protection HH - Fresh Water Organism Consumption Only NTR - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10 <sup>6</sup> Carc Risk Saturated Soil	Soil Protective of Vapor, Direct Contact, WAC 173-340-740(3)(b)(iii)C	Soil Protective of Vapor, Indoor/Ambient Exposure WAC 173-340-740(3)(c)(iv)(B)
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
acetone																
acenaphthene (CAS 83-29-9)	6.34557															
acenaphthylene (CAS 208-96-8)																
anthracene	827.4666667										3955.237842	198.592	45320.43361	2275.533333		
benzene	0.0230605										0.00924418	0.0005426	0.546947321	0.032103833		
benzo(g,h,i)perylene																
benzo[a]anthracene	0.00768396										0.0239008	0.001195283	0.264616001	0.013233487		
benzo[a]pyrene	0.01416756										0.044072	0.002203843	0.487940001	0.024399687		
benzo[b]fluoranthene	0.01446096										0.0449848	0.002249483	0.498046001	0.024904987		
benzo[k]fluoranthene	0.01416756										0.044072	0.002203843	0.487940001	0.024399687		
bis(2-ethylhexyl) phthalate	0.364510667										5.961600034	0.298236	19.54080011	0.977551333		
butyl benzyl phthalate	18.32676667															
carbon tetrachloride	0.000536491										0.001806533	8.38267E-05	0.031794987	0.001475349		
chlorobenzene	0.887466667										6.514734897	0.377173333	201.1903424	11.648		
chloroethane (ethyl chloride)											0.002157324	0.000127267	0.178900071	0.010553827		
chloroform (trichloromethane)	0.151202133										0.028277673	0.001833728	2.331667802	0.151202133		
chloromethane																
chrysene	0.00425496										0.013232801	0.000661883	0.146506011	0.007327987		
dibenz[a,h]anthracene	0.04720116										0.1468432	0.007342403	1.625764	0.081290887		
dibenzofuran																
di-butyl phthalate (di-n-butyl phth.)	7.86										89.64034648	4.716	398.4015399	20.96		
dichlorobenzene, 1,2-	0.948696667										35.09493476	1.97037	220.9681077	12.40603333		
dichlorobenzene, 1,3-	0.2752										1.6	0.114666667	10.4	0.745333333		
dichlorobenzene, 1,4-	0.136926667										5.14064	0.288266667	33.41416	1.873733333		
dichloroethane, 1,1-																
dichloroethane, 1,2-	0.012226897										0.001884595	0.000125574	0.490986494	0.03271521		
dichloroethylene, 1,1-	2.284117333										0.00037342	1.83373E-05	0.020963953	0.001029461		
diethyl phthalate	18.16613333										150.0529967	9.495933333	782.8852	49.544		
dimethyl phthalate	315.3333333										1252	89.72666667	11600	831.3333333		
di-n-octyl phthalate																
ethylbenzene	1.68938										46.23549411	2.493846667	432.52559	23.32953333		
fluoranthene	9.959133333										426.3001884	21.341	525.7702324	26.32056667		
fluorene	61.35633333										298.7488665	15.04966667	3217.295485	162.0733333		
hexachlorobenzene	1.06333E-06										0.000053791	0.00000275	5.52254E-05	2.82333E-06		
hexachlorobutadiene	0.023043										0.042633732	0.000563273	4.844742281	0.064008333		
indeno[1,2,3-cd]pyrene	0.04817316										0.1498672	0.007493603	1.659244001	0.082964887		
MEK (Methyl Ethyl Ketone;2-Butanone)																
methylene chloride (dichloromethane)	0.183139933										0.02275764	0.001458911	7.747281865	0.496650667		
methylnaphthalene, 2-																
MIBK (M-Isobutyl-K;4-M,2-Pentanone)																
naphthalene																

Table A-1. Soil Screening Level Deriva

MEDIA - MTCA Standard																
PATHWAYS HH - Human Health Ecol- Ecological	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC HH-Consumption Organisms EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection Aquatic Life Fresh/Acute, NTR - 40 CFR 131.36 Vadose Soil	Soil to Surface Water Protection Aquatic Life Fresh/Acute, NTR - 40 CFR 131.36 Saturated Soil	Soil to Surface Water Protection Aquatic Life Fresh/Chronic, NTR - 40 CFR 131.36 Vadose Soil	Soil to Surface Water Protection Aquatic Life Fresh/Chronic, NTR - 40 CFR 131.36 Saturated Soil	Soil to Surface Water Protection Aquatic Life Marine/Acute, NTR - 40 CFR 131.36 Vadose Soil	Soil to Surface Water Protection Aquatic Life Marine/Acute, NTR - 40 CFR 131.36 Saturated Soil	Soil to Surface Water Protection Aquatic Life Marine/Chronic, NTR - 40 CFR 131.36 Vadose Soil	Soil to Surface Water Protection Aquatic Life Marine/Chronic, NTR - 40 CFR 131.36 Saturated Soil	Soil to Surface Water Protection Aquatic Life Marine/Chronic, NTR - 40 CFR 131.36 Saturated Soil	Soil to Surface Water Protection HH - Fresh Water Water & Organism Consumption NTR - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10 <sup>6</sup> Carc Risk Vadose Soil	Soil to Surface Water Protection HH - Fresh Water Water & Organism Consumption NTR - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10 <sup>6</sup> Carc Risk Saturated Soil	Soil to Surface Water Protection HH - Fresh Water Organism Consumption Only NTR - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10 <sup>6</sup> Carc Risk Vadose Soil	Soil to Surface Water Protection HH - Fresh Water Organism Consumption Only NTR - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10 <sup>6</sup> Carc Risk Saturated Soil	Soil Protective of Vapor, Direct Contact, WAC 173-340-740(3)(b)(iii)C	Soil Protective of Vapor, Indoor/Ambient Exposure WAC 173-340-740(3)(c)(iv)(B)
	UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Nitrosodiphenylamine, N-	0.038644										0.635400425	0.032203333	2.033281359	0.103050667		
PCB mixtures	2.88683E-06										0.000153072	7.66813E-06	0.000153072	7.66813E-06		
PCB - Aroclor 1016				0.007646999	0.000383553			0.016386425	0.0008219							
PCB - Aroclor 1221				0.002949131	0.000148633			0.006319565	0.0003185							
PCB - Aroclor 1232				0.002949131	0.000148633			0.006319565	0.0003185							
PCB - Aroclor 1242				0.000181685	1.02881E-05			0.000389324	0.000022046							
PCB - Aroclor 1248				0.012348437	0.000618613			0.026460936	0.0013256							
PCB - Aroclor 1254				0.021235481	0.001062973			0.045504602	0.0022778							
PCB - Aroclor 1260				0.058016334	0.002902013			0.124320715	0.0062186							
phenanthrene																
pyrene	278.7866667										1336.51281	66.9088	15314.20928	766.6633333		
tetrachloroethylene (perchloroethylene)	0.00129844										0.005912714	0.000314773	0.065409403	0.00348218		
trichlorobenzene, 1,2,4-	0.024805667															
trichlorethane, 1,1,1-																
trichlorethane, 1,1,2-	0.005669867										0.003247452	0.00021262	0.227321635	0.0148834		
trichloroethylene	0.010631										0.01634133	0.00095679	0.490239896	0.0287037		
trimethylbenzene, 1,3,5-																
toluene	8.32										66.14530792	3.771733333	1945.450233	110.9333333		
vinyl chloride (chloroethylene)	0.000744976										0.012891524	0.000620813	3.384024973	0.1629635		
xylene (dimethylbenzene)																
benzoic acid																
benzyl alcohol																
dimethylphenol, 2,4-	0.852266667															
methylphenol, 2- (o-cresol)																
methylphenol, 4- (p-cresol)																
pentachlorophenol	0.011	1.432000035	0.073333333	0.930800023	0.047666667	0.930800023	0.047666667	0.565640014	0.028966667	0.020048	0.001026667	0.587120014	0.030066667			
phenol (total)	262.0993333									91.61376196	6.4001	20067.77643	1401.926667			
styrene (phenylethylene)																
Tributyltin																
Trichlorophenol, 2,4,6-	0.0035344									0.058212387	0.0030926	0.180181198	0.009572333			
Aluminum																
Antimony	28.98346667									12.656	0.634013333	3887.2	194.7326667			
Arsenic (III)																
Arsenic (V)																
Arsenic (total)	0.004100133	210.24	10.5432	110.96	5.564466667	40.296	2.02078	21.024	1.05432	0.010512	0.00052716	0.08176	0.004100133			
Barium																
Beryllium																
Cadmium		0.5106	0.025850667	0.138	0.006986667	5.796	0.29344	1.2834	0.064976							
Chromium (VI)		5.76	0.2893	3.84	0.192866667	422.4	21.21533333	19.2	0.964333333							
Chromium, total (or III)		11002.2	550.1576667	3600.72	180.0516											
Cobalt																
Copper		7.548	0.378873333	4.884	0.245153333	1.0656	0.053488	1.0656	0.053488							
Iron																
Lead		13000.26	650.0186333	500.01	25.00071667	42000.84	2100.0602	1620.0324	81.002322							
Manganese	0.028666667															



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	UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Mercury		2.1924	0.109802	167.04	8.365866667	1.8792	0.094116	0.0261	0.001307167	0.14616	0.007320133	0.1566	0.007843			
Mercury (organic)	0.000086															
Molybdenum																
Nickel	300.3186667	1825.6	91.40133333	6.52	0.326433333	96.496	4.831213333	10.6928	0.535350667	795.44	39.82486667	5998.4	300.3186667			
Selenium	22.204	2.08	0.105733333			30.16	1.533133333	7.384	0.375353333							
Silver		0.578	0.029194667			0.323	0.016314667									
Tin																
Thallium	0.033504733									2.4208	0.121187333	8.9712	0.449106			
Vanadium																
Zinc	1619.453333	136.84	6.851533333	124.4	6.228666667	111.96	5.6058	100.764	5.04522							
LPAH																
HPAH																
Total Petroleum Hydrocarbons																
Gasoline																
Gasoline (w/benzene)																
Diesel																
Heavy Oil																
2,3,7,8-TCDD (Dioxin)	7.47592E-10									3.809E-08	1.90563E-09	4.102E-08	2.05221E-09			
Aldrin	2.44858E-06	2.933136244	0.146915			1.271025706	0.063663167			0.000127103	6.36632E-06	0.00013688	6.85603E-06			
alpha-BHC (Benzene HexaChloride)	1.00385E-05									0.000153039	7.9898E-06	0.00051013	2.66327E-05			
beta-BHC	4.12363E-05									0.000654921	3.39593E-05	0.002151882	0.000111581			
gamma-BHC (Lindane)	0.0029496	0.06208199	0.003277333	0.00248328	0.000131093	0.004966559	0.000262187			0.000589779	3.11347E-05	0.001955583	0.000103236			
Chlordane	4.17933E-05	2.472488278	0.123832	0.004429875	0.000221866	0.09271831	0.0046437	0.004120814	0.000206387	0.000587216	2.94101E-05	0.00060782	3.0442E-05			
4,4'-DDT	0.000149209	14.91894863	0.746042733	0.013562681	0.000678221	1.763148475	0.088168687	0.013562681	0.000678221	0.008001982	0.00040015	0.008001982	0.00040015			
4,4'-DDE	1.90722E-05									0.00102194	5.11481E-05	0.00102194	5.11481E-05			
4,4'-DDD	1.42869E-05									0.0007636	3.82519E-05	0.0007728	3.87128E-05			
Dieldrin	1.39496E-06	1.287302682	0.064581667	0.00097835	4.90821E-05	0.365593962	0.018341193	0.00097835	4.90821E-05	7.2089E-05	3.61657E-06	7.2089E-05	3.61657E-06			
alpha-Endosulfan	0.207073333	0.009856175	0.000511867	0.002508845	0.000130293	0.001523227	7.91067E-05	0.000389767	0.000020242							
beta-Endosulfan	0.207073333	0.009856175	0.000511867	0.002508845	0.000130293	0.001523227	7.91067E-05	0.000389767	0.000020242							
Endosulfan Sulfate	0.207073333	0.009856175	0.000511867	0.002508845	0.000130293	0.001523227	7.91067E-05	0.000389767	0.000020242							
Endrin	0.00066586	0.039639696	0.00199758	0.000506507	2.55246E-05	0.00814816	0.000410614	0.000506507	2.55246E-05	0.016736761	0.000843423	0.178378632	0.00898911			
Endrin Aldehyde	0.0033293	0.039639696	0.00199758	0.000506507	2.55246E-05	0.00814816	0.000410614	0.000506507	2.55246E-05	0.016736761	0.000843423	0.178378632	0.00898911			
Heptachlor	7.75359E-07	0.10121149	0.005103627	0.000739622	3.72957E-05	0.010315786	0.000520177	0.000700695	3.53328E-05	4.08739E-05	2.06108E-06	4.08739E-05	2.06108E-06			
Heptachlor Epoxide	3.25598E-06	0.867360352	0.043413067	0.006338403	0.000317249	0.088404036	0.004424793	0.006004802	0.000300552	0.0001668	8.34867E-06	0.00018348	9.18353E-06			
Toxaphene	8.02667E-08	0.00292	0.000209267	0.0000008	5.73333E-08	0.00084	0.0000602	0.0000008	5.73333E-08							

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MEDIA - MTCA Standard																
PATHWAYS	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC HH-Consumption Organisms EQ. 747-1/ 747-2 Saturated Soil	Soil to Surface Water Protection Aquatic Life Fresh/Acute, NTR - 40 CFR 131.36 Vadose Soil	Soil to Surface Water Protection Aquatic Life Fresh/Acute, NTR - 40 CFR 131.36 Saturated Soil	Soil to Surface Water Protection Aquatic Life Fresh/Chronic, NTR - 40 CFR 131.36 Vadose Soil	Soil to Surface Water Protection Aquatic Life Fresh/Chronic, NTR - 40 CFR 131.36 Saturated Soil	Soil to Surface Water Protection Aquatic Life Marine/Acute, NTR - 40 CFR 131.36 Vadose Soil	Soil to Surface Water Protection Aquatic Life Marine/Acute, NTR - 40 CFR 131.36 Saturated Soil	Soil to Surface Water Protection Aquatic Life Marine/Chronic, NTR - 40 CFR 131.36 Vadose Soil	Soil to Surface Water Protection Aquatic Life Marine/Chronic, NTR - 40 CFR 131.36 Saturated Soil	Soil to Surface Water Protection Aquatic Life Marine/Chronic, NTR - 40 CFR 131.36 Saturated Soil	Soil to Surface Water Protection HH - Fresh Water Water & Organism Consumption NTR - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10 <sup>-6</sup> Carc Risk Vadose Soil	Soil to Surface Water Protection HH - Fresh Water Water & Organism Consumption NTR - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10 <sup>-6</sup> Carc Risk Saturated Soil	Soil to Surface Water Protection HH - Fresh Water Organism Consumption Only NTR - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10 <sup>-6</sup> Carc Risk Vadose Soil	Soil to Surface Water Protection HH - Fresh Water Organism Consumption Only NTR - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10 <sup>-6</sup> Carc Risk Saturated Soil	Soil Protective of Vapor, Direct Contact, WAC 173-340-740(3)(b)(iii)C	Soil Protective of Vapor, Indoor/Ambient Exposure WAC 173-340-740(3)(c)(iv)(B)
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
<b>Screening Levels Added by Integ</b>																
1,2,4-Trimethylbenzene																
1-Methylnaphthalene																
Carbazole																
Carbon disulfide																
Chloride																
cis-1,2-Dichloroethene																
Isophorone																
n-Nitrosodi-n-propylamine																
Sulfate																
trans-1,2-Dichloroethene																
Tributyl phosphate																



Table A-1. Soil Screening Level Deriva

MEDIA - MTCA Standard		SOIL POTENTIAL ARAR's										Always Applicable			EPA METHOD	SOIL MOST STRINGENT
PATHWAYS HH - Human Health Ecol- Ecological		CERCLA EPA Regional Screening Level (RSL; May, 2010) Residential	CERCLA EPA Regional Screening Level (RSL; May, 2010) Industrial	CERCLA - National Oil & Hazardous Substances Pollution Contingency Plan (NCP) - 40 CFR 300 Preliminary Remediation/ Cleanup Goals (PRG's) (2007)	Soil Protection of Surface Water HH - Organoleptic Effects CWA §304 NRWQC Vadose Soil	Soil Protection of Surface Water HH - Organoleptic Effects CWA §304 NRWQC Saturated Soil	CA EPA OEHHA HH-Direct Exposure Residential Screening Levels	CA EPA OEHHA HH-Direct Exposure Industrial Screening Levels	Soil - Toxics Substances Control Act (TSCA) 40 CFR 761.61	CERCLA EPA Regional Screening Level (RSL; May, 2010) Potable Groundwater Protection (Risk Based) Saturated Soil	EPA LDW Plant 2 TMCL's Groundwater Protection (Risk Based)	Natural Background Levels Ch. 173-340 WAC	Applicable DL (MDL) Ch. 173-340 WAC	Applicable PQL Ch. 173-340 WAC	Analytical Method	Screening Level (Includes to Protect Potable GW; W/O Potable SW)
UNITS		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
acetone	61000	630000							4.5	445.50396		0.00203	0.02	8260B-Low Soil	0.230918133	
acenaphthene (CAS 83-29-9)	3400	33000		2.529346475	0.128193333				22	12.06543591		0.0005		8270D-SIM	0.016749455	
acenaphthylene (CAS 208-96-8)										66		0.0003		8270D-SIM	0.069091503	
anthracene	17000	170000							360	66.2409256		0.0023		8270D-SIM	0.223091503	
benzene	1.1	5.4							0.00021	0.0146224		0.00022	0.001	8260B-Low Soil	0.00021	
benzo(g,h,i)perylene												0.0013		8270D-SIM	0.031003321	
benzo[a]anthracene	0.15	2.1							0.01	0.00039655		0.002		8270D-SIM	0.00039655	
benzo[a]pyrene	0.015	0.21				0.038	0.13		0.0035	7.72944E-05		0.0003		8270D-SIM	7.72944E-05	
benzo[b]fluoranthene	0.15	2.1							0.035	0.000630756		0.003		8270D-SIM	0.000630756	
benzo[k]fluoranthene	1.5	21							0.35	0.000647389		0.02		8270D-SIM	0.000647389	
bis(2-ethylhexyl) phthalate	35	120							1.1	2.875200009		0.004	0.02	8270D-SIM	0.047081657	
butyl benzyl phthalate	260	910							0.51	0.060311037		0.004	0.02	8270D-SIM	0.005050071	
carbon tetrachloride	0.61	3							0.00017	0.001717233		0.00039	0.001	8260B-Low Soil	0.000536491	
chlorobenzene	290	1400		0.19160985	0.011093333				0.062	2.414196		0.00054	0.001	8260B-Low Soil	0.011093333	
chloroethane (ethyl chloride)	15000	610000							5.9	106.25972		0.00047	0.004	8260B-Low Soil	0.010553827	
chloroform (trichloromethane)	0.29	1.5							0.000053	0.02105452		0.00035	0.001	8260B-Low Soil	0.000053	
chloromethane	120	500							0.049	9.29059E-01		0.00041	0.002	8260B-Low Soil	0.001014258	
chrysene	15	210							1.1	0.004042807		0.0003		8270D-SIM	0.00283664	
dibenz[a,h]anthracene	0.015	0.21							0.011	0.001036527		0.0004		8270D-SIM	0.001036527	
dibenzofuran	78	1000							0.68	15		0.004	0.02	8270D-SIM	0.015380531	
di-butyl phthalate (di-n-butyl phth.)	6100	62000							9.2	1.646068814		0.004	0.02	8270D-SIM	0.263196347	
dichlorobenzene, 1,2-	1900	9800							0.36	5.188931733		0.00059	0.001	8260B-Low Soil	0.003788337	
dichlorobenzene, 1,3-												0.00055	0.001	8260B-Low Soil	0.2752	
dichlorobenzene, 1,4-	2.4	12							0.00041			0.00058	0.001	8260B-Low Soil	0.00041	
dichloroethane, 1,1-	3.3	17							0.00069	0.166786484		0.00051	0.001	8260B-Low Soil	0.00069	
dichloroethane, 1,2-	0.43	2.2							0.000042	0.017271767		0.00035	0.001	8260B-Low Soil	0.000042	
dichloroethylene, 1,1-	240	1100							0.12	14.92945333		0.00051	0.001	8260B-Low Soil	0.000234524	
diethyl phthalate	49000	490000							12	112.2612678		0.008	0.02	8270D-SIM	0.199783069	
dimethyl phthalate												0.005	0.02	8270D-SIM	0.093952381	
di-n-octyl phthalate												0.003	0.02	8270D-SIM	0.05808483	
ethylbenzene	5.4	27							0.0017	5.4		0.00009	0.001	8260B-Low Soil	0.0017	
fluoranthene	2300	22000							160	12.24301258		0.0003		8270D-SIM	0.160646921	
fluorene	2300	22000							27	8.42420358		0.0005		8270D-SIM	0.023583481	
hexachlorobenzene	0.3	1.1							0.00053			0.0005		8270D-SIM	1.06333E-06	
hexachlorobutadiene	6.2	22							0.0017			0.004	0.02	8270D-SIM	0.007181735	
indeno[1,2,3-cd]pyrene	0.15	2.1							0.12	0.000885763		0.0003		8270D-SIM	0.000885763	
MEK (Methyl Ethyl Ketone;2-Butanone)	28000	200000							1.5	300		0.005	0.01	8260	1.5	
methylene chloride (dichloromethane)	11	53							0.0012	0.280005453		0.00051	0.0035	8260B-Low Soil	0.0012	
methylnaphthalene, 2-	310	4100							0.75	222.2222222		0.0007	0.01	8270D-SIM	0.043212121	
MIBK (M-Isobutyl-K;4-M,2-Pentanone)	5300	53000							0.45			0.005	0.01	8260	0.45	
naphthalene	3.6	18							0.00047	3.912406992		0.0008	0.002	8260B-Low Soil	0.00047	

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MEDIA - MTCA Standard		SOIL POTENTIAL ARAR's										Always Applicable			EPA METHOD	SOIL MOST STRINGENT
PATHWAYS HH - Human Health Ecol- Ecological		CERCLA EPA Regional Screening Level (RSL; May, 2010) Residential	CERCLA EPA Regional Screening Level (RSL; May, 2010) Industrial	CERCLA - National Oil & Hazardous Substances Pollution Contingency Plan (NCP) - 40 CFR 300 Preliminary Remediation/ Cleanup Goals (PRG's) (2007)	Soil Protection of Surface Water HH - Organoleptic Effects CWA §304 NRWQC Vadose Soil	Soil Protection of Surface Water HH - Organoleptic Effects CWA §304 NRWQC Saturated Soil	CA EPA OEHHA HH-Direct Exposure Residential Screening Levels	CA EPA OEHHA HH-Direct Exposure Industrial Screening Levels	Soil - Toxics Substances Control Act (TSCA) 40 CFR 761.61	CERCLA EPA Regional Screening Level (RSL; May, 2010) Potable Groundwater Protection (Risk Based) Saturated Soil	EPA LDW Plant 2 TMCL's Groundwater Protection (Risk Based)	Natural Background Levels Ch. 173-340 WAC	Applicable DL (MDL) Ch. 173-340 WAC	Applicable PQL Ch. 173-340 WAC	Analytical Method	Screening Level (Includes to Protect Potable GW; W/O Potable SW)
UNITS		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
nitrosodiphenylamine, N-	99	350							0.075	0.090354028		0.012		8270D-SIM	0.011528793	
PCB mixtures	0.22	0.74							0.00012	6.03617E-05				8082	2.88683E-06	
PCB - Aroclor 1016	3.9	21							0.092	6.14091E-05		0.00202	0.1	8082	6.14091E-05	
PCB - Aroclor 1221	0.14	0.54							0.00012	3.97083E-06		0.033	0.1	8082	3.97083E-06	
PCB - Aroclor 1232	0.14	0.54							0.00012			0.033	0.1	8082	0.00012	
PCB - Aroclor 1242	0.22	0.74							0.0053	3.61618E-05		0.033	0.1	8082	1.02881E-05	
PCB - Aroclor 1248	0.22	0.74							0.0052	0.22		0.0033	0.1	8082	0.000618613	
PCB - Aroclor 1254	0.22	0.74							0.0088	1.43548E-05		0.00209	0.1	8082	1.43548E-05	
PCB - Aroclor 1260	0.22	0.74							0.024	0.000161595		0.00234	0.1	8082	0.000161595	
phenanthrene										100		0.003	0.02	8270	0.101378205	
pyrene	1700	17000							120	10.68984766		0.0028		8270	1.004130644	
tetrachloroethylene (perchloroethylene)	0.55	2.6							0.000049	0.000147884		0.0004	0.001	8260B-Low Soil	0.000049	
trichlorobenzene, 1,2,4-	22	99							0.0068	0.499528533		0.00058	0.002	8260B-Low Soil	0.001133398	
trichloroethane, 1,1,1-	8700	38000							3.2	280.5908		0.00055	0.001	8260B-Low Soil	2	
trichloroethane, 1,1,2-	1.1	5.3							0.000078	0.012279089		0.00056	0.001	8260B-Low Soil	0.000078	
trichloroethylene	2.8	14							0.00072	0.004399645		0.00053	0.001	8260B-Low Soil	3.89803E-05	
trimethylbenzene, 1,3,5-	780	10000							0.52	0.74685		0.00055	0.001	8260B-Low Soil	0.395866667	
toluene	5000	45000							1.6	11.89430667		0.00054	0.001	8260B-Low Soil	0.776533333	
vinyl chloride (chloroethylene)	0.06	1.7							0.0000056	0.01526064		0.00016	0.001	8260B-Low Soil	0.0000056	
xylene (dimethylbenzene)	630	2700							0.2	15.63605333		0.00168	0.002	8260B-Low Soil	0.2	
benzoic acid	240000	2500000							34			0.047	0.2	8270D-SIM	0.675472165	
benzyl alcohol	6100	62000							0.89			0.001		8270D-SIM	0.055021137	
dimethylphenol, 2,4-	1200	12000		7.32802704	0.401066667				0.86	9.066142408		0.02		8270D-SIM	0.002029246	
methylphenol, 2- (o-cresol)	3100	31000							1.5	30.93420286		0.004	0.02	8270D-SIM	0.005188375	
methylphenol, 4- (p-cresol)	310	3100							0.15	3.341186422		0.004	0.02	8270D-SIM	0.050166667	
pentachlorophenol	3	9		2.148000052	0.11	4.4	13		0.0057			0.061	0.1	8270D-SIM	0.002673	
phenol (total)	18000	180000		1.308768028	0.09143				6.3	315.1395111		0.002	0.02	8270D-SIM	0.043462687	
styrene (phenylethylene)	6300	36000							1.8			0.00055	0.001	8260B-Low Soil	0.001174521	
Tributyltin	18	180							0.024					Krone et al	2.12133E-06	
Trichlorophenol, 2,4,6-	44	160		0.055440369	0.002945333				0.023			0.016	0.1	8270C	0.002945333	
Aluminum	77000	990000							55000						55000	
Antimony	31	410							0.66	3.494845361		5		6010B/6020	0.289834667	
Arsenic (III)															7	
Arsenic (V)															10	
Arsenic (total)	0.39	1.6				0.07	0.24		0.0013	7.3		7	0.07	0.5	6010B/6020	0.001707413
Barium	15000	190000				5200	63000		300	100.6498266					23.12053333	
Beryllium	160	2000				150	1700		58	140					10	
Cadmium	70	800				1.7	7.5		1.4	0.77		1	0.039	0.2	6010B/6020	0.001746667
Chromium (VI)	0.29	5.6				17	37		0.00083	0.22		117	0.003	0.1	0.00083	
Chromium, total (or III)	120000	1500000				100000	100000		77000000			117	0.04	0.5	6010B/6020	42
Cobalt	2.3	300				660	3200		0.49						0.49	
Copper	3100	41000		444	22.28666667	3000	38000		51	36		36	0.063	0.2	6010B/6020	0.053488
Iron	55000	720000							640						0.086	
Lead	400	800				150	3500			250		17	0.15	0.5	6010B/6020	25.00071667
Manganese	1800	23000							57	1700					0.014333333	

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MEDIA - MTCA Standard		SOIL POTENTIAL ARAR's									Always Applicable			EPA METHOD	SOIL MOST STRINGENT	
PATHWAYS HH - Human Health Ecol- Ecological		CERCLA EPA Regional Screening Level (RSL; May, 2010) Residential	CERCLA EPA Regional Screening Level (RSL; May, 2010) Industrial	CERCLA - National Oil & Hazardous Substances Pollution Contingency Plan (NCP) - 40 CFR 300 Preliminary Remediation/ Cleanup Goals (PRG's) (2007)	Soil Protection of Surface Water HH - Organoleptic Effects CWA §304 NRWQC Vadose Soil	Soil Protection of Surface Water HH - Organoleptic Effects CWA §304 NRWQC Saturated Soil	CA EPA OEHHA HH-Direct Exposure Residential Screening Levels	CA EPA OEHHA HH-Direct Exposure Industrial Screening Levels	Soil - Toxics Substances Control Act (TSCA) 40 CFR 761.61	CERCLA EPA Regional Screening Level (RSL; May, 2010) Potable Groundwater Protection (Risk Based) Saturated Soil	EPA LDW Plant 2 TMCL's Groundwater Protection (Risk Based)	Natural Background Levels Ch. 173-340 WAC	Applicable DL (MDL) Ch. 173-340 WAC	Applicable PQL Ch. 173-340 WAC	Analytical Method	Screening Level (Includes to Protect Potable GW; W/O Potable SW)
UNITS		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		mg/kg
Mercury		5.6	34						0.03	0.07	0.07	0.005	0.05	7470A/7471A	0.00062744	
Mercury (organic)		7.8	34							0.0000018					0.0000018	
Molybdenum		390	5100						3.7						0.050166667	
Nickel		3700	44000			1600	16000		48	38	38	0.1	0.5		0.326433333	
Selenium		390	5100			380	4800		0.95	0.52					0.026433333	
Silver		390	5100			380	4800		1.6	3.7		0.1	0.5	6010B/6020	0.016314667	
Tin		47000	610000						5500						50	
Thallium						5	63								0.033504733	
Vanadium		390	5200			530	6700		180	5					0.070233333	
Zinc		23000	310000		6220	311.4333333	23000	100000	680	85	86	0.66		6010B/6020	5.04522	
LPAH																
HPAH																
Total Petroleum Hydrocarbons															5.96267E-05	
Gasoline															100	
Gasoline (w/benzene)															30	
Diesel												1.6	10		2000	
Heavy Oil												3.19	25		2000	
2,3,7,8-TCDD (Dioxin)		0.0000045	0.000018	0.000072			0.0000046	0.000019		0.0000026	0.0000045	0.0000052	0.00000008	1613B	7.47592E-10	
Aldrin		0.029	0.1				0.033	0.13		0.00065			0.000012	0.0001	8081B	2.44858E-06
alpha-BHC (Benzene HexaChloride)		0.077	0.27							0.000062			0.0000069	0.00005	8081B	1.00385E-05
beta-BHC		0.27	0.96							0.00022			0.000012	0.00005	8081B	4.12363E-05
gamma-BHC (Lindane)		0.52	2.1			0.5	2			0.00036			0.000011	0.00005	8081B	0.000103236
Chlordane		1.6	6.5			0.038	1.7			0.013			0.0000066	0.00005	8081B	3.0442E-05
4,4'-DDT		1.7	7			1.6	6.3			0.067			0.000014	0.00005	8081B	0.000149209
4,4'-DDE		1.4	5.1			1.6	6.3			0.047			0.0000055	0.00005	8081B	1.90722E-05
4,4'-DDD		2	7.2			2.3	9			0.066			0.0000094	0.00005	8081B	1.42869E-05
Dieldrin		0.03	0.11				0.035	0.13		0.00017			0.000098	0.0005	8081B	1.39496E-06
alpha-Endosulfan		370	3700							3			0.000043	0.0002	8081B	0.000020242
beta-Endosulfan		370	3700							3			0.000043	0.0001	8081B	0.000020242
Endosulfan Sulfate		370	3700							3			0.000017	0.00005	8081B	0.000020242
Endrin		18	180				21	230		0.44			0.000045	0.0002	8081B	2.55246E-05
Endrin Aldehyde		18	180				21	230		0.44			0.000051	0.0001	8081B	2.55246E-05
Heptachlor		0.11	0.38				0.13	0.52		0.0012			0.0000091	0.0001	8081B	7.75359E-07
Heptachlor Epoxide		0.053	0.19				0.13	0.52		0.00015			0.001	0.00001	8081B	3.25598E-06
Toxaphene		0.44	1.6				0.46	1.8		0.0094					8081B	5.73333E-08

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PATHWAYS HH - Human Health Ecol- Ecological		CERCLA EPA Regional Screening Level (RSL; May, 2010) <b>Residential</b>	CERCLA EPA Regional Screening Level (RSL; May, 2010) <b>Industrial</b>	CERCLA - National Oil & Hazardous Substances Pollution Contingency Plan (NCP) - 40 CFR 300 Preliminary Remediation/ Cleanup Goals (PRG's) (2007)	Soil Protection of Surface Water HH - <b>Organoleptic Effects</b> CWA §304 <b>NRWQC</b> <i>Vadose Soil</i>	Soil Protection of Surface Water HH - <b>Organoleptic Effects</b> CWA §304 <b>NRWQC</b> <i>Saturated Soil</i>	CA EPA OEHHA HH-Direct Exposure <b>Residential</b> Screening Levels	CA EPA OEHHA HH-Direct Exposure <b>Industrial</b> Screening Levels	Soil - Toxics Substances Control Act ( <b>TSCA</b> ) 40 CFR 761.61	CERCLA EPA Regional Screening Level (RSL; May, 2010) <b>Potable Groundwater Protection (Risk Based)</b> <i>Saturated Soil</i>	EPA LDW Plant 2 TMCL's <b>Groundwater Protection (Risk Based)</b>	Natural <b>Background</b> Levels Ch. 173-340 WAC	Applicable <b>DL (MDL)</b> Ch. 173-340 WAC	Applicable <b>PQL</b> Ch. 173-340 WAC	Analytical Method	Screening Level (Includes to Protect Potable GW; W/O Potable SW)
UNITS		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
<b>Screening Levels Added by Integ</b>																
1,2,4-Trimethylbenzene		6.20E+01							2.10E-02							0.021
1-Methylnaphthalene		2.20E+01							1.20E-02							0.012
Carbazole									NV							0.016221333
Carbon disulfide		8.20E+02							3.10E-01							0.266133333
Chloride		--							--							--
<i>cis</i> -1,2-Dichloroethene		1.60E+02							2.10E-02							0.021
Isophorone		1.20E+04							2.30E-02							0.015348667
<i>n</i> -Nitrosodi- <i>n</i> -propylamine		6.90E-02							7.20E-06							2.9824E-06
Sulfate		--							--							--
<i>trans</i> -1,2-Dichloroethene		1.50E+02							2.90E-02							0.029
Tributyl phosphate		5.30E+01							3.60E-02							0.036

Notes:

- ARAR = applicable or relevant and appropriate requirement
- CA EPA OEHHA = California Environmental Protection Agency Office of Environmental Health Hazard Assessment
- Carc = carcinogenic
- CLARC = cleanup level and risk calculation
- CSL = cleanup screening level
- Ecol = ecological
- EPA = U.S. Environmental Protection Agency
- EQU = equation
- GW = groundwater
- HH = human health
- LDW = Lower Duwamish Waterway
- MDL = method detection limit
- NC = noncarcinogenic
- NRWQC = U.S. Environmental Protection Agency water quality criterion
- NTR = national toxics rule
- NV = no value available
- PQL = practical quantitation limit
- RSL = regional screening level
- SQS = sediment quality standard
- SW = surface water
- SWQS = Washington State water quality standard
- TMCL = total maximum contaminant load
- WAC = Washington Administrative Code

Table A-2. Groundwater Screening Level Derivation Table within Ecology Spreadsheet (µg/L)

MEDIA - MTCA Standard	GW Method A									GW Method B						
	Ground Water, Method A-HH, Potable (Table 720-1) WAC 173-340-720(3)(b)(i)	Ground Water Method A - HH Potable ARAR's WAC 173-340-720(3)(b)(ii)	Groundwater State Quality Criteria WAC 173-340-720(3)(b)(ii); WAC 173-200-040(3) Table 9.1	Ground Water Method A-HH-Potable Safe Drinking Water Act, 40 CFR 141; WAC 173-290-310; WAC 173-340-720(3)(b)(ii)(A) MCL	Ground Water Safe Drinking Water Act, 40 CFR 141; WAC 173-290-310; WAC 173-340-720(3)(b)(ii)(B) MCLG (Non-Zero Goals)	Ground Water State Board Health, Ch. 246-290 WAC: WAC 173-340-720(3)(b)(ii)(C) MCL	Ground Water State Board Health, Ch. 246-290 WAC: WAC 173-340-720(3)(b)(ii)(C) MCG	Ground Water Method A - Potable No Table Values WAC 173-340-720(3)(b)(iii)	Ground Water, Method A-HH, Potable/Protect Surface Water WAC 173-340-720(3)(b)(iv)	Ground Water Method B - HH Potable ARAR's WAC 173-340-720(4)(b)(i) Safe Drinking Water Standards - MCLs	Ground Water Method B - HH Potable ARAR's WAC 173-340-720(4)(b)(i) Safe Drinking Water Standards - MCGs	Ground Water Method B - HH Potable ARAR's WAC 173-340-720(4)(b)(i) State Department of Health Stanadrds - MCLs	Ground Water Method B - HH Potable ARAR's WAC 173-340-720(4)(b)(i) State Department of Health Stanadrds - MCGs	Ground Water, Method B-HH, Non-carcinogenic/Potable WAC 173-340-720(4)(b)(iii)(A) CLARC Database	Ground Water, Method B-HH, Carcinogen/Potable WAC 173-340-720(4)(b)(iii)(B) CLARC Database	Ground Water, Method B-HH, Potable, Petroleum Mixture WAC 173-340-720(4)(b)(iii)(C) EQ. 720-3 (4-Phase Model)
UNITS	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
acetone		6000						*	*					800		*
acenaphthene		400						*	*					960		*
acenaphthylene		*						*	*							*
anthracene		2000						*	*					4800		*
benzene	5	*	1	5	*0	5	*0	*	*	5	*0	5	*0	32	0.795	*
benzo(g,h,i)perylene		*						*	*							*
benzo[a]anthracene		*						*	*						0.012	*
benzo[a]pyrene		*	0.008	0.2	*0	0.2	*0	*	*	0.2	*0	0.2	*0		0.012	*
benzo[b]fluoranthene		*						*	*						0.012	*
benzo[k]fluoranthene		*						*	*						0.012	*
bis(2-ethylhexyl) phthalate		*	6	6	*0	6	*0	*	*	6	*0	6	*0		6.25	*
butyl benzyl phthalate		100						*	*					3200		*
carbon tetrachloride		*	0.3		*0	5	*0	*	*	5	*0	5	*0			*
chlorobenzene		*		100	100	100	100	*	*	100	100	100	100	160		*
chloroethane (ethyl chloride)		*						*	*							*
chloroform (trichloromethane)		*	7					*	*						7.17	*
chloromethane (Methyl Chloride)		*						*	*						3.37	*
chrysene		*						*	*						0.012	*
dibenz[a,h]anthracene		*						*	*						0.012	*
dibenzofuran		*						*	*					32		*
di-butyl phthalate (di-n-butyl phth.)		700						*	*					1600		*
dichlorobenzene, 1,2-		*		600	600	600	600	*	*	600	600	600	600	720		*
dichlorobenzene, 1,3-		600						*	*							*
dichlorobenzene, 1,4-		*	4	75	75	75	75	*	*	75	75	75	75			*
dichloroethane, 1,1-		*	1					*	*					800		*
dichloroethane, 1,2-	5	*	0.5	5	*0	5	*0	*	*	5	*0	5	*0	160	0.48	*
dichloroethylene, 1,1-		*		7	7	7	7	*	*	7	7	7	7	72		*
diethyl phthalate		6000						*	*							*
dimethyl phthalate		*						*	*							*
di-n-octyl phthalate		*						*	*					320		*
ethylbenzene	700	*		700	700	700	700	*	*	700	700	700	700	800		*
fluoranthene		300						*	*					640		*
fluorene		300						*	*					640		*
hexachlorobenzene		*	0.05	1	*0	1	*0	*	*	1	*0	1	*0			*
hexachlorobutadiene		0.9						*	*							*
indeno[1,2,3-cd]pyrene		*						*	*						0.012	*
MEK (Methyl Ethyl Ketone;2-Butanone)														4800		*
methylene chloride (dichloromethane)	5	30	5	5	*0	5	*0	*	*	5	*0	5	*0		5.83	*
methylnaphthalene, 2-		30						*	*							*
MIBK (M-Isobutyl-K;4-M,2-Pentanone)														640		*
naphthalene	160	100						*	*					160		*

Table A-2. Groundwater Screening Level Derivation Table within Ecology Spreadsheet (µg/L)

MEDIA - MTCA Standard	GW Method A									GW Method B						
	Ground Water, Method A-HH, Potable (Table 720-1) WAC 173-340-720(3)(b)(i)	Ground Water Method A - HH Potable ARAR's WAC 173-340-720(3)(b)(ii)	Groundwater State Quality Criteria WAC 173-340-720(3)(b)(ii); WAC 173-200-040(3) Table 9.1	Ground Water Method A-HH-Potable Safe Drinking Water Act, 40 CFR 141; WAC 173-290-310; WAC 173-340-720(3)(b)(ii)(A) MCL	Ground Water Safe Drinking Water Act, 40 CFR 141; WAC 173-290-310; WAC 173-340-720(3)(b)(ii)(B) MCLG (Non-Zero Goals)	Ground Water State Board Health, Ch. 246-290 WAC: WAC 173-340-720(3)(b)(ii)(C) MCL	Ground Water State Board Health, Ch. 246-290 WAC: WAC 173-340-720(3)(b)(ii)(C) MCG	Ground Water Method A - Potable No Table Values WAC 173-340-720(3)(b)(iii)	Ground Water, Method A-HH, Potable/Protect Surface Water WAC 173-340-720(3)(b)(iv)	Ground Water Method B - HH Potable ARAR's WAC 173-340-720(4)(b)(i) Safe Drinking Water Standards - MCLs	Ground Water Method B - HH Potable ARAR's WAC 173-340-720(4)(b)(i) Safe Drinking Water Standards - MCGs	Ground Water Method B - HH Potable ARAR's WAC 173-340-720(4)(b)(i) State Department of Health Stanadrs - MCLs	Ground Water Method B - HH Potable ARAR's WAC 173-340-720(4)(b)(i) State Department of Health Stanadrs - MCGs	Ground Water, Method B-HH, Non-carcinogenic/Potable WAC 173-340-720(4)(b)(iii)(A) CLARC Database	Ground Water, Method B-HH, Carcinogen/Potable WAC 173-340-720(4)(b)(iii)(B) CLARC Database	Ground Water, Method B-HH, Potable, Petroleum Mixture WAC 173-340-720(4)(b)(iii)(C) EQ. 720-3 (4-Phase Model)
UNITS	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
nitrosodiphenylamine, N-		7						*	*						*	
pcb mixtures	0.1	*	0.01	0.5		0.5	*0	*	*	0.5		0.5	*0	0.044	*	
pcb - Aroclor 1016		0.5						*	*					1.12	*	
pcb - Aroclor 1221		*						*	*						*	
pcb - Aroclor 1232		*						*	*						*	
pcb - Aroclor 1242		*						*	*						*	
pcb - Aroclor 1248		*						*	*						*	
pcb - Aroclor 1254		0.1						*	*					0.32	*	
pcb - Aroclor 1260		*						*	*						*	
phenanthrene		*						*	*						*	
pyrene		*						*	*					480	*	
tetrachloroethylene (perchloroethylene)	5	70	0.8	5	*0	5	*0	*	*	5	*0	5	*0	80	0.081	*
trichlorobenzene, 1,2,4-		*		70	70	70	70	*	*	70	70	70	70		*	
trichlorethane, 1,1,1-	200	*	200	200	200	200	200	*	*	200	200	200	200	7200	*	
trichlorethane, 1,1,2-		*		5	3	5	3	*	*	5	3	5	3		0.768	*
trichloroethylene	5	*	3	5	*0	5	*0	*	*	5	*0	5	*0	2.4	0.49	*
trimethylbenzene, 1,3,5-		*						*	*					400	*	
toluene	1000	*		1000	1000	1000	1000	*	*	1000	1000	1000	1000	1600	*	
vinyl chloride (chloroethylene)	0.2	*	0.02	2	*0	2	*0	*	*	2	*0	2	*0		0.029	*
xylene (dimethylbenzene)	1000	*		10000	10000	10000	10000	*	*	10000	10000	10000	10000	16000	*	
benzoic acid		*						*	*						*	
benzyl alcohol		*						*	*					2400	*	
dimethylphenol, 2,4-		100						*	*						*	
methylphenol, 2- (o-cresol)		*						*	*						*	
methylphenol, 4- (p-cresol)		*						*	*						*	
pentachlorophenol		*		1	*0	1	*0	*	*	1	*0	1	*0		0.729	*
phenol (total)		2000						*	*					4800	*	
styrene (phenylethylene)		*		100	100	100	100	*	*	100	100	100	100	1600	1.46	*
Tributyltin		*						*	*						*	
Trichlorophenol, 2,4,6-		3	4					*	*						4	*
		*						*	*						*	
Aluminum		*		50				*	*	50					*	
Antimony		*		6	6	6	6	*	*	6	6	6	6	6.4	*	
Arsenic (III)		*						*	*						*	
Arsenic (V)		*						*	*						*	
Arsenic (total)		*	0.05	10	10	10	*0	*	*	10	10	10	*0		0.0583	*
Barium		*	1000	2000	2000	2	2	*	*	2000	2000	2	2	560	*	
Beryllium		*		4	4	4	4	*	*	4	4	4	4	32	*	
Cadmium	5	*	10	5	5	5	5	*	*	5	5	5	5	8	*	
Chromium (VI)		20						*	*					48	*	
Chromium, total (or III)	50	10000	50	100	100	100	100	*	*	100	100	100	100		*	



Table A-2. Groundwater Screening Level Derivation Table within Ecology Spreadsheet (µg/L)

MEDIA - MTCA Standard	GW Method A									GW Method B						
	Ground Water, Method A-HH, Potable (Table 720-1) WAC 173-340-720(3)(b)(i)	Ground Water Method A - HH Potable ARAR's WAC 173-340-720(3)(b)(ii)	Groundwater State Quality Criteria WAC 173-340-720(3)(b)(ii); WAC 173-200-040(3) Table 9.1	Ground Water Method A-HH-Potable Safe Drinking Water Act, 40 CFR 141; WAC 173-290-310; WAC 173-340-720(3)(b)(ii)(A) MCL	Ground Water Safe Drinking Water Act, CFR 141; WAC 173-290-310; WAC 173-340-720(3)(b)(ii)(B) MCLG (Non-Zero Goals)	Ground Water State Board Health, Ch. 246-290 WAC; WAC 173-340-720(3)(b)(ii)(C) MCL	Ground Water State Board Health, Ch. 246-290 WAC; WAC 173-340-720(3)(b)(ii)(C) MCG	Ground Water Method A - Potable No Table Values WAC 173-340-720(3)(b)(iii)	Ground Water, Method A-HH, Potable/Protect Surface Water WAC 173-340-720(3)(b)(iv)	Ground Water Method B - HH Potable ARAR's WAC 173-340-720(4)(b)(i) Safe Drinking Water Standards - MCLs	Ground Water Method B - HH Potable ARAR's WAC 173-340-720(4)(b)(i) Safe Drinking Water Standards - MCGs	Ground Water Method B - HH Potable ARAR's WAC 173-340-720(4)(b)(i) State Department of Health Stanadrds - MCLs	Ground Water Method B - HH Potable ARAR's WAC 173-340-720(4)(b)(i) State Department of Health Stanadrds - MCGs	Ground Water, Method B-HH, Non-carcinogenic/Potable WAC 173-340-720(4)(b)(iii)(A) CLARC Database	Ground Water, Method B-HH, Carcinogen/Potable WAC 173-340-720(4)(b)(iii)(B) CLARC Database	Ground Water, Method B-HH, Potable, Petroleum Mixture WAC 173-340-720(4)(b)(iii)(C) EQ. 720-3 (4-Phase Model)
UNITS	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Cobalt		*						*	*							*
Copper		*	1000	1000	1300	1300	1300	*	*	1000	1300	1300	1300	592		*
Iron		*	300	300		300		*	*	300		300				*
Lead	15	*	50	15	*0	15	*0	*	*	15	*0	15	*0			*
Manganese		300	50	50		50		*	*	50		50				*
Mercury	2	*	2	2	2	2	2	*	*	2	2	2	2	4.8		*
Mercury (organic)		*						*	*							*
Molybdenum		40						*	*							*
Nickel		100				100		*	*			100		320		*
Selenium		*	10	50	50	50	50	*	*	50	50	50	50	80		*
Silver		100	50	100	100	100	100	*	*	100	100	100	100	80		*
Tin		*						*	*	NV	NV	NV	NV	9.60E+03	NV	*
Thallium		*		2	0.5	2	0.5	*	*	2	0.5	2	0.5	1.12		*
Vanadium		*						*	*							*
Zinc		2000	5000	5000		5000		*	*	5000		5000		4800		*
		*						*	*							*
LPAH		*	0.01					*	*							*
HPAH		*	0.01					*	*							*
Total Petroleum Hydrocarbons		*						*	*							*
Gasoline	1000	*						*	*							*
Gasoline (w/benzene)	800	*						*	*							*
Diesel	500	*						*	*							*
Heavy Oil	500	*						*	*							*
		*						*	*							*
2,3,7,8-TCDD (Dioxin)		*	0.000006	0.00003	*0	0.00003	*0	*	*	0.00003	*0	0.00003	*0		0.0000058	*
		*						*	*							*
Aldrin		*						*	*					0.24	0.002573529	*
alpha-BHC		*						*	*						0.013888889	*
beta-BHC		*						*	*						0.048611111	*
gamma-BHC (Lindane)	0.1	*		0.0002	0.0002	0.0002		*	*	0.0002	0.0002	0.0002		4.8		*
Chlordane		*		0.002	*0	0.002		*	*	0.002	*0	0.002		8	0.25	*
4,4'-DDT	0.3	*						*	*					8	0.257352941	*
4,4'-DDE		*						*	*						0.257352941	*
4,4'-DDD		*						*	*						0.364583333	*
Dieldrin		*						*	*					0.8	0.00546875	*
alpha-Endosulfan		*						*	*					96		*
beta-Endosulfan		*						*	*					96		*
Endosulfan Sulfate		*						*	*					96		*
Endrin		*		0.002	0.002	0.002		*	*	0.002	0.002	0.002		4.8		*
Endrin Aldehyde		*		0.002	0.002	0.002		*	*	0.002	0.002	0.002		4.8		*

Table A-2. Groundwater Screening Level Derivation Table within Ecology Spreadsheet (µg/L)

MEDIA - MTCA Standard	GW Method A									GW Method B						
	Ground Water, Method A-HH, Potable (Table 720-1) WAC 173-340-720(3)(b)(i)	Ground Water Method A - HH Potable ARAR's WAC 173-340-720(3)(b)(ii)	Groundwater State Quality Criteria WAC 173-340-720(3)(b)(ii); WAC 173-200-040(3) Table 9.1	Ground Water Method A-HH-Potable Safe Drinking Water Act, 40 CFR 141; WAC 173-290-310; WAC 173-340-720(3)(b)(ii)(A) MCL	Ground Water Safe Drinking Water Act, 40 CFR 141; WAC 173-290-310; WAC 173-340-720(3)(b)(ii)(B) MCLG (Non-Zero Goals)	Ground Water State Board Health, Ch. 246-290 WAC; WAC 173-340-720(3)(b)(ii)(C) MCL	Ground Water State Board Health, Ch. 246-290 WAC; WAC 173-340-720(3)(b)(ii)(C) MCG	Ground Water Method A - Potable No Table Values WAC 173-340-720(3)(b)(iii)	Ground Water, Method A-HH, Potable/Protect Surface Water WAC 173-340-720(3)(b)(iv)	Ground Water Method B - HH Potable ARAR's WAC 173-340-720(4)(b)(i) Safe Drinking Water Standards - MCLs	Ground Water Method B - HH Potable ARAR's WAC 173-340-720(4)(b)(i) Safe Drinking Water Standards - MCGs	Ground Water Method B - HH Potable ARAR's WAC 173-340-720(4)(b)(i) State Department of Health Stanadrs - MCLs	Ground Water Method B - HH Potable ARAR's WAC 173-340-720(4)(b)(i) State Department of Health Stanadrs - MCGs	Ground Water, Method B-HH, Non-carcinogenic/Potable WAC 173-340-720(4)(b)(iii)(A) CLARC Database	Ground Water, Method B-HH, Carcinogen/Potable WAC 173-340-720(4)(b)(iii)(B) CLARC Database	Ground Water, Method B-HH, Potable, Petroleum Mixture WAC 173-340-720(4)(b)(iii)(C) EQ. 720-3 (4-Phase Model)
UNITS	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Heptachlor		*		0.0004	*0	0.0004		*	*	0.0004	*0	0.0004		8	0.01944444	*
Heptachlor Epoxide		*		0.0002	*0	0.0002		*	*	0.0002	*0	0.0002		0.104	0.004807692	*
Toxaphene		*						*	*	0.003	--	NV	NV	NV	8.00E-02	*
<b>Screening Levels Added by Integral</b>																
1,2,4-Trimethylbenzene										NV	NV	NV	NV	400	NV	
1-Methylnaphthalene										NV	NV	NV	NV	1120	3.017241379	
Carbazole										NV	NV	NV	NV		4.40E+00	
Carbon disulfide										NV	NV	NV	NV	8.00E+02	NV	
Chloride										2.50E+05	NV	2.50E+05	NV	NV	NV	
cis-1,2-Dichloroethene										7.00E+01	70	NV	NV	80	NV	
Isophorone										NV	NV	NV	NV	1.60E+03	4.60E+01	
n-Nitrosodi-n-propylamine										NV	NV	NV	NV	NV	NV	
Sulfate										2.50E+05	NV	2.50E+05	NV	NV	NV	
trans-1,2-Dichloroethene										1.00E+02	100	NV	NV	160	NV	
Tributyl phosphate										NV	NV	NV	NV	3200	9.510869565	



Table A-2. Groundwater Screening Lev

MEDIA - MTCA Standard	GW Method C					GW PATHWAY EVALUATION				ARAR's		Always Applicable			EPA Method
<b>PATHWAYS</b> HH - Human Health Ecol- Ecological	Ground Water Method C - HH Potable ARAR's WAC 173-340-720(5)(b)(i)	Ground Water, Method C-HH, Protect Surface Water Highest Beneficial Use WAC 173-340-720(5)(b)(ii)	Ground Water, Method C-HH, Non-carcinogenic/ Potable WAC 173-340-720(5)(b)(iii)(A) CLARC Database	Ground Water, Method C-HH, Carcinogen/ Potable WAC 173-340-720(5)(b)(iii)(B) CLARC Database	Ground Water, Method C-HH, Potable, Petroleum Mixture WAC 173-340-720(5)(b)(iii)(C) EQ. 720-3 (4-Phase Model)	Ground Water, Method B-HH, Potable/Protect Surface Water WAC 173-340-720(4)(b)(ii)	Ground Water, Non-Potable, Surface Water Protection WAC 173-340-720(6)	Groundwater to Sediment Protection Ecology CSL WAC 173-340-720(1)(c)	Groundwater to Sediment Protection Ecology SQS WAC 173-340-720(1)(c)	EPA RCRA Plant 2 TMCLs	EPA Tap Water Residential Screening Levels (RSL's, 5/2010)	Natural Background Levels Ch. 173-340 WAC	Applicable DL (MDL) Ch. 173-340 WAC	Applicable PQL (RL) Ch. 173-340 WAC	Analytical Methods
UNITS	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
acetone	*	*	1750		*		*			110107	22000		2.954	10	8260B
acenaphthene	*	*	2100		*		*	9.31372549	2.614379085	115.4023696	2200		0.0205	0.1	8270D-SIM
acenaphthylene	*	*			*		*	10.78431373	10.78431373				0.0153	0.1	8270D-SIM
anthracene	*	*	11000		*		*	58.82352941	10.78431373	200	11000		0.0333	0.1	8270D-SIM
benzene	*	*	70	7.95	*		*			2.02819	0.41		0.252	1	8260B
benzo(g,h,i)perylene	*	*		0.12	*		*	0.029147982	0.011584454				0.0492	0.1	8270D-SIM
benzo[a]anthracene	*	*		0.12	*	0.018	*	0.632911392	0.257852789	0.000112155			0.004	0.01	8270D-SIM
benzo[a]pyrene	*	*		0.12	*	0.018	*	0.266903915	0.125826131	6.5888E-06			0.032	0.1	8270D-SIM
benzo[b]fluoranthene	*	*		0.12	*	0.018	*	0.560398506	0.286425903	5.26914E-05			0.006	0.01	8270D-SIM
benzo[k]fluoranthene	*	*		0.12	*	0.018	*	0.571791614	0.292249047	5.51854E-05			0.003	0.01	8270D-SIM
bis(2-ethylhexyl) phthalate	*	*	700	62.5	*	2.2	*	0.472727273	0.284848485	1.2	4.8		0.451	1	8270D-SIM
butyl benzyl phthalate	*	*	7000		*		*	6.837606838	0.523504274		35		0.025		8270D-SIM
carbon tetrachloride	*	*	12.3	3.37	*		*			0.247823653	0.2		0.233	1	8260B
chlorobenzene	*	*	350		*		*			270	91		0.145	1	8260B
chloroethane (ethyl chloride)	*	*			*		*			21000	21000		0.186	1	8260B
chloroform (trichloromethane)	*	*	175	71.7	*		*			4.3	0.19		0.192	1	8260B
chloromethane (Methyl Chloride)	*	*		33.7	*		*			190	190		0.134	1	8260B
chrysene	*	*	0.12	0.12	*	0.018	*	1.949152542	0.466101695	0.001120636			0.0314	0.01	8270D-SIM
dibenz[a,h]anthracene	*	*		0.12	*	0.018	*	0.01259542	0.004580153	2.71511E-05			0.0064	0.1	8270D-SIM
dibenzofuran	*	*	70		*		*	5.132743363	1.327433628				0.0366	0.1	8270D-SIM
di-butyl phthalate (di-n-butyl phth.)	*	*	3500		*		*	1164.383562	150.6849315	46.57806484	3700		0.458	1	8260B
dichlorobenzene, 1,2-	*	*	1580		*		*	5.191873589	5.191873589	440	370		0.02	1	8260B
dichlorobenzene, 1,3-	*	*			*		*						0.285	1	8260B
dichlorobenzene, 1,4-	*	*		18.2	*		*	20.73732719	7.142857143				0.281	1	8260B
dichloroethane, 1,1-	*	*	1750		*		*			33.26143751	2.4			0.2	8260B
dichloroethane, 1,2-	*	*	350	4.81	*		*			3.6	0.15		0.244	0.2	8260B
dichloroethylene, 1,1-	*	*	158	0.729	*		*			2300	340			0.2	8260B
diethyl phthalate	*	*	28000		*		*	873.015873	484.1269841	18409.42563	29000		0.496	1	8270D-SIM
dimethyl phthalate	*	*	35000		*		*	142.8571429	142.8571429	1100000			0.486	1	8270D-SIM
di-n-octyl phthalate	*	*	700		*		*	22.95918367	0.295918367				0.513	1	8270D-SIM
ethylbenzene	*	*	1750		*		*			800	1.5		0.182	1	8260B
fluoranthene	*	*	1400		*		*	16.92524683	2.256699577	11	1500		0.029	0.1	8270D-SIM
fluorene	*	*	1400		*		*	6.991150442	2.03539823	45	1500		0.0218	0.1	8270D-SIM
hexachlorobenzene	*	*	28	0.547	*		*	0.680473373	0.112426036				0.001		8270D-SIM
hexachlorobutadiene	*	*	3.5	5.61	*		*	6.237424547	3.923541247				0.02		8260B
indeno[1,2,3-cd]pyrene	*	*		0.12	*	0.018	*	0.032835821	0.012686567	2.27382E-05			0.011	0.1	8270D-SIM
MEK (Methyl Ethyl Ketone;2-Butanone)			11000							73000	7100				8260B
methylene chloride (dichloromethane)	*	*		58.3	*		*			61	4.8		0.19	2	8260B
methylnaphthalene, 2-	*	*			*		*	30.62200957	18.18181818	150	150		0.0244	0.1	8260B
MIBK (M-Isobutyl-K;4-M,2-Pentanone)			1400												8260B
naphthalene	*	*	350		*		*	92.39130435	53.80434783	112.0573734	0.14		0.0377	0.1	8270D-SIM

Table A-2. Groundwater Screening Lev

MEDIA - MTCA Standard	GW Method C					GW PATHWAY EVALUATION				ARAR's		Always Applicable			EPA Method
<b>PATHWAYS</b> HH - Human Health Ecol- Ecological	Ground Water Method C - HH Potable ARAR's WAC 173-340- 720(5)(b)(i)	Ground Water, Method C-HH, Protect Surface Water Highest Beneficial Use WAC 173-340- 720(5)(b)(ii)	Ground Water, Method C-HH, Non-carcinogenic/ Potable WAC 173-340- 720(5)(b)(iii)(A) CLARC Database	Ground Water, Method C-HH, Carcinogen/ Potable WAC 173-340- 720(5)(b)(iii)(B) CLARC Database	Ground Water, Method C-HH, Potable, Petroleum Mixture WAC 173-340- 720(5)(b)(iii)(C) EQ. 720-3 (4- Phase Model)	Ground Water, Method B-HH, Potable/Protect Surface Water WAC 173-340- 720(4)(b)(ii)	Ground Water, Non-Potable, Surface Water Protection WAC 173-340-720(6)	Groundwater to Sediment Protection Ecology CSL WAC 173-340- 720(1)(c)	Groundwater to Sediment Protection Ecology SQS WAC 173-340- 720(1)(c)	EPA RCRA Plant 2 TMCLs	EPA Tap Water Residential Screening Levels (RSL's, 5/2010)	Natural Background Levels Ch. 173-340 WAC	Applicable DL (MDL) Ch. 173-340 WAC	Applicable PQL (RL) Ch. 173-340 WAC	Analytical Methods
UNITS	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
nitrosodiphenylamine, N-	*	*		1.79	*		*	1.957295374	1.957295374	1.593580667	14		0.46	1	8270D-SIM
pcb mixtures	*	*		0.44	*	0.000064	*	1.450892857	0.267857143	2.30915E-05			0.1	0.01	8082/8270/1668
pcb - Aroclor 1016	*	*	2.45		*		*	2.398523985	0.442804428	0.0000641	0.96		0.0036	0.01	8082
pcb - Aroclor 1221	*	*			*		*			2.30915E-05	0.0068			0.01	8082
pcb - Aroclor 1232	*	*			*		*							0.01	8082
pcb - Aroclor 1242	*	*			*		*			2.30915E-05	0.034			0.01	8082
pcb - Aroclor 1248	*	*			*		*	1.480637813	0.273348519	2.30915E-05	0.034		0.1	0.01	8082
pcb - Aroclor 1254	*	*	0.7		*		*	0.85978836	0.158730159	5.49145E-06	0.034		0.1	0.01	8082
pcb - Aroclor 1260	*	*			*		*	0.314009662	0.057971014	2.30915E-05	0.034		0.0046	0.01	8082
phenanthrene	*	*			*		*	23.07692308	4.807692308				0.453	1	8270D-SIM
pyrene	*	*	1050		*		*	20.17291066	14.4092219	9.8	1100		0.344	1	8270D-SIM
tetrachloroethylene (perchloroethylene)	*	*	180	0.81	*		*			0.020523086	0.1		0.091	0.2	8260B
trichlorobenzene, 1,2,4-	*	*	175		*		*	2.506963788	1.128133705	16	2.3		0.02		8260B
trichlorethane, 1,1,1-	*	*	15800		*		*			46000	9100		0.183	0.2	8260B
trichlorethane, 1,1,2-	*	*	70	7.68	*		*			2.326407578	0.24			0.2	8260B
trichloroethylene	*	*	5.3	1.1	*		*			0.74	2			0.2	8260B
trimethylbenzene, 1,3,5-	*	*	880		*		*			45	370				8260B
toluene	*	*	1400		*		*			1300	2300				8260B
vinyl chloride (chloroethylene)	*	*	53	0.29	*		*			2.4	0.016		0.249	0.2	8260B
xylene (dimethylbenzene)	*	*	35000		*		*			1300	200		0.357	2	8260B
benzoic acid	*	*			*		*	2242.926156	2242.926156				3.69	10	8260B
benzyl alcohol	*	*	5300		*		*	233.0779055	181.9923372				1.31	5	8260B
dimethylphenol, 2,4-	*	*			*		*	2.020624303	2.020624303	655.2507426	730		0.32		8270D-SIM
methylphenol, 2- (o-cresol)	*	*	1750		*		*	7.110609481	7.110609481	3053.696194	1800		0.026		8270D-SIM
methylphenol, 4- (p-cresol)	*	*	175		*		*	77.18894009	77.18894009	333.8496875	180		0.345	1	8270D-SIM
pentachlorophenol	*	*	1050	7.29	*		*	10.20710059	5.325443787				0.032		8270D-SIM
phenol (total)	*	*	11000		*		*	223.880597	78.35820896	40694.5198	11000		0.388	1	8270D-SIM
styrene (phenylethylene)	*	*	3500	14.6	*		*						0.121	1	8270D-SIM
Tributyltin	*	*			*		*								Krone, 1988
Trichlorophenol, 2,4,6-	*	*		40	*		*						2.1	5	8270D-SIM
Aluminum	*	*			*		*								
Antimony	*	*	14		*		*			3.865979381	15				200.8
Arsenic (III)	*	*			*		*								
Arsenic (V)	*	*			*		*								
Arsenic (total)	*	*	11	0.583	*	0.71	*			7.3	0.045	5	0.18	0.2	200.8
Barium	*	*	7000		*		*			120	7300				
Beryllium	*	*	70		*		*			120	73				
Cadmium	*	*	17.5		*		*	3.357954465	2.556054891	0.21	18		0.008	0.2	
Chromium (VI)	*	*	105		*		*			0.58	0.043		3	10	7196A
Chromium, total (or III)	*	*			*		*	317.6470588	305.8823529				0.032	0.5	200.8

Table A-2. Groundwater Screening Lev

MEDIA - MTCA Standard	GW Method C					GW PATHWAY EVALUATION					ARAR's		Always Applicable			EPA Method
<b>PATHWAYS</b> HH - Human Health Ecol- Ecological	Ground Water Method C - HH Potable ARAR's WAC 173-340-720(5)(b)(i)	Ground Water, Method C-HH, Protect Surface Water Highest Beneficial Use WAC 173-340-720(5)(b)(ii)	Ground Water, Method C-HH, Non-carcinogenic/ Potable WAC 173-340-720(5)(b)(iii)(A) CLARC Database	Ground Water, Method C-HH, Carcinogen/ Potable WAC 173-340-720(5)(b)(iii)(B) CLARC Database	Ground Water, Method C-HH, Potable, Petroleum Mixture WAC 173-340-720(5)(b)(iii)(C) EQ. 720-3 (4-Phase Model)	Ground Water, Method B-HH, Potable/Protect Surface Water WAC 173-340-720(4)(b)(ii)	Ground Water, Non-Potable, Surface Water Protection WAC 173-340-720(6)	Groundwater to Sediment Protection Ecology CSL WAC 173-340-720(1)(c)	Groundwater to Sediment Protection Ecology SQS WAC 173-340-720(1)(c)	EPA RCRA Plant 2 TMCLs	EPA Tap Water Residential Screening Levels (RSL's, 5/2010)	Natural Background Levels Ch. 173-340 WAC	Applicable DL (MDL) Ch. 173-340 WAC	Applicable PQL (RL) Ch. 173-340 WAC	Analytical Methods	
UNITS	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L		
Cobalt	*	*			*		*									
Copper	*	*	1300		*		*	123.3288287	123.3288287	7.3	1500		0.059	0.5	200.8	
Iron	*	*			*		*									
Lead	*	*			*		*	13.31299809	11.30348894	2.5			0.127	1	200.8	
Manganese	*	*	4900		*		*			2000	880					
Mercury	*	*	10.5		*		*	0.00742766	0.005161594	0.012	0.57		0.0002	0.1	7470	
Mercury (organic)	*	*			*		*			0.00045	3.7					
Molybdenum	*	*	175		*		*									
Nickel	*	*	700		*		*			8.2	730			2	200.8	
Selenium	*	*	175		*		*			5	180					
Silver	*	*	175		*	1.9	*	1.532250723	1.532250723	22	180		0.5	0.02		
Tin	*	*			*		NV	NV	NV							
Thallium	*	*	2.45		*		2.33E-01			0.47						
Vanadium	*	*	245		*		NA			260	2.6					
Zinc	*	*	10500		*		3.26E+01	76.25551053	32.56745762	56	11000		0.4	4		
	*	*			*		0.00E+00									
LPAH	*	*			*		1.00E-02									
HPAH	*	*			*		1.00E-02									
Total Petroleum Hydrocarbons	*	*			*		2.08E-01								NWTPH-Dx	
Gasoline	*	*			*		1.00E+03								NWTPH-G	
Gasoline (w/benzene)	*	*			*		8.00E+02								NWTPH-G	
Diesel	*	*			*		5.00E+02						40	100	NWTPH-D	
Heavy Oil	*	*			*	500	5.00E+02						90	100	NWTPH-Dx	
	*	*			*		0.00E+00									
2,3,7,8-TCDD (Dioxin)	*	*		0.0000058	*		2.06E-10			2.06039E-10	0.00000052					
	*	*			*		0.00E+00									
Aldrin	*	*	0.525	0.025735294	*		1.24E-05						4.7E-08	0.000001	8081B	
alpha-BHC	*	*		0.138888889	*		1.21E-03						0.00000027	0.0000005	8081B	
beta-BHC	*	*		0.486111111	*		4.22E-03						0.00000031	0.0000005	8081B	
gamma-BHC (Lindane)	*	*	10.5		*		6.30E-02						0.00000015	0.0000005	8081B	
Chlordane	*	*	17.5	2.5	*		2.00E-04						0.00000015	0.0000005	8081B	
4,4'-DDT	*	*	17.5	2.573529412	*		5.42E-05						0.00000023	0.0000005	8081B	
4,4'-DDE	*	*		2.573529412	*		5.42E-05						0.00000013	0.0000005	8081B	
4,4'-DDD	*	*		3.645833333	*		7.67E-05						0.00000011	0.0000005	8081B	
Dieldrin	*	*	1.75	0.0546875	*		1.32E-05						0.00000023	0.0000005	8081B	
alpha-Endosulfan	*	*	210		*		8.70E-03						0.00000012	0.0000002	8081B	
beta-Endosulfan	*	*	210		*		8.70E-03						0.00000051	0.0000002	8081B	
Endosulfan Sulfate	*	*	210		*		8.70E-03						0.00000012	0.0000005	8081B	
Endrin	*	*	10.5		*		2.30E-03						0.00000084	0.0000002	8081B	
Endrin Aldehyde	*	*	10.5		*		2.30E-03						0.00000067	0.0000002	8081B	

Table A-2. Groundwater Screening Lev

MEDIA - MTCA Standard	GW Method C					GW PATHWAY EVALUATION				ARAR's		Always Applicable			EPA Method
<b>PATHWAYS</b> HH - Human Health Ecol- Ecological	Ground Water Method C - HH Potable ARAR's WAC 173-340-720(5)(b)(i)	Ground Water, Method C-HH, Protect Surface Water Highest Beneficial Use WAC 173-340-720(5)(b)(ii)	Ground Water, Method C-HH, Non-carcinogenic/ Potable WAC 173-340-720(5)(b)(iii)(A) CLARC Database	Ground Water, Method C-HH, Carcinogen/ Potable WAC 173-340-720(5)(b)(iii)(B) CLARC Database	Ground Water, Method C-HH, Potable, Petroleum Mixture WAC 173-340-720(5)(b)(iii)(C) EQ. 720-3 (4-Phase Model)	Ground Water, Method B-HH, Potable/Protect Surface Water WAC 173-340-720(4)(b)(ii)	Ground Water, Non-Potable, Surface Water Protection WAC 173-340-720(6)	Groundwater to Sediment Protection Ecology CSL WAC 173-340-720(1)(c)	Groundwater to Sediment Protection Ecology SQS WAC 173-340-720(1)(c)	EPA RCRA Plant 2 TMCLs	EPA Tap Water Residential Screening Levels (RSL's, 5/2010)	Natural Background Levels Ch. 173-340 WAC	Applicable DL (MDL) Ch. 173-340 WAC	Applicable PQL (RL) Ch. 173-340 WAC	Analytical Methods
UNITS	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
Heptachlor	*	*	17.5	0.19444444	*		1.96E-05						0.00000017	0.0000005	8081B
Heptachlor Epoxide	*	*	0.2275	0.048076923	*		9.69E-06						0.00000047	0.000001	8081B
Toxaphene	*	*			*		6.85E-05	NV	NV						8081B
	*	*			*		*								
<b>Screening Levels Added by Integr</b>															
1,2,4-Trimethylbenzene							NV	NV	NV		15				
1-Methylnaphthalene							NV	NV	NV		2.3				
Carbazole							NV	NV	NV		NV				
Carbon disulfide							NV	NV	NV		1000				
Chloride							230000	NV	NV		NV				
cis-1,2-Dichloroethene							NV	NV	NV		73				
Isophorone							236.1778047	NV	NV		71				
n-Nitrosodi-n-propylamine							0.128210808	NV	NV		0.0096				
Sulfate							NV	NV	NV		NV				
trans-1,2-Dichloroethene							4800	NV	NV		110				
Tributyl phosphate							NV	NV	NV		7.3				

Table A-2. Groundwater Screening Lev

MEDIA - MTCA Standard	POTABLE GW MOST STRINGENT	
<b>PATHWAYS</b> HH - Human Health Ecol- Ecological	Screening Levels	POTABLE GROUNDWATER (Screening Levels Include Potable Groundwater Regulations, When Applicable & Highlighted Below)
UNITS	µg/L	Regulatory Framework For Most Stringent Criteria
acetone	800	HH -Method B, Non-carcinogenic/Potable WAC 173-340-720(4)(b)(iii)(A); CLARC Database
acenaphthene	2.614379085	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
acenaphthylene	10.78431373	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
anthracene	10.78431373	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
benzene	0.795	HH -Method B, Carcinogen/Potable WAC 173-340-720(4)(b)(iii)(B); CLARC Database
benzo(g,h,i)perylene	0.011584454	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
benzo[a]anthracene	0.000112155	HH - Total Tribal Fish (w/o Salmon) Consumption including Early Life, Carc - Adult, EPA RCRA
benzo[a]pyrene	6.5888E-06	HH - Total Tribal Fish (w/o Salmon) Consumption including Early Life, Carc - Adult, EPA RCRA
benzo[b]fluoranthene	5.26914E-05	HH - Total Tribal Fish (w/o Salmon) Consumption including Early Life, Carc - Adult, EPA RCRA
benzo[k]fluoranthene	5.51854E-05	HH - Total Tribal Fish (w/o Salmon) Consumption including Early Life, Carc - Adult, EPA RCRA
bis(2-ethylhexyl) phthalate	0.284848485	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
butyl benzyl phthalate	0.523504274	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
carbon tetrachloride	0.247823653	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
chlorobenzene	100	HH -Method B Potable WAC 173-340-720(4)(b)(i); Safe Drinking Water Standards - MCLs
chloroethane (ethyl chloride)	21000	EPA Tap Water RSL
chloroform (trichloromethane)	4.3	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
chloromethane (Methyl Chloride)	3.37	HH -Method B, Carcinogen/Potable WAC 173-340-720(4)(b)(iii)(B) CLARC Database
chrysene	0.001120636	HH - Total Tribal Fish (w/o Salmon) Consumption including Early Life, Carc - Adult, EPA RCRA
dibenz[a,h]anthracene	2.71511E-05	HH - Total Tribal Fish (w/o Salmon) Consumption including Early Life, Carc - Adult, EPA RCRA
dibenzofuran	1.327433628	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
di-butyl phthalate (di-n-butyl phth.)	46.57806484	HH - Tribal Fish (w/o Salmon) Consumption, Non-Carc - Child, EPA RCRA
dichlorobenzene, 1,2-	5.191873589	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
dichlorobenzene, 1,3-	600	HH -Method A Potable ARAR's WAC 173-340-720(3)(b)(ii)
dichlorobenzene, 1,4-	7.142857143	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
dichloroethane, 1,1-	2.4	EPA Tap Water RSL
dichloroethane, 1,2-	0.48	HH -Method B, Carcinogen/Potable WAC 173-340-720(4)(b)(iii)(B) CLARC Database
dichloroethylene, 1,1-	0.729	HH -Method C, Carcinogen/Potable WAC 173-340-720(5)(b)(iii)(B); CLARC Database
diethyl phthalate	484.1269841	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
dimethyl phthalate	142.8571429	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
di-n-octyl phthalate	0.295918367	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
ethylbenzene	700	HH -Method A Potable Safe Drinking Water Act, 40 CFR 141: WAC 173-340-720(3)(b)(ii)(A); MCL
fluoranthene	2.256699577	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
fluorene	2.03539823	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
hexachlorobenzene	0.112426036	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
hexachlorobutadiene	0.9	HH -Method A Potable ARAR's WAC 173-340-720(3)(b)(ii)
indeno[1,2,3-cd]pyrene	2.27382E-05	HH - Total Tribal Fish (w/o Salmon) Consumption including Early Life, Carc - Adult, EPA RCRA
MEK (Methyl Ethyl Ketone;2-Butanone)	4800	HH -Method B, Non-Carc/Potable WAC 173-340-720(4)(b)(iii)(A); CLARC Database
methylene chloride (dichloromethane)	5	HH -Method B Potable WAC 173-340-720(4)(b)(i); Safe Drinking Water Standards - MCLs
methylnaphthalene, 2-	18.18181818	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
MIBK (M-Isobutyl-K;4-M,2-Pentanone)	640	HH -Method B, Non-Carc/Potable WAC 173-340-720(4)(b)(iii)(A); CLARC Database
naphthalene	53.80434783	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)



Table A-2. Groundwater Screening Lev

MEDIA - MTCA Standard	POTABLE GW MOST STRINGENT	
<b>PATHWAYS</b> HH - Human Health Ecol- Ecological	Screening Levels	POTABLE GROUNDWATER (Screening Levels Include Potable Groundwater Regulations, When Applicable & Highlighted Below)
UNITS	µg/L	Regulatory Framework For Most Stringent Criteria
nitrosodiphenylamine, N-	1.593580667	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
pcb mixtures	2.30915E-05	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
pcb - Aroclor 1016	0.0000641	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
pcb - Aroclor 1221	2.30915E-05	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
pcb - Aroclor 1232		
pcb - Aroclor 1242	2.30915E-05	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
pcb - Aroclor 1248	2.30915E-05	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
pcb - Aroclor 1254	5.49145E-06	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
pcb - Aroclor 1260	2.30915E-05	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
phenanthrene	4.807692308	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
pyrene	9.8	HH - Tribal Fish (w/o Salmon) Consumption, Non-Carc - Child, EPA RCRA
tetrachloroethylene (perchloroethylene)	0.020523086	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
trichlorobenzene, 1,2,4-	1.128133705	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
trichlorethane, 1,1,1-	200	HH -Method B Potable WAC 173-340-720(4)(b)(i); Safe Drinking Water Standards - MCLs
trichlorethane, 1,1,2-	0.768	HH -Method B, Carcinogen/Potable WAC 173-340-720(4)(b)(iii)(B) CLARC Database
trichloroethylene	0.49	HH -Method B, Carcinogen/Potable WAC 173-340-720(4)(b)(iii)(B) CLARC Database
trimethylbenzene, 1,3,5-	45	HH - Tribal Fish (w/o Salmon) Consumption, Non-Carc - Child, EPA RCRA
toluene	1000	HH -Method B Potable WAC 173-340-720(4)(b)(i); Safe Drinking Water Standards - MCLs
vinyl chloride (chloroethylene)	0.016	EPA Tap Water RSL
xylene (dimethylbenzene)	1000	HH -Method A, Potable (Table 720-1) WAC 173-340-720(3)(b)(i)
benzoic acid	2242.926156	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
benzyl alcohol	181.9923372	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
dimethylphenol, 2,4-	2.020624303	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
methylphenol, 2- (o-cresol)	7.110609481	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
methylphenol, 4- (p-cresol)	77.18894009	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
pentachlorophenol	0.729	HH -Method B, Carcinogen/Potable WAC 173-340-720(4)(b)(iii)(B) CLARC Database
phenol (total)	78.35820896	Protection -Groundwater to Sediment (Ecology SQS); WAC 173-340-720(1)(c)
styrene (phenylethylene)	1.46	HH -Method B, Carcinogen/Potable WAC 173-340-720(4)(b)(iii)(B) CLARC Database
Tributyltin		
Trichlorophenol, 2,4,6-	3	HH -Method A Potable ARAR's WAC 173-340-720(3)(b)(ii)
Aluminum	50	HH -Method A Potable Safe Drinking Water Act, 40 CFR 141: WAC 173-340-720(3)(b)(ii)(A); MCL
Antimony	3.865979381	HH - Tribal Fish (w/o Salmon) Consumption, Non-Carc - Child, EPA RCRA
Arsenic (III)		
Arsenic (V)		
Arsenic (total)	0.0583	HH -Method B, Carcinogen/Potable WAC 173-340-720(4)(b)(iii)(B) CLARC Database
Barium	2	State Board Health, Ch. 246-290 WAC: WAC 173-340-720(3)(b)(ii)(C); MCL
Beryllium	4	State Board Health, Ch. 246-290 WAC: WAC 173-340-720(3)(b)(ii)(C); MCL
Cadmium	0.21	HH - Tribal Fish (w/o Salmon) Consumption, Non-Carc - Child, EPA RCRA
Chromium (VI)	0.58	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
Chromium, total (or III)	100	State Board Health, Ch. 246-290 WAC: WAC 173-340-720(3)(b)(ii)(C); MCL

Table A-2. Groundwater Screening Lev

MEDIA - MTCA Standard	POTABLE GW MOST STRINGENT	
<b>PATHWAYS</b> HH - Human Health Ecol- Ecological	Screening Levels	POTABLE GROUNDWATER (Screening Levels Include Potable Groundwater Regulations, When Applicable & Highlighted Below)
<b>UNITS</b>	<b>µg/L</b>	<b>Regulatory Framework For Most Stringent Criteria</b>
Cobalt		
Copper	7.3	
Iron	300	HH -Method B Potable WAC 173-340-720(4)(b)(i); Safe Drinking Water Standards - MCLs
Lead	2.5	Aquatic Life Fresh/Chronic, CWA §304, NRWQC
Manganese	50	State Board Health, Ch. 246-290 WAC: WAC 173-340-720(3)(b)(ii)(C); Secondary MCL
Mercury	0.005161594	Protection -Groundwater to Sediment {Ecology SQS}; WAC 173-340-720(1)(c)
Mercury (organic)	0.00045	HH - Tribal Fish (w/o Salmon) Consumption, Non-Carc - Child, EPA RCRA
Molybdenum	40	HH -Method A Potable ARAR's WAC 173-340-720(3)(b)(ii)
Nickel	8.2	Aquatic Life Fresh/Chronic, NTR - 40 CFR 131.36
Selenium	5	Aquatic Life Fresh/Chronic, NTR - 40 CFR 131.36
Silver	1.532250723	Protection -Groundwater to Sediment {Ecology SQS}; WAC 173-340-720(1)(c)
Tin	9600	Ground Water, Method B-HH, Non-carcinogenic/ Potable WAC 173-340-720(4)(b)(iii)(A) CLARC Database
Thallium	0.233291859	HH -Consumption Organisms Only; Marine; CWA §304, NRWQC
Vanadium	245	HH -Method C, Non-carcinogenic/ Potable WAC 173-340-720(5)(b)(iii)(A); CLARC Database
Zinc	32.56745762	Protection -Groundwater to Sediment {Ecology SQS}; WAC 173-340-720(1)(c)
	0	
LPAH	0.01	
HPAH	0.01	
Total Petroleum Hydrocarbons	0.208	
Gasoline	1000	HH -Method A Potable (Table 720-1) WAC 173-340-720(3)(b)(i)
Gasoline (w/benzene)	800	HH -Method A Potable (Table 720-1) WAC 173-340-720(3)(b)(i)
Diesel	500	HH -Method A Potable (Table 720-1) WAC 173-340-720(3)(b)(i)
Heavy Oil	500	HH -Method A Potable (Table 720-1) WAC 173-340-720(3)(b)(i)
	0	
2,3,7,8-TCDD (Dioxin)	2.06039E-10	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
	0	
Aldrin	1.24351E-05	HH -Method B, Carc/Potable WAC 173-340-720(4)(b)(iii)(B); CLARC Database
alpha-BHC	0.001205401	HH -Method B, Carc/Potable WAC 173-340-720(4)(b)(iii)(B); CLARC Database
beta-BHC	0.004218903	HH -Method B, Carc/Potable WAC 173-340-720(4)(b)(iii)(B); CLARC Database
gamma-BHC (Lindane)	0.0002	HH -Method B, Non-Carc/Potable WAC 173-340-720(4)(b)(iii)(A); CLARC Database
Chlordane	0.000200045	HH -Method B, Non-Carc/Potable WAC 173-340-720(4)(b)(iii)(A); CLARC Database
4,4'-DDT	5.41716E-05	HH -Method B, Carc/Potable WAC 173-340-720(4)(b)(iii)(B); CLARC Database
4,4'-DDE	5.41716E-05	HH -Method B, Carc/Potable WAC 173-340-720(4)(b)(iii)(B); CLARC Database
4,4'-DDD	7.67431E-05	HH -Method B, Carc/Potable WAC 173-340-720(4)(b)(iii)(B); CLARC Database
Dieldrin	1.32123E-05	HH -Method B, Carc/Potable WAC 173-340-720(4)(b)(iii)(B); CLARC Database
alpha-Endosulfan	0.0087	HH -Method B, Non-Carc/Potable WAC 173-340-720(4)(b)(iii)(A); CLARC Database
beta-Endosulfan	0.0087	HH -Method B, Non-Carc/Potable WAC 173-340-720(4)(b)(iii)(A); CLARC Database
Endosulfan Sulfate	0.0087	HH -Method B, Non-Carc/Potable WAC 173-340-720(4)(b)(iii)(A); CLARC Database
Endrin	0.002	HH -Method B Potable WAC 173-340-720(4)(b)(i); Safe Drinking Water Standards - MCLs
Endrin Aldehyde	0.002	HH -Method B Potable WAC 173-340-720(4)(b)(i); Safe Drinking Water Standards - MCLs

Table A-2. Groundwater Screening Lev

MEDIA - MTCA Standard	POTABLE GW MOST STRINGENT	
<b>PATHWAYS</b> HH - Human Health Ecol- Ecological	Screening Levels	POTABLE GROUNDWATER (Screening Levels Include Potable Groundwater Regulations, When Applicable & Highlighted Below)
<b>UNITS</b>	<b>µg/L</b>	<b>Regulatory Framework For Most Stringent Criteria</b>
Heptachlor	1.95878E-05	HH -Method B Potable WAC 173-340-720(4)(b)(i); Safe Drinking Water Standards - MCLs
Heptachlor Epoxide	9.68626E-06	HH -Method B Potable WAC 173-340-720(4)(b)(i); Safe Drinking Water Standards - MCLs
Toxaphene	6.85096E-05	Ground Water, Non-Potable, Surface Water Protection WAC 173-340-720(6)
<b>Screening Levels Added by Integ</b>		
1,2,4-Trimethylbenzene	15	EPA Tap Water RSLs (5/2010)
1-Methylnaphthalene	2.3	EPA Tap Water RSLs (5/2010)
Carbazole	4.4	Ground Water, Method B-HH, Carcinogen/Potable WAC 173-340-720(4)(b)(iii)(B) CLARC Database
Carbon disulfide	800	Ground Water, Method B-HH, Non-carcinogenic/ Potable WAC 173-340-720(4)(b)(iii)(A) CLARC Database
Chloride	230000	Ground Water, Non-Potable, Surface Water Protection WAC 173-340-720(6)
cis-1,2-Dichloroethene	70	Ground Water Method B - HH Potable ARAR's WAC 173-340-720(4)(b)(i) Safe Drinking Water Standards - MCGs
Isophorone	46	Ground Water, Method B-HH, Carcinogen/Potable WAC 173-340-720(4)(b)(iii)(B) CLARC Database
n-Nitrosodi-n-propylamine	0.0096	EPA Tap Water RSLs (5/2010)
Sulfate	250000	Ground Water Method B - HH Potable ARARs WAC 173-340-720(4)(b)(i) State Department of Health Stanadrds - MCLs Ground Water Method B - HH Potable ARAR's WAC 173-340-720(4)(b)(i) Safe Drinking Water Standards - MCGs
trans-1,2-Dichloroethene	100	MCGs
Tributyl phosphate	7.3	EPA Tap Water RSLs (5/2010)

Notes:

- ARAR = applicable or relevant and appropriate requirement
- CLARC = cleanup level and risk calculation
- CSL = cleanup screening level
- HH = human health
- MCG = maximum contaminant level goal
- MCL = maximum contaminant level
- MCLG = maximum contaminant level goal
- MDL = method detection limit
- NV = no value available
- PQL = practical quantitation limit
- RSL = residential screening level
- SQS = sediment quality standard
- TMCL = total maximum contaminant load
- WAC = Washington Administrative Code



Table A-3. Summary of Medium-Specific Screening Levels within Ecology Spreadsheet

MEDIA - MTCA Standard	SOIL MOST STRINGENT	VADOSE Soil To Protect The Most Stringent Potable GW	SATURATED Soil To Protect The Most Stringent Potable GW	VADOSE Soil To Protect The Most Stringent SW	SATURATED Soil To Protect The Most Stringent SW	Soil Standard to Protect Potable Ground Waters	GW MOST STRINGENT POTABLE*	SW MOST STRINGENT Non-Potable
<i>Note: Natural Background and PQLs Have Not Been Incorporated Into These Screening Levels Because They Are Site Specific And Have Not Been Determined By Ecology</i>						<b>Screening Levels</b>	<b>Screening Levels*</b>	<b>Screening Levels</b>
<b>UNITS</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>µg/L</b>	<b>µg/L</b>
acetone	0.230918133	3.233947718	0.2309			0.2309	800	110107.0077
acenaphthene	0.016749455	0.330633526	0.017132026	0.330633526	28.51850296	0.016749455	2.614379085	2.614379085
acenaphthylene	0.069091503	1.363879887	0.070669608	1.363879887	0.069123856	0.069091503	10.78431373	10.78431373
anthracene	0.223091503	4.443179766	0.224637255	4.443179766	0.223091503	0.223091503	10.78431373	10.78431373
benzene	0.00021	0.006124269	0.000473423	0.015624156	0.000917082	0.00021	0.795	2.028193577
benzo(g,h,i)perylene	0.031003321	0.620046338	0.031004981	0.620046338	0.031003321	0.031003321	0.011584454	0.011584454
benzo[a]anthracene	0.00039655	0.000957358	4.78937E-05	0.00220511	0.000110278	4.78937E-05	0.000112155	0.000258331
benzo[a]pyrene	7.72944E-05	0.000103708	5.1869E-06	0.000238873	1.1945E-05	5.1869E-06	6.5888E-06	1.51762E-05
benzo[b]fluoranthene	0.000630756	0.00084654	4.23391E-05	0.001949861	9.75036E-05	4.23391E-05	5.26914E-05	0.000121366
benzo[k]fluoranthene	0.000647389	0.000868618	4.34436E-05	0.002000713	0.000100047	4.34436E-05	5.51854E-05	0.000127111
bis(2-ethylhexyl) phthalate	0.047081657	0.943418187	0.047236424	0.943418187	0.047195596	0.047081657	0.284848485	0.284848485
butyl benzyl phthalate	0.005050071	0.100083594	0.005124583	0.078371192	0.003954085	0.003954085	0.523504274	0.409933862
carbon tetrachloride	0.000536491	0.001790807	0.000118618	0.001790807	8.30969E-05	8.30969E-05	0.247823653	0.247823653
chlorobenzene	0.011093333	0.95804925	0.0698	0.19160985	0.011093333	0.011093333	100	20
chloroethane	0.010553827			0.178900071	0.010553827	0.010553827	21000	34
chloroform (trichloromethane)	0.000053	0.02133228	0.001999672	0.021308514	0.001381798	0.000053	4.3	4.2952095
chloromethane	0.001014258	0.016551147	0.001497291	0.09945782	0.006094796	0.001014258	3.37	20.25073279
chrysene	0.00283664	0.005296124	0.000265064	0.012198717	0.00061016	0.000265064	0.001120636	0.002581193
dibenz[a,h]anthracene	0.001036527	0.001423913	7.12019E-05	0.00327974	0.000163992	7.12019E-05	2.71511E-05	6.25379E-05
dibenzofuran	0.015380531	0.305064294	0.015557522	0.305064294	0.015367257	0.015367257	1.327433628	1.327433628
di-butyl phthalate (di-n-butyl phth.)	0.263196347	1.54639773	0.088032543	1.54639773	0.081356353	0.081356353	46.57806484	46.57806484
dichlorobenzene, 1,2-	0.003788337	0.067484617	0.004533025	0.067484617	0.003788856	0.003788337	5.191873589	5.191873589
dichlorobenzene, 1,3-	0.2752			3.84	0.2752	0.2752	600	960
dichlorobenzene, 1,4-	0.00041	0.091797143	0.006171429	0.009507942	0.000533168	0.00041	7.142857143	0.739825557
dichloroethane, 1,1-	0.00069	0.012238191	0.001116096	0.16960826	0.010700426	0.00069	2.4	33.26143751
dichloroethane, 1,2-	0.000042	0.002380541	0.000227419	0.01761977	0.001174033	0.000042	0.48	3.552760138
dichloroethylene, 1,1-	0.000234524	0.004775851	0.000339014	0.020963953	0.001029461	0.000234524	0.729	3.2
diethyl phthalate	0.199783069	3.158465423	0.269271429	3.158465423	0.199879894	0.199783069	484.1269841	484.1269841
dimethyl phthalate	0.093952381	0.571428571	0.061428571	0.571428571	0.040952381	0.040952381	142.8571429	142.8571429
di-n-octyl phthalate	0.05808483	0.01045914	0.000590949	0.01045914	0.000548534	0.000548534	0.295918367	0.295918367
ethylbenzene	0.0017	10.44027286	0.66346	0.035694822	0.001925305	0.0017	700	2.393268421
fluoranthene	0.160646921	3.206771516	0.160857546	3.206771516	0.160534086	0.160534086	2.256699577	2.256699577

Table A-3. Summary of Medium-Specific Screening Levels within Ecology Spreadsheet

MEDIA - MTCA Standard	SOIL MOST STRINGENT	VADOSE Soil To Protect The Most Stringent Potable GW	SATURATED Soil To Protect The Most Stringent Potable GW	VADOSE Soil To Protect The Most Stringent SW	SATURATED Soil To Protect The Most Stringent SW	Soil Standard to Protect Potable Ground Waters	GW MOST STRINGENT POTABLE*	SW MOST STRINGENT Non-Potable
<i>Note: Natural Background and PQLs Have Not Been Incorporated Into These Screening Levels Because They Are Site Specific And Have Not Been Determined By Ecology</i>						<b>Screening Levels</b>	<b>Screening Levels*</b>	<b>Screening Levels</b>
<b>UNITS</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>µg/L</b>	<b>µg/L</b>
fluorene	0.023583481	0.467748395	0.023854867	0.467748395	0.023563127	0.023563127	2.03539823	2.03539823
hexachlorobenzene	1.06333E-06	0.008063345	0.000428343	4.74746E-06	2.42708E-07	2.42708E-07	0.112426036	6.61931E-05
hexachlorobutadiene	0.007181735	0.087205361	0.00128115	0.380170923	0.005022787	0.00128115	0.9	3.923541247
indeno[1,2,3-cd]pyrene	0.000885763	0.00121704	6.08572E-05	0.002803243	0.000140167	6.08572E-05	2.27382E-05	5.23736E-05
MEK (Methyl Ethyl Ketone;2-Butanone)	1.5					1.5	4800	73404.6718
methylene chloride (dichloromethane)	0.0012	0.024210256	0.0022687	0.297433756	0.019067419	0.0012	5	61.42722279
methylnaphthalene, 2-	0.043212121	1.15557682	0.061927273	1.15557682	0.059321212	0.043212121	18.18181818	18.18181818
MIBK (M-Isobutyl-K;4-M,2-Pentanone)	0.45					0.45	640	
naphthalene	0.00047	2.193667561	0.121974457	2.193667561	0.1142625	0.00047	53.80434783	53.80434783
nitrosodiphenylamine, N-	0.011528793	0.202512367	0.010492135	0.188259921	0.00954138	0.00954138	1.593580667	1.481427406
pcb mixtures	2.88683E-06	2.07922E-05	1.04489E-06	1.42455E-05	7.13627E-07	7.13627E-07	2.30915E-05	1.58209E-05
pcb - Aroclor 1016	6.14091E-05	3.50123E-05	1.76531E-06	0.000246903	1.2384E-05	1.76531E-06	0.0000641	0.000452025
pcb - Aroclor 1221	3.97083E-06			4.85242E-06	2.44557E-07	2.44557E-07	2.30915E-05	2.30352E-05
pcb - Aroclor 1232	0.00012			0.002949131	0.000148633	0.00012		0.014
pcb - Aroclor 1242	1.02881E-05			2.98939E-07	1.69278E-08	1.69278E-08	2.30915E-05	2.30352E-05
pcb - Aroclor 1248	0.000618613	2.03674E-05	1.02365E-06	2.03178E-05	1.01785E-06	1.01785E-06	2.30915E-05	2.30352E-05
pcb - Aroclor 1254	1.43548E-05	8.32954E-05	4.17734E-07	8.31911E-06	4.16425E-07	4.16425E-07	5.49145E-06	5.48457E-06
pcb - Aroclor 1260	0.000161595	9.56918E-05	4.78988E-06	9.54585E-05	4.77489E-06	4.77489E-06	2.30915E-05	2.30352E-05
phenanthrene	0.101378205	2.022129803	0.102211538	2.022129803	0.101522436	0.101378205	4.807692308	4.807692308
pyrene	1.004130644	13.64356827	0.684432	13.68360955	0.685031889	0.684432	9.8	9.828761139
tetrachloroethylene (perchloroethylene)	0.000049	0.000151684	1.10168E-05	0.000152309	8.10842E-06	8.10842E-06	0.020523086	0.02060763
trichlorobenzene, 1,2,4-	0.001133398	0.006105926	0.000561472	0.006105926	0.000399773	0.000399773	1.128133705	1.128133705
trichlorethane, 1,1,1-	2	1.238448805	0.095728	284.9891395	15.43200785	0.095728	200	46023.56406
trichlorethane, 1,1,2-	0.000078	0.004156738	0.000382234	0.012643365	0.000827797	0.000078	0.768	2.335991132
trichloroethylene	3.89803E-05	0.002965649	0.000243873	0.004475667	0.000262052	3.89803E-05	0.49	0.739493051
trimethylbenzene, 1,3,5-	0.395866667	0.84067986	0.050985			0.050985	45	45.21613312
toluene	0.776533333	9.727251165	0.698	12.58756567	0.71776733	0.698	1000	1294.051676
vinyl chloride (chloroethylene)	0.0000056	0.000103132	7.25984E-06	0.003437025	0.000165516	0.0000056	0.016	0.53322242
xylene (dimethylbenzene)	0.2	13.0924182	0.8731	20.65919136	1.151535872	0.2	1000	1577.950768
benzoic acid	0.675472165	8.998864665	0.965804003	8.998864665	0.64431792	0.64431792	2242.926156	2242.926156
benzyl alcohol	0.055021137	0.784973697	0.081106705	0.784973697	0.055021137	0.055021137	181.9923372	181.9923372
dimethylphenol, 2,4-	0.002029246	0.037017974	0.002315635	0.037017974	0.002026013	0.002026013	2.020624303	2.020624303

Table A-3. Summary of Medium-Specific Screening Levels within Ecology Spreadsheet

MEDIA - MTCA Standard	SOIL MOST STRINGENT	VADOSE Soil To Protect The Most Stringent Potable GW	SATURATED Soil To Protect The Most Stringent Potable GW	VADOSE Soil To Protect The Most Stringent SW	SATURATED Soil To Protect The Most Stringent SW	Soil Standard to Protect Potable Ground Waters	GW MOST STRINGENT POTABLE*	SW MOST STRINGENT Non-Potable
<i>Note: Natural Background and PQLs Have Not Been Incorporated Into These Screening Levels Because They Are Site Specific And Have Not Been Determined By Ecology</i>						<b>Screening Levels</b>	<b>Screening Levels*</b>	<b>Screening Levels</b>
<b>UNITS</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>µg/L</b>	<b>µg/L</b>
methylphenol, 2- (o-cresol)	0.005188375	0.041384351	0.003704628	0.041384351	0.00268544	0.00268544	7.110609481	7.110609481
methylphenol, 4- (p-cresol)	0.050166667	0.30875576	0.033191244	0.30875576	0.022127496	0.022127496	77.18894009	77.18894009
pentachlorophenol	0.002673	0.052196401	0.00277749	0.049979423	0.002559468	0.002559468	0.729	0.698036623
phenol (total)	0.043462687	0.341842395	0.035112313	0.341842395	0.02388097	0.02388097	78.35820896	78.35820896
styrene (phenylethylene)	0.001174521	0.021244415	0.001383788			0.001174521	1.46	NA
Tributyltin	2.12133E-06			0.0000296	2.12133E-06			0.0074
Trichlorophenol, 2,4,6-	0.002945333	0.083160553	0.004848	0.015479763	0.00082238	0.00082238	3	0.558429298
Aluminum	55000	0.2	0.0215			0.0215	50	NA
Antimony	0.289834667	3.494845361	0.175631443	3.494845361	0.17507732	0.17507732	3.865979381	3.865979381
Arsenic (III)	7					7		
Arsenic (V)	10					10		
Arsenic (total)	0.001707413	0.0340472	0.001715769	0.003146798	0.000157807	0.000157807	0.0583	0.005388353
Barium	23.12053333	1.648	0.08286			0.08286	2	122.1478478
Beryllium	10	63.216	3.16172	197.090123	9.855586963	3.16172	4	12.47090123
Cadmium	0.001746667	0.02898	0.0014973	0.0345	0.001746667	0.0014973	0.21	0.25
Chromium (VI)	0.00083	0.22272	0.0112694	0.047386715	0.002380031	0.00083	0.58	0.123402903
Chromium, total (or III)	42	2000.4	100.043	1480.296	74.02121333	42	100	74
Cobalt	0.49					0.49		
Copper	0.053488	3.2412	0.163739	1.3764	0.069088667	0.053488	7.3	3.1
Iron	0.086	1.2	0.129			0.086	300	
Lead	25.00071667			108.00216	5.4001548	5.4001548	2.5	0.54
Manganese	0.014333333	0.2	0.0215			0.014333333	50	100
Mercury	0.00062744	0.005388704	0.000270622	0.005388704	0.000269883	0.000269883	0.005161594	0.005161594
Mercury (organic)	0.0000018				1.30382E-07	1.30382E-07	0.00045	0.000454821
Molybdenum	0.050166667	0.16	0.0172			0.0172	40	NA
Nickel	0.326433333	10.6928	0.536526	10.6928	0.535350667	0.326433333	8.2	8.2
Selenium	0.026433333	0.52	0.02715	0.52	0.026433333	0.026433333	5	5
Silver	0.016314667	0.260482623	0.013376549	0.260482623	0.013156926	0.013156926	1.532250723	1.532250723
Tin	50					50	9600	
Thallium	0.033504733	0.332207608	0.016664038	0.332207608	0.016630599	0.016630599	0.233291859	0.233291859
Vanadium	0.070233333	0.98	0.10535			0.070233333	245	NA

Table A-3. Summary of Medium-Specific Screening Levels within Ecology Spreadsheet

MEDIA - MTCA Standard	SOIL MOST STRINGENT	VADOSE Soil To Protect The Most Stringent Potable GW	SATURATED Soil To Protect The Most Stringent Potable GW	VADOSE Soil To Protect The Most Stringent SW	SATURATED Soil To Protect The Most Stringent SW	Soil Standard to Protect Potable Ground Waters	GW MOST STRINGENT POTABLE*	SW MOST STRINGENT Non-Potable
<i>Note: Natural Background and PQLs Have Not Been Incorporated Into These Screening Levels Because They Are Site Specific And Have Not Been Determined By Ecology</i>						<b>Screening Levels</b>	<b>Screening Levels*</b>	<b>Screening Levels</b>
<b>UNITS</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>µg/L</b>	<b>µg/L</b>
Zinc	5.04522	40.51391728	2.033186379	40.51391728	2.028518377	2.028518377	32.56745762	32.56745762
LPAH						NA	0.01	0.01
HPAH						NA	0.01	0.01
Total Petroleum Hydrocarbons						NA	NA	0.208
Gasoline	100					100	1000	1000
Gasoline (w/benzene)	30					30	800	800
Diesel	2000					2000	500	500
Heavy Oil	2000					2000	500	500
2,3,7,8-TCDD (Dioxin)	7.47592E-10	6.03696E-10	3.02322E-11	6.03696E-10	3.02026E-11	3.02026E-11	2.06039E-10	2.06039E-10
Aldrin	2.44858E-06	1.2158E-05	6.1075E-07	1.2158E-05	6.08968E-07	6.08968E-07	1.24351E-05	1.24351E-05
alpha-BHC	1.00385E-05	4.73008E-05	2.64224E-06	4.73008E-05	2.46946E-06	2.46946E-06	0.001205401	0.001205401
beta-BHC	4.12363E-05	0.00019736	1.08384E-05	0.00019736	1.02337E-05	1.02337E-05	0.004218903	0.004218903
gamma-BHC	0.000103236	6.2082E-06	3.564E-07	0.001955583	0.000103236	3.564E-07	0.0002	0.063
Chlordane	3.0442E-05	0.000206087	1.03503E-05	0.000206087	1.03217E-05	1.03217E-05	0.000200045	0.000200045
4,4'-DDT	0.000149209	0.000734712	3.67481E-05	0.000734712	3.67403E-05	3.67403E-05	5.41716E-05	5.41716E-05
4,4'-DDE	1.90722E-05	9.38307E-05	4.70399E-06	9.38307E-05	4.69623E-06	4.69623E-06	5.41716E-05	5.41716E-05
4,4'-DDD	1.42869E-05	7.06037E-05	3.54783E-06	7.06037E-05	3.53683E-06	3.53683E-06	7.67431E-05	7.67431E-05
Dieldrin	1.39496E-06	6.80329E-06	3.43203E-07	6.80329E-06	3.41309E-07	3.41309E-07	1.32123E-05	1.32123E-05
alpha-Endosulfan	0.000020242	0.000389767	0.000021489	0.000389767	0.000020242	0.000020242	0.0087	0.0087
beta-Endosulfan	0.000020242	0.000389767	0.000021489	0.000389767	0.000020242	0.000020242	0.0087	0.0087
Endosulfan Sulfate	0.000020242	0.000389767	0.000021489	0.000389767	0.000020242	0.000020242	0.0087	0.0087
Endrin	2.55246E-05	0.000440441	0.000022482	0.000506507	2.55246E-05	0.000022482	0.002	0.0023
Endrin Aldehyde	2.55246E-05	0.000440441	0.000022482	0.000506507	2.55246E-05	0.000022482	0.002	0.0023
Heptachlor	7.75359E-07	3.81251E-06	1.95055E-07	3.81251E-06	1.92247E-07	1.92247E-07	1.95878E-05	1.95878E-05
Heptachlor Epoxide	3.25598E-06	1.61567E-05	8.10062E-07	1.61567E-05	8.08673E-07	8.08673E-07	9.68626E-06	9.68626E-06
Toxaphene	5.73333E-08					5.73333E-08	6.85096E-05	6.85096E-05

Table A-3. Summary of Medium-Specific Screening Levels within Ecology Spreadsheet

MEDIA - MTCA Standard	SOIL MOST STRINGENT	VADOSE Soil To Protect The Most Stringent Potable GW	SATURATED Soil To Protect The Most Stringent Potable GW	VADOSE Soil To Protect The Most Stringent SW	SATURATED Soil To Protect The Most Stringent SW	Soil Standard to Protect Potable Ground Waters	GW MOST STRINGENT POTABLE*	SW MOST STRINGENT Non-Potable
<i>Note: Natural Background and PQLs Have Not Been Incorporated Into These Screening Levels Because They Are Site Specific And Have Not Been Determined By Ecology</i>						<b>Screening Levels</b>	<b>Screening Levels*</b>	<b>Screening Levels</b>
<b>UNITS</b>	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L
<b>Screening Levels Added by Integral</b>								
1,2,4-Trimethylbenzene						0.021	15	NV
1-Methylnaphthalene						0.012	2.3	NV
Carbazole						0.016221333	4.4	NV
Carbon disulfide						0.266133333	800	NV
Chloride						--	230000	230000
cis-1,2-Dichloroethene						0.021	70	NV
Isophorone						0.015348667	46	236.1778047
n-Nitrosodi-n-propylamine						2.9824E-06	0.0096	0.128210808
Sulfate						--	250000	NV
trans-1,2-Dichloroethene						0.029	100	4800
Tributyl phosphate						0.036	7.3	NV

Notes:

- Ecology = Washington State Department of Ecology
- GW = groundwater
- HPAH = high molecular weight polycyclic aromatic hydrocarbon
- LPAH = low molecular weight polycyclic aromatic hydrocarbon
- NA = not available
- NV = no value available
- PCB = polychlorinated biphenyl
- PQL = practical quantitation limit
- SW = surface water

Table A-4. Surface Water Screening Level Derivation Table within Ecology Spreadsheet (µg/L)

MEDIA - MTCA Standard	SW Method A						SW Method B										
	Surface Water, Method A - HH ARAR's WAC 173-340-730(2)(b)(i) [See Required ARAR's]	Surface Water, Method A - WAC 173-340-730(2)(b)(i)(A) [See Required ARAR's]	Surface Water, Method A - HH/ Aquatic Organisms: CWA §304 WAC 173-340-730(2)(b)(i)(B) [See Required ARAR's]	Surface Water, Method A - HH NTR - 40 CFR 131 WAC 173-340-730(2)(b)(i)(C) [See Required ARAR's]	Surface Water, Method A - HH Potability WAC 173-340-730(2)(b)(ii) [See Required ARAR's]	Surface Water, Method A - HH No Table Values WAC 173-340-730(2)(b)(iii) [See applicable SW background or PQL values]	Surface Water, Method B - HH ARAR's WAC 173-340-730(3)(b)(i) [See Required ARAR's]	Surface Water, Method B - WA WQS:Ch. 173-2101 A WAC 173-340-730(3)(b)(i)(A) [See Required ARAR's]	Surface Water, Method B - HH/ Aquatic Organisms: CWA §304 WAC 173-340-730(3)(b)(i)(B) [See Required ARAR's]	Surface Water, Method B - HH NTR - 40 CFR 131 WAC 173-340-730(3)(b)(i)(C) [See Required ARAR's]	Surface Water, Method B, Environmental Effects, WAC 173-340-730(3)(b)(ii) [WET TESTING]	Surface Water, Method B-HH, Non-carcinogen, Fish Consumption WAC 173-340-730(3)(b)(iii)(A) EQ. 730-1 CLARC Database	Surface Water, Method B-HH, Non-carcinogen, Fish Consumption WAC 173-340-730(3)(c) EQ. 730-1 MOD - Tribal Adult	Surface Water, Method B-HH, Non-carcinogen, Fish Consumption WAC 173-340-730(3)(c) EQ. 730-1 MOD - Tribal Child	Surface Water, Method B-HH, Carcinogen, Fish Consumption WAC 173-340-730(3)(b)(iii)(B) EQ. 730-2 CLARC Database	Surface Water, Method B-HH, Carcinogen, Fish Consumption WAC 173-340-730(3)(b)(iii)(B) EQ. 730-2 MOD - Tribal Adult	Surface Water, Method B-HH, Carcinogen, Fish Consumption WAC 173-340-730(3)(b)(iii)(B) EQ. 730-2 MOD - Tribal Child
UNITS	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
acetone	*	*	*	*	*	*	*	*	*	*	*						
acenaphthene	*	*	*	*	*	*	*	*	*	*	*	642.7915519	208.8670622	95.85072847			
acenaphthylene	*	*	*	*	*	*	*	*	*	*	*						
anthracene	*	*	*	*	*	*	*	*	*	*	*	25925.92593	8424.30484	3865.979381			
benzene	*	*	*	*	*	*	*	*	*	*	*	1994.301994	648.0234493	297.3830293	22.66252266	3.221707489	15.77031216
benzo(g,h,i)perylene	*	*	*	*	*	*	*	*	*	*	*						
benzo[a]anthracene	*	*	*	*	*	*	*	*	*	*	*				0.029595806	0.004507869	0.02059502
benzo[a]pyrene	*	*	*	*	*	*	*	*	*	*	*				0.029595806	0.004507869	0.02059502
benzo[b]fluoranthene	*	*	*	*	*	*	*	*	*	*	*				0.029595806	0.004507869	0.02059502
benzo[k]fluoranthene	*	*	*	*	*	*	*	*	*	*	*				0.029595806	0.004507869	0.02059502
bis(2-ethylhexyl) phthalate	*	*	*	*	*	*	*	*	*	*	*	398.8603989	129.6046899	59.47660587	3.561253561	0.542430343	2.478191911
butyl benzyl phthalate	*	*	*	*	*	*	*	*	*	*	*	1252.46019	406.9712483	186.762289	8.239869669	1.255051136	5.733929924
carbon tetrachloride	*	*	*	*	*	*	*	*	*	*	*	96.79012346	31.45073807	14.43298969	2.659069326	0.405014656	1.850383294
chlorobenzene	*	*	*	*	*	*	*	*	*	*	*						
chloroethane (ethyl chloride)	*	*	*	*	*	*	*	*	*	*	*						
chloroform (trichloromethane)	*	*	*	*	*	*	*	*	*	*	*	6913.580247	2246.481291	1030.927835	283.3434527	43.15729939	197.1719903
chloromethane	*	*	*	*	*	*	*	*	*	*	*				132.9534663	20.25073279	92.51916468
chrysene	*	*	*	*	*	*	*	*	*	*	*				0.029595806	0.004507869	0.02059502
dibenz[a,h]anthracene	*	*	*	*	*	*	*	*	*	*	*				0.029595806	0.004507869	0.02059502
dibenzofuran	*	*	*	*	*	*	*	*	*	*	*						
di-butyl phthalate (di-n-butyl phth.)	*	*	*	*	*	*	*	*	*	*	*	2913.025385	946.5511057	434.3797058			
dichlorobenzene, 1,2-	*	*	*	*	*	*	*	*	*	*	*	4196.642686	1363.646467	625.7880294			
dichlorobenzene, 1,3-	*	*	*	*	*	*	*	*	*	*	*						
dichlorobenzene, 1,4-	*	*	*	*	*	*	*	*	*	*	*				4.857225331	0.739825557	3.380027936
dichloroethane, 1,1-	*	*	*	*	*	*	*	*	*	*	*						
dichloroethane, 1,2-	*	*	*	*	*	*	*	*	*	*	*	43209.87654	14040.50807	6443.298969	59.35422602	9.04050571	41.30319852
dichloroethylene, 1,1-	*	*	*	*	*	*	*	*	*	*	*	23148.14815	7521.70075	3451.767305			
diethyl phthalate	*	*	*	*	*	*	*	*	*	*	*	28411.97362	9232.114894	4236.689733			
dimethyl phthalate	*	*	*	*	*	*	*	*	*	*	*	72016.46091	23400.84678	10738.83162			
di-n-octyl phthalate	*	*	*	*	*	*	*	*	*	*	*						
ethylbenzene	*	*	*	*	*	*	*	*	*	*	*	6913.580247	2246.481291	1030.927835		2.393268421	10.9340831
fluoranthene	*	*	*	*	*	*	*	*	*	*	*	90.17713366	29.30192988	13.44688481			
fluorene	*	*	*	*	*	*	*	*	*	*	*	3456.790123	1123.240645	515.4639175			
hexachlorobenzene	*	*	*	*	*	*	*	*	*	*	*	0.238399319	0.077464872	0.035549236	0.000465624	7.09212E-05	0.000324016
hexachlorobutadiene	*	*	*	*	*	*	*	*	*	*	*	185.1851852	60.173606	27.61413844	29.67711301	4.520252855	20.65159926
indeno[1,2,3-cd]pyrene	*	*	*	*	*	*	*	*	*	*	*				0.029595806	0.004507869	0.02059502
MEK (Methyl Ethyl Ketone;2-Butanone)																	
methylene chloride (dichloromethane)	*	*	*	*	*	*	*	*	*	*	*	172839.5062	56162.03227	25773.19588	960.2194787	146.2552924	668.1939672
methylnaphthalene, 2-	*	*	*	*	*	*	*	*	*	*	*						
MIBK (M-Isobutyl-K;4-M,2-Pentanone)																	



Table A-4. Surface Water Screening Level Derivation Table within Ecology Spreadsheet (µg/L)

MEDIA - MTCA Standard	SW Method A						SW Method B										
	Surface Water, Method A - HH ARAR's WAC 173-340-730(2)(b)(i) [See Required ARAR's]	Surface Water, Method A - WAC 173-340-730(2)(b)(i)(A) [See Required ARAR's]	Surface Water, Method A - HH/ Aquatic Organisms: CWA §304 WAC 173-340-730(2)(b)(i)(B) [See Required ARAR's]	Surface Water, Method A - HH NTR - 40 CFR 131 WAC 173-340-730(2)(b)(i)(C) [See Required ARAR's]	Surface Water, Method A - HH Potability WAC 173-340-730(2)(b)(ii) [See Required ARAR's]	Surface Water, Method A - HH No Table Values WAC 173-340-730(2)(b)(iii) [See applicable SW background or PQL values]	Surface Water, Method B - HH ARAR's WAC 173-340-730(3)(b)(i) [See Required ARAR's]	Surface Water, Method B - WA WQS:Ch. 173-2101 A WAC 173-340-730(3)(b)(i)(A) [See Required ARAR's]	Surface Water, Method B - HH/ Aquatic Organisms: CWA §304 WAC 173-340-730(3)(b)(i)(B) [See Required ARAR's]	Surface Water, Method B - HH NTR - 40 CFR 131 WAC 173-340-730(3)(b)(i)(C) [See Required ARAR's]	Surface Water, Method B, Environmental Effects, WAC 173-340-730(3)(b)(ii) [WET TESTING]	Surface Water, Method B-HH, Non-carcinogen, Fish Consumption WAC 173-340-730(3)(b)(iii)(A) EQ. 730-1 CLARC Database	Surface Water, Method B-HH, Non-carcinogen, Fish Consumption WAC 173-340-730(3)(c) EQ. 730-1 MOD - Tribal Adult	Surface Water, Method B-HH, Non-carcinogen, Fish Consumption WAC 173-340-730(3)(c) EQ. 730-1 MOD - Tribal Child	Surface Water, Method B-HH, Carcinogen, Fish Consumption WAC 173-340-730(3)(b)(iii)(B) EQ. 730-2 CLARC Database	Surface Water, Method B-HH, Carcinogen, Fish Consumption WAC 173-340-730(3)(b)(iii)(B) EQ. 730-2 MOD - Tribal Adult	Surface Water, Method B-HH, Carcinogen, Fish Consumption WAC 173-340-730(3)(b)(iii)(B) EQ. 730-2 MOD - Tribal Child
UNITS	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
naphthalene	*	*	*	*	*	*	*	*	*	*	*	4938.271605	1604.629493	736.377025			
nitrosodiphenylamine, N-	*	*	*	*	*	*	*	*	*	*	*				9.726112667	1.481427406	6.768171186
PCB mixtures	*	*	*	*	*	*	*	*	*	*	*				0.00010387	1.58209E-05	7.22806E-05
PCB - Aroclor 1016	*	*	*	*	*	*	*	*	*	*	*	0.005816714	0.001890068	0.000867367	0.002967711	0.000452025	0.00206516
PCB - Aroclor 1221	*	*	*	*	*	*	*	*	*	*	*						
PCB - Aroclor 1232	*	*	*	*	*	*	*	*	*	*	*						
PCB - Aroclor 1242	*	*	*	*	*	*	*	*	*	*	*						
PCB - Aroclor 1248	*	*	*	*	*	*	*	*	*	*	*						
PCB - Aroclor 1254	*	*	*	*	*	*	*	*	*	*	*	0.001661918	0.00054002	0.000247819	0.00010387	1.58209E-05	7.22806E-05
PCB - Aroclor 1260	*	*	*	*	*	*	*	*	*	*	*						
phenanthrene	*	*	*	*	*	*	*	*	*	*	*						
pyrene	*	*	*	*	*	*	*	*	*	*	*						
tetrachloroethylene (perchloroethylene)	*	*	*	*	*	*	*	*	*	*	*	836.3201912	271.751769	124.7090123	0.387185274	0.058973908	0.269433051
trichlorobenzene, 1,2,4-	*	*	*	*	*	*	*	*	*	*	*	227.4204029	73.89741088	33.91209984			
trichlorethane, 1,1,1-	*	*	*	*	*	*	*	*	*	*	*	925925.9259	300868.03	138070.6922			
trichlorethane, 1,1,2-	*	*	*	*	*	*	*	*	*	*	*	2304.526749	748.8270969	343.6426117	25.26893365	3.848823483	17.58405177
trichloroethylene	*	*	*	*	*	*	*	*	*	*	*	70.70707071	22.97537684	10.54358013	6.620512238	1.008399615	4.607057486
trimethylbenzene, 1,3,5-	*	*	*	*	*	*	*	*	*	*	*						
toluene	*	*	*	*	*	*	*	*	*	*	*	19383.86985	6298.545675	2890.451874			
vinyl chloride (chloroethylene)	*	*	*	*	*	*	*	*	*	*	*	6647.673314	2160.078164	991.2767645	3.693151841	0.562520355	2.569976797
xylene (dimethylbenzene)	*	*	*	*	*	*	*	*	*	*	*						
benzoic acid	*	*	*	*	*	*	*	*	*	*	*						
benzyl alcohol	*	*	*	*	*	*	*	*	*	*	*						
dimethylphenol, 2,4-	*	*	*	*	*	*	*	*	*	*	*	552.7915976	179.6227045	82.430264			
methylphenol, 2- (o-cresol)	*	*	*	*	*	*	*	*	*	*	*						
methylphenol, 4- (p-cresol)	*	*	*	*	*	*	*	*	*	*	*						
pentachlorophenol	*	*	*	*	*	*	*	*	*	*	*	7070.707071	2297.537684	1054.358013	4.910213244	0.747896381	3.416900968
phenol (total)	*	*	*	*	*	*	*	*	*	*	*	1111111.111	361041.636	165684.8306			
styrene (phenylethylene)	*	*	*	*	*	*	*	*	*	*	*						
Tributyltin	*	*	*	*	*	*	*	*	*	*	*						
Trichlorophenol, 2,4,6-	*	*	*	*	*	*	*	*	*	*	*				3.928170595	0.598317105	2.733520775
Aluminum	*	*	*	*	*	*	*	*	*	*	*						
Antimony	*	*	*	*	*	*	*	*	*	*	*	1037.037037	336.9721936	154.6391753			
Arsenic (III)	*	*	*	*	*	*	*	*	*	*	*						
Arsenic (V)	*	*	*	*	*	*	*	*	*	*	*						
Arsenic (total)	*	*	*	*	*	*	*	*	*	*	*	17.67676768	5.743844209	2.635895033	0.098204265	0.014957928	0.068338019
Barium	*	*	*	*	*	*	*	*	*	*	*						
Beryllium	*	*	*	*	*	*	*	*	*	*	*	272.9044834	88.67689306	40.6945198			
Cadmium	*	*	*	*	*	*	*	*	*	*	*	20.25462963	6.581488157	3.020296392			

Table A-4. Surface Water Screening Level Derivation Table within Ecology Spreadsheet (µg/L)

MEDIA - MTCA Standard	SW Method A						SW Method B										
<b>PATHWAYS</b> HH - Human Health Ecol- Ecological	Surface Water, Method A - HH ARAR's WAC 173-340- 730(2)(b)(i) [See Required ARAR's]	Surface Water, Method A - WAC 173-340- 730(2)(b)(i)(A) [See Required ARAR's]	Surface Water, Method A - HH/ Aquatic Organisms: CWA §304 WAC 173-340- 730(2)(b)(i)(B) [See Required ARAR's]	Surface Water, Method A - HH NTR - 40 CFR 131 WAC 173-340- 730(2)(b)(i)(C) [See Required ARAR's]	Surface Water, Method A - HH Potability WAC 173-340- 730(2)(b)(ii) [See Required ARAR's]	Surface Water, Method A - HH No Table Values WAC 173-340- 730(2)(b)(iii) [See applicable SW background or PQL values]	Surface Water, Method B - HH ARAR's WAC 173-340-730(3)(b)(i) [See Required ARAR's]	Surface Water, Method B - WA WQS:Ch. 173- 2101 A WAC 173-340- 730(3)(b)(i)(A) [See Required ARAR's]	Surface Water, Method B - HH/ Aquatic Organisms: CWA §304 WAC 173-340- 730(3)(b)(i)(B) [See Required ARAR's]	Surface Water, Method B - HH NTR - 40 CFR 131 WAC 173-340- 730(3)(b)(i)(C) [See Required ARAR's]	Surface Water, Method B, Environmental Effects, WAC 173-340- 730(3)(b)(ii) [WET TESTING]	Surface Water, Method B-HH, Non-carcinogen, Fish Consumption WAC 173-340- 730(3)(b)(iii)(A) EQ. 730-1 CLARC Database	Surface Water, Method B-HH, Non-carcinogen, Fish Consumption WAC 173-340- 730(3)(c) EQ. 730-1 MOD - Tribal Adult	Surface Water, Method B-HH, Non-carcinogen, Fish Consumption WAC 173-340- 730(3)(c) EQ. 730-1 MOD - Tribal Child	Surface Water, Method B-HH, Carcinogen, Fish Consumption WAC 173-340- 730(3)(b)(iii)(B) EQ. 730-2 CLARC Database	Surface Water, Method B-HH, Carcinogen, Fish Consumption WAC 173-340- 730(3)(b)(iii)(B) EQ. 730-2 MOD - Tribal Adult	Surface Water, Method B-HH, Carcinogen, Fish Consumption WAC 173-340- 730(3)(b)(iii)(B) EQ. 730-2 MOD - Tribal Child
UNITS	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Chromium (VI)	*	*	*	*	*	*	*	*	*	*	*	486.1111111	157.9557158	72.4871134	0.810185185	0.123402903	0.56378866
Chromium, total (or III)	*	*	*	*	*	*	*	*	*	*	*						
Cobalt	*	*	*	*	*	*	*	*	*	*	*						
Copper	*	*	*	*	*	*	*	*	*	*	*	2664.609053	865.8313308	397.3367698			
Iron	*	*	*	*	*	*	*	*	*	*	*						
Lead	*	*	*	*	*	*	*	*	*	*	*						
Manganese	*	*	*	*	*	*	*	*	*	*	*						
Mercury	*	*	*	*	*	*	*	*	*	*	*						
Mercury (organic)	*	*	*	*	*	*	*	*	*	*	*						
Molybdenum	*	*	*	*	*	*	*	*	*	*	*						
Nickel	*	*	*	*	*	*	*	*	*	*	*	1103.23089	358.481057	164.5097609			
Selenium	*	*	*	*	*	*	*	*	*	*	*	2700.617284	877.5317542	402.7061856			
Silver	*	*	*	*	*	*	*	*	*	*	*	25925.92593	8424.30484	3865.979381			
Tin	*	*	*	*	*	*	*	*	*	*	*	NV	NV	NV	NV	NV	NV
Thallium	*	*	*	*	*	*	*	*	*	*	*	1.56449553	0.508363223	0.233291859			
Vanadium	*	*	*	*	*	*	*	*	*	*	*						
Zinc	*	*	*	*	*	*	*	*	*	*	*	16548.46336	5377.215856	2467.646414			
LPAH	*	*	*	*	*	*	*	*	*	*	*						
HPAH	*	*	*	*	*	*	*	*	*	*	*						
Total Petroleum Hydrocarbons	*	*	*	*	*	*	*	*	*	*	0.7						
Gasoline	*	*	*	*	*	*	*	*	*	*	*						
Gasoline (w/benzene)	*	*	*	*	*	*	*	*	*	*	*						
Diesel	*	*	*	*	*	*	*	*	*	*	*						
Heavy Oil	*	*	*	*	*	*	*	*	*	*	*						
2,3,7,8-TCDD (Dioxin)	*	*	*	*	*	*	*	*	*	*	*	5.18519E-07	1.68486E-07	7.73196E-08	8.64198E-09	1.3163E-09	6.01375E-09
Aldrin	*	*	*	*	*	*	*	*	*	*	*	0.01665477	0.005411759	0.002483499	8.1641E-05	1.24351E-05	5.68121E-05
alpha-BHC	*	*	*	*	*	*	*	*	*	*	*				0.007913897	0.001205401	0.005507093
beta-BHC	*	*	*	*	*	*	*	*	*	*	*				0.027698639	0.004218903	0.019274826
gamma-BHC (Lindane)	*	*	*	*	*	*	*	*	*	*	*	5.982905983	1.944070348	0.892149088			
Chlordane	*	*	*	*	*	*	*	*	*	*	*	0.091935908	0.029873421	0.013709147	0.00131337	0.000200045	0.000913943
4,4'-DDT	*	*	*	*	*	*	*	*	*	*	*	0.024184632	0.007858493	0.003606324	0.000355656	5.41716E-05	0.000247493
4,4'-DDE	*	*	*	*	*	*	*	*	*	*	*				0.000355656	5.41716E-05	0.000247493
4,4'-DDD	*	*	*	*	*	*	*	*	*	*	*				0.000503847	7.67431E-05	0.000350615
Dieldrin	*	*	*	*	*	*	*	*	*	*	*	0.027757951	0.009019598	0.004139164	8.67436E-05	1.32123E-05	6.03628E-05
alpha-Endosulfan	*	*	*	*	*	*	*	*	*	*	*	57.61316872	18.72067742	8.591065292			
beta-Endosulfan	*	*	*	*	*	*	*	*	*	*	*	57.61316872	18.72067742	8.591065292			
Endosulfan Sulfate	*	*	*	*	*	*	*	*	*	*	*	57.61316872	18.72067742	8.591065292			



Table A-4. Surface Water Screening Level Derivation Table within Ecology Spreadsheet (µg/L)

MEDIA - MTCA Standard	SW Method A						SW Method B											
	Surface Water, Method A - HH ARAR's WAC 173-340-730(2)(b)(i) [See Required ARAR's]	Surface Water, Method A - WAC 173-340-730(2)(b)(i)(A) [See Required ARAR's]	Surface Water, Method A - HH/ Aquatic Organisms: CWA §304 WAC 173-340-730(2)(b)(i)(B) [See Required ARAR's]	Surface Water, Method A - HH NTR - 40 CFR 131 WAC 173-340-730(2)(b)(i)(C) [See Required ARAR's]	Surface Water, Method A - HH Potability WAC 173-340-730(2)(b)(ii) [See Required ARAR's]	Surface Water, Method A - HH No Table Values WAC 173-340-730(2)(b)(iii) [See applicable SW background or PQL values]	Surface Water, Method B - HH ARAR's WAC 173-340-730(3)(b)(i) [See Required ARAR's]	Surface Water, Method B - WA WQS:Ch. 173-2101 A WAC 173-340-730(3)(b)(i)(A) [See Required ARAR's]	Surface Water, Method B - HH/ Aquatic Organisms: CWA §304 WAC 173-340-730(3)(b)(i)(B) [See Required ARAR's]	Surface Water, Method B - HH NTR - 40 CFR 131 WAC 173-340-730(3)(b)(i)(C) [See Required ARAR's]	Surface Water, Method B, Environmental Effects, WAC 173-340-730(3)(b)(ii) [WET TESTING]	Surface Water, Method B-HH, Non-carcinogen, Fish Consumption WAC 173-340-730(3)(b)(iii)(A) EQ. 730-1 CLARC Database	Surface Water, Method B-HH, Non-carcinogen, Fish Consumption WAC 173-340-730(3)(c) EQ. 730-1 MOD - Tribal Adult	Surface Water, Method B-HH, Non-carcinogen, Fish Consumption WAC 173-340-730(3)(c) EQ. 730-1 MOD - Tribal Child	Surface Water, Method B-HH, Carcinogen, Fish Consumption WAC 173-340-730(3)(b)(iii)(B) EQ. 730-2 CLARC Database	Surface Water, Method B-HH, Carcinogen, Fish Consumption WAC 173-340-730(3)(b)(iii)(B) EQ. 730-2 MOD - Tribal Adult	Surface Water, Method B-HH, Carcinogen, Fish Consumption WAC 173-340-730(3)(b)(iii)(B) EQ. 730-2 MOD - Tribal Child	
UNITS	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
Endrin	*	*	*	*	*	*	*	*	*	*	*	0.195913798	0.063659734	0.02921395				
Endrin Aldehyde	*	*	*	*	*	*	*	*	*	*	*	0.195913798	0.063659734	0.02921395				
Heptachlor	*	*	*	*	*	*	*	*	*	*	*	0.115740741	0.037608504	0.017258837	0.000128601	1.95878E-05	8.94903E-05	
Heptachlor Epoxide	*	*	*	*	*	*	*	*	*	*	*	0.003009259	0.000977821	0.00044873	6.35938E-05	9.68626E-06	4.42534E-05	
Toxaphene	*	*	*	*	*	*	*	*	*	*	*	NV	NV	NV	0.000449791	6.85096E-05	0.000312999	
	*	*	*	*	*	*	*	*	*	*	*							
<b>Screening Levels Added by Integral</b>																		
1,2,4-Trimethylbenzene												NV	NV	NV	NV	NV	NV	
1-Methylnaphthalene												NV	NV	NV	NV	NV	NV	
Carbazole												NV	NV	NV	NV	NV	NV	
Carbon disulfide												NV	NV	NV	NV	NV	NV	
Chloride												NV	NV	NV	NV	NV	NV	
cis-1,2-Dichloroethene												NV	NV	NV	NV	NV	NV	
Isophorone												1.20E+05	3.83E+04	1.76E+04	1.60E+03	2.36E+02	1.08E+03	
n-Nitrosodi-n-propylamine												NV	NV	NV	8.20E-01	1.28E-01	5.86E-01	
Sulfate												NV	NV	NV	NV	NV	NV	
trans-1,2-Dichloroethene												3.30E+04	1.10E+04	4.80E+03	NV	NV	NV	
Tributyl phosphate												NV	NV	NV	NV	NV	NV	

Table A-4. Surface Water Screening L<sub>t</sub>

MEDIA - MTCA Standard		SW Method C							SW MCTA Method A,B,C F								
PATHWAYS HH - Human Health Ecol- Ecological	Surface Water, Method B-HH Petroleum Mixture WAC 173-340- 730(3)(b)(iii)(C)	Surface Water, Method B-HH Potability WAC 173-340- 730(3)(b)(iv)	Surface Water, Method C - HH ARAR's WAC 173-340- 730(4)(b)(i) [See Required ARAR's]	Surface Water, Method C, Environmental Effects, WAC 173-340- 730(4)(b)(ii) [WET TESTING]	Surface Water, Method C, Non-carcinogen, Fish Consumption WAC 173-340- 730(4)(b)(iii)(A) EQ. 730-1 CLARC Database	Surface Water, Method C, Carcinogen, Fish Consumption WAC 173-340- 730(4)(b)(iii)(B) EQ. 730-2 CLARC Database	Surface Water, Method C, Petroleum Mixture WAC 173-340- 730(4)(b)(iii)(C)	Surface Water, Method C-HH Potability WAC 173-340- 730(4)(b)(iv)	Surface Water Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340- 730(2)(b)(i)(A) Fresh Acute	Surface Water Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340- 730(2)(b)(i)(A) Fresh - Chronic	Surface Water Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340- 730(2)(b)(i)(A) Marine - Acute	Surface Water Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340- 730(2)(b)(i)(A) Marine - Chronic	Surface Water HH - Consumption; Water + Organism (Fresh) CWA §304 NRWQC	Surface Water HH - Consumption; Organism Only (Marine) CWA §304 NRWQC	Surface Water HH - Organoleptic Effects CWA §304 NRWQC	Surface Water Aquatic Life Fresh/Acute, CWA §304, NRWQC	Surface Water Aquatic Life Fresh/Chronic, CWA §304, NRWQC
	UNITS	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
acetone		*	*	*			*	*									
acenaphthene		*	*	*	1606.97888		*	*					670	990	20		
acenaphthylene		*	*	*			*	*									
anthracene		*	*	*	64814.81481		*	*					8300	40000			
benzene		*	*	*	4985.754986	567	*	*					2.2	51			
benzo(g,h,i)perylene		*	*	*			*	*									
benzo[a]anthracene	0.018	*	*	*		0.74	*	*					0.0038	0.018			
benzo[a]pyrene	0.018	*	*	*		0.74	*	*					0.0038	0.018			
benzo[b]fluoranthene	0.018	*	*	*		0.74	*	*					0.0038	0.018			
benzo[k]fluoranthene	0.018	*	*	*		0.74	*	*					0.0038	0.018			
bis(2-ethylhexyl) phthalate	2.2	*	*	*	997.1509972	89	*	*					1.2	2.2			
butyl benzyl phthalate		*	*	*	3131.150474		*	*					1500	1900			
carbon tetrachloride		*	*	*	241.9753086	66.5	*	*					0.23	1.6			
chlorobenzene		*	*	*			*	*					130	1600	20		
chloroethane (ethyl chloride)		*	*	*			*	*									
chloroform (trichloromethane)		*	*	*	17283.95062	7080	*	*					5.7	470			
chloromethane		*	*	*		3320	*	*									
chrysene	0.018	*	*	*		0.74	*	*					0.0038	0.018			
dibenz[a,h]anthracene	0.018	*	*	*		0.74	*	*					0.0038	0.018			
dibenzofuran		*	*	*			*	*									
di-butyl phthalate (di-n-butyl phth.)		*	*	*	7282.563462		*	*					2000	4500			
dichlorobenzene, 1,2-		*	*	*	10491.60671		*	*					420	1300			
dichlorobenzene, 1,3-		*	*	*			*	*					320	960			
dichlorobenzene, 1,4-		*	*	*		121	*	*					63	190			
dichloroethane, 1,1-		*	*	*			*	*									
dichloroethane, 1,2-		*	*	*	108024.6914	1480	*	*					0.38	37			
dichloroethylene, 1,1-		*	*	*	57870.37037	48.2	*	*					330	7100			
diethyl phthalate		*	*	*	71029.93404		*	*					17000	44000			
dimethyl phthalate		*	*	*	180041.1523		*	*					270000	1100000			
di-n-octyl phthalate		*	*	*			*	*									
ethylbenzene		*	*	*	17283.95062		*	*					530	2100			
fluoranthene		*	*	*	225.4428341		*	*					130	140			
fluorene		*	*	*	8641.975309		*	*					1100	5300			
hexachlorobenzene		*	*	*	0.595998297	0.0117	*	*					0.00028	0.00029			
hexachlorobutadiene		*	*	*	462.962963	747	*	*					0.44	18			
indeno[1,2,3-cd]pyrene	0.018	*	*	*		0.74	*	*					0.0038	0.018			
MEK (Methyl Ethyl Ketone;2-Butanone)																	
methylene chloride (dichloromethane)		*	*	*	432098.7654	24000	*	*					4.6	590			
methylnaphthalene, 2-		*	*	*			*	*									
MIBK (M-Isobutyl-K;4-M,2-Pentanone)																	

Table A-4. Surface Water Screening L<sub>t</sub>

MEDIA - MTCA Standard		SW Method C							SW MCTA Method A,B,C F								
PATHWAYS HH - Human Health Ecol- Ecological	Surface Water, Method B-HH Petroleum Mixture WAC 173-340- 730(3)(b)(iii)(C)	Surface Water, Method B-HH Potability WAC 173-340- 730(3)(b)(iv)	Surface Water, Method C - HH ARAR's WAC 173-340- 730(4)(b)(i) [See Required ARAR's]	Surface Water, Method C, Environmental Effects, WAC 173-340- 730(4)(b)(ii) [WET TESTING]	Surface Water, Method C, Non-carcinogen, Fish Consumption WAC 173-340- 730(4)(b)(iii)(A) EQ. 730-1 CLARC Database	Surface Water, Method C, Carcinogen, Fish Consumption WAC 173-340- 730(4)(b)(iii)(B) EQ. 730-2 CLARC Database	Surface Water, Method C, Petroleum Mixture WAC 173-340- 730(4)(b)(iii)(C)	Surface Water, Method C-HH Potability WAC 173-340- 730(4)(b)(iv)	Surface Water Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340- 730(2)(b)(i)(A) Fresh Acute	Surface Water Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340- 730(2)(b)(i)(A) Fresh - Chronic	Surface Water Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340- 730(2)(b)(i)(A) Marine - Acute	Surface Water Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340- 730(2)(b)(i)(A) Marine - Chronic	Surface Water HH - Consumption; Water + Organism (Fresh) CWA §304 NRWQC	Surface Water HH - Consumption; Organism Only (Marine) CWA §304 NRWQC	Surface Water HH - Organoleptic Effects CWA §304 NRWQC	Surface Water Aquatic Life Fresh/Acute, CWA §304, NRWQC	Surface Water Aquatic Life Fresh/Chronic, CWA §304, NRWQC
	UNITS	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
naphthalene		*	*	*	12345.67901		*	*									
nitrosodiphenylamine, N-		*	*	*		243	*	*					3.3	6			
PCB mixtures		*	*	*	2.077397911		*	*	2	0.014	10	0.03	0.000064	0.000064			0.014
PCB - Aroclor 1016		*	*	*	0.014541785		*	*									
PCB - Aroclor 1221		*	*	*			*	*									
PCB - Aroclor 1232		*	*	*			*	*									
PCB - Aroclor 1242		*	*	*			*	*									
PCB - Aroclor 1248		*	*	*			*	*									
PCB - Aroclor 1254		*	*	*	0.004154796		*	*									
PCB - Aroclor 1260		*	*	*			*	*									
phenanthrene		*	*	*			*	*									
pyrene		*	*	*			*	*					830	4000			
tetrachloroethylene (perchloroethylene)		*	*	*	2090.800478	104	*	*					0.69	3.3			
trichlorobenzene, 1,2,4-		*	*	*	568.5510071		*	*					35	70			
trichlorethane, 1,1,1-		*	*	*	2314814.815		*	*									
trichlorethane, 1,1,2-		*	*	*	5761.316872	632	*	*					0.59	16			
trichloroethylene		*	*	*	176.7676768	1390	*	*					2.5	30			
trimethylbenzene, 1,3,5-		*	*	*			*	*									
toluene		*	*	*	48459.67463		*	*					1300	15000			
vinyl chloride (chloroethylene)		*	*	*	16619.18329	92.3	*	*					0.025	2.4			
xylene (dimethylbenzene)		*	*	*			*	*									
benzoic acid		*	*	*			*	*									
benzyl alcohol		*	*	*		10500	*	*									
dimethylphenol, 2,4-		*	*	*	1381.978994		*	*					380	850	400		
methylphenol, 2- (o-cresol)		*	*	*			*	*									
methylphenol, 4- (p-cresol)		*	*	*			*	*									
pentachlorophenol		*	*	*	17676.76768	123	*	*			13	7.9	0.27	3	30	19	15
phenol (total)		*	*	*	2777777.778		*	*					10000	860000	300		
styrene (phenylethylene)		*	*	*			*	*									
Tributyltin		*	*	*			*	*								0.46	0.072
Trichlorophenol, 2,4,6-		*	*	*		98.2	*	*					1.4	2.4	2		
Aluminum		*	*	*			*	*									
Antimony		*	*	*	2592.592593		*	*					5.6	640			
Arsenic (III)		*	*	*			*	*									
Arsenic (V)		*	*	*			*	*									
Arsenic (total)	0.0982	*	*	*	44.19191919	2.46	*	*	360	190	69	36	0.018	0.14		340	150
Barium		*	*	*			*	*					1000				
Beryllium		*	*	*	682.2612086	682	*	*									
Cadmium		*	*	*	50.63657407		*	*			42	9.3				2	0.25

Table A-4. Surface Water Screening L<sub>t</sub>

MEDIA - MTCA Standard		SW Method C							SW MCTA Method A,B,C F								
PATHWAYS HH - Human Health Ecol- Ecological	Surface Water, Method B-HH Petroleum Mixture WAC 173-340- 730(3)(b)(iii)(C)	Surface Water, Method B-HH Potability WAC 173-340- 730(3)(b)(iv)	Surface Water, Method C - HH ARAR's WAC 173-340- 730(4)(b)(i) [See Required ARAR's]	Surface Water, Method C, Environmental Effects, WAC 173-340- 730(4)(b)(ii) [WET TESTING]	Surface Water, Method C, Non-carcinogen, Fish Consumption WAC 173-340- 730(4)(b)(iii)(A) EQ. 730-1 CLARC Database	Surface Water, Method C, Carcinogen, Fish Consumption WAC 173-340- 730(4)(b)(iii)(B) EQ. 730-2 CLARC Database	Surface Water, Method C, Petroleum Mixture WAC 173-340- 730(4)(b)(iii)(C)	Surface Water, Method C-HH Potability WAC 173-340- 730(4)(b)(iv)	Surface Water Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340- 730(2)(b)(i)(A) Fresh Acute	Surface Water Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340- 730(2)(b)(i)(A) Fresh - Chronic	Surface Water Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340- 730(2)(b)(i)(A) Marine - Acute	Surface Water Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340- 730(2)(b)(i)(A) Marine - Chronic	Surface Water HH - Consumption; Water + Organism (Fresh) CWA §304 NRWQC	Surface Water HH - Consumption; Organism Only (Marine) CWA §304 NRWQC	Surface Water HH - Organoleptic Effects CWA §304 NRWQC	Surface Water Aquatic Life Fresh/Acute, CWA §304, NRWQC	Surface Water Aquatic Life Fresh/Chronic, CWA §304, NRWQC
	UNITS	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Chromium (VI)		*	*	*	1215.277778		*	*	15	10	1100	50				16	11
Chromium, total (or III)		*	*	*			*	*								570	74
Cobalt		*	*	*			*	*									
Copper		*	*	*	6661.522634		*	*		11.4	4.8	3.1	1300		1000	13	9
Iron		*	*	*			*	*					300				1000
Lead		*	*	*			*	*		0.54	210	8.1				65	2.5
Manganese		*	*	*			*	*					50	100			
Mercury		*	*	*			*	*	2.1	0.012	1.8	0.025				1.4	0.77
Mercury (organic)		*	*	*			*	*						0.3			
Molybdenum		*	*	*			*	*			74	8.2	610	4600		470	52
Nickel		*	*	*	2758.077226		*	*									
Selenium		*	*	*	6751.54321		*	*	20	5	290	71	170	4200			5
Silver	1.9	*	*	*	64814.81481		*	*			1.9					3.2	
Tin		*	*	*			*	*	NV	NV	NV	NV		NV		NV	NV
Thallium		*	*	*	3.911238825		*	*						0.47			
Vanadium		*	*	*			*	*									
Zinc		*	*	*	41371.15839		*	*		104	90	81		26000	5000	120	120
LPAH		*	*	*			*	*									
HPAH		*	*	*			*	*									
Total Petroleum Hydrocarbons		*	*	*			*	*	0.208								
Gasoline		*	*	*			*	*									
Gasoline (w/benzene)		*	*	*			*	*									
Diesel		*	*	*			*	*									
Heavy Oil	500	*	*	*			*	*									
2,3,7,8-TCDD (Dioxin)		*	*	*		0.00000216	*	*						5.1E-09			
Aldrin		*	*	*	0.041636926	0.002041026	*	*	2.5	0.0019	0.71	0.0019		0.00005		3	
alpha-BHC		*	*	*		0.19784742	*	*						0.0049			
beta-BHC		*	*	*		0.69246597	*	*						0.017			
gamma-BHC (Lindane)		*	*	*	14.95726496		*	*	2	0.08	0.16			1.8		0.95	
Chlordane		*	*	*	0.229839769	0.032834253	*	*	2.4	0.0043	0.09	0.004		0.00081		2.4	0.0043
4,4'-DDT		*	*	*	0.060461581	0.008891409	*	*	1.1	0.001	0.13	0.001		0.00022		1.1	0.001
4,4'-DDE		*	*	*		0.008891409	*	*	1.1	0.001	0.13	0.001		0.00022			
4,4'-DDD		*	*	*		0.012596163	*	*	1.1	0.001	0.13	0.001		0.00031			
Dieldrin		*	*	*	0.069394877	0.00216859	*	*	2.5	0.0019	0.71	0.0019		0.000054		0.24	0.056
alpha-Endosulfan		*	*	*	144.0329218		*	*	0.22	0.056	0.034	0.0087		89		0.22	0.056
beta-Endosulfan		*	*	*	144.0329218		*	*	0.22	0.056	0.034	0.0087		89		0.22	0.056
Endosulfan Sulfate		*	*	*	144.0329218		*	*	0.22	0.056	0.034	0.0087		89		0.22	0.056

Table A-4. Surface Water Screening Levels

MEDIA - MTCA Standard		SW Method C							SW MCTA Method A,B,C									
<b>PATHWAYS</b> HH - Human Health Ecol- Ecological		Surface Water, Method B-HH Petroleum Mixture WAC 173-340- 730(3)(b)(iii)(C)	Surface Water, Method B-HH Potability WAC 173-340- 730(3)(b)(iv)	Surface Water, Method C - HH ARAR's WAC 173-340- 730(4)(b)(i) [See Required ARAR's]	Surface Water, Method C, Environmental Effects, WAC 173-340- 730(4)(b)(ii) [WET TESTING]	Surface Water, Method C, Non-carcinogen, Fish Consumption WAC 173-340- 730(4)(b)(iii)(A) EQ. 730-1 CLARC Database	Surface Water, Method C, Carcinogen, Fish Consumption WAC 173-340- 730(4)(b)(iii)(B) EQ. 730-2 CLARC Database	Surface Water, Method C, Petroleum Mixture WAC 173-340- 730(4)(b)(iii)(C)	Surface Water, Method C-HH Potability WAC 173-340- 730(4)(b)(iv)	Surface Water Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340- 730(2)(b)(i)(A) Fresh Acute	Surface Water Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340- 730(2)(b)(i)(A) Fresh - Chronic	Surface Water Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340- 730(2)(b)(i)(A) Marine - Acute	Surface Water Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340- 730(2)(b)(i)(A) Marine - Chronic	Surface Water HH - Consumption; Water + Organism (Fresh) CWA §304 NRWQC	Surface Water HH - Consumption; Organism Only (Marine) CWA §304 NRWQC	Surface Water HH - Organoleptic Effects CWA §304 NRWQC	Surface Water Aquatic Life Fresh/Acute, CWA §304, NRWQC	Surface Water Aquatic Life Fresh/Chronic, CWA §304, NRWQC
UNITS		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Endrin			*	*	*	0.489784495		*	*	0.18	0.0023	0.037	0.0023		0.06		0.086	0.036
Endrin Aldehyde			*	*	*	0.489784495		*	*	0.18	0.0023	0.037	0.0023		0.3		0.086	0.036
Heptachlor			*	*	*	0.289351852	0.003215021	*	*	0.52	0.0038	0.053	0.0036		0.000079		0.52	0.0038
Heptachlor Epoxide			*	*	*	0.007523148	0.001589845	*	*						0.000039		0.52	0.0038
Toxaphene			*	*	*			*	*	0.73	0.0002	0.21	0.0002		0.00028		0.73	0.0002
			*	*	*			*	*									
<b>Screening Levels Added by Integr</b>																		
1,2,4-Trimethylbenzene										NV	NV	NV	NV		NV		NV	NV
1-Methylnaphthalene										NV	NV	NV	NV		NV		NV	NV
Carbazole										NV	NV	NV	NV		NV		NV	NV
Carbon disulfide										NV	NV	NV	NV		NV		NV	NV
Chloride										8.60E+05	2.30E+05				NV		8.60E+05	2.30E+05
<i>cis</i> -1,2-Dichloroethene										NV	NV	NV	NV		NV		NV	NV
Isophorone										NV	NV	NV	NV		960		NV	NV
<i>n</i> -Nitrosodi- <i>n</i> -propylamine										NV	NV	NV	NV		NV		NV	NV
Sulfate										NV	NV	NV	NV		NV		NV	NV
<i>trans</i> -1,2-Dichloroethene										NV	NV	NV	NV		10,000		NV	NV
Tributyl phosphate										NV	NV	NV	NV		NV		NV	NV

Table A-4. Surface Water Screening Lr

MEDIA - MTCA Standard		Required ARAR's						Surface Water ARAR									
PATHWAYS HH - Human Health Ecol- Ecological	Surface Water Aquatic Life Marine/Acute, CWA §304, NRWQC	Surface Water Aquatic Life Marine/Chronic, CWA §304, NRWQC	Surface Water Aquatic Life Fresh/Acute, NTR - 40 CFR 131.36	Surface Water Aquatic Life Fresh/Chronic, NTR - 40 CFR 131.36	Surface Water Aquatic Life Marine/Acute, NTR - 40 CFR 131.36	Surface Water Aquatic Life Marine/Chronic, NTR - 40 CFR 131.36	Surface Water HH Fresh Water & Organism Consumption NTR - 40 CFR 131.36 (WAC 173-201A- 040[5]) HH - 10 <sup>6</sup> Carc Risk	Surface Water HH Fresh Water Organism Consumption Only NTR - 40 CFR 131.36 (WAC 173- 201A-040[5]) HH - 10 <sup>6</sup> Carc Risk	Surface Water HH - Marine Water Organism Consumption Only NTR - 40 CFR 131.36 (WAC 173- 201A-040[5]) HH - 10 <sup>6</sup> Carc Risk	Surface Water Discharge (NPDES) 40 CFR 122.125/ RCW 90-48; WAC 173-216, 220, -122	Waste Water - Toxics Substances Control Act (TSCA) 40 CFR 761.61	Shoreline Management Act RCW 90-58; WAC 173-16; King County/City Seattle Shoreline Master Plans (KCC Title 25;SMC 23.60)	Groundwater to Sediment Protection Ecology CSL WAC 173-340 730(1)(d)	Groundwater to Sediment Protection Ecology SQS WAC 173-340 730(1)(d)	Surface Water HH Adult Carcinogen Tribal Fish Consumption w/o Salmon RCRA (using EPA EQ 730-1)	Surface Water HH Child Carcinogen Tribal Fish Consumption w/o Salmon RCRA (using EPA EQ 730-1)	Surface Water HH Adult Carcinogen Tribal Fish Consumption w/o Salmon RCRA (using EPA EQ 730-2)
	UNITS	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
acetone															239932.7328	110107.0077	
acenaphthene									643				9.31372549	2.614379085	251.4717863	115.4023696	
acenaphthylene													10.78431373	10.78431373			
anthracene							9600	110000	110000	2400			58.82352941	10.78431373	434.2425175	199.2772877	
benzene							1.2	71	71	1.2					407.9566509	187.2144979	2.028193577
benzo(g,h,i)perylene													0.029147982	0.011584454			
benzo[a]anthracene							0.0028	0.031	0.031	0.0028			0.632911392	0.257852789			0.000258331
benzo[a]pyrene							0.0028	0.031	0.031	0.0028			0.266903915	0.125826131			1.51762E-05
benzo[b]fluoranthene							0.0028	0.031	0.031	0.0028			0.560398506	0.286425903			0.000121366
benzo[k]fluoranthene							0.0028	0.031	0.031	0.0028			0.571791614	0.292249047			0.00012711
bis(2-ethylhexyl) phthalate							1.8	5.9	5.9				0.472727273	0.284848485	316.1089996	145.0648924	1.23480078
butyl benzyl phthalate													6.837606838	0.523504274	142.4227361	65.35890755	0.409933862
carbon tetrachloride							0.25	4.4	4.4						117.8224453	54.0696417	0.247823653
chlorobenzene							680	21000	21000						589.1122266	270.3482085	
chloroethane (ethyl chloride)							0.41	34	34								
chloroform (trichloromethane)							5.7	470	470						1217.385093	558.6675407	4.2952095
chloromethane																	22.4296091
chrysene							0.0028	0.031	0.031	0.0028			1.949152542	0.466101695			0.002581193
dibenz[a,h]anthracene							0.0028	0.031	0.031	0.0028			0.01259542	0.004580153			6.25379E-05
dibenzofuran													5.132743363	1.327433628			
di-butyl phthalate (di-n-butyl phth.)							2700	12000	12000				1164.383562	150.6849315	101.4976487	46.57806484	
dichlorobenzene, 1,2-							2700	17000	17000				5.191873589	5.191873589	948.9204451	435.4670142	
dichlorobenzene, 1,3-							400	2600	2600								
dichlorobenzene, 1,4-							400	2600	2600				20.73732719	7.142857143			
dichloroethane, 1,1-															34667.92115	15909.38017	33.26143751
dichloroethane, 1,2-							0.38	99	99						5911.79287	2712.967987	3.552760138
dichloroethylene, 1,1-							0.057	3.2	3.2						5099.458136	2340.181224	
diethyl phthalate							23000	120000	120000				873.015873	484.1269841			
dimethyl phthalate							313000	2900000	2900000				142.8571429	142.8571429			
di-n-octyl phthalate													22.95918367	0.295918367			
ethylbenzene							3100	29000	29000						1733.396058	795.4690085	
fluoranthene							300	370	370	90.2			16.92524683	2.256699577	23.89873714	10.96731739	
fluorene							1300	14000	14000	640			6.991150442	2.03539823	98.52988117	45.21613312	
hexachlorobenzene							0.00075	0.00077	0.00077				0.680473373	0.112426036			6.61931E-05
hexachlorobutadiene							0.44	50	50				6.237424547	3.923541247			4.218902664
indeno[1,2,3-cd]pyrene							0.0028	0.031	0.031	0.0028			0.032835821	0.012686567			5.23736E-05
MEK (Methyl Ethyl Ketone;2-Butanone)															159955.1552	73404.6718	
methylene chloride (dichloromethane)							4.7	1600	1600						25272.91452	11597.93814	61.42722279
methylnaphthalene, 2-													30.62200957	18.18181818			
MIBK (M-Isobutyl-K;4-M,2-Pentanone)																	

Table A-4. Surface Water Screening L

MEDIA - MTCA Standard		Required ARAR's						Surface Water ARAR									
PATHWAYS HH - Human Health Ecol- Ecological	Surface Water Aquatic Life Marine/Acute, CWA §304, NRWQC	Surface Water Aquatic Life Marine/Chronic, CWA §304, NRWQC	Surface Water Aquatic Life Fresh/Acute, NTR - 40 CFR 131.36	Surface Water Aquatic Life Fresh/Chronic, NTR - 40 CFR 131.36	Surface Water Aquatic Life Marine/Acute, NTR - 40 CFR 131.36	Surface Water Aquatic Life Marine/Chronic, NTR - 40 CFR 131.36	Surface Water HH - Fresh Water & Organism Consumption NTR - 40 CFR 131.36 (WAC 173-201A- 040[5]) HH - 10 <sup>6</sup> Carc Risk	Surface Water HH - Fresh Water Organism Consumption Only NTR - 40 CFR 131.36 (WAC 173- 201A-040[5]) HH - 10 <sup>6</sup> Carc Risk	Surface Water HH - Marine Water Organism Consumption Only NTR - 40 CFR 131.36 (WAC 173- 201A-040[5]) HH - 10 <sup>6</sup> Carc Risk	Surface Water Discharge (NPDES) 40 CFR 122.125/ RCW 90-48; WAC 173-216, 220, -122	Waste Water - Toxics Substances Control Act (TSCA) 40 CFR 761.61	Shoreline Management Act RCW 90-58; WAC 173-16; King County/City Seattle Shoreline Master Plans (KCC Title 25;SMC 23.60)	Groundwater to Sediment Protection Ecology CSL WAC 173-340 730(1)(d)	Groundwater to Sediment Protection Ecology SQS WAC 173-340 730(1)(d)	Surface Water HH Adult Non- Carcinogen Tribal Fish Consumption w/o Salmon EPA RCRA (using EQ 730-1)	Surface Water HH Child Non- Carcinogen Tribal Fish Consumption w/o Salmon EPA RCRA (using EQ 730-1)	Surface Water HH Adult Non- Carcinogen Tribal Fish Consumption w/o Salmon EPA RCRA (using EQ 730-2)
	UNITS	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
naphthalene									160				92.39130435	53.80434783	244.182749	112.0573734	
nitrosodiphenylamine, N-							5	16	16				1.957295374	1.957295374			1.593580667
PCB mixtures		0.03					0.00017	0.00017	0.00017		0.5		1.450892857	0.267857143			2.30352E-05
PCB - Aroclor 1016				0.014		0.03							2.398523985	0.442804428	0.002948507	0.001353093	0.000658149
PCB - Aroclor 1221				0.014		0.03											2.30352E-05
PCB - Aroclor 1232				0.014		0.03											
PCB - Aroclor 1242				0.014		0.03											2.30352E-05
PCB - Aroclor 1248				0.014		0.03						1.480637813	0.273348519				2.30352E-05
PCB - Aroclor 1254				0.014		0.03						0.85978836	0.158730159	0.000200579	9.20471E-05	5.48457E-06	
PCB - Aroclor 1260				0.014		0.03						0.314009662	0.057971014				2.30352E-05
phenanthrene													23.07692308	4.807692308			
pyrene							960	11000	11000	480			20.17291066	14.4092219	21.41772417	9.828761139	
tetrachloroethylene (perchloroethylene)							0.8	8.85	8.85						101.7428121	46.69057224	0.02060763
trichlorobenzene, 1,2,4-													2.506963788	1.128133705	35.10127017	16.10824742	
trichlorethane, 1,1,1-															100289.3433	46023.56406	
trichlorethane, 1,1,2-							0.6	42	42						486.954037	223.4670163	2.335991132
trichloroethylene							2.7	81	81						18.0520818	8.284241532	0.739493051
trimethylbenzene, 1,3,5-															98.52988117	45.21613312	
toluene							6800	200000	200000						2819.850993	1294.051676	
vinyl chloride (chloroethylene)							2	525	525						1053.038105	483.2474227	0.53322242
xylene (dimethylbenzene)															3438.491772	1577.950768	
benzoic acid													2242.926156	2242.926156			
benzyl alcohol													233.0779055	181.9923372			
dimethylphenol, 2,4-													2.020624303	2.020624303	1427.848278	655.2507426	
methylphenol, 2- (o-cresol)													7.110609481	7.110609481	6654.269226	3053.696194	
methylphenol, 4- (p-cresol)													77.18894009	77.18894009	727.4874646	333.8496875	
pentachlorophenol	13	7.9	20	13	13	7.9	0.28	8.2	8.2				10.20710059	5.325443787			0.698036623
phenol (total)							21000	4600000	4600000				223.880597	78.35820896	88676.89306	40694.5198	
styrene (phenylethylene)																	
Tributyltin	0.42	0.0074															
Trichlorophenol, 2,4,6-							2.1	6.5	6.5								0.558429298
Aluminum																	
Antimony							14	4300	4300						8.42430484	3.865979381	
Arsenic (III)																	
Arsenic (V)																	
Arsenic (total)	69	36	360	190	69	36	0.018	0.14	0.14	360					2.216922326	1.017362995	0.005388353
Barium															266.170769	122.1478478	
Beryllium															27.1751769	12.47090123	
Cadmium	40	8.8	3.7	1	42	9.3							3.357954465	2.556054891	0.928809795	0.42623808	



Table A-4. Surface Water Screening L

MEDIA - MTCA Standard		Required ARAR's						Surface Water ARAR									
PATHWAYS HH - Human Health Ecol- Ecological	Surface Water Aquatic Life Marine/Acute, CWA §304, NRWQC	Surface Water Aquatic Life Marine/Chronic, CWA §304, NRWQC	Surface Water Aquatic Life Fresh/Acute, NTR - 40 CFR 131.36	Surface Water Aquatic Life Fresh/Chronic, NTR - 40 CFR 131.36	Surface Water Aquatic Life Marine/Acute, NTR - 40 CFR 131.36	Surface Water Aquatic Life Marine/Chronic, NTR - 40 CFR 131.36	Surface Water HH Fresh Water & Organism Consumption NTR - 40 CFR 131.36 (WAC 173-201A- 040[5]) HH - 10 <sup>6</sup> Carc Risk	Surface Water HH Fresh Water Organism Consumption Only NTR - 40 CFR 131.36 (WAC 173- 201A-040[5]) HH - 10 <sup>6</sup> Carc Risk	Surface Water HH - Marine Water Organism Consumption Only NTR - 40 CFR 131.36 (WAC 173- 201A-040[5]) HH - 10 <sup>6</sup> Carc Risk	Surface Water Discharge (NPDES) 40 CFR 122.125/ RCW 90-48; WAC 173-216, 220, -122	Waste Water - Toxics Substances Control Act (TSCA) 40 CFR 761.61	Shoreline Management Act RCW 90-58; WAC 173-16; King County/City Seattle Shoreline Master Plans (KCC Title 25;SMC 23.60)	Groundwater to Sediment Protection Ecology CSL WAC 173-340 730(1)(d)	Groundwater to Sediment Protection Ecology SQS WAC 173-340 730(1)(d)	Surface Water HH Adult Carcinogen Tribal Fish Consumption w/o Salmon RCRA (using EPA 730-1)	Surface Water HH Child Carcinogen Tribal Fish Consumption w/o Salmon EPA RCRA (using EQ 730-1)	Surface Water HH Adult Carcinogen Tribal Fish Consumption w/o Salmon EPA RCRA (using EQ 730-2)
	UNITS	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Chromium (VI)	1100	50	15	10	1100	50									789.7785788	362.435567	0.575880214
Chromium, total (or III)			550	180									317.6470588	305.8823529			
Cobalt																	
Copper	4.8	3.1	17	11	2.4	2.4							123.3288287	123.3288287	936.0338712	429.5532646	
Iron																	
Lead	210	8.1	65	2.5	210	8.1				17.5			13.31299809	11.30348894			
Manganese																	
Mercury	1.8	0.94	2.1	160	1.8	0.025	0.14	0.15	0.15				0.00742766	0.005161594	0.026957775	0.012371134	
Mercury (organic)															0.000991095	0.000454821	
Molybdenum																	
Nickel	74	8.2	1400	160	74	8.2	610	4600	4600						216.0078164	99.12767645	
Selenium	290	71	20		290	71									32.65234434	14.98441621	
Silver	1.9		3.4		1.9								1.532250723	1.532250723	47.86536841	21.96579194	
Tin	NV	NV	NV	NV	NV	NV		NV	NV								
Thallium							1.7	6.3	6.3								
Vanadium																	
Zinc	90	81	110	100	90	81							76.25551053	32.56745762	122.7436354	56.3280143	
LPAH																	
HPAH																	
Total Petroleum Hydrocarbons																	
Gasoline										1000							
Gasoline (w/benzene)																	
Diesel										10000							
Heavy Oil										10000							
2,3,7,8-TCDD (Dioxin)							0.000000013	0.000000014	0.000000014						2.44893E-08	1.12383E-08	2.06039E-10
Aldrin	1.3		3		1.3		0.00013	0.00014	0.00014								
alpha-BHC							0.0039	0.013	0.013								
beta-BHC							0.014	0.046	0.046								
gamma-BHC (Lindane)	0.16		2	0.08	0.16		0.019	0.063	0.063								
Chlordane	0.09	0.004	2.4	0.0043	0.09	0.004	0.00057	0.00059	0.00059								
4,4'-DDT	0.13	0.001	1.1	0.001	0.13	0.001	0.00059	0.00059	0.00059								
4,4'-DDE							0.00059	0.00059	0.00059								
4,4'-DDD							0.00083	0.00084	0.00084								
Dieldrin	0.71	0.0019	2.5	0.0019	0.71	0.0019	0.00014	0.00014	0.00014								
alpha-Endosulfan	0.034	0.0087	0.22	0.056	0.034	0.0087											
beta-Endosulfan	0.034	0.0087	0.22	0.056	0.034	0.0087											
Endosulfan Sulfate	0.034	0.0087	0.22	0.056	0.034	0.0087											



Table A-4. Surface Water Screening Levels

MEDIA - MTCA Standard		Required ARAR's							Surface Water ARAR									
<b>PATHWAYS</b> HH - Human Health Ecol- Ecological		Surface Water Aquatic Life Marine/Acute, CWA §304, <b>NRWQC</b>	Surface Water Aquatic Life Marine/Chronic, CWA §304, <b>NRWQC</b>	Surface Water Aquatic Life Fresh/Acute, <b>NTR</b> - 40 CFR 131.36	Surface Water Aquatic Life Fresh/Chronic, <b>NTR</b> - 40 CFR 131.36	Surface Water Aquatic Life Marine/Acute, <b>NTR</b> - 40 CFR 131.36	Surface Water Aquatic Life Marine/Chronic, <b>NTR</b> - 40 CFR 131.36	Surface Water Fresh Water & Organism Consumption <b>NTR</b> - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10 <sup>6</sup> Carc Risk	Surface Water Fresh Water Organism Consumption Only <b>NTR</b> - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10 <sup>6</sup> Carc Risk	Surface Water Marine Water Organism Consumption Only <b>NTR</b> - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10 <sup>6</sup> Carc Risk	Surface Water Discharge (NPDES) 40 CFR 122.125/ RCW 90-48; WAC 173-216, 220, -122	Waste Water - Toxics Substances Control Act (TSCA) 40 CFR 761.61	Shoreline Management Act RCW 90-58; WAC 173-16; King County/City Seattle Shoreline Master Plans (KCC Title 25;SMC 23.60)	Groundwater to Sediment Protection Ecology CSL WAC 173-340 730(1)(d)	Groundwater to Sediment Protection Ecology SQS WAC 173-340 730(1)(d)	Surface Water HH Adult Carcinogen Tribal Fish Consumption w/o EPA RCRA (using EQ 730-1)	Surface Water HH Non-Child Carcinogen Tribal Fish Consumption w/o EPA RCRA (using EQ 730-1)	Surface Water HH Adult Carcinogen Tribal Fish Consumption w/o EPA RCRA (using EQ 730-2)
UNITS		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Endrin		0.037	0.0023	0.18	0.0023	0.037	0.0023	0.076	0.81	0.81								
Endrin Aldehyde		0.037	0.0023	0.18	0.0023	0.037	0.0023	0.076	0.81	0.81								
Heptachlor		0.053	0.0036	0.52	0.0038	0.053	0.0036	0.00021	0.00021	0.00021								
Heptachlor Epoxide		0.053	0.0036	0.52	0.0038	0.053	0.0036	0.0001	0.00011	0.00011								
Toxaphene		0.21	0.0002	0.73	0.0002	0.21	0.0002		0.00075	0.00075								
<b>Screening Levels Added by Integri</b>																		
1,2,4-Trimethylbenzene		NV	NV	NV	NV	NV	NV		NV	NV								
1-Methylnaphthalene		NV	NV	NV	NV	NV	NV		NV	NV								
Carbazole		NV	NV	NV	NV	NV	NV		NV	NV								
Carbon disulfide		NV	NV	NV	NV	NV	NV		NV	NV								
Chloride		NV	NV	NV	NV	NV	NV		NV	NV								
cis-1,2-Dichloroethene		NV	NV	NV	NV	NV	NV		NV	NV								
Isophorone		NV	NV	NV	NV	NV	NV		600	600								
n-Nitrosodi-n-propylamine Sulfate		NV	NV	NV	NV	NV	NV		NV	NV								
trans-1,2-Dichloroethene		NV	NV	NV	NV	NV	NV		NV	NV								
Tributyl phosphate		NV	NV	NV	NV	NV	NV		NV	NV								

Table A-4. Surface Water Screening Lr

MEDIA - MTCA Standard		Always Applicable			EPA Method	ALWAYS APPLICABLE	SW MOST STRINGENT	
<b>PATHWAYS</b> HH - Human Health Ecol- Ecological	Surface Water HH Child Carcinogen Tribal Fish Consumption w/o Salmon RCRA (using EPA EQ 730-2)	Natural Background Levels Ch. 173-340 WAC	Applicable DL (MDL) Ch. 173-340 WAC	Applicable PQL(RL/RDL) Ch. 173-340 WAC	Analytical Method	Natural Background Levels Ch. 173-340 WAC LDW	Adjusted* Screening Level	FRESH/MARINE SURFACE WATER
UNITS	µg/L	µg/L	µg/L	µg/L		µg/L	µg/L	*Regulatory Framework For 'Adjusted' For NON-POTABLE Most Stringent Criteria
acetone					*		110107.0077	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Child, EPA RCRA
acenaphthene				0.01	*		2.614379085	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
acenaphthylene					*		10.78431373	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
anthracene				0.01	*		10.78431373	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
benzene	9.928041555				*		2.028193577	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
benzo(g,h,i)perylene					*		0.011584454	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
benzo[a]anthracene	0.001264533	0.00022		0.15/0.01	*	0.0032	0.000258331	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
benzo[a]pyrene	7.42877E-05			0.01	*	0.0032	1.51762E-05	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
benzo[b]fluoranthene	0.000594087			0.01	*	0.0032	0.000121366	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
benzo[k]fluoranthene	0.000622206			0.01	*		0.00012711	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
bis(2-ethylhexyl) phthalate	6.044370515	1.37		1	*		0.284848485	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
butyl benzyl phthalate	2.006633126				*		0.409933862	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
carbon tetrachloride	1.213100936				*		0.247823653	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
chlorobenzene					*		20	HH -Organoleptic Effects CWA §304 NRWQC
chloroethane (ethyl chloride)					*		34	HH - Fresh Water - Organism Consumption, NTR - 40 CFR 131.36 (WAC 173-201A-040[5])
chloroform (trichloromethane)	21.0251225				*		4.2952095	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
chloromethane	109.7933125				*		20.25073279	HH -Method B; Tribal Fish Consumption (Adult-Carc); Mod EQ 730-2 (WAC 173-340-730(3)c)
chrysene	0.012634981			0.01	*	0.0032	0.002581193	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
dibenz[a,h]anthracene	0.000306124			0.01	*	0.0032	6.25379E-05	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
dibenzofuran					*		1.327433628	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
di-butyl phthalate (di-n-butyl phth.)					*		46.57806484	HH - Tribal Fish (w/o Salmon) Consumption, Non-Carc - Child, EPA RCRA
dichlorobenzene, 1,2-					*		5.191873589	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
dichlorobenzene, 1,3-					*		960	HH -Consumption; Organism CWA §304 NRWQC
dichlorobenzene, 1,4-					*		0.739825557	HH -Method B; Tribal Fish Consumption (Adult-Carc); Mod EQ 730-2 (WAC 173-340-730(3)c)
dichloroethane, 1,1-	162.8152941				*		33.26143751	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
dichloroethane, 1,2-	17.39082043				*		3.552760138	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
dichloroethylene, 1,1-					*		3.2	HH -Fresh Water - Organism Consumption NTR - 40 CFR 131.36 (WAC 173-201A-040[5])
diethyl phthalate					*		484.1269841	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
dimethyl phthalate					*		142.8571429	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
di-n-octyl phthalate					*		0.295918367	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
ethylbenzene					*		2.393268421	HH -Method B; Tribal Fish Consumption (Adult-Carc); Mod EQ 730-2 (WAC 173-340-730(3)c)
fluoranthene				0.01	*		2.256699577	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
fluorene				0.01	*		2.03539823	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
hexachlorobenzene	0.000324016				*		6.61931E-05	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
hexachlorobutadiene	20.65159926				*		3.923541247	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
indeno[1,2,3-cd]pyrene	0.00025637			0.01	*	0.0032	5.23736E-05	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
MEK (Methyl Ethyl Ketone;2-Butanone)					*		73404.6718	HH - Tribal Fish (w/o Salmon) Consumption, Non-Carc - Child, EPA RCRA
methylene chloride (dichloromethane)	300.6872852				*		61.42722279	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
methylnaphthalene, 2-					*		18.18181818	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
MIBK (M-Isobutyl-K;4-M,2-Pentanone)					*			

Table A-4. Surface Water Screening L<sub>t</sub>

MEDIA - MTCA Standard		Always Applicable			EPA Method	ALWAYS APPLICABLE	SW MOST STRINGENT	
<b>PATHWAYS</b> HH - Human Health Ecol- Ecological	Surface Water HH Child Carcinogen Tribal Fish Consumption w/o Salmon RCRA (using EPA EQ 730-2)	Natural Background Levels Ch. 173-340 WAC	Applicable DL (MDL) Ch. 173-340 WAC	Applicable PQL(RL/RDL) Ch. 173-340 WAC	Analytical Method	Natural Background Levels Ch. 173-340 WAC LDW	Adjusted* Screening Level	FRESH/MARINE SURFACE WATER
UNITS	µg/L	µg/L	µg/L	µg/L		µg/L	µg/L	*Regulatory Framework For 'Adjusted' For NON-POTABLE Most Stringent Criteria
naphthalene				0.01	*		53.80434783	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
nitrosodiphenylamine, N-	7.800604079				*		1.481427406	HH -Method B; Tribal Fish Consumption (Adult-Carc); Mod EQ 730-2 (WAC 173-340-730(3)c
PCB mixtures	0.000112758	0.00033		0.01	*	0.00153	1.58209E-05	HH -Method B; Tribal Fish Consumption (Adult-Carc); Mod EQ 730-2 (WAC 173-340-730(3)c
PCB - Aroclor 1016	0.003221649				*	0.00153	0.000452025	HH -Method B; Tribal Fish Consumption (Adult-Carc); Mod EQ 730-2 (WAC 173-340-730(3)c
PCB - Aroclor 1221	0.000112758				*	0.00153	2.30352E-05	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
PCB - Aroclor 1232					*	0.00153	0.014	Aquatic Life Fresh/Chronic, NTR - 40 CFR 131.36
PCB - Aroclor 1242	0.000112758				*	0.00153	2.30352E-05	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
PCB - Aroclor 1248	0.000112758				*	0.00153	2.30352E-05	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
PCB - Aroclor 1254	2.68471E-05				*	0.00153	5.48457E-06	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
PCB - Aroclor 1260	0.000112758				*	0.00153	2.30352E-05	Aquatic Life Fresh/Chronic, NTR - 40 CFR 131.36
phenanthrene					*		4.807692308	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
pyrene				0.01	*		9.828761139	HH - Tribal Fish (w/o Salmon) Consumption, Non-Carc - Child, EPA RCRA
tetrachloroethylene (perchloroethylene)	0.100874693				*		0.02060763	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
trichlorobenzene, 1,2,4-					*		1.128133705	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
trichlorethane, 1,1,1-					*		46023.56406	HH - Tribal Fish (w/o Salmon) Consumption, Non-Carc - Child, EPA RCRA
trichlorethane, 1,1,2-	11.43471574				*		2.335991132	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
trichloroethylene	3.619830882				*		0.739493051	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
trimethylbenzene, 1,3,5-					*		45.21613312	HH - Tribal Fish (w/o Salmon) Consumption, Non-Carc - Child, EPA RCRA
toluene					*		1294.051676	HH - Tribal Fish (w/o Salmon) Consumption, Non-Carc - Child, EPA RCRA
vinyl chloride (chloroethylene)	2.610132684				*		0.53322242	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
xylene (dimethylbenzene)					*		1577.950768	HH - Tribal Fish (w/o Salmon) Consumption, Non-Carc - Child, EPA RCRA
benzoic acid					*		2242.926156	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
benzyl alcohol					*		181.9923372	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
dimethylphenol, 2,4-					*		2.020624303	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
methylphenol, 2- (o-cresol)					*		7.110609481	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
methylphenol, 4- (p-cresol)					*		77.18894009	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
pentachlorophenol	3.416900968				*		0.698036623	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
phenol (total)					*		78.35820896	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
styrene (phenylethylene)					*		NA	
Tributyltin					*		0.0074	Aquatic Life Marine/Chronic, CWA §304, NRWQC
Trichlorophenol, 2,4,6-	2.733520775				*		0.558429298	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
Aluminum					*		NA	
Antimony					*		3.865979381	HH - Tribal Fish (w/o Salmon) Consumption, Non-Carc - Child, EPA RCRA
Arsenic (III)					*			
Arsenic (V)					*			
Arsenic (total)	0.026376078	0.71		0.02	*	0.87	0.005388353	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
Barium					*		122.1478478	HH - Tribal Fish (w/o Salmon) Consumption, Non-Carc - Child, EPA RCRA
Beryllium					*		12.47090123	HH - Tribal Fish (w/o Salmon) Consumption, Non-Carc - Child, EPA RCRA
Cadmium					*		0.25	Aquatic Life Fresh/Chronic, CWA §304, NRWQC

Table A-4. Surface Water Screening List

MEDIA - MTCA Standard		Always Applicable			EPA Method	ALWAYS APPLICABLE	SW MOST STRINGENT	
<b>PATHWAYS</b> HH - Human Health Ecol- Ecological	Surface Water HH Child Carcinogen Tribal Fish Consumption w/o Salmon RCRA (using EPA EQ 730-2)	Natural Background Levels Ch. 173-340 WAC	Applicable DL (MDL) Ch. 173-340 WAC	Applicable PQL(RL/RDL) Ch. 173-340 WAC	Analytical Method	Natural Background Levels Ch. 173-340 WAC <b>LDW</b>	Adjusted* Screening Level	FRESH/MARINE SURFACE WATER
UNITS	µg/L	µg/L	µg/L	µg/L		µg/L	µg/L	*Regulatory Framework For 'Adjusted' For NON-POTABLE Most Stringent Criteria
Chromium (VI)	2.818943299				*		0.123402903	Aquatic Life Fresh/Chronic, NTR - 40 CFR 131.36
Chromium, total (or III)					*		74	Aquatic Life Fresh/Chronic, CWA §304, NRWQC
Cobalt					*			
Copper					*		3.1	Aquatic Life Marine/Chronic, CWA §304, NRWQC
Iron					*			
Lead					*		0.54	Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 WAC 173-340-730(2)(b)(i)(A) Fresh - Chronic
Manganese					*		100	HH -Consumption; Organism CWA §304 NRWQC
Mercury					*		0.005161594	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
Mercury (organic)					*		0.000454821	HH - Tribal Fish (w/o Salmon) Consumption, Non-Carc - Child, EPA RCRA
Molybdenum					*		NA	
Nickel					*		8.2	
Selenium					*		5	Aquatic Life Fresh/Chronic, CWA §304, NRWQC
Silver				0.02	*		1.532250723	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
Tin					*		NV	
Thallium					*		0.233291859	HH -Method B; Tribal Fish Consumption (Child Non-Carc); Mod EQ 730-1 (WAC 173-340-730(3)c)
Vanadium					*		NA	
Zinc					*		32.56745762	Protection -Surface Water to Sediment {Ecology SQS}; WAC 173-340-730(1)(d)
					*			
LPAH					*		0.01	
HPAH					*		0.01	
Total Petroleum Hydrocarbons					*		0.208	Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 WAC 173-340-730(2)(b)(i)(A) Fresh - Chronic
Gasoline					*		1000	
Gasoline (w/benzene)					*		800	
Diesel					*		500	
Heavy Oil					*		500	
					*			
2,3,7,8-TCDD (Dioxin)	1.00857E-09				*		2.06039E-10	HH - Tribal Fish (w/o Salmon) Consumption, Carc - Adult, EPA RCRA
					*			
Aldrin					*		1.24351E-05	HH -Method B; Tribal Fish Consumption (Adult-Carc); Mod EQ 730-2 (WAC 173-340-730(3)c)
alpha-BHC					*		0.001205401	HH -Method B; Tribal Fish Consumption (Adult-Carc); Mod EQ 730-2 (WAC 173-340-730(3)c)
beta-BHC					*		0.004218903	HH -Method B; Tribal Fish Consumption (Adult-Carc); Mod EQ 730-2 (WAC 173-340-730(3)c)
gamma-BHC (Lindane)					*		0.063	HH -Fresh Water - Organism Consumption NTR - 40 CFR 131.36 (WAC 173-201A-040[5])
Chlordane					*		0.000200045	HH -Method B; Tribal Fish Consumption (Adult-Carc); Mod EQ 730-2 (WAC 173-340-730(3)c)
4,4'-DDT					*		5.41716E-05	HH -Method B; Tribal Fish Consumption (Adult-Carc); Mod EQ 730-2 (WAC 173-340-730(3)c)
4,4'-DDE					*		5.41716E-05	HH -Method B; Tribal Fish Consumption (Adult-Carc); Mod EQ 730-2 (WAC 173-340-730(3)c)
4,4'-DDD					*		7.67431E-05	HH -Method B; Tribal Fish Consumption (Adult-Carc); Mod EQ 730-2 (WAC 173-340-730(3)c)
Dieldrin					*		1.32123E-05	HH -Method B; Tribal Fish Consumption (Adult-Carc); Mod EQ 730-2 (WAC 173-340-730(3)c)
alpha-Endosulfan					*		0.0087	Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 WAC 173-340-730(2)(b)(i)(A) Marine - Chronic
beta-Endosulfan					*		0.0087	Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 WAC 173-340-730(2)(b)(i)(A) Marine - Chronic
Endosulfan Sulfate					*		0.0087	Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 WAC 173-340-730(2)(b)(i)(A) Marine - Chronic

Table A-4. Surface Water Screening Levels

MEDIA - MTCA Standard		Always Applicable			EPA Method	ALWAYS APPLICABLE	SW MOST STRINGENT	
<b>PATHWAYS</b> HH - Human Health Ecol- Ecological	Surface Water HH Child Carcinogen Tribal Fish Consumption w/o Salmon RCRA (using EPA EQ 730-2)	Natural Background Levels Ch. 173-340 WAC	Applicable DL (MDL) Ch. 173-340 WAC	Applicable PQL(RL/RDL) Ch. 173-340 WAC	Analytical Method	Natural Background Levels Ch. 173-340 WAC <b>LDW</b>	Adjusted* Screening Level	FRESH/MARINE SURFACE WATER
UNITS	µg/L	µg/L	µg/L	µg/L		µg/L	µg/L	*Regulatory Framework For 'Adjusted' For NON-POTABLE Most Stringent Criteria
Endrin					*		0.0023	Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 WAC 173-340-730(2)(b)(i)(A) Fresh - Chronic
Endrin Aldehyde					*		0.0023	Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 WAC 173-340-730(2)(b)(i)(A) Fresh - Chronic
Heptachlor					*		1.95878E-05	HH -Method B; Tribal Fish Consumption (Adult-Carc); Mod EQ 730-2 (WAC 173-340-730(3)c
Heptachlor Epoxide					*		9.68626E-06	HH -Method B; Tribal Fish Consumption (Adult-Carc); Mod EQ 730-2 (WAC 173-340-730(3)c
Toxaphene					*		6.85096E-05	HH -Method B; Tribal Fish Consumption (Adult-Carc); Mod EQ 730-2 (WAC 173-340-730(3)c
<b>Screening Levels Added by Integr</b>								
1,2,4-Trimethylbenzene							NV	
1-Methylnaphthalene							NV	
Carbazole							NV	
Carbon disulfide							NV	
Chloride							230000	Surface Water Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A)
cis-1,2-Dichloroethene							NV	
Isophorone							236.1778047	Surface Water, Method B-HH, Carcinogen, Fish Consumption WAC 173-340-730(3)(b)(iii)(B) EQ. 730-2MOD - Tribal Adult
n-Nitrosodi-n-propylamine							0.128210808	Surface Water, Method B-HH, Carcinogen, Fish Consumption WAC 173-340-730(3)(b)(iii)(B) EQ. 730-2 MOD - Tribal Adult
Sulfate							NV	
trans-1,2-Dichloroethene							4800	Surface Water, Method B-HH, Non-carcinogen, Fish Consumption WAC 173-340-730(3)(c) EQ. 730-1 MOD - Tribal Child
Tributyl phosphate							NV	

Notes:

- ARAR = applicable or relevant and appropriate requirement
- CLARC = cleanup level and risk calculation
- CSL = cleanup screening level
- CWA = clean water act
- Ecol = Washington State Department of Ecology
- EPA = U.S. Environmental Protection Agency
- EQ = equation
- DL = detection limit
- HH = human health
- MDL = method detection limit
- MOD =
- NPDES = national pollutant discharge elimination system
- NRWQC = U.S. Environmental Protection Agency water quality criterion
- NTR = national toxics rule
- NV = no value available
- PCB = polychlorinated biphenyl
- PQL = practical quantitation limit
- RCRA = Resource Conservation and Recovery Act
- SQS = sediment quality standard
- SW = solid waste
- SWQS = Washington State water quality standard
- WAC = Washington Administrative Code
- WET = whole effluent toxicity
- WQS = water quality standard

Table A-5. Chemical-Specific Changes to Ecology Screening Levels

Chemical	Page	Original Column	Column Heading	Original Value	Modified Value	Comment
1,2,4-Trimethylbenzene	Soil and Groundwater	Multiple	Multiple	--	--	ARARs added at bottom of page to derive a SL for detected analyte
1-Methylnaphthalene	Soil and Groundwater	Multiple	Multiple	--	--	ARARs added at bottom of page to derive a SL for detected analyte
Arsenic	Surface Water	BF	Natural Background Levels Ch. 173-340 WAC LDW	0.87	1.2	Value shown was mean upstream background. Changed to 90th percentile upstream background.
Carbazole	Soil and Groundwater	Multiple	Multiple	--	--	ARARs added at bottom of page to derive a SL for detected analyte
Carbon disulfide	Soil and Groundwater	Multiple	Multiple	--	--	ARARs added at bottom of page to derive a SL for detected analyte
Chloride	Groundwater	Multiple	Multiple	--	--	ARARs added at bottom of page to derive a SL for detected analyte
Copper	Groundwater	G, H, M, and N	MCLs and MCLGs	1.3	1300	Unit error
<i>cis</i> -1,2-Dichloroethene	Soil and Groundwater	Multiple	Multiple	--	--	ARARs added at bottom of page to derive a SL for detected analyte
Dimethyl phthalate	Soil	G	Soil, Direct Contact Method B-HH, Non-carcinogen, WAC 173-340-740(3)(b)(iii)(B)(I) CLARC Database EQ. 740-1	--	8.00E+04	No value was reported but a value is available
Di- <i>n</i> -octyl phthalate	Groundwater	O	Ground Water, Method B-HH, Non-carcinogenic/Potable WAC 173-340-720(4)(b)(iii)(A) CLARC Database	--	320	No value was reported but a value is available
Di- <i>n</i> -octyl phthalate	Soil	G	Soil, Direct Contact Method B-HH, Non-carcinogen, WAC 173-340-740(3)(b)(iii)(B)(I) CLARC Database EQ. 740-1	--	1,600	No value was reported but a value is available
Isophorone	Soil and Groundwater	Multiple	Multiple	--	--	ARARs added at bottom of page to derive a SL for detected analyte
Nickel	Surface Water	AM	Surface Water Aquatic Life Fresh/Chronic, NTR - 40 CFR 131.36	5	160	Value shown was inconsistent with EPA's website
<i>n</i> -Nitrosodi- <i>n</i> -propylamine	Soil and Groundwater	Multiple	Multiple	--	--	ARARs added at bottom of page to derive a SL for detected analyte
Sulfate	Groundwater	Multiple	Multiple	--	--	ARARs added at bottom of page to derive a SL for detected analyte

Table A-5. Chemical-Specific Changes to Ecology Screening Levels

Chemical	Page	Original Column	Column Heading	Original Value	Modified Value	Comment
Tetrachloroethene	Groundwater	O	Groundwater, Method B-HH, Non-carcinogenic/Potable WAC 173-340-720(4)(b)(iii)(A) CLARC Database	--	80	No value was reported but a value is available
Tetrachloroethene	Groundwater	P	Groundwater, Method B-HH, Carcinogen/Potable WAC 173-340-720(4)(b)(iii)(B) CLARC Database	0.858	0.081	Value shown was inconsistent with CLARC database
Total petroleum hydrocarbons	Surface Water	AA	Surface Water Aquatic Life SWQS:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) Fresh - Acute	0.208	--	Value shown was from the CAP for the Skykomish site; it is not from the listed ARAR
<i>trans</i> -1,2-Dichloroethene	Soil and Groundwater	Multiple	Multiple	--	--	ARARs added at bottom of page to derive a SL for detected analyte
Tributylphosphate	Soil and Groundwater	Multiple	Multiple	--	--	ARARs added at bottom of page to derive a SL for detected analyte
Trichloroethene	Groundwater	O	Groundwater, Method B-HH, Non-carcinogenic/Potable WAC 173-340-720(4)(b)(iii)(A) CLARC Database	--	2.4	No value was reported but a value is available
Trichloroethene	Groundwater	P	Groundwater, Method B-HH, Carcinogen/Potable WAC 173-340-720(4)(b)(iii)(B) CLARC Database	0.11	0.49	Value shown was inconsistent with CLARC database

Notes:

- ARAR = applicable or relevant and appropriate requirement
- CAP = cleanup action plan
- CLARC = cleanup level and risk calculation
- EPA = U.S. Environmental Protection Agency
- HH = human health
- MCL = maximum contaminant level
- MCLG = maximum contaminant level goal
- NTR = national toxics rule
- SL = screening level
- SWQS = Washington State water quality standard

## **APPENDIX B**

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### **RESULTS OF STEP 1 SCREEN**



Table B-1. Chemicals Not Screened During Step 1

Group	Chemical	Soil	Groundwater	Reason for Exclusion	
Conventionals	All but chloride and sulfate in groundwater	x	x	No ARARs or toxicity parameter values available	
	Barium		x	Not analyzed in GW	
	Beryllium		x	Not analyzed in GW	
Metals	Calcium	x	x	Essential nutrient not usually associated with toxicity	
	Magnesium	x	x	Essential nutrient not usually associated with toxicity	
	Selenium		x	Not analyzed in GW	
	Silver		x	Not analyzed in GW	
	Benzo(a)anthracene	x	x	Included in BaP TEQ calculation	
	Benzo(a)pyrene	x	x	Included in BaP TEQ calculation	
	Benzo(b)fluoranthene	x	x	Included in BaP TEQ calculation	
PAHs	Benzo(k)fluoranthene	x	x	Included in BaP TEQ calculation	
	Benzofluoranthenes	x	x	Included in BaP TEQ calculation	
	Chrysene	x	x	Included in BaP TEQ calculation	
	Dibenz(a,h)anthracene	x	x	Included in BaP TEQ calculation	
	Indeno[1,2,3-cd]pyrene	x	x	Included in BaP TEQ calculation	
	Retene	x	x	Detected but no ARARs or toxicity parameter values available	
	High Molecular Weight PAH	x		Detected but no ARARs or toxicity parameter values available	
	Low Molecular Weight PAH	x		Detected but no ARARs or toxicity parameter values available	
	PCBs	Individual Aroclors	x	x	Included in total PCB calculation
		Endrin ketone	x	x	Not detected, SL not provided in Ecology spreadsheet
Pesticides	delta-Hexachlorocyclohexane	x	x	Not detected, SL not provided in Ecology spreadsheet	
	Methoxychlor	x	x	Not detected, SL not provided in Ecology spreadsheet	
	Aniline	x	x	Not detected, SL not provided in Ecology spreadsheet	
	Azobenzene	x	x	Not detected, SL not provided in Ecology spreadsheet	
	Benzydine	x	x	Not detected, SL not provided in Ecology spreadsheet	
	Bis(2-chloro-1-methylethyl) ether	x	x	Not detected, SL not provided in Ecology spreadsheet	
	Bis(2-chloroethoxy) methane	x	x	Not detected, SL not provided in Ecology spreadsheet	
	Bis(2-chloroethyl) ether	x	x	Not detected, SL not provided in Ecology spreadsheet	
	4-Bromophenyl phenyl ether	x	x	Not detected, SL not provided in Ecology spreadsheet	
	Butyl diphenyl phosphate	x	x	Not detected, SL not provided in Ecology spreadsheet	
	4-Chloro-3-methylphenol	x	x	Not detected, SL not provided in Ecology spreadsheet	
	4-Chloroaniline	x	x	Not detected, SL not provided in Ecology spreadsheet	
	2-Chloronaphthalene	x	x	Not detected, SL not provided in Ecology spreadsheet	
	2-Chlorophenol	x	x	Not detected, SL not provided in Ecology spreadsheet	
	4-Chlorophenyl phenyl ether	x	x	Not detected, SL not provided in Ecology spreadsheet	
	2-Chlorotoluene	x	x	Not detected, SL not provided in Ecology spreadsheet	
	Dibutyl phenylphosphate	x	x	Detected but no ARARs or toxicity parameter values available	
	3,3'-Dichlorobenzidine	x	x	Not detected, SL not provided in Ecology spreadsheet	
	SVOCs	2,4-Dichlorophenol	x	x	Not detected, SL not provided in Ecology spreadsheet
		4,6-Dinitro-2-methylphenol	x	x	Not detected, SL not provided in Ecology spreadsheet
2,4-Dinitrophenol		x	x	Not detected, SL not provided in Ecology spreadsheet	
2,4-Dinitrotoluene		x	x	Not detected, SL not provided in Ecology spreadsheet	

Table B-1. Chemicals Not Screened During Step 1

Group	Chemical	Soil	Groundwater	Reason for Exclusion
	2,6-Dinitrotoluene	x	x	Not detected, SL not provided in Ecology spreadsheet
	1,4-Dioxane	x	x	Not detected, SL not provided in Ecology spreadsheet
	2,6-Di- <i>tert</i> -butyl- <i>p</i> -cresol	x	x	Not detected, SL not provided in Ecology spreadsheet
	Hexachlorocyclopentadiene	x	x	Not detected, SL not provided in Ecology spreadsheet
	Hexachlorodibenzofuran	x	x	Not detected, SL not provided in Ecology spreadsheet
	2-Nitroaniline	x	x	Not detected, SL not provided in Ecology spreadsheet
	3-Nitroaniline	x	x	Not detected, SL not provided in Ecology spreadsheet
	4-Nitroaniline	x	x	Not detected, SL not provided in Ecology spreadsheet
	Nitrobenzene	x	x	Not detected, SL not provided in Ecology spreadsheet
	2-Nitrophenol	x	x	Not detected, SL not provided in Ecology spreadsheet
	4-Nitrophenol	x	x	Not detected, SL not provided in Ecology spreadsheet
	<i>n</i> -Nitrosodimethylamine	x	x	Not detected, SL not provided in Ecology spreadsheet
	<i>n</i> -Nitrosodi- <i>n</i> -propylamine		x	Not detected, SL not provided in Ecology spreadsheet
	alpha-Terpineol	x	x	Not detected, SL not provided in Ecology spreadsheet
	2,4,5-Trichlorophenol	x	x	Not detected, SL not provided in Ecology spreadsheet
	Triphenyl phosphate	x	x	Not detected, SL not provided in Ecology spreadsheet
	Acrolein	x	x	Not detected, SL not provided in Ecology spreadsheet
	Acrylonitrile	x	x	Not detected, SL not provided in Ecology spreadsheet
	Bromobenzene	x	x	Not detected, SL not provided in Ecology spreadsheet
	Bromochloromethane	x	x	Not detected, SL not provided in Ecology spreadsheet
	Bromodichloromethane	x	x	Not detected, SL not provided in Ecology spreadsheet
	Bromoethane	x	x	Not detected, SL not provided in Ecology spreadsheet
	Bromoform	x	x	Not detected, SL not provided in Ecology spreadsheet
	Bromomethane	x	x	Detected but no ARARs or toxicity parameter values available
	<i>n</i> -Butylbenzene	x	x	Detected but no ARARs or toxicity parameter values available
	<i>sec</i> -Butylbenzene	x	x	Detected but no ARARs or toxicity parameter values available
	<i>tert</i> -Butylbenzene	x	x	Not detected, SL not provided in Ecology spreadsheet
	Chlorodibromomethane	x	x	Not detected, SL not provided in Ecology spreadsheet
	2-Chloroethyl vinyl ether	x	x	Detected but no ARARs or toxicity parameter values available
	4-Chlorotoluene	x	x	Not detected, SL not provided in Ecology spreadsheet
	1,2-Dibromo-3-chloropropane	x	x	Not detected, SL not provided in Ecology spreadsheet
	Dichlorodifluoromethane	x	x	Not detected, SL not provided in Ecology spreadsheet
	<i>cis</i> -1,2-Dichloroethene	x		Not detected, SL not provided in Ecology spreadsheet
	<i>trans</i> -1,2-Dichloroethene	x		Not detected, SL not provided in Ecology spreadsheet
	1,2-Dichloropropane	x	x	Not detected, SL not provided in Ecology spreadsheet
	1,3-Dichloropropane	x	x	Not detected, SL not provided in Ecology spreadsheet
VOCs	2,2-Dichloropropane	x	x	Not detected, SL not provided in Ecology spreadsheet
	1,1-Dichloropropene	x	x	Not detected, SL not provided in Ecology spreadsheet
	<i>cis</i> -1,3-Dichloropropene	x	x	Not detected, SL not provided in Ecology spreadsheet
	<i>trans</i> -1,3-Dichloropropene	x	x	Not detected, SL not provided in Ecology spreadsheet
	Ethylene dibromide	x	x	Not detected, SL not provided in Ecology spreadsheet
	Hexachloroethane	x	x	Not detected, SL not provided in Ecology spreadsheet

Table B-1. Chemicals Not Screened During Step 1

Group	Chemical	Soil	Groundwater	Reason for Exclusion
	Isopropylbenzene	x	x	Not detected, SL not provided in Ecology spreadsheet
	Methyl iodide	x	x	Not detected, SL not provided in Ecology spreadsheet
	Methyl <i>n</i> -butyl ketone	x	x	Not detected, SL not provided in Ecology spreadsheet
	Methyl <i>tert</i> -butyl ether	x	x	Not detected, SL not provided in Ecology spreadsheet
	1-Methyl-4-isopropylbenzene	x	x	Not detected, SL not provided in Ecology spreadsheet
	Methylene bromide	x	x	Not detected, SL not provided in Ecology spreadsheet
	<i>n</i> -Propylbenzene	x	x	Detected but no ARARs or toxicity parameter values available
	Pyridine	x	x	Not detected, SL not provided in Ecology spreadsheet
	1,1,1,2-Tetrachloroethane	x	x	Not detected, SL not provided in Ecology spreadsheet
	1,1,2,2-Tetrachloroethane	x	x	Not detected, SL not provided in Ecology spreadsheet
	1,1,2-Trichloro-1,2,2-trifluoroethane	x	x	Not detected, SL not provided in Ecology spreadsheet
	1,2,3-Trichlorobenzene	x	x	Not detected, SL not provided in Ecology spreadsheet
	Trichlorofluoromethane	x	x	Not detected, SL not provided in Ecology spreadsheet
	1,2,3-Trichloropropane	x	x	Not detected, SL not provided in Ecology spreadsheet
	1,2,4-Trimethylbenzene	x	x	Not detected, SL not provided in Ecology spreadsheet
	Vinyl acetate	x	x	Not detected, SL not provided in Ecology spreadsheet
Dioxins	Individual congeners	x	x	Included in TCDD TEQ calculation

Notes:

- ARAR = applicable or relevant and appropriate requirement
- BaP = benzo(a)pyrene
- GW = groundwater
- PAH = polycyclic aromatic hydrocarbon
- PCB = polychlorinated biphenyl
- SL = screening level
- SVOC = semivolatatile organic compound
- TCDD = 2,3,7,8-tetrachlorodibenzo-p-dioxin
- TEQ = toxicity equivalency
- VOC = volatile organic compound

Table B-2. Step 1 Soil Screening Summary (mg/kg)

Group	Chemical	CAS No.	Screening Level	Total No. Samples	Total No. Detects	Max Detect	Ratio of Max Detect to Screening Level	Max MDL	Ratio of Max MDL to Screening Level	Preliminary COPC	Reason for Exclusion
Dioxins and furans	TCDD TEQ (ND = 1/2DL)	TEQ_DIOXIN.5	3.02E-11	9	9	1.41E-04	4.67E+06			Yes	
Metals	Arsenic	7440-38-2	1.58E-04	69	31	1.40E+02	8.87E+05	7.00E+00	4.44E+04	Yes	
	Cadmium	7440-43-9	1.50E-03	96	49	5.30E+00	3.54E+03	1.00E+00	6.68E+02	Yes	
	Chromium	7440-47-3	4.20E+01	96	96	1.32E+02	3.14E+00			Yes	
	Chromium hexavalent	18540-29-9	8.30E-04	27	2	8.57E-01	1.03E+03	2.46E-01	2.96E+02	Yes	
	Copper	7440-50-8	5.35E-02	69	69	2.61E+03	4.88E+04			Yes	
	Lead	7439-92-1	5.40E+00	69	61	2.83E+03	5.24E+02	2.10E-01	3.89E-02	Yes	
	Mercury	7439-97-6	2.70E-04	96	57	3.30E+00	1.22E+04	6.00E-02	2.22E+02	Yes	
	Nickel	7440-02-0	3.26E-01	69	69	2.33E+03	7.14E+03			Yes	
	Tin	7440-31-5	5.00E+01	69	14	7.90E+01	1.58E+00	1.20E+00	2.40E-02	Yes	
Zinc	7440-66-6	2.03E+00	69	69	2.85E+03	1.40E+03			Yes		
PAHs	Acenaphthene	83-32-9	1.67E-02	145	24	1.30E+01	7.76E+02	2.00E+01	1.19E+03	Yes	
	Acenaphthylene	208-96-8	6.91E-02	145	16	1.60E-01	2.32E+00	2.00E+01	2.89E+02	Yes	
	Anthracene	120-12-7	2.23E-01	145	44	4.90E+01	2.20E+02	2.00E+01	8.96E+01	Yes	
	Benzo(g,h,i)perylene	191-24-2	3.10E-02	145	58	1.20E+02	3.87E+03	2.00E+01	6.45E+02	Yes	
	Fluoranthene	206-44-0	1.61E-01	145	89	4.40E+02	2.74E+03	2.00E+01	1.25E+02	Yes	
	Fluorene	86-73-7	2.36E-02	145	30	4.90E+01	2.08E+03	8.20E-02	3.48E+00	Yes	
	1-Methylnaphthalene	90-12-0	1.20E-02	136	62	9.40E+00	7.83E+02	9.50E-02	7.92E+00	Yes	
	2-Methylnaphthalene	91-57-6	4.32E-02	145	69	5.20E+02	1.20E+04	7.00E-02	1.62E+00	Yes	
	Naphthalene	91-20-3	4.70E-04	150	49	3.50E+00	7.45E+03	2.00E+01	4.26E+04	Yes	
	Phenanthrene	85-01-8	1.01E-01	145	98	2.80E+02	2.76E+03	6.60E-02	6.51E-01	Yes	
	Pyrene	129-00-0	6.84E-01	145	94	3.80E+02	5.55E+02	6.60E-02	9.64E-02	Yes	
	BaP TEQ	BAPEQ	5.19E-06	145	85	2.86E+02	5.51E+07	2.00E+01	3.86E+06	Yes	
PCBs	Total PCBs	SMSPCB	7.14E-10	282	134	3.80E+03	5.32E+12	9.40E-02	1.32E+08	Yes	
Pesticides	Aldrin	309-00-2	6.09E-07	10	0			2.00E-03	3.28E+03	No	Never detected
	cis-Chlordane	5103-71-9	1.03E-05	10	0			2.60E-03	2.52E+02	No	Never detected
	trans-Chlordane	5103-74-2	1.03E-05	10	0			2.50E-03	2.42E+02	No	Never detected
	4,4'-DDD	72-54-8	3.54E-06	10	0			5.30E-03	1.50E+03	No	Never detected
	4,4'-DDE	72-55-9	4.70E-06	10	0			5.30E-03	1.13E+03	No	Never detected
	4,4'-DDT	50-29-3	3.67E-05	10	0			5.30E-03	1.44E+02	No	Never detected
	Dieldrin	60-57-1	3.41E-07	10	0			5.30E-03	1.55E+04	No	Never detected
	alpha-Endosulfan	959-98-8	2.02E-05	10	0			2.50E-03	1.24E+02	No	Never detected
	beta-Endosulfan	33213-65-9	2.02E-05	10	0			5.20E-03	2.57E+02	No	Never detected
	Endosulfan sulfate	1031-07-8	2.02E-05	10	0			7.90E-03	3.90E+02	No	Never detected
	Endrin	72-20-8	2.25E-05	10	0			4.80E-03	2.14E+02	No	Never detected
	Endrin aldehyde	7421-93-4	2.25E-05	10	0			9.00E-03	4.00E+02	No	Never detected
	Heptachlor	76-44-8	1.92E-07	10	0			2.00E-03	1.04E+04	No	Never detected
	Heptachlor epoxide	1024-57-3	8.09E-07	10	0			2.70E-03	3.34E+03	No	Never detected
	alpha-Hexachlorocyclohexane	319-84-6	2.47E-06	10	0			1.60E-03	6.48E+02	No	Never detected
	beta-Hexachlorocyclohexane	319-85-7	1.02E-05	10	0			3.00E-03	2.93E+02	No	Never detected
	gamma-Hexachlorocyclohexane	58-89-9	3.56E-07	10	0			1.60E-03	4.49E+03	No	Never detected
	Toxaphene	8001-35-2	5.73E-08	10	0			1.60E+00	2.79E+07	No	Never detected
	Total Chlordanes	TOTCHLDANE	2.00E-04	10	0			2.60E-03	1.30E+01	No	Never detected
	Total DDTs	TOTDDT	3.54E-06	10	0			5.30E-03	1.50E+03	No	Never detected
Diesel Range Hydrocarbons	DRH	2.00E+03	159	83	1.50E+04	7.50E+00	5.00E+01	2.50E-02	Yes		

Table B-2. Step 1 Soil Screening Summary (mg/kg)

Group	Chemical	CAS No.	Screening Level	Total No. Samples	Total No. Detects	Max Detect	Ratio of Max Detect to Screening Level	Max MDL	Ratio of Max MDL to Screening Level	Preliminary COPC	Reason for Exclusion
Petroleum	Gasoline Range Hydrocarbons	GRH	3.00E+01 <sup>a</sup>	146	36	4.50E+03	1.50E+02	3.20E+01	1.07E+00	Yes	
	Motor oil	M09800000	2.00E+03	159	90	1.80E+04	9.00E+00	1.00E+02	5.00E-02	Yes	
	TPH	TPH	2.00E+03	158	95	3.52E+04	1.76E+01	1.00E+02	5.00E-02	Yes	
SVOCs	Benzoic acid	65-85-0	6.44E-01	127	6	2.10E-01	3.26E-01	1.50E+00	2.33E+00	No	Max detect does not exceed SL
	Benzyl alcohol	100-51-6	5.50E-02	132	0			7.10E-01	1.29E+01	No	Never detected
	Bis(2-ethylhexyl) phthalate	117-81-7	4.71E-02	133	49	7.85E+01	1.67E+03	3.10E-01	6.58E+00	Yes	
	Butylbenzyl phthalate	85-68-7	3.95E-03	133	1	6.10E-02	1.54E+01	2.00E+01	5.06E+03	Yes	
	Carbazole	86-74-8	1.60E-02	132	21	2.00E+01	1.25E+03	6.60E-02	4.13E+00	Yes	
	Dibenzofuran	132-64-9	1.54E-02	145	65	2.40E+01	1.56E+03	7.30E-02	4.75E+00	Yes	
	Dibutyl phthalate	84-74-2	8.14E-02	133	13	6.90E-02	8.48E-01	5.50E+01	6.76E+02	No	Max detect does not exceed SL
	1,2-Dichlorobenzene	95-50-1	3.79E-03	137	0			1.00E-01	2.64E+01	No	Never detected
	1,3-Dichlorobenzene	541-73-1	2.75E-01	137	0			2.20E-01	7.99E-01	No	Never detected
	1,4-Dichlorobenzene	106-46-7	4.10E-04	137	0			3.80E-01	9.27E+02	No	Never detected
	Diethyl phthalate	84-66-2	2.00E-01	132	12	4.20E-02	2.10E-01	1.30E-01	6.51E-01	No	Max detect does not exceed SL
	Dimethyl phthalate	131-11-3	4.10E-02	133	8	5.80E-02	1.42E+00	2.00E+01	4.88E+02	Yes	
	2,4-Dimethylphenol	105-67-9	2.03E-03	127	0			2.80E-01	1.38E+02	No	Never detected
	Di-n-octyl phthalate	117-84-0	5.49E-04	133	2	2.50E-01	4.56E+02	2.00E+01	3.65E+04	Yes	
	Hexachlorobenzene	118-74-1	2.43E-07	132	0			1.20E-01	4.94E+05	No	Never detected
	Hexachlorobutadiene	87-68-3	1.28E-03	137	0			1.00E-01	7.81E+01	No	Never detected
	Isophorone	78-59-1	1.50E-02	132	4	5.30E+00	3.53E+02	9.50E-02	6.33E+00	Yes	
	2-Methylphenol	95-48-7	2.69E-03	127	0			1.90E-01	7.08E+01	No	Never detected
	4-Methylphenol	106-44-5	2.21E-02	128	0			2.00E+01	9.04E+02	No	Never detected
	<i>n</i> -Nitrosodi- <i>n</i> -propylamine	621-64.7	3.00E-06	27	0			3.30E-01	1.10E+05	No	Never detected
	<i>n</i> -Nitrosodiphenylamine	86-30-6	9.54E-03	132	0			7.10E-01	7.44E+01	No	Never detected
	Pentachlorophenol	87-86-5	2.56E-03	127	1	3.80E-02	1.48E+01	9.70E-01	3.79E+02	Yes	
	Tributyl phosphate	126-73-8	3.60E-02	48	10	5.40E-01	1.50E+01	6.60E-02	1.83E+00	Yes	
2,4,6-Trichlorophenol	88-06-2	8.22E-04	127	0			4.00E-01	4.86E+02	No	Never detected	
VOCs	Acetone	67-64-1	2.31E-01	44	21	3.10E-01	1.34E+00	3.60E+00	1.56E+01	Yes	
	Benzene	71-43-2	2.10E-04	50	8	7.30E-02	3.48E+02	3.50E-01	1.67E+03	Yes	
	Carbon disulfide	75-15-0	2.66E-01	44	6	2.80E-03	1.05E-02	5.70E-01	2.14E+00	No	Max detect does not exceed SL
	Carbon tetrachloride	56-23-5	5.36E-04	44	0			6.40E-01	1.19E+03	No	Never detected
	Chlorobenzene	108-90-7	1.11E-02	44	0			1.60E-01	1.44E+01	No	Never detected
	Chloroethane	75-00-3	1.06E-02	44	0			7.00E-01	6.63E+01	No	Never detected
	Chloroform	67-66-3	5.30E-05	44	0			5.60E-01	1.06E+04	No	Never detected
	Chloromethane	74-87-3	1.01E-03	44	0			1.50E-01	1.48E+02	No	Never detected
	1,1-Dichloroethane	75-34-3	6.90E-04	44	0			2.10E-01	3.04E+02	No	Never detected
	1,2-Dichloroethane	107-06-2	4.20E-05	44	0			5.60E-01	1.33E+04	No	Never detected
	1,1-Dichloroethene	75-35-4	2.35E-04	44	0			3.00E-01	1.28E+03	No	Never detected
	<i>cis</i> -1,2-Dichloroethene	156-59-2	2.10E-02	44	0			1.80E-01	8.57E+00	No	Never detected
	<i>trans</i> -1,2-Dichloroethene	156-60-5	2.90E-02	44	0			3.30E-01	1.14E+01	No	Never detected
	Ethylbenzene	100-41-4	1.70E-03	50	3	4.10E-01	2.41E+02	1.40E-01	8.24E+01	Yes	
	Methyl isobutyl ketone	108-10-1	4.50E-01	44	1	3.60E-02	8.00E-02	1.50E+00	3.33E+00	No	Max detect does not exceed SL
	Methylene chloride	75-09-2	1.20E-03	44	2	4.60E-03	3.83E+00	1.10E+00	9.17E+02	Yes	
	Methylethyl ketone	78-93-3	1.50E+00	44	5	2.70E-02	1.80E-02	1.50E+00	1.00E+00	No	Max detect does not exceed SL
	Phenol	108-95-2	2.39E-02	128	21	3.30E-02	1.38E+00	2.20E+01	9.21E+02	Yes	
	Styrene	100-42-5	1.17E-03	44	0			3.70E-01	3.15E+02	No	Never detected

Table B-2. Step 1 Soil Screening Summary (mg/kg)

Group	Chemical	CAS No.	Screening Level	Total No. Samples	Total No. Detects	Max Detect	Ratio of Max Detect to Screening Level	Max MDL	Ratio of Max MDL to Screening Level	Preliminary COPC	Reason for Exclusion
	Tetrachloroethene	127-18-4	8.11E-06	44	2	3.00E-03	3.70E+02	6.40E-01	7.89E+04	Yes	
	Toluene	108-88-3	6.98E-01	50	5	1.40E-01	2.01E-01	3.60E-01	5.16E-01	No	Max detect does not exceed SL
	1,2,4-Trichlorobenzene	120-82-1	4.00E-04	137	0			4.30E-01	1.08E+03	No	Never detected
	1,1,1-Trichloroethane	71-55-6	2.00E+00	44	0			2.00E-01	1.00E-01	No	Never detected
	1,1,2-Trichloroethane	79-00-5	7.80E-05	44	0			4.10E-01	5.26E+03	No	Never detected
	Trichloroethene	79-01-6	3.90E-05	44	1	1.40E-03	3.59E+01	8.20E-01	2.10E+04	Yes	
	1,2,4-Trimethylbenzene	95-63-6	2.10E-02	44	4	2.20E+00	1.05E+02	9.20E-03	4.38E-01	Yes	
	1,3,5-Trimethylbenzene	108-67-8	5.10E-02	44	1	1.40E-02	2.75E-01	2.60E-01	5.10E+00	No	Max detect does not exceed SL
	Vinyl chloride	75-01-4	5.60E-06	44	1	1.60E-03	2.86E+02	2.50E-01	4.46E+04	Yes	
	m,p-Xylene	179601-23-1	2.00E-01	50	6	8.00E-01	4.00E+00	4.20E-01	2.10E+00	Yes	
	o-Xylene	95-47-6	2.00E-01	50	5	6.60E-01	3.30E+00	3.30E-01	1.65E+00	Yes	

Notes:

- BaP = benzo[a]pyrene
- CAS = Chemical Abstract Services
- COPC = chemical of potential concern
- DL = detection limit
- MDL = method detection limit
- PAH = polycyclic aromatic hydrocarbon
- PCB = polychlorinated biphenyl
- ND = not detected
- SMSPCB = Sediment Management Standards for polychlorinated biphenyl
- SL = screening level
- TCDD = tetrachlorodibenzo-*p*-dioxin
- TEQ = toxicity equivalency
- TPH = total petroleum hydrocarbon

<sup>a</sup> The Method A value of 30 mg/kg was used because benzene was detected in soil.

Column headers:

- Group: chemical grouping
- Chemical: chemical name
- CAS No.: identification number assigned by the Chemical Abstracts Service
- Screening Level: Step 1 soil screening level shown in Table A-3
- Total No. Samples: total number of samples analyzed (not including duplicates and replicates)
- Total No. Detects: total number of samples classified as detected
- Max Detect: maximum detected concentration on site
- Ratio of Max Detect to Screening Level: ratio of maximum detected concentration on site to Step 1 soil screening level
- Max MDL: maximum method detection limit reported by lab for samples classified as not detected
- Ratio of Max MDL to Screening Level: ratio of maximum method detection limit reported by lab for samples classified as not detected to Step 1 soil screening level
- Preliminary COPC: preliminary chemical of potential concern (yes/no)
- Reason for Exclusion: rationale for eliminating a chemical as a COPC

Table B-3. Step 1 Groundwater Screening Summary (µg/L)

Group	Chemical	CAS No.	Screening Level	Total No. Samples	Total No. Detects	Max Detect	Ratio of Max Detect to Screening Level	Max MDL	Ratio of Max MDL to Screening Level	Preliminary COPC	Reason for Exclusion
Conventionals	Chloride	16887-00-6	2.30E+05	6	6	3.45E+03	1.50E-02			No	Max detect does not exceed SL
	Sulfate	14808-79-8	2.50E+05	6	6	4.25E+04	1.70E-01			No	Max detect does not exceed SL
Dioxins and furans	TCDD TEQ (ND = 1/2DL)	TEQ_DIOXIN.5	2.06E-10	1	0			8.66E-07	4.20E+03	No	Never detected
Metals	Arsenic	7440-38-2	5.83E-02	7	7	3.40E+00	5.83E+01			Yes	
	Cadmium	7440-43-9	2.10E-01	17	1	1.15E+00	5.48E+00	2.10E-01	1.00E+00	Yes	
	Chromium	7440-47-3	1.00E+02	17	0			6.00E-01	6.00E-03	No	Never detected
	Chromium hexavalent	18540-29-9	5.80E-01	16	0			3.00E+00	5.17E+00	No	Never detected
	Copper	7440-50-8	7.30E+00	7	4	3.40E+00	4.66E-01	2.30E-01	3.15E-02	No	Max detect does not exceed SL
	Lead	7439-92-1	2.50E+00	7	0			2.00E-01	8.00E-02	No	Never detected
	Mercury	7439-97-6	5.16E-03	17	0			8.90E-03	1.72E+00	No	Never detected
	Nickel	7440-02-0	8.20E+00	7	7	3.30E+01	4.02E+00			Yes	
	Tin	7440-31-5	9.60E+03	7	1	3.00E+01	3.13E-03	1.80E+00	1.88E-04	No	Max detect does not exceed SL
Zinc	7440-66-6	3.26E+01	7	2	4.50E+00	1.38E-01	8.10E-01	2.49E-02	No	Max detect does not exceed SL	
PAHs	Acenaphthene	83-32-9	2.61E+00	29	4	1.40E-01	5.36E-02	2.00E-02	7.65E-03	No	Max detect does not exceed SL
	Acenaphthylene	208-96-8	1.08E+01	29	0			2.00E-02	1.85E-03	No	Never detected
	Anthracene	120-12-7	1.08E+01	29	0			3.00E-02	2.78E-03	No	Never detected
	Benzo(g,h,i)perylene	191-24-2	1.16E-02	29	0			5.00E-02	4.32E+00	No	Never detected
	Fluoranthene	206-44-0	2.26E+00	29	0			3.00E-02	1.33E-02	No	Never detected
	Fluorene	86-73-7	2.04E+00	29	3	6.30E-01	3.10E-01	3.00E-02	1.47E-02	No	Max detect does not exceed SL
	1-Methylnaphthalene	90-12-0	2.30E+00	29	2	9.40E-01	4.09E-01	5.00E-01	2.17E-01	No	Max detect does not exceed SL
	2-Methylnaphthalene	91-57-6	1.82E+01	29	2	1.10E+00	6.05E-02	2.00E-02	1.10E-03	No	Max detect does not exceed SL
	Naphthalene	91-20-3	5.38E+01	29	10	2.90E-01	5.39E-03	4.00E-02	7.43E-04	No	Max detect does not exceed SL
	Phenanthrene	85-01-8	4.81E+00	29	1	5.40E-01	1.12E-01	3.00E-02	6.24E-03	No	Max detect does not exceed SL
	Pyrene	129-00-0	9.80E+00	29	0			4.00E-02	4.08E-03	No	Never detected
	BaP TEQ	BAPEQ	6.59E-06	9	0			1.00E-01	1.52E+04	No	Never detected
	High Molecular Weight PAH	SMSHPAH	1.00E-02	9	0			1.00E-01	1.00E+01	No	Never detected
Low Molecular Weight PAH	SMSLPAH	1.00E-02	9	2	1.63E+00	1.63E+02	4.00E-02	4.00E+00	Yes		
PCBs	Total PCB (SMSPCB)	SMSPCB	2.31E-05	11	4	4.30E+00	1.86E+05	3.20E-03	1.39E+02	Yes	
Pesticides	Aldrin	309-00-2	1.24E-05	3	0			1.00E-02	8.04E+02	No	Never detected
	cis-Chlordane	5103-71-9	2.00E-03	3	0			8.20E-03	4.10E+00	No	Never detected
	trans-Chlordane	5103-74-2	2.00E-03	3	0			8.20E-03	4.10E+00	No	Never detected
	4,4'-DDD	72-54-8	7.67E-05	3	0			1.90E-02	2.48E+02	No	Never detected
	4,4'-DDE	72-55-9	5.42E-05	3	0			1.80E-02	3.32E+02	No	Never detected
	4,4'-DDT	50-29-3	5.42E-05	3	0			1.70E-02	3.14E+02	No	Never detected
	Dieldrin	60-57-1	1.32E-05	3	0			1.70E-02	1.29E+03	No	Never detected
	alpha-Endosulfan	959-98-8	8.70E-03	3	0			8.90E-03	1.02E+00	No	Never detected
	beta-Endosulfan	33213-65-9	8.70E-03	3	0			1.40E-02	1.61E+00	No	Never detected
	Endosulfan sulfate	1031-07-8	8.70E-03	3	0			2.40E-02	2.76E+00	No	Never detected
	Endrin	72-20-8	2.00E-03	3	0			1.70E-02	8.50E+00	No	Never detected
	Endrin aldehyde	7421-93-4	2.00E-03	3	0			1.60E-02	8.00E+00	No	Never detected
	Heptachlor	76-44-8	1.96E-05	3	0			1.10E-02	5.62E+02	No	Never detected
	Heptachlor epoxide	1024-57-3	9.69E-06	3	0			7.90E-03	8.16E+02	No	Never detected
	alpha-Hexachlorocyclohexane	319-84-6	1.21E-03	3	0			8.50E-03	7.05E+00	No	Never detected
	beta-Hexachlorocyclohexane	319-85-7	4.22E-03	3	0			9.80E-03	2.32E+00	No	Never detected
gamma-Hexachlorocyclohexane	58-89-9	2.00E-04	3	0			1.60E-02	8.00E+01	No	Never detected	

Table B-3. Step 1 Groundwater Screening Summary (µg/L)

Group	Chemical	CAS No.	Screening Level	Total No. Samples	Total No. Detects	Max Detect	Ratio of Max Detect to Screening Level	Max MDL	Ratio of Max MDL to Screening Level	Preliminary COPC	Reason for Exclusion
	Toxaphene	8001-35-2	6.85E-05	3	0			2.20E-01	3.21E+03	No	Never detected
	Total Chlordanes	TOTCHLDANE	2.00E-04	3	0			8.20E-03	4.10E+01	No	Never detected
	Total DDTs	TOTDDT	5.42E-05	3	0			1.90E-02	3.51E+02	No	Never detected
	Diesel Range Hydrocarbons	DRH	5.00E+02	19	0			2.00E+01	4.00E-02	No	Never detected
Petroleum	Gasoline Range Hydrocarbons	GRH	1.00E+03 <sup>a</sup>	19	0			7.00E+01	7.00E-02	No	Never detected
	Motor oil	M09800000	5.00E+02	19	0			5.00E+02	1.00E+00	No	Never detected
	TPH	TPH	5.00E+02	9	0			6.00E+01	1.20E-01	No	Never detected
	Benzoic acid	65-85-0	2.24E+03	19	0			5.10E+00	2.27E-03	No	Never detected
	Benzyl alcohol	100-51-6	1.82E+02	19	0			2.00E+00	1.10E-02	No	Never detected
	Bis(2-ethylhexyl) phthalate	117-81-7	2.85E-01	19	1	1.70E+00	5.97E+00	1.00E+00	3.51E+00	Yes	
	Butylbenzyl phthalate	85-68-7	5.24E-01	19	0			5.60E-01	1.07E+00	No	Never detected
	Carbazole	86-74-8	4.40E+00	19	0			3.10E-01	7.05E-02	No	Never detected
	Dibenzofuran	132-64-9	1.33E+00	29	1	1.10E-01	8.29E-02	4.00E-02	3.01E-02	No	Max detect does not exceed SL
	Dibutyl phthalate	84-74-2	4.66E+01	19	0			5.40E-01	1.16E-02	No	Never detected
	1,2-Dichlorobenzene	95-50-1	5.19E+00	29	0			6.00E-02	1.16E-02	No	Never detected
	1,3-Dichlorobenzene	541-73-1	6.00E+02	29	0			4.00E-02	6.67E-05	No	Never detected
	1,4-Dichlorobenzene	106-46-7	7.14E+00	29	0			6.00E-02	8.40E-03	No	Never detected
	Diethyl phthalate	84-66-2	4.84E+02	19	0			5.80E-01	1.20E-03	No	Never detected
SVOCs	Dimethyl phthalate	131-11-3	1.43E+02	19	0			5.30E-01	3.71E-03	No	Never detected
	2,4-Dimethylphenol	105-67-9	2.02E+00	19	0			3.60E-01	1.78E-01	No	Never detected
	Di- <i>n</i> -octyl phthalate	117-84-0	2.96E-01	19	0			5.10E-01	1.72E+00	No	Never detected
	Hexachlorobenzene	118-74-1	1.12E-01	19	0			4.70E-01	4.18E+00	No	Never detected
	Hexachlorobutadiene	87-68-3	9.00E-01	29	0			1.10E-01	1.22E-01	No	Never detected
	Isophorone	78-59-1	4.60E+01	19	0			4.80E-01	1.04E-02	No	Never detected
	2-Methylphenol	95-48-7	7.11E+00	19	0			5.30E-01	7.45E-02	No	Never detected
	4-Methylphenol	106-44-5	7.72E+01	19	0			5.20E-01	6.74E-03	No	Never detected
	<i>n</i> -Nitrosodiphenylamine	86-30-6	1.59E+00	19	0			2.60E+00	1.63E+00	No	Never detected
	Pentachlorophenol	87-86-5	7.29E-01	19	0			2.40E+00	3.29E+00	No	Never detected
	Tributyl phosphate	126-73-8	7.30E+00	19	5	4.15E+00	5.68E-01	5.40E-01	7.40E-02	No	Max detect does not exceed SL
	2,4,6-Trichlorophenol	88-06-2	3.00E+00	19	0			2.40E+00	8.00E-01	No	Never detected
	Acetone	67-64-1	8.00E+02	29	1	3.60E+00	4.50E-03	8.10E-01	1.01E-03	No	Max detect does not exceed SL
	Benzene	71-43-2	7.95E-01	29	0			6.00E-02	7.55E-02	No	Never detected
	Carbon disulfide	75-15-0	8.00E+02	29	0			9.00E-02	1.13E-04	No	Never detected
	Carbon tetrachloride	56-23-5	2.48E-01	29	0			8.00E-02	3.23E-01	No	Never detected
	Chlorobenzene	108-90-7	1.00E+02	29	0			4.00E-02	4.00E-04	No	Never detected
	Chloroethane	75-00-3	2.10E+04	29	0			1.50E-01	7.14E-06	No	Never detected
	Chloroform	67-66-3	4.30E+00	29	1	5.00E-01	1.16E-01	8.00E-02	1.86E-02	No	Max detect does not exceed SL
	Chloromethane	74-87-3	3.37E+00	29	0			1.00E-01	2.97E-02	No	Never detected
	1,1-Dichloroethane	75-34-3	2.40E+00	29	0			5.00E-02	2.08E-02	No	Never detected
	1,2-Dichloroethane	107-06-2	4.80E-01	29	0			8.00E-02	1.67E-01	No	Never detected
	1,1-Dichloroethene	75-35-4	7.29E-01	29	1	5.80E-02	7.96E-02	9.00E-02	1.23E-01	No	Max detect does not exceed SL
	<i>cis</i> -1,2-Dichloroethene	156-59-2	7.00E+01	29	2	7.00E+00	1.00E-01	1.00E-01	1.43E-03	No	Max detect does not exceed SL
	<i>trans</i> -1,2-Dichloroethene	156-60-5	1.00E+02	29	1	7.60E-01	7.60E-03	8.00E-02	8.00E-04	No	Max detect does not exceed SL
	Ethylbenzene	100-41-4	7.00E+02	29	0			9.00E-02	1.29E-04	No	Never detected



Table B-3. Step 1 Groundwater Screening Summary (µg/L)

Group	Chemical	CAS No.	Screening Level	Total No. Samples	Total No. Detects	Max Detect	Ratio of Max Detect to Screening Level	Max MDL	Ratio of Max MDL to Screening Level	Preliminary COPC	Reason for Exclusion
VOCs	Methyl isobutyl ketone	108-10-1	6.40E+02	29	0			3.80E-01	5.94E-04	No	Never detected
	Methylene chloride	75-09-2	5.00E+00	29	0			3.90E-01	7.80E-02	No	Never detected
	Methylethyl ketone	78-93-3	4.80E+03	29	0			8.10E-01	1.69E-04	No	Never detected
	Phenol	108-95-2	7.84E+01	19	0			5.20E-01	6.64E-03	No	Never detected
	Styrene	100-42-5	1.46E+00	29	0			7.00E-02	4.79E-02	No	Never detected
	Tetrachloroethene	127-18-4	2.05E-02	29	6	1.20E-01	5.85E+00	9.00E-02	4.39E+00	Yes	
	Toluene	108-88-3	1.00E+03	29	0			6.00E-02	6.00E-05	No	Never detected
	1,2,4-Trichlorobenzene	120-82-1	1.13E+00	29	0			1.00E-01	8.86E-02	No	Never detected
	1,1,1-Trichloroethane	71-55-6	2.00E+02	29	0			9.00E-02	4.50E-04	No	Never detected
	1,1,2-Trichloroethane	79-00-5	7.68E-01	29	0			4.00E-02	5.21E-02	No	Never detected
	Trichloroethene	79-01-6	4.90E-01	29	10	1.10E+00	2.24E+00	8.00E-02	1.63E-01	Yes	
	1,3,5-Trimethylbenzene	108-67-8	4.50E+01	29	0			6.00E-02	1.33E-03	No	Never detected
	Vinyl chloride	75-01-4	1.60E-02	29	1	2.80E-02	1.75E+00	8.00E-02	5.00E+00	Yes	
	m,p-Xylene	179601-23-1	1.00E+03	29	0			1.40E-01	1.40E-04	No	Never detected
	o-Xylene	95-47-6	1.00E+03	29	0			6.00E-02	6.00E-05	No	Never detected

Notes:

- BaP = benzo[a]pyrene
- CAS = Chemical Abstract Services
- COPC = chemical of potential concern
- DL = detection limit
- MDL = method detection limit
- ND = not detected
- PCB = polychlorinated biphenyl
- SL = screening level
- TCDD = tetrachlorodibenzo-p-dioxin
- TEQ = toxicity equivalency
- TPH = total petroleum hydrocarbon

<sup>a</sup> The Method A value of 1,000 µg/L was used because benzene was not detected in groundwater.

Column headers:

- Group: chemical grouping
- Chemical: chemical name
- CAS No.: identification number assigned by the Chemical Abstracts Service
- Screening Level: Step 1 groundwater screening level shown in Table A-3
- Total No. Samples: total number of samples analyzed (not including duplicates and replicates)
- Total No. Detects: total number of samples classified as detected
- Max Detect: maximum detected concentration on site
- Ratio of Max Detect to Screening Level: ratio of maximum detected concentration on site to Step 1 soil screening level
- Max MDL: maximum method detection limit reported by lab for samples classified as not detected
- Ratio of Max MDL to Screening Level: ratio of maximum method detection limit reported by lab for samples classified as not detected to Step 1 soil screening level
- Preliminary COPC: preliminary chemical of potential concern (yes/no)
- Reason for Exclusion: rationale for eliminating a chemical as a COPC

Table B-4. Chemicals Never Detected in Soil and/or Groundwater with Inadequate Detection Limits

Group	Chemical	Medium Never Detected	Typical Industrial Uses	Comments
Dioxins/furans	TCDD TEQ (ND = 1/2DL)	Groundwater	By-product of combustion when chlorine is present.	Not expected to leach significantly so not expected to be found in GW.
Metals	Chromium hexavalent	Groundwater	Production and use of chromium compounds in stainless steels, alloy cast irons, nonferrous alloys, as linings for high temperature industrial furnaces and pigments, for metal finishing, leather tanning, and wood preservation; various waste streams.	The listed industrial practices are not known to have occurred at the GTSP site.
	Mercury	Groundwater	Combustion of fuels containing mercury impurities, use in batteries, pigments, catalysts, explosives, laboratory-based reasearch, pharmaceutical applications.	Combustion of coal occurred at site, but mercury in soil did not exceed its Step 2 SL
PAHs	Benzo(g,h,i)perylene	Groundwater	Emitted by effluents from petroleum refining and coal tar distillation. Produced by the combustion of wood, coal, oil, propane, diesel fuel. Also in various waste streams through industrial effluents, municipal waste water treatment facilities and waste incinerators.	All MDLs exceed Step 1 SL, but there is no Step 2 SL.
	BaP TEQ	Groundwater	No commerical production or use. Product of incomplete combustion. Found in fossil fuels, crude oils, coal tars.	Not expected to leach significantly so not expected to be found in GW.
	HPAH	Groundwater	Only a few PAHs are commercially produced. Generated during combustion or pyrolysis processes. Combustion of fossil fuels, discharges from industrial plants, waste water treatment plants, escape from waste storage containers. Also machine lubricating, cutting, color printing oils. Found in the wood preservative creosote. Found in coal tar used in roofing, surface coating and binder for aluminum smelting electrons in the aluminum reduction process.	All MDLs exceed Step 1 SL, but there is no Step 2 SL.
Pesticides	Aldrin	Soil and Groundwater	Formerly produced and used as a pesticide; direct release to the environment.	Pesticides are not known to have been used at the GTSP site.
	<i>cis</i> -Chlordane	Soil and Groundwater	Formerly produced and used as an insecticide; direct release to the environment.	
	<i>trans</i> -Chlordane	Soil and Groundwater	Formerly produced and used as an insecticide; direct release to the environment.	

Table B-4. Chemicals Never Detected in Soil and/or Groundwater with Inadequate Detection Limits

Group	Chemical	Medium Never Detected	Typical Industrial Uses	Comments
	4,4'-DDD	Soil and Groundwater	Formerly produced and used as an insecticide; direct release to the environment. Also a metabolite of DDT; direct release to the environment.	
	4,4'-DDE	Soil and Groundwater	Impurity and a degradation product of the pesticide DDT; direct release to the environment.	
	4,4'-DDT	Soil and Groundwater	Formerly produced and used as an insecticide; direct release to the environment. Currently used as a malaria control agent and topical medication in lotions, powders and shampoos; various waste streams.	
	Dieldrin	Soil and Groundwater	Formerly produced and used as an insecticide; direct release to the environment. Also the degradation product of aldrin.	
	alpha-Endosulfan	Soil and Groundwater	Produced and used as an insecticide; various waste streams and direct release to the environment.	
	beta-Endosulfan	Soil and Groundwater	Produced and used as an insecticide; various waste streams and direct release to the environment.	
	Endosulfan sulfate	Soil and Groundwater	Not produced or used. Occurs as the oxidative degradation product and biodegradative product of the pesticide endosulfan; various waste streams and direct release to the environment.	
	Endrin	Soil and Groundwater	Formerly produced and used as a pesticide, rodenticide and avicide; wastewaters from its manufacturing and direct release to the environment.	
	Endrin aldehyde	Soil and Groundwater	Impurity of the pesticide endrin; wastewaters from endrine manufacturing and direct release to the environment.	
	Heptachlor	Soil and Groundwater	Produced and formerly used in termite control, seed and furrow treatment, wood treatment; direct release to the environment.	
	Heptachlor epoxide	Soil and Groundwater	Not produced or used. Derived from the chemical and biological transformation of heptachlor and chlordane in the environment.	

Table B-4. Chemicals Never Detected in Soil and/or Groundwater with Inadequate Detection Limits

Group	Chemical	Medium Never Detected	Typical Industrial Uses	Comments
	alpha-Hexachlorocyclohexane	Soil and Groundwater	Formerly produced and used as an insecticide; direct release to the environment.	
	beta-Hexachlorocyclohexane	Soil and Groundwater	Formerly produced and used as an insecticide; direct release to the environment.	
	gamma-Hexachlorocyclohexane	Soil and Groundwater	Produced and formerly used as an insecticide; various waste streams and direct release to the environment.	
	Toxaphene	Soil and Groundwater	Produced and used as an insecticide; direct release to the environment. Currently used in emergency situations on corn, cotton and small grains, scabies treatment of cattle and sheep.	
	Total Chlordanes	Groundwater	Formerly produced and used as an insecticide; direct release to the environment.	Pesticides are not known to have been used at the GTSP site.
	Total DDTs	Groundwater	Formerly produced and used as an insecticide; direct release to the environment. Currently used as a malaria control agent and topical medication in lotions, powders and shampoos; various waste streams.	
SVOCs	Benzyl alcohol	Soil	Produced and used as a chemical intermediate, in perfumery and flavoring, in textiles and sheet plastics, inks, cosmetics, drug ingredient; various waste streams.	The listed industrial practices are not known to have occurred at the GTSP site.
	Butylbenzyl phthalate	Groundwater	Produced and used as a plasticizer for polyvinyl and cellulose resins and organic intermediate; various waste streams.	The listed industrial practices are not known to have occurred at the GTSP site.
	1,2-Dichlorobenzene	Soil	Produced and used in the manufacture of 3,4-dichloroaniline, as a solvent for waxes, gums, resins, tars, rubbers, oils, and asphalts; various waste streams. Formerly used as a herbicide, insecticide, and soil fumigant; direct release to the environment.	The listed industrial practices are not known to have occurred at the GTSP site. Pesticides are not known to have been used at the GTSP site.
	1,4-Dichlorobenzene	Soil	Produced and used as a chemical intermediate for the manufacture of dyes, 2,5-dichloroaniline, pharmaceutical and agricultural product; various waste streams. Used as an insecticidal fumigant as space deodorant; direct release to the environment.	The listed industrial practices are not known to have occurred at the GTSP site. Pesticides are not known to have been used at the GTSP site.

Table B-4. Chemicals Never Detected in Soil and/or Groundwater with Inadequate Detection Limits

Group	Chemical	Medium Never Detected	Typical Industrial Uses	Comments
	2,4-Dimethylphenol	Soil	Produced and used for the preparation of coal tar disinfectants, in the manufacture of artificial resins, as a constituent of coal tar creosote, and as a component of gasoline, rubber, and automobile and diesel exhaust; various waste streams.	The listed industrial practices are not known to have occurred at the GTSP site. If analyte is present as a component of GRO, it would be included in the GRO results.
	Di- <i>n</i> -octyl phthalate	Groundwater	Produced and used as a constituent in C6-C10 phthalate plasticizers. Wastewaters from its manufacturing.	The listed industrial practices are not known to have occurred at the GTSP site.
	Hexachlorobenzene	Soil and Groundwater	Produced and used as an organic synthesis reagent. Wastewaters from its manufacturing. Formerly used as a fungicide. Waste product of chlorinated hydrocarbons and pesticides manufacturing.	The listed industrial practices are not known to have occurred at the GTSP site. Pesticides are not known to have been used at the GTSP site.
	Hexachlorobutadiene	Soil	Produced and used as a solvent for elastometers, heat transfer liquid, transformer and hydraulic fluid; various waste streams.	36/153 MDLs exceeded Step 1 SL but none exceeded Step 2 SL.
	2-Methylphenol	Soil	Produced and used as a solvent, disinfectant and chemical intermediate in the production of synthetic resins; various waste streams. Also released through coal tar and petroleum refining and wood pulping.	The listed industrial practices are not known to have occurred at the GTSP site.
	4-Methylphenol	Soil	Produced and used as a solvent, disinfectant and chemical intermediate in the production of synthetic resins, and as food flavoring; various waste streams.	The listed industrial practices are not known to have occurred at the GTSP site.
	<i>n</i> -Nitrosodi- <i>n</i> -propylamine	Soil	Not commercially produced. Identified as a contaminant in the substituted dinitrotrifluralin herbicides; direct release to the environment, spills and industrial waste streams.	Pesticides are not known to have been used at the GTSP site.
	<i>n</i> -Nitrosodiphenylamine	Soil and Groundwater	Produced and used as vulcanization retarder in rubber processing, and for the production of <i>p</i> -Nitrosodiphenylamine. Wastewaters from its manufacturing.	The listed industrial practices are not known to have occurred at the GTSP site.
	Pentachlorophenol	Groundwater	Produced and used as wood preservative, surface disinfectant. Wastewaters from its manufacturing.	The listed industrial practices are not known to have occurred at the GTSP site.

Table B-4. Chemicals Never Detected in Soil and/or Groundwater with Inadequate Detection Limits

Group	Chemical	Medium Never Detected	Typical Industrial Uses	Comments
	2,4,6-Trichlorophenol	Soil	Produced and used in the manufacture of the fungicide Prochloraz and the bleaching agent Chloralime. Formerly used as a herbicide and fungicide; various waste streams. Released from the chlorination of phenol-containing wastewater or drinking water, from the bleaching process in pulp and paper mills.	The listed industrial practices are not known to have occurred at the GTSP site. Pesticides are not known to have been used at the GTSP site.
VOCs	Carbon tetrachloride	Soil	Produced and used as a solvent for asphalt, benzyl resin, bitumes, chlorinated rubber, ethylcellulose, gums, and rosin, cleaning agent for machinery and electrical equipment, and in the synthesis of nylon-7 and other chlorination processes; various waste streams.	44/52 MDLs exceed Step SL but 1 exceeds Step 2 SL.
	Chlorobenzene	Soil	Produced and used as a chemical intermediate, solvent, and heat transfer medium; various waste streams.	The listed industrial practices are not known to have occurred at the GTSP site.
	Chloroethane	Soil	Produced and used as a refrigerant, solvent, anesthetic and in organic synthesis; various waste streams.	The listed industrial practices are not known to have occurred at the GTSP site.
	Chloroform	Soil	Produced and used in the synthesis of hydrochlorofluorocarbon 22, used as an extractant or solvent, chemical intermediate, dry cleaning agent, fumigant ingredient, synthetic rubber production; various waste streams. Indirectly produced in the manufacture of ethylene dichloride and as a disinfection byproduct in the chlorination of drinking water, municipal sewage, cooling water in electric power generating plants; direct release to the environment. Also produced during the atmospheric photodegradation of trichloroethylenes.	All 52 MDLs exceed Step 1 SL but 1 exceeds Step 2 SL.
	Chloromethane	Soil	Produced and used as a chemical intermediate, solvent, propellant, and in the manufacture of fumigants; various waste streams. Also formed in the chlorination of drinking water and sewage effluent and found in the effluent of some publicly owned treatment works.	The listed industrial practices are not known to have occurred at the GTSP site.

Table B-4. Chemicals Never Detected in Soil and/or Groundwater with Inadequate Detection Limits

Group	Chemical	Medium Never Detected	Typical Industrial Uses	Comments
	1,1-Dichloroethane	Soil	Produced and used as chemical intermediate, in paint removers, and as a coupling agent in antiknock gasoline; various waste streams. Also derived from ethylene dichloride tars, which are by-products of vinyl chloride synthesis.	The listed industrial practices are not known to have occurred at the GTSP site.
	1,2-Dichloroethane	Soil	Produced and used as a chemical intermediate, in soaps, lead scavenger, solvent, and formerly used as a fumigant; various waste streams.	The listed industrial practices are not known to have occurred at the GTSP site.
	1,1-Dichloroethene	Soil	Produced and used in polymers and organic synthesis and as an intermediate in the production of vinylidene polymer plastdics, such as Saran and Velon; various waste streams.	The listed industrial practices are not known to have occurred at the GTSP site.
	Styrene	Soil	Produced and used in plastic and resin manufacture; various waste streams. Found in exhaust from combustion engines and waste incineration. May be released to the environment via emission from vents on process equipment, storage tank losses, miscellaneous leaks and spills, process wastewaters, and solid process wastes. Also released in the combustion of a styrene polymeric product.	20/52 MDLs exceed Step 1 SL but none exceed Step 2 SL.
	Tetrachloroethene	Groundwater	Produced and used as dry cleaning and degreasing agent, as a chemical intermediate in the prduction of fluorocarbons; various waste streams. Leaching from vinyl liners in asbestos-cement water pipelines for water distribution. It can form during chlorination water treatment. Wastewaters from manufacturing of aluminum and organic chemical/plastics, metal finishing and municipal treatment plants.	8/11 MDLs exceed Step 1 SL, but none exceed Step 2 SL. Because of lack of soil detects, appears to be originating from off site.
	1,2,4-Trichlorobenzene	Soil	Produced and used as a solvent in chemical manufacturing, dyes and intermediate, in dielectric fluid, synthetic transformer oils, lubricants and heat-transfer mediums and used as a coolant in electrical equipmet and glass tempering; various waste streams. Formerly used as an insecticide; direct release to the environment.	126/152 MDLs exceed Step 1 SL but none exceed Step 2 SL.



Table B-4. Chemicals Never Detected in Soil and/or Groundwater with Inadequate Detection Limits

Group	Chemical	Medium Never Detected	Typical Industrial Uses	Comments
	1,1,2-Trichloroethane	Soil	Produced and used as an intermediate in the production of 1,1-dichloroethene, a solvent for fats, oils, waxes, resins and other products; various waste streams. It is also a degradation product of 1,1,2,2-tetrachloroethane emissions.	The listed industrial practices are not known to have occurred at the GTSP site.

Notes:

- BaP = benzo(a)pyrene
- DL = detection level
- MDL = method detection limit
- GRO = gasoline range organics
- GTSP = Georgetown Steam Plant
- GW = groundwater
- HGS = Human Genome Sciences
- HPAH = high molecular weight polycyclic aromatic hydrocarbons
- ND = not detected
- PAH = polycyclic aromatic hydrocarbons
- SL = screening level
- SVOC = semivolatile organic compound
- TCDD = 2,3,7,8-tetrachlorodibenzo-*p*-dioxin
- TEQ = toxicity equivalency

## **APPENDIX C**

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**DEVELOPMENT OF STEP 2**

**SCREENING LEVELS**

Table C-1. Soil Screening Levels for Protection of Groundwater

Chemical	CAS No.	Hcc (unitless)	Kd (L/kg)	Koc (L/kg)	GW SL (ug/L)	Soil SL (mg/kg)	
						Vadose	Saturated
Arsenic	7440-38-2	0E+00	2.9E+01	N/A	1.20E+00	7.0E-01	3.5E-02
Bis(2-ethylhexyl) phthalate	117-81-7	4.2E-06	N/A	1.1E+05	2.85E-01	6.3E-01	3.2E-02
Cadmium	7440-43-9	0E+00	6.7E+00	N/A	2.50E-01	3.5E-02	1.7E-03
Nickel	7440-02-0	0E+00	6.5E+01	N/A	8.20E+00	1.1E+01	5.4E-01
PCBs	1336-36-3	0E+00	N/A	3.1E+05	1.53E-03	9.5E-03	4.7E-04
Tetrachloroethene	127-18-4	8E-01	N/A	2.7E+02	2.06E-02	2.2E-04	1.1E-05
Trichloroethene	79-01-6	4.2E-01	N/A	9.4E+01	4.90E-01	3.2E-03	1.9E-04
Vinyl chloride	75-01-4	1.1E+00	N/A	1.9E+01	1.60E-02	1.0E-04	4.9E-06

Parameter	Symbol	Units	Saturated	Vadose
Dilution Factor	DF	unitless	1	20
Water-filled soil porosity	$\theta_w$	unitless	0.43	0.3
Air-filled soil porosity	$\theta_a$	unitless	0	0.13
Soil fraction organic carbon	foc	unitless	0.001	0.001
Dry soil bulk density	$\rho_b$	kg/L	1.5	1.5

Equations (MTCA equations 747-1 and 747-2)

Inorganic chemicals Soil SL = GW SL  $\times$  UCF  $\times$  DF [ Kd + ( $\theta_w$  +  $\theta_a \times$  Hcc) /  $\rho_b$ ]

Organic chemicals Soil SL = GW SL  $\times$  UCF  $\times$  DF [ (Koc  $\times$  foc) + ( $\theta_w$  +  $\theta_a \times$  Hcc) /  $\rho_b$ ]

Sources:

CLARC: <https://fortress.wa.gov/ecy/clarc/Reporting/CLARCReporting.aspx>

GW SL: Integral Step 2 screening levels for groundwater

Notes:

CLARC = cleanup levels and risk calculation database

DF = dilution factor

foc = fraction organic carbon

GW = groundwater

Hcc = Henry's law constant

Kd = distribution coefficient

Koc = soil organic carbon-water partition coefficient

N/A = not applicable

PCB = polychlorinated biphenyl

SL = screening level

UCF = unit conversion factor (1 mg/1,000 ug)

$\theta_a$  = air-filled soil porosity

$\theta_w$  = water-filled soil porosity

$\rho_b$  = dry soil bulk density

Table C-2. Step 2 Soil Screening Level Derivation (mg/kg)

Chemical	Original Column Letter in Ecology Table												Step 2 Soil Screening Levels		
	B	E	F	G	--	--	BK	BL	BN	BS	BT	BV	Direct Contact	Leaching - Vadose Zone	Leaching - Saturated Zone
	Method A		Method B		Pathway Evaluation			Applicable or Relevant and Appropriate Requirements							
	Method A Unrestricted Land Use Table 740-1	Simplified Terrestrial Ecological Evaluation Table 749-2	Direct Contact Carcinogen CLARC Equation 740-2	Direct Contact Noncarcinogen CLARC Equation 740-1	Leaching from Vadose Zone to Final Groundwater Cleanup Level	Leaching from Saturated Zone to Final Groundwater Cleanup Level	Soil Vapors to Indoor Air	EPA Regional Screening Level Residential Direct Contact	EPA Preliminary Remediation Goal	Toxic Substances Control Act	EPA Regional Screening Level for Leaching from Saturated Zone	Natural Background Level			
Acetone			8.00E+03				6.10E+04				4.50E+00		8.00E+03		
Acenaphthene (CAS 83-29-9)			4.80E+03				3.40E+03				2.20E+01		3.40E+03		
Acenaphthylene (CAS 208-96-8)													NV		
Anthracene				2.40E+04			1.70E+04				3.60E+02		1.70E+04		
Benzene			1.82E+01	3.20E+02			1.10E+00				2.10E-04		1.10E+00		
Benzo(g,h,i)perylene													NV		
Benzo[a]pyrene		3.00E+02	1.40E-01				1.50E-02				3.50E-03		1.50E-02		
bis(2-Ethylhexyl) phthalate			7.10E+01	1.60E+03	6.3E-01	3.2E-02	3.50E+01				1.10E+00		3.50E+01	6.34E-01	3.17E-02
Butyl benzyl phthalate				1.60E+04			2.60E+02				5.10E-01		2.60E+02		
Carbon tetrachloride			7.70E+00	5.60E+01			6.10E-01				1.70E-04		6.10E-01		
Chlorobenzene				1.60E+03			2.90E+02				6.20E-02		2.90E+02		
Chloroethane (ethyl chloride)							1.50E+04				5.90E+00		1.50E+04		
Chloroform (trichloromethane)			1.60E+02	8.00E+02			2.90E-01				5.30E-05		2.90E-01		
Chloromethane			7.70E+01				1.20E+02				4.90E-02		7.70E+01		
Dibenzofuran				1.60E+02			7.80E+01				6.80E-01		7.80E+01		
di-Butyl phthalate (di-n-butyl phthalate)				8.00E+03			6.10E+03				9.20E+00		6.10E+03		
Dichlorobenzene, 1,2-				7.20E+03			1.90E+03				3.60E-01		1.90E+03		
Dichlorobenzene, 1,3-													NV		
Dichlorobenzene, 1,4-			4.20E+01				2.40E+00				4.10E-04		2.40E+00		
Dichloroethane, 1,1-				1.60E+04			3.30E+00				6.90E-04		3.30E+00		
Dichloroethane, 1,2-			1.10E+01	1.60E+03			4.30E-01				4.20E-05		4.30E-01		
Dichloroethylene, 1,1-				4.00E+03			2.40E+02				1.20E-01		2.40E+02		
Diethyl phthalate							4.90E+04				1.20E+01		4.90E+04		
Dimethyl phthalate													NV		
di-n-octyl Phthalate				1.60E+03									1.60E+03		
Ethylbenzene				8.00E+03			5.40E+00				1.70E-03		5.40E+00		
Fluoranthene				3.20E+03			2.30E+03				1.60E+02		2.30E+03		
Fluorene				3.20E+03			2.30E+03				2.70E+01		2.30E+03		
Hexachlorobenzene		3.10E+01					3.00E-01				5.30E-04		3.00E-01		
Hexachlorobutadiene							6.20E+00				1.70E-03		6.20E+00		
MEK (methyl ethyl ketone;2-butanone)				4.80E+04			2.80E+04				1.50E+00		2.80E+04		
Methylene chloride (dichloromethane)			1.30E+02	4.80E+03			1.10E+01				1.20E-03		1.10E+01		
Methylnaphthalene, 2-				3.20E+02			3.10E+02				7.50E-01		3.10E+02		
MIBK (M-isobutyl-K;4-M,2-pentanone)				6.40E+03			5.30E+03				4.50E-01		5.30E+03		
Naphthalene				1.60E+03			3.60E+00				4.70E-04		3.60E+00		
Nitrosodiphenylamine, N-							9.90E+01				7.50E-02		9.90E+01		
PCB mixtures		2.00E+00	5.00E-01		9.5E-03	4.7E-04	2.20E-01			1.00E+00	1.20E-04		2.20E-01	9.46E-03	1.20E-04
Phenanthrene													NV		
Pyrene				2.40E+03			1.70E+03				1.20E+02		1.70E+03		

Table C-2. Step 2 Soil Screening Level Derivation (mg/kg)

Chemical	Original Column Letter in Ecology Table												Step 2 Soil Screening Levels			
	B	E	F	G	--	--	BK	BL	BN	BS	BT	BV				
	Method A		Method B		Pathway Evaluation			Applicable or Relevant and Appropriate Requirements					Direct Contact	Leaching - Vadose Zone	Leaching - Saturated Zone	
	Method A Unrestricted Land Use Table 740-1	Simplified Terrestrial Ecological Evaluation Table 749-2	Direct Contact Carcinogen CLARC Equation 740-2	Direct Contact Noncarcinogen CLARC Equation 740-1	Leaching from Vadose Zone to Final Groundwater Cleanup Level	Leaching from Saturated Zone to Final Groundwater Cleanup Level	Soil Vapors to Indoor Air	EPA Regional Screening Level Residential Direct Contact	EPA Preliminary Remediation Goal	Toxic Substances Control Act	EPA Regional Screening Level for Leaching from Saturated Zone	Natural Background Level				
Tetrachloroethylene (perchloroethylene)			1.90E+00	8.00E+02				5.50E-01					4.90E-05	5.50E-01	5.50E+02	4.90E-02
Trichlorobenzene, 1,2,4-				8.00E+02				2.20E+01					6.80E-03	2.20E+01		
Trichlorethane, 1,1,1-				7.20E+04				8.70E+03					3.20E+00	8.70E+03		
Trichlorethane, 1,1,2-			1.80E+01	3.20E+02				1.10E+00					7.80E-05	1.10E+00		
Trichloroethylene			1.10E+01	2.40E+01	3.2E-03	1.9E-04		2.80E+00					7.20E-04	2.80E+00	3.24E-03	1.87E-04
Trimethylbenzene, 1,3,5-				4.00E+03				7.80E+02					5.20E-01	7.80E+02		
Toluene				6.40E+03				5.00E+03					1.60E+00	5.00E+03		
Vinyl chloride (chloroethylene)			6.70E-01	2.40E+02	1.0E-04	4.9E-06		6.00E-02					5.60E-06	6.00E-02	1.01E-04	4.89E-06
Xylene (dimethylbenzene)				1.60E+04				6.30E+02					2.00E-01	6.30E+02		
Benzoic acid				3.20E+05				2.40E+05					3.40E+01	2.40E+05		
Benzyl alcohol				2.40E+04				6.10E+03					8.90E-01	6.10E+03		
Dimethylphenol, 2,4-								1.20E+03					8.60E-01	1.20E+03		
Methylphenol, 2- (o-cresol)				4.00E+03				3.10E+03					1.50E+00	3.10E+03		
Methylphenol, 4- (p-cresol)				4.00E+02				3.10E+02					1.50E-01	3.10E+02		
Pentachlorophenol		1.10E+01	8.30E+00	2.40E+03				3.00E+00					5.70E-03	3.00E+00		
Phenol (total)				4.80E+04				1.80E+04					6.30E+00	1.80E+04		
Styrene (phenylethylene)			3.30E+01	1.60E+04				6.30E+03					1.80E+00	3.30E+01		
Tributyltin								1.80E+01					2.40E-02	1.80E+01		
Trichlorophenol, 2,4,6-			9.10E+01					4.40E+01					2.30E-02	4.40E+01		
Aluminum								7.70E+04					5.50E+04	7.70E+04		
Antimony				3.20E+01				3.10E+01				5.00E+00	6.60E-01	3.10E+01		
Arsenic (III)		2.00E+01												2.00E+01		
Arsenic (V)		2.60E+02												2.60E+02		
Arsenic (total)		2.00E+01	6.70E-01	2.40E+01	7.0E-01	3.5E-02		3.90E-01				7.00E+00	1.30E-03	7.00E+00	7.00E+00	7.00E+00
Barium		1.32E+03		1.60E+04				1.50E+04					3.00E+02	1.32E+03		
Beryllium				1.60E+02				1.60E+02					5.80E+01	1.60E+02		
Cadmium		3.60E+01		8.00E+01	3.5E-02	1.7E-03		7.00E+01				1.00E+00	1.40E+00	3.60E+01	1.00E+00	1.00E+00
Chromium (VI)				2.40E+02				2.90E-01					8.30E-04	1.17E+02		
Chromium, total (or III)		1.35E+02		1.20E+05				1.20E+05					7.70E+07	1.17E+02	1.35E+02	
Cobalt								2.30E+00					4.90E-01	2.30E+00		
Copper		5.50E+02		3.00E+03				3.10E+03				3.60E+01	5.10E+01	5.50E+02		
Iron								5.50E+04					6.40E+02	5.50E+04		
Lead	2.50E+02	2.20E+02						4.00E+02				1.70E+01		2.20E+02		
Manganese		2.35E+04						1.80E+03					5.70E+01	1.80E+03		
Mercury		9.00E+00		2.40E+01				5.60E+00				7.00E-02	3.00E-02	5.60E+00		
Mercury (organic)		7.00E-01						7.80E+00						7.00E-01		
Molybdenum		7.10E+01						3.90E+02					3.70E+00	7.10E+01		
Nickel		1.85E+03		1.60E+03	1.1E+01	5.4E-01		3.70E+03				3.80E+01	4.80E+01	1.60E+03	3.80E+01	3.80E+01

Table C-2. Step 2 Soil Screening Level Derivation (mg/kg)

Chemical	Original Column Letter in Ecology Table													Step 2 Soil Screening Levels			
	B	E	F	G	--	--	BK	BL	BN	BS	BT	BV					
	Method A		Method B		Pathway Evaluation			Applicable or Relevant and Appropriate Requirements									
	Method A Unrestricted Land Use Table 740-1	Simplified Terrestrial Ecological Evaluation Table 749-2	Direct Contact Carcinogen CLARC Equation 740-2	Direct Contact Noncarcinogen CLARC Equation 740-1	Leaching from Vadose Zone to Final Groundwater Cleanup Level	Leaching from Saturated Zone to Final Groundwater Cleanup Level	Soil Vapors to Indoor Air	EPA Regional Screening Level Residential Direct Contact	EPA Preliminary Remediation Goal	Toxic Substances Control Act	EPA Regional Screening Level for Leaching from Saturated Zone	Natural Background Level	Direct Contact	Leaching - Vadose Zone	Leaching - Saturated Zone		
Selenium		8.00E-01		4.00E+02				3.90E+02							8.00E-01		
Silver				4.00E+02				3.90E+02							3.90E+02		
Tin								4.70E+04							4.70E+04		
Thallium				5.60E+00											5.60E+00		
Vanadium								3.90E+02							3.90E+02		
Zinc		5.70E+02		2.40E+04				2.30E+04				8.60E+01			5.70E+02		
LPAH															NV		
HPAH															NV		
Total Petroleum Hydrocarbons															NV		
Gasoline	1.00E+02	1.20E+04													1.00E+02		
Gasoline (w/benzene)	3.00E+01														3.00E+01		
Diesel	2.00E+03	1.50E+04													2.00E+03		
Heavy Oil	2.00E+03														2.00E+03		
2,3,7,8-TCDD (Dioxin)			1.10E-05					4.50E-06	7.20E-05		2.60E-07	5.20E-06			5.20E-06		
Aldrin			5.88E-02	2.40E+00				2.90E-02			6.50E-04				2.90E-02		
alpha-BHC (Benzene HexaChloride)			1.59E-01					7.70E-02			6.20E-05				7.70E-02		
beta-BHC			5.56E-01					2.70E-01			2.20E-04				2.70E-01		
gamma-BHC (Lindane)				2.40E+01				5.20E-01			3.60E-04				5.20E-01		
Chlordane			2.86E+00	4.00E+01				1.60E+00			1.30E-02				1.60E+00		
4,4'-DDT			2.94E+00	4.00E+01				1.70E+00			6.70E-02				1.70E+00		
4,4'-DDE			2.94E+00					1.40E+00			4.70E-02				1.40E+00		
4,4'-DDD			4.17E+00					2.00E+00			6.60E-02				2.00E+00		
Dieldrin			6.25E-02	4.00E+00				3.00E-02			1.70E-04				3.00E-02		
alpha-Endosulfan				4.80E+02				3.70E+02			3.00E+00				3.70E+02		
beta-Endosulfan				4.80E+02				3.70E+02			3.00E+00				3.70E+02		
Endosulfan Sulfate				4.80E+02				3.70E+02			3.00E+00				3.70E+02		
Endrin				2.40E+01				1.80E+01			4.40E-01				1.80E+01		
Endrin Aldehyde								1.80E+01			4.40E-01				1.80E+01		
Heptachlor			2.22E-01	4.00E+01				1.10E-01			1.20E-03				1.10E-01		
Heptachlor Epoxide			1.10E-01	1.04E+00				5.30E-02			1.50E-04				5.30E-02		
Toxaphene			9.09E-01					4.40E-01			9.40E-03				4.40E-01		
1,2,4-Trimethylbenzene			NV	4.00E+03	NV	NV		6.20E+01			2.10E-02				6.20E+01		
1-Methylnaphthalene			NV	NV	NV	NV		2.20E+01			1.20E-02				2.20E+01		
Carbazole			5.00E+01	NV	3.17E-01	1.62E-02					NV				5.00E+01		
Carbon disulfide			NV	8.00E+03	5.60E+00	2.66E-01		8.20E+02			3.10E-01				8.20E+02		

Table C-2. Step 2 Soil Screening Level Derivation (mg/kg)

Chemical	Original Column Letter in Ecology Table												Step 2 Soil Screening Levels		
	B	E	F	G	--	--	BK	BL	BN	BS	BT	BV			
	Method A		Method B		Pathway Evaluation			Applicable or Relevant and Appropriate Requirements							
	Method A Unrestricted Land Use Table 740-1	Simplified Terrestrial Ecological Evaluation Table 749-2	Direct Contact Carcinogen CLARC Equation 740-2	Direct Contact Noncarcinogen CLARC Equation 740-1	Leaching from Vadose Zone to Final Groundwater Cleanup Level	Leaching from Saturated Zone to Final Groundwater Cleanup Level	Soil Vapors to Indoor Air	EPA Regional Screening Level Residential Direct Contact	EPA Preliminary Remediation Goal	Toxic Substances Control Act	EPA Regional Screening Level for Leaching from Saturated Zone	Natural Background Level	Direct Contact	Leaching - Vadose Zone	Leaching - Saturated Zone
Chloride			--	--	--	--	--				--				NV
cis-1,2-Dichloroethene			NV	8.00E+02	3.51E-01	2.26E-02		1.60E+02			2.10E-02				1.60E+02
Isophorone			1.10E+03	1.60E+04	2.27E-01	1.53E-02		1.20E+04			2.30E-02				1.10E+03
n-Nitrosodi-n-propylamine			1.40E-01	NV	4.30E-05	2.98E-06		6.90E-02			7.20E-06				6.90E-02
Sulfate			--	--	--	--		--			--				NV
trans-1,2-Dichloroethene			NV	1.60E+03	5.44E-01	3.25E-02		1.50E+02			2.90E-02				1.50E+02
Tributyl phosphate			NV	NV	NV	NV		5.30E+01			3.60E-02				5.30E+01

Notes:  
 CLARC = cleanup level and risk calculation  
 EPA = U.S. Environmental Protection Agency  
 NV = no value available



Table C-3. Step 2 Groundwater Screening Level Derivation (µg/L)

Chemical	Original Column Letter in Ecology Table											Step 2 Groundwater Screening Level for Protection of Drinking Water and Surface Water
	B	K	L	M	N	O	P	Y	Z	--	AC	
	Method A	Method B					Pathway Evaluation					
	Safe Drinking Water Act MCL	Safe Drinking Water Act MCLG	State Board of Health MCL	State Board of Health MCLG	Drinking Water Noncarcinogen CLARC Equation 720-1	Drinking Water Carcinogen CLARC Equation 720-2	Groundwater to Sediment CSL	Groundwater to Sediment SQS	Step 2 Surface Water Screening Level	Natural Background Level		
acetone					8.00E+02				1.10E+05		8.00E+02	
acenaphthene					9.60E+02				2.00E+01		2.00E+01	
acenaphthylene									NV		NV	
anthracene					4.80E+03				1.99E+02		1.99E+02	
benzene	5.00E+00	*0	5.00E+00	*0	3.20E+01	7.95E-01			2.03E+00		7.95E-01	
benzo(g,h,i)perylene									NV		NV	
benzo[a]pyrene	2.00E-01	*0	2.00E-01	*0		1.20E-02			3.20E-03		3.20E-03	
bis(2-ethylhexyl) phthalate	6.00E+00	*0	6.00E+00	*0		6.25E+00	4.73E-01	2.85E-01	1.37E+00		2.85E-01	
butyl benzyl phthalate					3.20E+03				4.10E-01		4.10E-01	
carbon tetrachloride	5.00E+00	*0	5.00E+00	*0					2.48E-01		2.48E-01	
chlorobenzene	1.00E+02	1.00E+02	1.00E+02	1.00E+02	1.60E+02				2.00E+01		2.00E+01	
chloroethane (ethyl chloride)									3.40E+01		3.40E+01	
chloroform (trichloromethane)						7.17E+00			4.30E+00		4.30E+00	
chloromethane (methyl chloride)						3.37E+00			2.03E+01		3.37E+00	
dibenzofuran					3.20E+01				NV		3.20E+01	
di-butyl phthalate (di-n-butyl phthalate)					1.60E+03				4.66E+01		4.66E+01	
dichlorobenzene, 1,2-	6.00E+02	6.00E+02	6.00E+02	6.00E+02	7.20E+02				4.35E+02		4.35E+02	
dichlorobenzene, 1,3-									9.60E+02		9.60E+02	
dichlorobenzene, 1,4-	7.50E+01	7.50E+01	7.50E+01	7.50E+01					7.40E-01		7.40E-01	
dichloroethane, 1,1-					8.00E+02				3.33E+01		3.33E+01	
dichloroethane, 1,2-	5.00E+00	*0	5.00E+00	*0	1.60E+02	4.80E-01			3.55E+00		4.80E-01	
dichloroethylene, 1,1-	7.00E+00	7.00E+00	7.00E+00	7.00E+00	7.20E+01				3.20E+00		3.20E+00	
diethyl phthalate									4.24E+03		4.24E+03	
dimethyl phthalate									1.07E+04		1.07E+04	
di-n-octyl phthalate					3.20E+02				NV		3.20E+02	
ethylbenzene	7.00E+02	7.00E+02	7.00E+02	7.00E+02	8.00E+02				2.39E+00		2.39E+00	
fluoranthene					6.40E+02				1.10E+01		1.10E+01	
fluorene					6.40E+02				4.52E+01		4.52E+01	
hexachlorobenzene	1.00E+00	*0	1.00E+00	*0					6.62E-05		6.62E-05	
hexachlorobutadiene									4.22E+00		4.22E+00	
MEK (methyl ethyl ketone;2-butanone)					4.80E+03				7.34E+04		4.80E+03	
methylene chloride (dichloromethane)	5.00E+00	*0	5.00E+00	*0		5.83E+00			6.14E+01		5.00E+00	
methylnaphthalene, 2-									NV		NV	
MIBK (M-isobutyl-K;4-M,2-pentanone)					6.40E+02				NV		6.40E+02	

Table C-3. Step 2 Groundwater Screening Level Derivation (µg/L)

Chemical	Original Column Letter in Ecology Table											Step 2 Groundwater Screening Level for Protection of Drinking Water and Surface Water
	B	K	L	M	N	O	P	Y	Z	--	AC	
	Method A	Method B					Pathway Evaluation					
	Safe Drinking Water Act MCL	Safe Drinking Water Act MCLG	State Board of Health MCL	State Board of Health MCLG	Drinking Water Noncarcinogen CLARC Equation 720-1	Drinking Water Carcinogen CLARC Equation 720-2	Groundwater to Sediment CSL	Groundwater to Sediment SQS	Step 2 Surface Water Screening Level	Natural Background Level		
naphthalene					1.60E+02				1.12E+02		1.12E+02	
nitrosodiphenylamine, N-									1.48E+00		1.48E+00	
PCB mixtures	5.00E-01		5.00E-01	*0		4.40E-02	1.45E+00	2.68E-01	1.53E-03		1.53E-03	
phenanthrene									NV		NV	
pyrene					4.80E+02				9.83E+00		9.83E+00	
tetrachloroethylene (perchloroethylene)	5.00E+00	*0	5.00E+00	*0	8.00E+01	8.10E-02			2.06E-02		2.06E-02	
trichlorobenzene, 1,2,4-	7.00E+01	7.00E+01	7.00E+01	7.00E+01					1.61E+01		1.61E+01	
trichlorethane, 1,1,1-	2.00E+02	2.00E+02	2.00E+02	2.00E+02	7.20E+03				4.60E+04		2.00E+02	
trichlorethane, 1,1,2-	5.00E+00	3.00E+00	5.00E+00	3.00E+00		7.68E-01			2.34E+00		7.68E-01	
trichloroethylene	5.00E+00	*0	5.00E+00	*0	2.40E+00	4.90E-01			7.39E-01		4.90E-01	
trimethylbenzene, 1,3,5-					4.00E+02				4.52E+01		4.52E+01	
toluene	1.00E+03	1.00E+03	1.00E+03	1.00E+03	1.60E+03				1.29E+03		1.00E+03	
vinyl chloride (chloroethylene)	2.00E+00	*0	2.00E+00	*0		2.90E-02			5.33E-01		2.90E-02	
xylene (dimethylbenzene)	1.00E+04	1.00E+04	1.00E+04	1.00E+04	1.60E+04				1.58E+03		1.58E+03	
benzoic acid									NV		NV	
benzyl alcohol					2.40E+03				NV		2.40E+03	
dimethylphenol, 2,4-									8.24E+01		8.24E+01	
methylphenol, 2- (o-cresol)									3.05E+03		3.05E+03	
methylphenol, 4- (p-cresol)									3.34E+02		3.34E+02	
pentachlorophenol	1.00E+00	*0	1.00E+00	*0		7.29E-01			6.98E-01		6.98E-01	
phenol (total)					4.80E+03				3.00E+02		3.00E+02	
styrene (phenylethylene)	1.00E+02	1.00E+02	1.00E+02	1.00E+02	1.60E+03	1.46E+00			NV		1.46E+00	
Tributyltin									7.40E-03		7.40E-03	
Trichlorophenol, 2,4,6-						4.00E+00			5.58E-01		5.58E-01	
Aluminum	5.00E+01								NV		5.00E+01	
Antimony	6.00E+00	6.00E+00	6.00E+00	6.00E+00	6.40E+00				3.87E+00		3.87E+00	
Arsenic (III)									NV		NV	
Arsenic (V)									NV		NV	
Arsenic (total)	1.00E+01	1.00E+01	1.00E+01	*0		5.83E-02			1.20E+00	5.00E+00	1.20E+00	
Barium	2.00E+03	2.00E+03	2.00E+00	2.00E+00	5.60E+02				1.22E+02		2.00E+00	
Beryllium	4.00E+00	4.00E+00	4.00E+00	4.00E+00	3.20E+01				1.25E+01		4.00E+00	
Cadmium	5.00E+00	5.00E+00	5.00E+00	5.00E+00	8.00E+00				2.50E-01		2.50E-01	
Chromium (VI)					4.80E+01				1.23E-01		1.23E-01	

Table C-3. Step 2 Groundwater Screening Level Derivation (µg/L)

Chemical	Original Column Letter in Ecology Table											Step 2 Groundwater Screening Level for Protection of Drinking Water and Surface Water
	B	K	L	M	N	O	P	Y	Z	--	AC	
	Method A	Method B					Pathway Evaluation					
	Safe Drinking Water Act MCL	Safe Drinking Water Act MCLG	State Board of Health MCL	State Board of Health MCLG	Drinking Water Noncarcinogen CLARC Equation 720-1	Drinking Water Carcinogen CLARC Equation 720-2	Groundwater to Sediment CSL	Groundwater to Sediment SQS	Step 2 Surface Water Screening Level	Natural Background Level		
Chromium, total (or III)		1.00E+02	1.00E+02	1.00E+02	1.00E+02					7.40E+01		7.40E+01
Cobalt										NV		NV
Copper		1.00E+03	1.30E+03	1.30E+03	1.30E+03	5.92E+02				2.40E+00		2.40E+00
Iron		3.00E+02		3.00E+02						1.00E+03		3.00E+02
Lead	1.50E+01	1.50E+01	*0	1.50E+01	*0			1.33E+01	1.13E+01	5.40E-01		5.40E-01
Manganese		5.00E+01		5.00E+01						1.00E+02		5.00E+01
Mercury		2.00E+00	2.00E+00	2.00E+00	2.00E+00	4.80E+00		7.43E-03	5.16E-03	5.16E-03		5.16E-03
Mercury (organic)										4.55E-04		4.55E-04
Molybdenum										NV		NV
Nickel				1.00E+02		3.20E+02				8.20E+00		8.20E+00
Selenium		5.00E+01	5.00E+01	5.00E+01	5.00E+01	8.00E+01				5.00E+00		5.00E+00
Silver		1.00E+02	1.00E+02	1.00E+02		8.00E+01				1.90E+00		1.90E+00
Tin							9.60E+03			NV		9.60E+03
Thallium		2.00E+00	5.00E-01	2.00E+00	5.00E-01	1.12E+00				2.33E-01		2.33E-01
Vanadium										NV		NV
Zinc		5.00E+03		5.00E+03		4.80E+03		7.63E+01	3.26E+01	3.26E+01		3.26E+01
LPAH										NV		NV
HPAH										NV		NV
Total Petroleum Hydrocarbons										NV		NV
Gasoline	1.00E+03									NV		1.00E+03
Gasoline (w/benzene)	8.00E+02									NV		8.00E+02
Diesel	5.00E+02									NV		5.00E+02
Heavy Oil	5.00E+02									NV		5.00E+02
2,3,7,8-TCDD (Dioxin)		3.00E-05	*0	3.00E-05	*0		5.80E-07			2.06E-10		2.06E-10
Aldrin						2.40E-01	2.57E-03			1.24E-05		1.24E-05
alpha-BHC							1.39E-02			1.21E-03		1.21E-03
beta-BHC							4.86E-02			4.22E-03		4.22E-03
gamma-BHC (Lindane)		2.00E-04	2.00E-04	2.00E-04		4.80E+00				6.30E-02		2.00E-04
Chlordane		2.00E-03	*0	2.00E-03		8.00E+00	2.50E-01			2.00E-04		2.00E-04
4,4'-DDT						8.00E+00	2.57E-01			5.42E-05		5.42E-05
4,4'-DDE							2.57E-01			5.42E-05		5.42E-05

Table C-3. Step 2 Groundwater Screening Level Derivation (µg/L)

Chemical	Original Column Letter in Ecology Table											Step 2 Groundwater Screening Level for Protection of Drinking Water and Surface Water
	B	K	L	M	N	O	P	Y	Z	--	AC	
	Method A	Method B					Pathway Evaluation					
	Safe Drinking Water Act MCL	Safe Drinking Water Act MCLG	State Board of Health MCL	State Board of Health MCLG	Drinking Water Noncarcinogen CLARC Equation 720-1	Drinking Water Carcinogen CLARC Equation 720-2	Groundwater to Sediment CSL	Groundwater to Sediment SQS	Step 2 Surface Water Screening Level	Natural Background Level		
4,4'-DDD						3.65E-01				7.67E-05		7.67E-05
Dieldrin					8.00E-01	5.47E-03				1.32E-05		1.32E-05
alpha-Endosulfan					9.60E+01					8.70E-03		8.70E-03
beta-Endosulfan					9.60E+01					8.70E-03		8.70E-03
Endosulfan Sulfate					9.60E+01					8.70E-03		8.70E-03
Endrin	2.00E-03	2.00E-03	2.00E-03		4.80E+00					2.30E-03		2.00E-03
Endrin Aldehyde	2.00E-03	2.00E-03	2.00E-03		4.80E+00					2.30E-03		2.00E-03
Heptachlor	4.00E-04	*0	4.00E-04		8.00E+00	1.94E-02				1.96E-05		1.96E-05
Heptachlor Epoxide	2.00E-04	*0	2.00E-04		1.04E-01	4.81E-03				9.69E-06		9.69E-06
Toxaphene										6.85E-05		6.85E-05
1,2,4-Trimethylbenzene	NV	NV	NV	NV	4.00E+02	NV	NV	NV	NV	NV		4.00E+02
1-Methylnaphthalene	NV	NV	NV	NV	1.12E+03	3.02E+00	NV	NV	NV	NV		3.02E+00
Carbazole	NV	NV	NV	NV		4.40E+00	NV	NV	NV	NV		4.40E+00
Carbon disulfide	NV	NV	NV	NV	8.00E+02	NV	NV	NV	NV	NV		8.00E+02
Chloride	2.50E+05	NV	2.50E+05	NV	NV	NV	2.30E+05	NV	NV	NV		2.30E+05
cis-1,2-Dichloroethene	7.00E+01	7.00E+01	NV	NV	8.00E+01	NV	NV	NV	NV	NV		7.00E+01
Isophorone	NV	NV	NV	NV	1.60E+03	4.60E+01	2.36E+02	NV	NV	NV		4.60E+01
n-Nitrosodi-n-propylamine	NV	NV	NV	NV	NV	NV	1.28E-01	NV	NV	NV		1.28E-01
Sulfate	2.50E+05	NV	2.50E+05	NV	NV	NV	NV	NV	NV	NV		2.50E+05
trans-1,2-Dichloroethene	1.00E+02	1.00E+02	NV	NV	1.60E+02	NV	4.80E+03	NV	NV	NV		1.00E+02
Tributyl phosphate	NV	NV	NV	NV	3.20E+03	9.51E+00	NV	NV	NV	NV		9.51E+00

Notes:

- ARAR = applicable or relevant and appropriate requirement
- CLARC = cleanup level and risk calculation
- CSL = cleanup screening level
- EPA = U.S. Environmental Protection Agency
- HPAH = high molecular weight polycyclic aromatic hydrocarbon
- LPAH = low molecular weight polycyclic aromatic hydrocarbon
- MCL = maximum contaminant level
- MCLG = maximum contaminant level goal
- NV = no value available
- PCB = polychlorinated biohenyl
- SQS = sediment quality standard

Table C-4. Step 2 Surface Water Screening Level Derivation (µg/L)

Chemical	Original Column Letter in Ecology Table													
	M	N	O	P	Q	R	AA	AB	AC	AD	AF	AG	AH	AI
	Method B													
	Fish Consumption Noncarcinogen CLARC Equation 730-1	Fish Consumption Noncarcinogen Tribal Adult Equation 730-1 Modif	Fish Consumption Noncarcinogen Tribal Child Equation 730-1 Modif	Fish Consumption Carcinogen CLARC Equation 730-2	Fish Consumption Carcinogen Tribal Adult Equation 730-2 Modif	Fish Consumption Carcinogen Tribal Child Equation 730-2 Modif	State Water Quality Standard Freshwater Acute	State Water Quality Standard Freshwater Chronic	State Water Quality Standard Marine Acute	State Water Quality Standard Marine Chronic	Clean Water Act Human Consumption Organisms Only	Clean Water Act Organoleptic Effects	Clean Water Act Freshwater Acute	Clean Water Act Freshwater Chronic
Acetone														
Acenaphthene	6.43E+02	2.09E+02	9.59E+01								9.90E+02	2.00E+01		
Acenaphthylene														
Anthracene	2.59E+04	8.42E+03	3.87E+03								4.00E+04			
Benzene	1.99E+03	6.48E+02	2.97E+02	2.27E+01	3.22E+00	1.58E+01					5.10E+01			
Benzo(g,h,i)perylene														
Benzo[a]pyrene				2.96E-02	4.51E-03	2.06E-02					1.80E-02			
bis(2-ethylhexyl) Phthalate	3.99E+02	1.30E+02	5.95E+01	3.56E+00	5.42E-01	2.48E+00					2.20E+00			
Butyl benzyl phthalate	1.25E+03	4.07E+02	1.87E+02	8.24E+00	1.26E+00	5.73E+00					1.90E+03			
Carbon tetrachloride	9.68E+01	3.15E+01	1.44E+01	2.66E+00	4.05E-01	1.85E+00					1.60E+00			
Chlorobenzene											1.60E+03	2.00E+01		
Chloroethane (ethyl chloride)														
Chloroform (trichloromethane)	6.91E+03	2.25E+03	1.03E+03	2.83E+02	4.32E+01	1.97E+02					4.70E+02			
Chloromethane				1.33E+02	2.03E+01	9.25E+01								
Dibenzofuran														
di-butyl Phthalate (di-n-butyl phth.)	2.91E+03	9.47E+02	4.34E+02								4.50E+03			
Dichlorobenzene, 1,2-	4.20E+03	1.36E+03	6.26E+02								1.30E+03			
Dichlorobenzene, 1,3-											9.60E+02			
Dichlorobenzene, 1,4-				4.86E+00	7.40E-01	3.38E+00					1.90E+02			
Dichloroethane, 1,1-														
Dichloroethane, 1,2-	4.32E+04	1.40E+04	6.44E+03	5.94E+01	9.04E+00	4.13E+01					3.70E+01			
Dichloroethylene, 1,1-	2.31E+04	7.52E+03	3.45E+03								7.10E+03			
Diethyl phthalate	2.84E+04	9.23E+03	4.24E+03								4.40E+04			
Dimethyl phthalate	7.20E+04	2.34E+04	1.07E+04								1.10E+06			
di-n-octyl Phthalate														
Ethylbenzene	6.91E+03	2.25E+03	1.03E+03		2.39E+00	1.09E+01					2.10E+03			
Fluoranthene	9.02E+01	2.93E+01	1.34E+01								1.40E+02			
Fluorene	3.46E+03	1.12E+03	5.15E+02								5.30E+03			
Hexachlorobenzene	2.38E-01	7.75E-02	3.55E-02	4.66E-04	7.09E-05	3.24E-04					2.90E-04			
Hexachlorobutadiene	1.85E+02	6.02E+01	2.76E+01	2.97E+01	4.52E+00	2.07E+01					1.80E+01			
MEK (Methyl Ethyl Ketone;2-Butanone)														
Methylene chloride (dichloromethane)	1.73E+05	5.62E+04	2.58E+04	9.60E+02	1.46E+02	6.68E+02					5.90E+02			
Methylnaphthalene, 2-														
MIBK (M-Isobutyl-K;4-M,2-Pentanone)														
Naphthalene	4.94E+03	1.60E+03	7.36E+02											
Nitrosodiphenylamine, N-				9.73E+00	1.48E+00	6.77E+00					6.00E+00			
PCB mixtures				1.04E-04	1.58E-05	7.23E-05	2.00E+00	1.40E-02	1.00E+01	3.00E-02	6.40E-05			1.40E-02
Phenanthrene														
Pyrene											4.00E+03			
Tetrachloroethylene (perchloroethylene)	8.36E+02	2.72E+02	1.25E+02	3.87E-01	5.90E-02	2.69E-01					3.30E+00			
Trichlorobenzene, 1,2,4-	2.27E+02	7.39E+01	3.39E+01								7.00E+01			
Trichlorethane, 1,1,1-	9.26E+05	3.01E+05	1.38E+05											
Trichlorethane, 1,1,2-	2.30E+03	7.49E+02	3.44E+02	2.53E+01	3.85E+00	1.76E+01					1.60E+01			
Trichloroethylene	7.07E+01	2.30E+01	1.05E+01	6.62E+00	1.01E+00	4.61E+00					3.00E+01			
Trimethylbenzene, 1,3,5-														
Toluene	1.94E+04	6.30E+03	2.89E+03								1.50E+04			

Table C-4. Step 2 Surface Water Screening Level Derivation (µg/L)

Chemical	Method B						Original Column Letter in Ecology Table							
	M	N	O	P	Q	R	AA	AB	AC	AD	AF	AG	AH	AI
	Fish Consumption Noncarcinogen CLARC Equation 730-1	Fish Consumption Noncarcinogen Tribal Adult Equation 730-1 Modif	Fish Consumption Noncarcinogen Tribal Child Equation 730-1 Modif	Fish Consumption Carcinogen CLARC Equation 730-2	Fish Consumption Carcinogen Tribal Adult Equation 730-2 Modif	Fish Consumption Carcinogen Tribal Child Equation 730-2 Modif	State Water Quality Standard Freshwater Acute	State Water Quality Standard Freshwater Chronic	State Water Quality Standard Marine Acute	State Water Quality Standard Marine Chronic	Clean Water Act Human Consumption Organisms Only	Clean Water Act Organoleptic Effects	Clean Water Act Freshwater Acute	Clean Water Act Freshwater Chronic
Vinyl chloride (chloroethylene)	6.65E+03	2.16E+03	9.91E+02	3.69E+00	5.63E-01	2.57E+00					2.40E+00			
Xylene (dimethylbenzene)														
Benzoic acid														
Benzyl alcohol														
Dimethylphenol, 2,4-	5.53E+02	1.80E+02	8.24E+01							8.50E+02	4.00E+02			
Methylphenol, 2- (o-cresol)														
Methylphenol, 4- (p-cresol)														
Pentachlorophenol	7.07E+03	2.30E+03	1.05E+03	4.91E+00	7.48E-01	3.42E+00			1.30E+01	7.90E+00	3.00E+00	3.00E+01	1.90E+01	1.50E+01
Phenol (total)	1.11E+06	3.61E+05	1.66E+05								8.60E+05	3.00E+02		
Styrene (phenylethylene)														
Tributyltin													4.60E-01	7.20E-02
Trichlorophenol, 2,4,6-				3.93E+00	5.98E-01	2.73E+00					2.40E+00	2.00E+00		
Aluminum														
Antimony	1.04E+03	3.37E+02	1.55E+02								6.40E+02			
Arsenic (III)														
Arsenic (V)														
Arsenic (total)	1.77E+01	5.74E+00	2.64E+00	9.82E-02	1.50E-02	6.83E-02	3.60E+02	1.90E+02	6.90E+01	3.60E+01	1.40E-01		3.40E+02	1.50E+02
Barium														
Beryllium	2.73E+02	8.87E+01	4.07E+01											
Cadmium	2.03E+01	6.58E+00	3.02E+00						4.20E+01	9.30E+00			2.00E+00	2.50E-01
Chromium (VI)	4.86E+02	1.58E+02	7.25E+01	8.10E-01	1.23E-01	5.64E-01	1.50E+01	1.00E+01	1.10E+03	5.00E+01			1.60E+01	1.10E+01
Chromium, total (or III)													5.70E+02	7.40E+01
Cobalt														
Copper	2.66E+03	8.66E+02	3.97E+02						1.14E+01	4.80E+00	3.10E+00		1.00E+03	1.30E+01
Iron														9.00E+00
Lead									5.40E-01	2.10E+02	8.10E+00			1.00E+03
Manganese														1.00E+02
Mercury							2.10E+00	1.20E-02	1.80E+00	2.50E-02				1.40E+00
Mercury (organic)														7.70E-01
Molybdenum														
Nickel	1.10E+03	3.58E+02	1.65E+02						7.40E+01	8.20E+00	4.60E+03			4.70E+02
Selenium	2.70E+03	8.78E+02	4.03E+02				2.00E+01	5.00E+00	2.90E+02	7.10E+01	4.20E+03			5.00E+00
Silver	2.59E+04	8.42E+03	3.87E+03						1.90E+00					3.20E+00
Tin														
Thallium	1.56E+00	5.08E-01	2.33E-01											4.70E-01
Vanadium														
Zinc	1.65E+04	5.38E+03	2.47E+03						1.04E+02	9.00E+01	8.10E+01	2.60E+04	5.00E+03	1.20E+02
LPAH														
HPAH														
Total petroleum hydrocarbons														
Gasoline														
Gasoline (with benzene)														
Diesel														
Heavy oil														

Table C-4. Step 2 Surface Water Screening Level Derivation (µg/L)

Chemical	Original Column Letter in Ecology Table													
	M	N	O	P	Q	R	AA	AB	AC	AD	AF	AG	AH	AI
	Method B													
	Fish Consumption Noncarcinogen CLARC Equation 730-1	Fish Consumption Noncarcinogen Tribal Adult Equation 730-1 Modif	Fish Consumption Noncarcinogen Tribal Child Equation 730-1 Modif	Fish Consumption Carcinogen CLARC Equation 730-2	Fish Consumption Carcinogen Tribal Adult Equation 730-2 Modif	Fish Consumption Carcinogen Tribal Child Equation 730-2 Modif	State Water Quality Standard Freshwater Acute	State Water Quality Standard Freshwater Chronic	State Water Quality Standard Marine Acute	State Water Quality Standard Marine Chronic	Clean Water Act Human Consumption Organisms Only	Clean Water Act Organoleptic Effects	Clean Water Act Freshwater Acute	Clean Water Act Freshwater Chronic
2,3,7,8-TCDD (dioxin)	5.19E-07	1.68E-07	7.73E-08	8.64E-09	1.32E-09	6.01E-09					5.10E-09			
Aldrin	1.67E-02	5.41E-03	2.48E-03	8.16E-05	1.24E-05	5.68E-05	2.50E+00	1.90E-03	7.10E-01	1.90E-03	5.00E-05		3.00E+00	
alpha-BHC				7.91E-03	1.21E-03	5.51E-03					4.90E-03			
beta-BHC				2.77E-02	4.22E-03	1.93E-02					1.70E-02			
gamma-BHC (Lindane)	5.98E+00	1.94E+00	8.92E-01				2.00E+00	8.00E-02	1.60E-01		1.80E+00		9.50E-01	
Chlordane	9.19E-02	2.99E-02	1.37E-02	1.31E-03	2.00E-04	9.14E-04	2.40E+00	4.30E-03	9.00E-02	4.00E-03	8.10E-04		2.40E+00	4.30E-03
4,4'-DDT	2.42E-02	7.86E-03	3.61E-03	3.56E-04	5.42E-05	2.47E-04	1.10E+00	1.00E-03	1.30E-01	1.00E-03	2.20E-04		1.10E+00	1.00E-03
4,4'-DDE				3.56E-04	5.42E-05	2.47E-04	1.10E+00	1.00E-03	1.30E-01	1.00E-03	2.20E-04			
4,4'-DDD				5.04E-04	7.67E-05	3.51E-04	1.10E+00	1.00E-03	1.30E-01	1.00E-03	3.10E-04			
Dieldrin	2.78E-02	9.02E-03	4.14E-03	8.67E-05	1.32E-05	6.04E-05	2.50E+00	1.90E-03	7.10E-01	1.90E-03	5.40E-05		2.40E-01	5.60E-02
alpha-Endosulfan	5.76E+01	1.87E+01	8.59E+00				2.20E-01	5.60E-02	3.40E-02	8.70E-03	8.90E+01		2.20E-01	5.60E-02
beta-Endosulfan	5.76E+01	1.87E+01	8.59E+00				2.20E-01	5.60E-02	3.40E-02	8.70E-03	8.90E+01		2.20E-01	5.60E-02
Endosulfan sulfate	5.76E+01	1.87E+01	8.59E+00				2.20E-01	5.60E-02	3.40E-02	8.70E-03	8.90E+01		2.20E-01	5.60E-02
Endrin	1.96E-01	6.37E-02	2.92E-02				1.80E-01	2.30E-03	3.70E-02	2.30E-03	6.00E-02		8.60E-02	3.60E-02
Endrin aldehyde	1.96E-01	6.37E-02	2.92E-02				1.80E-01	2.30E-03	3.70E-02	2.30E-03	3.00E-01		8.60E-02	3.60E-02
Heptachlor	1.16E-01	3.76E-02	1.73E-02	1.29E-04	1.96E-05	8.95E-05	5.20E-01	3.80E-03	5.30E-02	3.60E-03	7.90E-05		5.20E-01	3.80E-03
Heptachlor epoxide	3.01E-03	9.78E-04	4.49E-04	6.36E-05	9.69E-06	4.43E-05					3.90E-05		5.20E-01	3.80E-03
Toxaphene				4.50E-04	6.85E-05	3.13E-04					2.80E-04		7.30E-01	2.00E-04
1,2,4-Trimethylbenzene	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
1-Methylnaphthalene	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
Carbazole	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
Carbon disulfide	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
Chloride	NV	NV	NV	NV	NV	NV	8.60E+05	2.30E+05			NV	NV	8.60E+05	2.30E+05
cis-1,2-Dichloroethene	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
Isophorone	1.20E+05	3.83E+04	1.76E+04	1.60E+03	2.36E+02	1.08E+03	NV	NV	NV	NV	9.60E+02	NV		NV
n-Nitrosodi-n-propylamine	NV	NV	NV	8.20E-01	1.28E-01	5.86E-01	NV	NV	NV	NV	NV	NV	NV	NV
Sulfate	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
trans-1,2-Dichloroethene	3.30E+04	1.10E+04	4.80E+03	NV	NV	NV	NV	NV	NV	NV	1.00E+04	NV	NV	NV
Tributyl phosphate	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV

Notes:  
 CLARC = cleanup level and risk calculation  
 CSL = cleanup screening level  
 HPAH = high molecular weight polycyclic aromatic hydrocarbon  
 LDW = Lower Duwamish Waterway  
 LPAH = low molecular weight polycyclic aromatic hydrocarbon  
 NV = no value available  
 PCB = polychlorinated biphenyl  
 SQS = sediment quality standard  
 TMCL = total maximum contaminant load

Chemical	Original Column Letter in Ecology Table														Pathway Analysis		Step 2 Surface Water Screening Level
	AJ	AK	AL	AM	AN	AO	AQ	AR	AX	AY	AZ	BA	AV	AW	BB	BF	
	Applicable or Relevant and Appropriate Requirements																
	Clean Water Act Marine Acute	Clean Water Act Marine Chronic	National Toxics Rule Freshwater Acute	National Toxics Rule Freshwater Chronic	National Toxics Rule Marine Acute	National Toxics Rule Marine Chronic	National Toxics Rule Human Consumption Only Freshwater	National Toxics Rule Human Consumption Only Marine	Plant 2 TMCL Fish Consumption without Salmon Noncarcinogen Tribal Adult	Plant 2 TMCL Fish Consumption without Salmon Noncarcinogen Tribal Child	Plant 2 TMCL Fish Consumption without Salmon Carcinogen Tribal Adult	Plant 2 TMCL Fish Consumption without Salmon Carcinogen Tribal Child	Groundwater to Sediment CSL	Groundwater to Sediment SQS	Natural Background Level	Natural Background Level LDW	
Acetone								2.40E+05	1.10E+05								1.10E+05
Acenaphthene								2.51E+02	1.15E+02								2.00E+01
Acenaphthylene																	NV
Anthracene							1.10E+05	1.10E+05	4.34E+02	1.99E+02							1.99E+02
Benzene							7.10E+01	7.10E+01	4.08E+02	1.87E+02	2.03E+00	9.93E+00					2.03E+00
Benzo(g,h,i)perylene																	NV
Benzo[a]pyrene							3.10E-02	3.10E-02			1.52E-05	7.43E-05				3.20E-03	3.20E-03
bis(2-ethylhexyl) Phthalate							5.90E+00	5.90E+00	3.16E+02	1.45E+02	1.23E+00	6.04E+00	4.73E-01	2.85E-01	1.37E+00		1.37E+00
Butyl benzyl phthalate									1.42E+02	6.54E+01	4.10E-01	2.01E+00					4.10E-01
Carbon tetrachloride							4.40E+00	4.40E+00	1.18E+02	5.41E+01	2.48E-01	1.21E+00					2.48E-01
Chlorobenzene							2.10E+04	2.10E+04	5.89E+02	2.70E+02							2.00E+01
Chloroethane (ethyl chloride)							3.40E+01	3.40E+01									3.40E+01
Chloroform (trichloromethane)							4.70E+02	4.70E+02	1.22E+03	5.59E+02	4.30E+00	2.10E+01					4.30E+00
Chloromethane											2.24E+01	1.10E+02					2.03E+01
Dibenzofuran																	NV
di-butyl Phthalate (di-n-butyl phth.)							1.20E+04	1.20E+04	1.01E+02	4.66E+01							4.66E+01
Dichlorobenzene, 1,2-							1.70E+04	1.70E+04	9.49E+02	4.35E+02							4.35E+02
Dichlorobenzene, 1,3-							2.60E+03	2.60E+03									9.60E+02
Dichlorobenzene, 1,4-							2.60E+03	2.60E+03									7.40E-01
Dichloroethane, 1,1-									3.47E+04	1.59E+04	3.33E+01	1.63E+02					3.33E+01
Dichloroethane, 1,2-							9.90E+01	9.90E+01	5.91E+03	2.71E+03	3.55E+00	1.74E+01					3.55E+00
Dichloroethylene, 1,1-							3.20E+00	3.20E+00	5.10E+03	2.34E+03							3.20E+00
Diethyl phthalate							1.20E+05	1.20E+05									4.24E+03
Dimethyl phthalate							2.90E+06	2.90E+06									1.07E+04
di-n-octyl Phthalate																	NV
Ethylbenzene							2.90E+04	2.90E+04	1.73E+03	7.95E+02							2.39E+00
Fluoranthene							3.70E+02	3.70E+02	2.39E+01	1.10E+01							1.10E+01
Fluorene							1.40E+04	1.40E+04	9.85E+01	4.52E+01							4.52E+01
Hexachlorobenzene							7.70E-04	7.70E-04			6.62E-05	3.24E-04					6.62E-05
Hexachlorobutadiene							5.00E+01	5.00E+01			4.22E+00	2.07E+01					4.22E+00
MEK (Methyl Ethyl Ketone;2-Butanone)									1.60E+05	7.34E+04							7.34E+04
Methylene chloride (dichloromethane)							1.60E+03	1.60E+03	2.53E+04	1.16E+04	6.14E+01	3.01E+02					6.14E+01
Methylnaphthalene, 2-																	NV
MIBK (M-Isobutyl-K;4-M,2-Pentanone)																	NV
Naphthalene									2.44E+02	1.12E+02							1.12E+02
Nitrosodiphenylamine, N-							1.60E+01	1.60E+01			1.59E+00	7.80E+00					1.48E+00
PCB mixtures		3.00E-02					1.70E-04	1.70E-04			2.30E-05	1.13E-04	1.45E+00	2.68E-01	3.30E-04	1.53E-03	1.53E-03
Phenanthrene																	NV
Pyrene							1.10E+04	1.10E+04	2.14E+01	9.83E+00							9.83E+00
Tetrachloroethylene (perchloroethylene)							8.85E+00	8.85E+00	1.02E+02	4.67E+01	2.06E-02	1.01E-01					2.06E-02
Trichlorobenzene, 1,2,4-									3.51E+01	1.61E+01							1.61E+01
Trichlorethane, 1,1,1-									1.00E+05	4.60E+04							4.60E+04
Trichlorethane, 1,1,2-							4.20E+01	4.20E+01	4.87E+02	2.23E+02	2.34E+00	1.14E+01					2.34E+00
Trichloroethylene							8.10E+01	8.10E+01	1.81E+01	8.28E+00	7.39E-01	3.62E+00					7.39E-01
Trimethylbenzene, 1,3,5-									9.85E+01	4.52E+01							4.52E+01
Toluene							2.00E+05	2.00E+05	2.82E+03	1.29E+03							1.29E+03



Chemical	Original Column Letter in Ecology Table														Pathway Analysis		Step 2 Surface Water Screening Level
	AJ	AK	AL	AM	AN	AO	AQ	AR	AX	AY	AZ	BA	AV	AW	BB	BF	
	Applicable or Relevant and Appropriate Requirements																
	Clean Water Act Marine Acute	Clean Water Act Marine Chronic	National Toxics Rule Freshwater Acute	National Toxics Rule Freshwater Chronic	National Toxics Rule Marine Acute	National Toxics Rule Marine Chronic	National Toxics Rule Human Consumption Only Freshwater	National Toxics Rule Human Consumption Only Marine	Plant 2 TMCL Fish Consumption without Salmon Noncarcinogen Tribal Adult	Plant 2 TMCL Fish Consumption without Salmon Noncarcinogen Tribal Child	Plant 2 TMCL Fish Consumption without Salmon Carcinogen Tribal Adult	Plant 2 TMCL Fish Consumption without Salmon Carcinogen Tribal Child	Groundwater to Sediment CSL	Groundwater to Sediment SQS	Natural Background Level	Natural Background Level LDW	
Vinyl chloride (chloroethylene)							5.25E+02	5.25E+02	1.05E+03	4.83E+02	5.33E-01	2.61E+00					5.33E-01
Xylene (dimethylbenzene)									3.44E+03	1.58E+03							1.58E+03
Benzoic acid																	NV
Benzyl alcohol																	NV
Dimethylphenol, 2,4-									1.43E+03	6.55E+02							8.24E+01
Methylphenol, 2- (o-cresol)									6.65E+03	3.05E+03							3.05E+03
Methylphenol, 4- (p-cresol)									7.27E+02	3.34E+02							3.34E+02
Pentachlorophenol	1.30E+01	7.90E+00	2.00E+01	1.30E+01	1.30E+01	7.90E+00	8.20E+00	8.20E+00			6.98E-01	3.42E+00					6.98E-01
Phenol (total)							4.60E+06	4.60E+06	8.87E+04	4.07E+04							3.00E+02
Styrene (phenylethylene)																	NV
Tributyltin	4.20E-01	7.40E-03															7.40E-03
Trichlorophenol, 2,4,6-							6.50E+00	6.50E+00			5.58E-01	2.73E+00					5.58E-01
Aluminum																	NV
Antimony							4.30E+03	4.30E+03	8.42E+00	3.87E+00							3.87E+00
Arsenic (III)																	NV
Arsenic (V)																	NV
Arsenic (total)	6.90E+01	3.60E+01	3.60E+02	1.90E+02	6.90E+01	3.60E+01	1.40E-01	1.40E-01	2.22E+00	1.02E+00	5.39E-03	2.64E-02			7.10E-01	1.20E+00	1.20E+00
Barium									2.66E+02	1.22E+02							1.22E+02
Beryllium									2.72E+01	1.25E+01							1.25E+01
Cadmium	4.00E+01	8.80E+00	3.70E+00	1.00E+00	4.20E+01	9.30E+00			9.29E-01	4.26E-01							2.50E-01
Chromium (VI)	1.10E+03	5.00E+01	1.50E+01	1.00E+01	1.10E+03	5.00E+01			7.90E+02	3.62E+02	5.76E-01	2.82E+00					1.23E-01
Chromium, total (or III)			5.50E+02	1.80E+02													7.40E+01
Cobalt																	NV
Copper	4.80E+00	3.10E+00	1.70E+01	1.10E+01	2.40E+00	2.40E+00			9.36E+02	4.30E+02							2.40E+00
Iron																	1.00E+03
Lead	2.10E+02	8.10E+00	6.50E+01	2.50E+00	2.10E+02	8.10E+00							1.33E+01	1.13E+01			5.40E-01
Manganese																	1.00E+02
Mercury	1.80E+00	9.40E-01	2.10E+00	1.60E+02	1.80E+00	2.50E-02	1.50E-01	1.50E-01	2.70E-02	1.24E-02			7.43E-03	5.16E-03			5.16E-03
Mercury (organic)									9.91E-04	4.55E-04							4.55E-04
Molybdenum																	NV
Nickel	7.40E+01	8.20E+00	1.40E+03	1.60E+02	7.40E+01	8.20E+00	4.60E+03	4.60E+03	2.16E+02	9.91E+01							8.20E+00
Selenium	2.90E+02	7.10E+01	2.00E+01		2.90E+02	7.10E+01			3.27E+01	1.50E+01							5.00E+00
Silver	1.90E+00		3.40E+00		1.90E+00				4.79E+01	2.20E+01							1.90E+00
Tin																	NV
Thallium							6.30E+00	6.30E+00									2.33E-01
Vanadium																	NV
Zinc	9.00E+01	8.10E+01	1.10E+02	1.00E+02	9.00E+01	8.10E+01			1.23E+02	5.63E+01			7.63E+01	3.26E+01			3.26E+01
LPAH																	NV
HPAH																	NV
Total petroleum hydrocarbons																	NV
Gasoline																	NV
Gasoline (with benzene)																	NV
Diesel																	NV
Heavy oil																	NV

Chemical	Original Column Letter in Ecology Table														Step 2 Surface Water Screening Level			
	AJ	AK	AL	AM	AN	AO	AQ	AR	AX	AY	AZ	BA	AV	AW		BB	BF	
	Applicable or Relevant and Appropriate Requirements												Pathway Analysis					
	Clean Water Act Marine Acute	Clean Water Act Marine Chronic	National Toxics Rule Freshwater Acute	National Toxics Rule Freshwater Chronic	National Toxics Rule Marine Acute	National Toxics Rule Marine Chronic	National Toxics Rule Consumption Organisms Only Freshwater	National Toxics Rule Consumption Organisms Only Marine	Plant 2 TMCL Fish Consumption without Salmon Noncarcinogen Tribal Adult	Plant 2 TMCL Fish Consumption without Salmon Noncarcinogen Tribal Child	Plant 2 TMCL Fish Consumption without Salmon Carcinogen Tribal Adult	Plant 2 TMCL Fish Consumption without Salmon Carcinogen Tribal Child	Groundwater to Sediment CSL	Groundwater to Sediment SQS		Natural Background Level	Natural Background Level LDW	
2,3,7,8-TCDD (dioxin)								1.40E-08	1.40E-08	2.45E-08	1.12E-08	2.06E-10	1.01E-09					2.06E-10
Aldrin	1.30E+00		3.00E+00		1.30E+00			1.40E-04	1.40E-04									1.24E-05
alpha-BHC								1.30E-02	1.30E-02									1.21E-03
beta-BHC								4.60E-02	4.60E-02									4.22E-03
gamma-BHC (Lindane)	1.60E-01		2.00E+00	8.00E-02	1.60E-01			6.30E-02	6.30E-02									6.30E-02
Chlordane	9.00E-02	4.00E-03	2.40E+00	4.30E-03	9.00E-02	4.00E-03		5.90E-04	5.90E-04									2.00E-04
4,4'-DDT	1.30E-01	1.00E-03	1.10E+00	1.00E-03	1.30E-01	1.00E-03		5.90E-04	5.90E-04									5.42E-05
4,4'-DDE								5.90E-04	5.90E-04									5.42E-05
4,4'-DDD								8.40E-04	8.40E-04									7.67E-05
Dieldrin	7.10E-01	1.90E-03	2.50E+00	1.90E-03	7.10E-01	1.90E-03		1.40E-04	1.40E-04									1.32E-05
alpha-Endosulfan	3.40E-02	8.70E-03	2.20E-01	5.60E-02	3.40E-02	8.70E-03												8.70E-03
beta-Endosulfan	3.40E-02	8.70E-03	2.20E-01	5.60E-02	3.40E-02	8.70E-03												8.70E-03
Endosulfan sulfate	3.40E-02	8.70E-03	2.20E-01	5.60E-02	3.40E-02	8.70E-03												8.70E-03
Endrin	3.70E-02	2.30E-03	1.80E-01	2.30E-03	3.70E-02	2.30E-03		8.10E-01	8.10E-01									2.30E-03
Endrin aldehyde	3.70E-02	2.30E-03	1.80E-01	2.30E-03	3.70E-02	2.30E-03		8.10E-01	8.10E-01									2.30E-03
Heptachlor	5.30E-02	3.60E-03	5.20E-01	3.80E-03	5.30E-02	3.60E-03		2.10E-04	2.10E-04									1.96E-05
Heptachlor epoxide	5.30E-02	3.60E-03	5.20E-01	3.80E-03	5.30E-02	3.60E-03		1.10E-04	1.10E-04									9.69E-06
Toxaphene	2.10E-01	2.00E-04	7.30E-01	2.00E-04	2.10E-01	2.00E-04												6.85E-05
1,2,4-Trimethylbenzene	NV	NV	NV	NV	NV	NV	NV	NV	NV					NV	NV			NV
1-Methylnaphthalene	NV	NV	NV	NV	NV	NV	NV	NV	NV					NV	NV			NV
Carbazole	NV	NV	NV	NV	NV	NV	NV	NV	NV					NV	NV			NV
Carbon disulfide	NV	NV	NV	NV	NV	NV	NV	NV	NV					NV	NV			NV
Chloride	NV	NV	NV	NV	NV	NV	NV	NV	NV					NV	NV			2.30E+05
cis-1,2-Dichloroethene	NV	NV	NV	NV	NV	NV	NV	NV	NV					NV	NV			NV
Isophorone	NV	NV	NV	NV	NV	NV	6.00E+02	6.00E+02	6.00E+02					NV	NV			2.36E+02
n-Nitrosodi-n-propylamine	NV	NV	NV	NV	NV	NV	NV	NV	NV					NV	NV			1.28E-01
Sulfate	NV	NV	NV	NV	NV	NV	NV	NV	NV					NV	NV			NV
trans-1,2-Dichloroethene	NV	NV	NV	NV	NV	NV	NV	NV	NV					NV	NV			4.80E+03
Tributyl phosphate	NV	NV	NV	NV	NV	NV	NV	NV	NV					NV	NV			NV

Table C-5. Rationale for Selection of ARARs to be Included in the Derivation of Step 2 Soil Screening Levels

Media Column Title <sup>a</sup>	Column Letter	Pathway Column Title <sup>a</sup>	Included?		Comments
			Yes	No	
Soil Method A	B	Soil Method A, Unrestricted Land Use-HH WAC 173-340-740(2)(b)(iii) CLARC Database	(X)		Site does not qualify for Method A but Method A CULs were used for petroleum and lead
	C	Soil Method A, Unrestricted Land Use-Ecol WAC 173-340-740(2)(b)(ii); Table 749-2		X	Site qualifies for commercial land use
	D	Soil Method A, Industrial Land Use-HH WAC 173-340-745(3)(b)(i) CLARC Database		X	Site does not qualify for Method A
	E	Soil Method A, Industrial Land Use-Ecol, WAC 173-340-745(3)(b)(iii) Table 749-2	X		Site qualifies for commercial land use
Soil Method B	F	Soil Direct Contact Method B-HH Carcinogen WAC 173-340-740(3)(b)(iii)(B)(II) CLARC Database	X		
	G	Soil Direct Contact Method B-HH Non-carcinogen WAC 173-340-740(3)(b)(iii)(B)(I)	X		
	H	Soil Direct Contact Method B-HH Petroleum Mixture WAC 173-340-740(3)(b)(iii)(B)(III) equation. 740-3 (4-Phase Model)		(X)	Not used for screening levels but were considered for Step 3 CULs
	I	Site-Specific Wildlife Exposure Model WAC 173-340-7493(3) Table 749-4 and -5		X	Site-specific TEE not required for this site
	J	Soil Terrestrial Method B-Ecol WAC 173-340-740(3)(b)(ii); WAC 173-340-7493 Table 749-3 <b>Plants</b>		X	Site-specific TEE not required for this site
	K	Soil Terrestrial Method B-Ecol WAC 173-340-740(3)(b)(ii); WAC 173-340-7493 Table 749-3 <b>Soil Biota</b>		X	Site-specific TEE not required for this site
Soil Method C	L	Soil Terrestrial Method B-Ecol WAC 173-340-740(3)(b)(ii); WAC 173-340-7493 Table 749-3 <b>Wildlife</b>		X	Site-specific TEE not required for this site
	M	Soil Direct Contact Method C-HH Carcinogen WAC 173-340-745(5)(b)(iii)(B)(II) Ingestion Only CLARC Database equation 745-2		X	Site does not qualify for Method C
	N	Soil Direct Contact Method C-HH Non-carcinogen WAC 173-340-745(5)(b)(iii)(B)(I) Ingestion Only CLARC Database equation 745-1		X	Site does not qualify for Method C
	O	Soil Direct Contact Method C-HH Carcinogen WAC 173-340-745(5)(b)(iii)(B)(II) Ingestion + Dermal equation 745-5		X	Site does not qualify for Method C
	P	Soil Direct Contact Method C-HH Non-carcinogen WAC 173-340-745(5)(b)(iii)(B)(I) Ingestion + Dermal equation 745-4		X	Site does not qualify for Method C
	Q	Soil Direct Contact Method C-HH Petroleum Mixture WAC 173-340-745(5)(b)(iii)(B)(III) equation 740-3 (4-Phase Model)		X	Site does not qualify for Method C
Soil Pathway Evaluation	R	Soil to Method B-HH Groundwater Protection -NC, WAC 173-340-740(3)(b)(iii)(A) equation 747-1/747-2 Vadose Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the vadose zone based on the final groundwater SL
	S	Soil to Method B-HH Groundwater Protection - NC, WAC 173-340-740(3)(b)(iii)(A) equation 747-1/747-2 Saturated Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the saturated zone based on the final groundwater SL
	T	Soil to Method B - HH Groundwater Protection - Carc, WAC 173-340-740(3)(b)(iii)(A) equation 747-1/747-2 CLARC Database Vadose Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the vadose zone based on the final groundwater SL
	U	Soil to Method B - HH Groundwater Protection - Carc, WAC 173-340-740(3)(b)(iii)(A) equation 747-1/747-2 CLARC Database Saturated Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the saturated zone based on the final groundwater SL
	V	Soil to Method C-HH Groundwater Protection - NC, WAC 173-340-740(3)(b)(iii)(A) equation 747-1/747-2 Vadose Soil		X	Site does not qualify for Method C
	W	Soil to Method C-HH Groundwater Protection - NC, WAC 173-340-740(3)(b)(iii)(A) equation 747-1/747-2 Saturated Soil		X	Site does not qualify for Method C

Table C-5. Rationale for Selection of ARARs to be Included in the Derivation of Step 2 Soil Screening Levels

Media Column Title <sup>a</sup>	Column Letter	Pathway Column Title <sup>a</sup>	Included?		Comments
			Yes	No	
	X	Soil to Method C-HH Groundwater Protection - Carc, WAC 173-340-740(3)(b)(iii)(A) equation 747-1/747-2 Vadose Soil		X	Site does not qualify for Method C
	Y	Soil to Method C-HH Groundwater Protection - Carc, WAC 173-340-740(3)(b)(iii)(A) equation 747-1/747-2 Saturated Soil		X	Site does not qualify for Method C
	Z	Soil to Sediment Protection Ecology CSL WAC 173-340-740(1)(d) equation 747-1/747-2 Vadose Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the vadose zone based on the final groundwater SL
	AA	Soil to Sediment Protection Ecology SQS WAC 173-340-740(1)(d) equation 747-1/747-2 Vadose Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the vadose zone based on the final groundwater SL
	AB	Soil to Sediment Protection Ecology CSL WAC 173-340-740(1)(d) equation 747-1/747-2 Saturated Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the saturated zone based on the final groundwater SL
	AC	Soil to Sediment Protection Ecology SQS WAC 173-340-740(1)(d) equation 747-1/747-2 Saturated Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the saturated zone based on the final groundwater SL
	AD	Soil to Surface Water Protection Aquatic Life <b>SWQS</b> :RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) <b>Fresh - Acute</b> Vadose Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the vadose zone based on the final groundwater SL
	AE	Soil to Surface Water Protection Aquatic Life <b>SWQS</b> :RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) <b>Fresh - Acute</b> Saturated Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the saturated zone based on the final groundwater SL
	AF	Soil to Surface Water Protection Aquatic Life <b>SWQS</b> :RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) <b>Fresh - Chronic</b> Vadose Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the vadose zone based on the final groundwater SL
	AG	Soil to Surface Water Protection Aquatic Life <b>SWQS</b> :RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) <b>Fresh - Chronic</b> Saturated Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the saturated zone based on the final groundwater SL
	AH	Soil to Surface Water Protection Aquatic Life <b>SWQS</b> :RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) <b>Marine - Acute</b> Vadose Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the vadose zone based on the final groundwater SL
	AI	Soil to Surface Water Protection Aquatic Life <b>SWQS</b> :RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) <b>Marine - Acute</b> Saturated Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the saturated zone based on the final groundwater SL
	AJ	Soil to Surface Water Protection Aquatic Life <b>SWQS</b> :RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) <b>Marine - Chronic</b> Vadose Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the vadose zone based on the final groundwater SL
	AK	Soil to Surface Water Protection Aquatic Life <b>SWQS</b> :RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) <b>Marine - Chronic</b> Saturated Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the saturated zone based on the final groundwater SL
	AL	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Saltwater Acute equation 747-1/747-2 Vadose Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the vadose zone based on the final groundwater SL

Table C-5. Rationale for Selection of ARARs to be Included in the Derivation of Step 2 Soil Screening Levels

Media Column Title <sup>a</sup>	Column Letter	Pathway Column Title <sup>a</sup>	Included?		Comments
			Yes	No	
	AM	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC equation 747-1/747-2 Saturated Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the saturated zone based on the final groundwater SL
	AN	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC equation 747-1/747-2 Vadose Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the vadose zone based on the final groundwater SL
	AO	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC equation 747-1/747-2 Saturated Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the saturated zone based on the final groundwater SL
	AP	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC equation 747-1/747-2 Vadose Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the vadose zone based on the final groundwater SL
	AQ	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC equation 747-1/747-2 Saturated Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the saturated zone based on the final groundwater SL
	AR	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC equation 747-1/747-2 Vadose Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the vadose zone based on the final groundwater SL
	AS	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC equation 747-1/747-2 Saturated Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the saturated zone based on the final groundwater SL
	AT	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Water & Organisms equation 747-1/747-2 Vadose Soil		X	Lower Duwamish Waterway not rated for drinking water per WAC 173-201A
	AU	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Water & Organisms equation 747-1/747-2 Saturated Soil		X	Lower Duwamish Waterway not rated for drinking water per WAC 173-201A
	AV	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Organisms equation 747-1/747-2 Vadose Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the vadose zone based on the final groundwater SL
	AW	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Organisms equation 747-1/747-2 Saturated Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the saturated zone based on the final groundwater SL
	AX	Soil to Surface Water Protection Aquatic Life Fresh/Acute, <b>NTR</b> - 40 CFR 131.36 Vadose Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the vadose zone based on the final groundwater SL
	AY	Soil to Surface Water Protection Aquatic Life Fresh/Acute, <b>NTR</b> - 40 CFR 131.36 Saturated Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the saturated zone based on the final groundwater SL
	AZ	Soil to Surface Water Protection Aquatic Life Fresh/Chronic, <b>NTR</b> - 40 CFR 131.36 Vadose Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the vadose zone based on the final groundwater SL
	BA	Soil to Surface Water Protection Aquatic Life Fresh/Chronic, <b>NTR</b> - 40 CFR 131.36 Saturated Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the saturated zone based on the final groundwater SL

Table C-5. Rationale for Selection of ARARs to be Included in the Derivation of Step 2 Soil Screening Levels

Media Column Title <sup>a</sup>	Column Letter	Pathway Column Title <sup>a</sup>	Included?		Comments
			Yes	No	
	BB	Soil to Surface Water Protection Aquatic Life Marine/Acute, <b>NTR</b> - 40 CFR 131.36 Vadose Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the vadose zone based on the final groundwater SL
	BC	Soil to Surface Water Protection Aquatic Life Marine/Acute, <b>NTR</b> - 40 CFR 131.36 Saturated Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the saturated zone based on the final groundwater SL
	BD	Soil to Surface Water Protection Aquatic Life Marine/Chronic, <b>NTR</b> - 40 CFR 131.36 Vadose Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the vadose zone based on the final groundwater SL
	BE	Soil to Surface Water Protection Aquatic Life Marine/Chronic, <b>NTR</b> - 40 CFR 131.36 Saturated Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the saturated zone based on the final groundwater SL
	BF	Soil to Surface Water Protection HH-Fresh Water <b>Water &amp; Organism Consumption NTR</b> - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10-6 Carc Risk Vadose Soil		X	Lower Duwamish Waterway not rated for drinking water per WAC 173-201A
	BG	Soil to Surface Water Protection HH-Fresh Water <b>Water &amp; Organism Consumption NTR</b> - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10-6 Carc Risk Saturated Soil		X	Lower Duwamish Waterway not rated for drinking water per WAC 173-201A
	BH	Soil to Surface Water Protection HH-Fresh Water <b>Organism Consumption Only NTR</b> - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10-6 Carc Risk Vadose Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the vadose zone based on the final groundwater SL
	BI	Soil to Surface Water Protection HH-Fresh Water <b>Organism Consumption Only NTR</b> - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10-6 Carc Risk Saturated Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the saturated zone based on the final groundwater SL
	BJ	Soil Protective of Vapor, Direct Contact, WAC 173-340-740(3)(b)(iii)C		X	No values in column
	BK	Soil Protective of Vapor, Indoor/Ambient Exposure WAC 173-340-740(3)(c)(iv)(B)		X	No values in column
Soil Potential ARARs	BL	CERCLA EPA Regional Screening Level (RSL: May, 2010) Residential	X		
	BM	CERCLA EPA Regional Screening Level (RSL: May, 2010) Industrial		X	Site does not qualify for industrial land use
	BN	CERCLA - National Oil & Hazardous Substances Pollution Contingency Plan (NCP) - 40 CFR 300 Preliminary Remediation/Cleanup Goals (2007)	X		
	BO	Soil Protection of Surface Water HH- <b>Organoleptic Effects</b> CWA §304 <b>NRWQC</b> Vadose Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the vadose zone based on the final groundwater SL
	BP	Soil Protection of Surface Water HH- <b>Organoleptic Effects</b> CWA §304 <b>NRWQC</b> Saturated Soil		X	For each chemical selected as a COPC in groundwater, one leaching SL was calculated for the saturated zone based on the final groundwater SL
	BQ	CA EPA OEHHA HH-Direct Exposure <b>Residential</b> Screening Levels		X	CalEPA SLs are not an ARAR for Washington sites
	BR	CA EPA OEHHA HH-Direct Exposure <b>Industrial</b> Screening Levels		X	CalEPA SLs are not an ARAR for Washington sites
	BS	Soil - Toxic Substances Control Act ( <b>TSCA</b> ) 40 CFR 761.61	X		
	BT	CERCLA EPA Regional Screening Level (RSL: May, 2010) Potable Groundwater Protection (Risk Based) Saturated Soil	(X)		Included in determination of SLs for the saturated zone for chemicals listed as COPCs in groundwater
	BU	EPA LDW Plant 2 TMCL's Groundwater Protection (Risk Based)		X	Not a promulgated standard
Always Applicable	BV	Natural <b>Background</b> Levels Ch. 173-340 WAC	X		If derived screening level is below this value, screening level is adjusted to this value
	BW	Applicable <b>DL (MDL)</b> Ch. 173-340 WAC		X	Not used in Step 2

Table C-5. Rationale for Selection of ARARs to be Included in the Derivation of Step 2 Soil Screening Levels

Media Column Title <sup>a</sup>	Column Letter	Pathway Column Title <sup>a</sup>	Included?		Comments
			Yes	No	
	BX	Applicable <b>PQL (RL)</b> Ch. 173-340 WAC		X	Not used in Step 2
EPA Method	BY	Analytical Method		X	Important documentation but not incorporated into SLs

Notes:

- (X) = used under specific conditions explained in the comment column
- ARAR = applicable or relevant and appropriate requirement
- CA EPA OEHHA = California Environmental Protection Agency Office of Environmental Health Hazard Assessment
- CalEPA = California Environmental Protection Agency
- Carc = carcinogenic
- CLARC = cleanup level and risk calculation
- COC = chemical of concern
- COPC = chemical of potential concern
- CSL = cleanup screening level
- CUL = cleanup level
- DL = detection level
- Ecol = ecological
- GTSP = Georgetown Steam Plant
- HH = human health
- LDW = Lower Duwamish Waterway
- MDL = method detection limit
- MTCA = Model Toxics Control Act
- NC = noncarcinogenic
- NRWQC = U.S. Environmental Protection Agency water quality criterion
- NTR = national toxics rule
- PQL = practical quantitation limit
- RL = reporting level
- SL = screening level
- SQS = sediment quality standard
- SWQS = Washington State water quality standard
- TEE = terrestrial ecological evaluation
- TMCL = total maximum contaminant load
- TSCA = Toxic Substances Control Act

<sup>a</sup>From Ecology's (2010) Draft LDW ARARs & CULs v12-17-2010

Table C-6. Rationale for Selection of ARARs to be Included in the Derivation of Step 2 Groundwater Screening Levels

Media Column Title <sup>a</sup>	Column Letter	Pathway Column Title <sup>a</sup>	Included?		Comments
			Yes	No	
Groundwater Method A	B	Groundwater Method A-HH <b>Potable</b> (Table 720-1) WAC 173-340-720(3)(b)(i)		X	Site does not qualify for Method A, but Method A SLs were used for petroleum and lead
	C	Groundwater Method A-HH <b>Potable ARARs</b> WAC 173-340-720(3)(b)(ii)		X	Values in this column are USGS health-based screening levels, which are not promulgated standards
	D	Groundwater State Quality Criteria WAC 173-340-(3)(b)(ii); WAC 173-200-040(3) <b>Table 9.1</b>		X	Not an ARAR under MTCA; State Board of Health values are the listed ARAR
	E	Groundwater Method A-HH Potable Safe Drinking Water Act, 40 CFR 141: WAC 173-290-310; WAC 173-340-720(3)(b)(ii)(A) <b>MCL</b>		X	Site does not qualify for Method A
	F	Groundwater Safe Drinking Water Act, 40 CFR 141: WAC 173-290-310; WAC 173-340-720(3)(b)(ii)(B) <b>MCLG (Non-Zero Goals)</b>		X	Site does not qualify for Method A
	G	Groundwater State Board Health, Ch. 246-290 WAC: WAC 173-340-720(3)(b)(ii)(C) <b>MCL</b>		X	Site does not qualify for Method A
	H	Groundwater State Board Health, Ch. 246-290 WAC: WAC 173-340-720(3)(b)(ii)(C) <b>MCG</b>		X	Site does not qualify for Method A
	I	Groundwater Method A- <b>Potable</b> No Table Values WAC 173-340-720(3)(b)(iii)		X	Site does not qualify for Method A
J	Groundwater Method A-HH Potable/Protect Surface Water WAC 173-340-720(3)(b)(iv)		X	Lower Duwamish Waterway not rated for drinking water per WAC 173-201A	
Groundwater Method B	K	Groundwater Method B-HH Potable ARARs WAC 173-340-720(4)(b)(i) Safe Drinking Water Standards — <b>MCLs</b>	X		
	L	Groundwater Method B-HH Potable ARARs WAC 173-340-720(4)(b)(i) Safe Drinking Water Standards — <b>MCGs</b>	X		
	M	Groundwater Method B-HH Potable ARARs WAC 173-340-720(4)(b)(i) State Department of Health Standards — <b>MCLs</b>	X		
	N	Groundwater Method B-HH Potable ARARs WAC 173-340-720(4)(b)(i) State Department of Health Standards — <b>MCGs</b>	X		
	O	Groundwater Method B-HH Non-carcinogenic/Potable WAC 173-340-720(4)(b)(iii)(A) CLARC Database	X		



Table C-6. Rationale for Selection of ARARs to be Included in the Derivation of Step 2 Groundwater Screening Levels

Media Column Title <sup>a</sup>	Column Letter	Pathway Column Title <sup>a</sup>	Included?		Comments
			Yes	No	
	P	Groundwater Method B-HH Carcinogen/Potable WAC 173-340-720(4)(b)(iii)(B) CLARC Database	X		
	Q	Groundwater Method B-HH Potable, Petroleum Mixture WAC 173-340-720(4)(b)(iii)(C) EQ. 720-3 (4-Phase Model)		(X)	Method B cleanup levels specific to GTSP were not calculated for screening purposes but were considered for Step 3 IALs
	R	Groundwater Method C-HH Potable ARARs WAC 173-340-720(5)(b)(i)		X	Site does not qualify for Method C
Groundwater Method C	S	Groundwater Method C-HH Protect Surface Water Highest Beneficial Use WAC 173-340-720(5)(b)(ii)		X	Site does not qualify for Method C
	T	Groundwater Method C-HH Non-carcinogenic/Potable WAC 173-340-720(5)(b)(iii)(A) CLARC Database		X	Site does not qualify for Method C
	U	Groundwater Method C-HH Carcinogen/Potable WAC 173-340-720(5)(b)(iii)(B) CLARC Database		X	Site does not qualify for Method C
	V	Groundwater Method C-HH Potable, Petroleum Mixture WAC 173-340-720(5)(b)(iii)(C) EQ. 720-3 (4-Phase Model)		X	Site does not qualify for Method C
Groundwater Pathway Evaluation	W	Groundwater Method B-HH Potable/Protect Surface Water WAC 173-340-720(4)(b)(ii)		X	The values in this column are from T117 and are not a promulgated standards
	X	Groundwater Non-Potable Surface Water Protection WAC 173-340-720(6)		X	Groundwater is potable
	Y	Groundwater to Sediment Protection Ecology <b>CSL</b> WAC 173-340-720(1)(c)	(X)		Only for specific chemicals identified as COCs in Slip 4 sediment (PCBs, indeno(1,2,3-cd)pyrene, BEHP, mercury, lead, zinc, and dioxin)
	Z	Groundwater to Sediment Protection Ecology <b>SQS</b> WAC 173-340-720(1)(c)	(X)		Only for specific chemicals identified as COCs in Slip 4 sediment
ARAR's	AA	EPA RCRA Plant 2 TMCLs		X	The values in this column are from Boeing Plant 2 and are not promulgated standards
ARAR's (Not Applied)	AB	EPA Tap Water Residential Screening Levels (5/2010)		X	These values are applicable to water system providers but not for setting groundwater CULs
Always Applicable	AC	Natural <b>Background</b> Levels Ch. 173-340 WAC	X		If derived screening level is below this value, screening level is adjusted to this value
	AD	Applicable <b>DL (MDL)</b> Ch. 173-340 WAC		X	Not used in Step 2
	AE	Applicable <b>PQL (RL)</b> Ch. 173-340 WAC		X	Not used in Step 2

Table C-6. Rationale for Selection of ARARs to be Included in the Derivation of Step 2 Groundwater Screening Levels

Media Column Title <sup>a</sup>	Column Letter	Pathway Column Title <sup>a</sup>	Included?		Comments
			Yes	No	
EPA Method	AF	Analytical Methods		X	Important documentation but not incorporated into SLs

Notes:

- (X) = used under specific conditions explained in the comment column
- ARAR = applicable or relevant and appropriate requirement
- BEHP = bis(2-ethylhexyl)phthalate
- CLARC = cleanup level and risk calculation
- COC = chemical of concern
- CSL = cleanup screening level
- DL = detection limit
- GTSP = Georgetown Steam Plant
- HH = human health
- IAL = interim action level
- MCG = maximum contaminant level goal
- MCL = maximum contaminant level
- MCLG = maximum contaminant level goal
- MDL = method detection limit
- PQL = practical quantitation limit
- SL = screening level
- SQS = sediment quality standard
- TMCL = total maximum contaminant load
- USGS = U.S. Geological Survey

<sup>a</sup>From Ecology's (2010) Draft LDW ARARs & CULs v12-17-2010

Table C-7. Rationale for Selection of ARARs to be Included in the Derivation of Step 2 Surface Water Screening Levels

Media Column Title <sup>a</sup>	Column Letter	Pathway Column Title <sup>a</sup>	Included?		Comments
			Yes	No	
Surface Water Method A	B	Surface Water Method A-HH ARARs WAC 173-340-730(2)(b)(i) [See Required ARARs]		X	Site does not qualify for Method A
	C	Surface Water Method A-WAC 173-340-730(2)(b)(i)(A) [See Required ARARs]		X	Site does not qualify for Method A
	D	Surface Water Method A-HH/Aquatic Organisms: CWA §304 WAC 173-340-730(2)(b)(i)(B) [See Required ARARs]		X	Site does not qualify for Method A
	E	Surface Water Method A-HH NTR - 40 CFR 131 WAC 173-340-730(2)(b)(i)(C) [See Required ARARs]		X	Site does not qualify for Method A
	F	Surface Water Method A-HH Potability WAC 173-340-730(2)(b)(ii) [See Required ARARs]		X	Site does not qualify for Method A
	G	Surface Water Method A-HH No Table Values WAC 173-340-730(2)(b)(iii) [See applicable surface water background or PQL values]		X	Site does not qualify for Method A
Surface Water Method B	H	Surface Water Method B-HH ARARs WAC 173-340-730(3)(b)(i) [See Required ARARs]		X	No values in column
	I	Surface Water Method B-WA WQS: Ch. 173-2101 A WAC 173-340-730(3)(b)(i)(A) [See Required ARARs]		X	No values in column
	J	Surface Water Method B-HH/Aquatic Organisms:CWA §304 WAC 173-340-730(3)(b)(i)(B) [See Required ARARs]		X	No values in column
	K	Surface Water Method B-HH NTR - 40 CFR 131 WAC 173-340-730(3)(b)(i)(C) [See Required ARARs]		X	No values in column
	L	Surface Water Method B, Environmental Effects WAC 173-340-730(3)(b)(ii) [WET TESTING]		X	Skykomish WET results are specific to the petroleum mixture at Skykomish and are not relevant to the petroleum mixture at GTSP
	M	Surface Water Method B-HH Non-carcinogen Fish Consumption WAC 173-340-730(3)(b)(iii)(A) Equation 730-1 CLARC Database	X		
	N	Surface Water, Method B-HH, Non-carcinogen, Fish Consumption WAC 173-340-730(3)© Equation 730-1 MOD - Tribal Adult	X		
	O	Surface Water, Method B-HH, Non-carcinogen, Fish Consumption WAC 173-340-730(3)© Equation 730-1 MOD - Tribal Child	X		
	P	Surface Water Method B-HH Carcinogen Fish Consumption WAC 173-340-730(3)(b)(iii)(B) Equation 730-2 CLARC Database	X		
Q	Surface Water, Method B-HH, Carcinogen, Fish Consumption WAC 173-340-730(3)(b)(iii)(B) Equation 730-2 MOD - Tribal Adult	X			

Table C-7. Rationale for Selection of ARARs to be Included in the Derivation of Step 2 Surface Water Screening Levels

Media Column Title <sup>a</sup>	Column Letter	Pathway Column Title <sup>a</sup>	Included?		Comments
			Yes	No	
Surface Water Method C	R	Surface Water, Method B-HH, Carcinogen, Fish Consumption WAC 173-340-730(3)(b)(iii)(B) Equation 730-2 MOD - Tribal Child	X		
	S	Surface Water Method B-HH Petroleum Mixture WAC 173-340-730(3)(b)(iii)(C)		X	The values in this column are from T117 and are not promulgated standards
	T	Surface Water Method B-HH Potability WAC 173-340-730(3)(b)(iv)		X	Lower Duwamish Waterway not rated for drinking water per WAC 173-201A
	U	Surface Water Method C-HH ARARs WAC 173-340-730(4)(b)(i) [See Required ARARs]		X	Site does not qualify for Method C
	V	Surface Water Method C, Environmental Effects WAC 173-340-730(4)(b)(ii) [WET TESTING]		X	Site does not qualify for Method C
	W	Surface Water Method C, Non-carcinogen Fish Consumption WAC 173-340-730(4)(b)(iii)(A) Equation 730-1 CLARC Database		X	Site does not qualify for Method C
	X	Surface Water Method C, Carcinogen Fish Consumption WAC 173-340-730(4)(b)(iii)(B) Equation 730-2 CLARC Database		X	Site does not qualify for Method C
	Y	Surface Water Method C, Petroleum Mixture WAC 173-340-730(4)(b)(iii)(C)		X	Site does not qualify for Method C
	Z	Surface Water Method C-HH Potability WAC 173-340-730(4)(b)(iv)		X	Site does not qualify for Method C
Surface Water MTCA Method A,B,C Required ARARs	AA	Surface Water Aquatic Life <b>SWQS</b> :RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) <b>Fresh - Acute</b>	X		
	AB	Surface Water Aquatic Life <b>SWQS</b> :RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) <b>Fresh - Chronic</b>	X		
	AC	Surface Water Aquatic Life <b>SWQS</b> :RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) <b>Marine - Acute</b>	X		
	AD	Surface Water Aquatic Life <b>SWQS</b> :RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) <b>Marine - Chronic</b>	X		
	AE	Surface Water HH-Consumption; Water + Organism CWA §304 <b>NRWQC</b>		X	Lower Duwamish Waterway not rated for drinking water
	AF	Surface Water HH-Consumption; Organism Only CWA §304 <b>NRWQC</b>	X		
	AG	Surface Water HH-Organoleptic Effects CWA §304 <b>NRWQC</b>	X		
	AH	Surface Water Aquatic Life Fresh/Acute CWA §304 <b>NRWQC</b>	X		

Table C-7. Rationale for Selection of ARARs to be Included in the Derivation of Step 2 Surface Water Screening Levels

Media Column Title <sup>a</sup>	Column Letter	Pathway Column Title <sup>a</sup>	Included?		Comments
			Yes	No	
	AI	Surface Water Aquatic Life Fresh/Chronic CWA §304 <b>NRWQC</b>	X		
	AJ	Surface Water Aquatic Life Marine/Acute CWA §304 <b>NRWQC</b>	X		
	AK	Surface Water Aquatic Life Marine/Chronic CWA §304 <b>NRWQC</b>	X		
	AL	Surface Water Aquatic Life Fresh/Acute <b>NTR</b> - 40 CFR 131.36	X		
	AM	Surface Water Aquatic Life Fresh/Chronic <b>NTR</b> - 40 CFR 131.36	X		
	AN	Surface Water Aquatic Life Marine/Acute <b>NTR</b> - 40 CFR 131.36	X		
	AO	Surface Water Aquatic Life Marine/Chronic <b>NTR</b> - 40 CFR 131.36	X		
	AP	Surface Water HH-Fresh Water <b>Water &amp; Organism Consumption NTR</b> - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10-6 Carc Risk		X	Lower Duwamish Waterway not rated for drinking water
	AQ	Surface Water HH-Fresh Water <b>Organism Consumption Only NTR</b> - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10-6 Carc Risk	X		
	AR	Surface Water HH-Marine Water <b>Organism Consumption Only NTR</b> - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10-6 Carc Risk	X		
Surface Water ARAR	AS	Surface Water Discharge ( <b>NPDES</b> ) 40 CFR 122, 125/RCW 90-48; WAC 173-216, -220, -122		X	Applicable to construction storm water but not to groundwater
	AT	Waste Water - Toxics Substances Control Act ( <b>TSCA</b> ) 40 CFR 761.61		X	Applicable to remediation wastes but not to groundwater
	AU	Shoreline Management Act RCW 90-58; WAC 173-16; King County/City Seattle Shoreline Master Plans (KCC Title 25;SMC 23.60)		X	Site is outside of shoreline district boundaries
	AV	Groundwater to Sediment Protection Ecology <b>CSL</b> WAC 173-340-730(1)(d)	(X)		Only for specific chemicals identified as COCs in Slip 4 sediment (PCBs, indeno(1,2,3-cd)pyrene, BEHP, mercury, lead, zinc, and dioxin)
	AW	Groundwater to Sediment Protection Ecology <b>SQS</b> WAC 173-340-730(1)(d)	(X)		Only for specific chemicals identified as COCs in Slip 4 sediment
	AX	Surface Water HH - Adult Non-Carcinogen Tribal Fish Consumption without Salmon EPA RCRA (using EQ 730-1)	X		
	AY	Surface Water HH - Child Non-Carcinogen Tribal Fish Consumption without Salmon EPA RCRA (using EQ 730-1)	X		

Table C-7. Rationale for Selection of ARARs to be Included in the Derivation of Step 2 Surface Water Screening Levels

Media Column Title <sup>a</sup>	Column Letter	Pathway Column Title <sup>a</sup>	Included?		Comments
			Yes	No	
	AZ	Surface Water HH - Adult Non-Carcinogen Tribal Fish Consumption without Salmon EPA RCRA (using EQ 730-2)	X		
	BA	Surface Water HH - Child Non-Carcinogen Tribal Fish Consumption without Salmon EPA RCRA (using EQ 730-2)	X		
Always Applicable	BB	Natural <b>Background</b> Levels Ch. 173-340 WAC	X		If derived screening level is below this value, screening level is adjusted to this value
	BC	Applicable <b>DL (MDL)</b> Ch. 173-340 WAC		X	Not used in Step 2
	BD	Applicable <b>PQL (RL/RDL)</b> Ch. 173-340 WAC		X	Not used in Step 2
	BE	Analytical method		X	Important documentation but not incorporated into SLs
	BF	Natural Background Levels, Ch. 173-340 WAC, LDW	X		If derived screening level is below this value, screening level is adjusted to this value

Notes:

- (X) = used under specific conditions explained in the comment column
- ARAR = applicable or relevant and appropriate requirement
- BEHP = bis(2-ethylhexyl)phthalate
- CLARC = cleanup level and risk calculation
- COC = chemical of concern
- CSL = cleanup screening level
- CWA = clean water act
- EPA = U.S. Environmental Protection Agency
- GTSP = Georgetown Steam Plant
- HH = human health
- MDL = method detection limit
- NPDES = national pollutant discharge elimination system
- NRWQC = U.S. Environmental Protection Agency water quality criterion
- NTR = national toxics rule
- NV = no value available
- PQL = practical quantitation limit
- RCRA = Resource Conservation and Recovery Act
- SQS = sediment quality standard
- SL = screening level
- SWQS = Washington State water quality standard
- TSCA = Toxic Substances Control Act
- WET = whole effluent toxicity
- WQS = water quality standard

<sup>a</sup>From Ecology's (2010) Draft LDW ARARs & CULs v12-17-2010

## **APPENDIX D**

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### **RESULTS OF STEP 2 SCREEN**

Table D-1. Step 2 Soil Screening Summary (mg/kg)

Group	Chemical	Screening Level	CAS No.	Total No. Samples	Total No. Detects	Freq Detect (%)	Min Detect	Max Detect	Ratio of Max Detect to SL	No. Detected Exceed	Freq Detected Exceed (%)	Min MDL	Max MDL	Ratio of Max MDL to SL	No. MDL Exceed	Freq MDL Exceed (%)
<b>Leaching</b>																
Metals	Arsenic	7.00E+00	7440-38-2	69	31	45	6.00E+00	1.40E+02	2.00E+01	25	81	3.10E-01	7.00E+00	1.00E+00		
	Cadmium	1.00E+00	7440-43-9	96	49	51	2.00E-01	5.30E+00	5.30E+00	6	12	2.00E-02	1.00E+00	1.00E+00		
	Nickel	3.80E+01	7440-02-0	69	69	100	3.00E+00	2.33E+03	6.13E+01	13	19					0
PCBs	Total PCBs	1.20E-04	SMSPCB	282	134	48	2.40E-02	3.80E+03	3.17E+07	134	100	3.00E-08	9.40E-02	7.83E+02	145	98
SVOCs	Bis(2-ethylhexyl) phthalate	3.17E-02	117-81-7	133	49	37	1.10E-02	7.85E+01	2.48E+03	32	65	8.30E-03	3.10E-01	9.78E+00	29	35
	Tetrachloroethene	1.10E-05	127-18-4	44	2	5	1.40E-03	3.00E-03	2.73E+02	2	100	4.30E-04	6.40E-01	5.82E+04	42	100
VOCs	Trichloroethene	1.87E-04	79-01-6	44	1	2	1.40E-03	1.40E-03	7.49E+00	1	100	5.50E-04	8.20E-01	4.39E+03	43	100
	Vinyl chloride	4.89E-06	75-01-4	44	1	2	1.60E-03	1.60E-03	3.27E+02	1	100	1.70E-04	2.50E-01	5.11E+04	43	100
<b>Direct Contact</b>																
Dioxins and furans	TCDD TEQ (ND = 1/2DL)	5.20E-06	TEQ_DIOXIN.5	9	9	100	1.30E-07	1.41E-04	2.71E+01	5	56					0
	Arsenic	7.00E+00	7440-38-2	69	31	45	6.00E+00	1.40E+02	2.00E+01	25	81	3.10E-01	7.00E+00	1.00E+00		
	Cadmium	3.60E+01	7440-43-9	96	49	51	2.00E-01	5.30E+00	1.47E-01			2.00E-02	1.00E+00	2.78E-02		
	Chromium	1.35E+02	7440-47-3	96	96	100	9.30E+00	1.32E+02	9.78E-01							0
	Chromium hexavalent	1.17E+02	18540-29-9	27	2	7	1.35E-01	8.57E-01	7.32E-03			1.15E-01	2.46E-01	2.10E-03		
Metals	Copper	5.50E+02	7440-50-8	69	69	100	5.30E+00	2.61E+03	4.75E+00	1	1					0
	Lead	2.20E+02	7439-92-1	69	61	88	2.00E+00	2.83E+03	1.29E+01	2	3	1.80E-01	2.10E-01	9.55E-04		
	Mercury	5.60E+00	7439-97-6	96	57	59	2.00E-02	3.30E+00	5.89E-01			7.80E-04	6.00E-02	1.07E-02		
	Nickel	1.60E+03	7440-02-0	69	69	100	3.00E+00	2.33E+03	1.46E+00	1	1					0
	Tin	4.70E+04	7440-31-5	69	14	20	1.00E+00	7.90E+01	1.68E-03			1.80E-01	1.20E+00	2.55E-05		
	Zinc	5.70E+02	7440-66-6	69	69	100	1.15E+01	2.85E+03	5.00E+00	1	1					0
	Acenaphthene	3.40E+03	83-32-9	145	24	17	1.10E-02	1.30E+01	3.82E-03			1.40E-03	2.00E+01	5.88E-03		
	Acenaphthylene		208-96-8	145	16	11	6.50E-03	1.60E-01				1.30E-03	2.00E+01			
	Anthracene	1.70E+04	120-12-7	145	44	30	4.90E-03	4.90E+01	2.88E-03			1.30E-03	2.00E+01	1.18E-03		
	Benzo(g,h,i)perylene		191-24-2	145	58	40	8.40E-03	1.20E+02				1.90E-03	2.00E+01			
PAHs	Fluoranthene	2.30E+03	206-44-0	145	89	61	9.90E-03	4.40E+02	1.91E-01			1.30E-03	2.00E+01	8.70E-03		
	Fluorene	2.30E+03	86-73-7	145	30	21	7.90E-03	4.90E+01	2.13E-02			1.30E-03	8.20E-02	3.57E-05		
	1-Methylnaphthalene	2.20E+01	90-12-0	136	62	46	4.80E-03	9.40E+00	4.27E-01			1.20E-03	9.50E-02	4.32E-03		
	2-Methylnaphthalene	3.10E+02	91-57-6	145	69	48	5.50E-03	5.20E+02	1.68E+00	1	1	1.90E-03	7.00E-02	2.26E-04		
	Naphthalene	3.60E+00	91-20-3	150	49	33	5.30E-03	3.50E+00	9.72E-01			1.00E-04	2.00E+01	5.56E+00	1	1
	Phenanthrene		85-01-8	145	98	68	6.20E-03	2.80E+02				1.30E-03	6.60E-02			
	Pyrene	1.70E+03	129-00-0	145	94	65	4.70E-03	3.80E+02	2.24E-01			1.30E-03	6.60E-02	3.88E-05		
PCBs	BaP TEQ	1.50E-02	BAPEQ	145	85	59	2.47E-03	2.86E+02	1.91E+04	70	82	4.60E-03	2.00E+01	1.33E+03	30	50
	Total PCBs	2.20E-01	SMSPCB	282	134	48	2.40E-02	3.80E+03	1.73E+04	82	61	3.00E-08	9.40E-02	4.27E-01		
	Diesel Range Hydrocarbons	2.00E+03	DRH	159	83	52	5.40E+00	1.50E+04	7.50E+00	12	14	5.20E-03	5.00E+01	2.50E-02		
Petroleum	Gasoline Range Hydrocarbons	30 <sup>a</sup>	GRH	146	36	25	7.00E+00	4.50E+03	1.50E+02	24	67	5.60E-03	3.20E+01	1.07E+00	1	1
	Motor oil	2.00E+03	M09800000	159	90	57	1.30E+01	1.80E+04	9.00E+00	12	13	1.00E-02	1.00E+02	5.00E-02		
	TPH	2.00E+03	TPH	158	95	60	1.07E+01	3.52E+04	1.76E+01	17	18	1.00E-02	1.00E+02	5.00E-02		
	Bis(2-ethylhexyl) phthalate	3.50E+01	117-81-7	133	49	37	1.10E-02	7.85E+01	2.24E+00	1	2	8.30E-03	3.10E-01	8.86E-03		
	Butylbenzyl phthalate	2.60E+02	85-68-7	133	1	1	6.10E-02	6.10E-02	2.35E-04			3.90E-03	2.00E+01	7.69E-02		
	Carbazole	5.00E+01	86-74-8	132	21	16	1.00E-02	2.00E+01	4.00E-01			2.30E-03	6.60E-02	1.32E-03		
SVOCs	Dibenzofuran	7.80E+01	132-64-9	145	65	45	4.80E-03	2.40E+01	3.08E-01			1.50E-03	7.30E-02	9.36E-04		
	Dimethyl phthalate	8.00E+01	131-11-3	133	8	6	1.50E-02	5.80E-02	7.25E-04			3.50E-03	2.00E+01	2.50E-01		
	Di-n-octyl phthalate	1.60E+03	117-84-0	133	2	2	1.30E-02	2.50E-01	1.56E-04			5.00E-03	2.00E+01	1.25E-02		
	Isophorone	1.10E+03	78-59-1	132	4	3	3.50E-02	5.30E+00	4.82E-03			2.50E-03	9.50E-02	8.64E-05		
	Pentachlorophenol	3.00E+00	87-86-5	127	1	1	3.80E-02	3.80E-02	1.27E-02			2.60E-02	9.70E-01	3.23E-01		
	Tributyl phosphate	5.30E+01	126-73-8	48	10	21	1.20E-02	5.40E-01	1.02E-02			5.40E-03	6.60E-02	1.25E-03		
	Acetone	8.00E+03	67-64-1	44	21	48	1.00E-02	3.10E-01	3.88E-05			5.20E-03	3.60E+00	4.50E-04		
	Benzene	1.10E+00	71-43-2	50	8	16	1.30E-03	7.30E-02	6.64E-02				3.50E-01	3.18E-01		
	Ethylbenzene	5.40E+00	100-41-4	50	3	6	5.80E-03	4.10E-01	7.59E-02				1.40E-01	2.59E-02		
	Methylene chloride	1.10E+01	75-09-2	44	2	5	3.70E-03	4.60E-03	4.18E-04			7.60E-04	1.10E+00	1.00E-01		
	Phenol	1.80E+04	108-95-2	128	21	16	1.50E-02	3.30E-02	1.83E-06			3.60E-03	2.20E+01	1.22E-03		
VOCs	Tetrachloroethene	5.50E-01	127-18-4	44	2	5	1.40E-03	3.00E-03	5.45E-03			4.30E-04	6.40E-01	1.16E+00	1	2



Table D-1. Step 2 Soil Screening Summary (mg/kg)

Group	Chemical	Screening Level	CAS No.	Total No. Samples	Total No. Detects	Freq Detect (%)	Min Detect	Max Detect	Ratio of Max Detect to SL	No. Detected Exceed	Freq Detected Exceed (%)	Min MDL	Max MDL	Ratio of Max MDL to SL	No. MDL Exceed	Freq MDL Exceed (%)
	Trichloroethene	2.80E+00	79-01-6	44	1	2	1.40E-03	1.40E-03	5.00E-04			5.50E-04	8.20E-01	2.93E-01		
	1,2,4-Trimethylbenzene	6.20E+01	95-63-6	44	4	9	2.05E-03	2.20E+00	3.55E-02			1.30E-04	9.20E-03	1.48E-04		
	Vinyl chloride	6.00E-02	75-01-4	44	1	2	1.60E-03	1.60E-03	2.67E-02			1.70E-04	2.50E-01	4.17E+00	1	2
	m,p-Xylene	6.30E+02	179601-23-1	50	6	12	2.30E-03	8.00E-01	1.27E-03				4.20E-01	6.67E-04		
	o-Xylene	6.30E+02	95-47-6	50	5	10	2.60E-03	6.60E-01	1.05E-03				3.30E-01	5.24E-04		

**Notes:**

BaP = benzo(a)pyrene  
 CAS = Chemical Abstract Service  
 COPC = chemical of potential concern  
 DL = detection level  
 MDL = method detection limit  
 Freq = frequency  
 FOD = frequency of detection  
 Max = maximum  
 ND = not detected  
 PAH = polycyclic aromatic hydrocarbons  
 PCB = polychlorinated biphenyl  
 SL = screening level  
 SVOC = semivolatile organic compound  
 TCDD = 2,3,7,8-tetrachlorodibenzo-p-dioxin  
 TEQ = toxicity equivalency  
 VOC = volatile organic compound  
<sup>a</sup> The Method A value of 30 mg/kg was used because benzene has been detected in soil.

**Column headers:**

Group: chemical grouping  
 Chemical: chemical name  
 Screening Level: Step 2 soil screening level shown in Table C-2  
 CAS No.: identification number assigned by the Chemical Abstracts Service  
 Total No. Samples: total number of samples analyzed (not including duplicates and replicates)  
 Total No. Detects: total number of samples classified as detected  
 Freq Detect (%): frequency of detection  
 Min Detect: minimum detected concentration on site  
 Max Detect: maximum detected concentration on site  
 Ratio of Max Detect to Screening Level: ratio of maximum detected concentration on site to Step 2 soil screening level  
 No. Detected Exceed: number of samples classified as detected that exceed Step 2 soil screening level  
 Freq Detected Exceed (%): frequency of samples classified as detected exceeding Step 2 soil screening level  
 Min MDL: minimum method detection limit reported by lab for samples classified as not detected  
 Max MDL: maximum method detection limit reported by lab for samples classified as not detected  
 Ratio of Max MDL to Screening Level: ratio of maximum method detection limit for samples classified as not detected to Step 2 soil screening level  
 No. MDL Exceed: number of samples classified as not detected that exceed Step 2 soil screening level  
 Freq MDL Exceed (%): frequency of samples classified as not detected exceeding Step 2 soil screening level  
 Total Freq Exceed (%): frequency of all samples (detected or not) exceeding Step 2 soil screening level  
 Freq Detect >5%?: yes if frequency of detection exceeds 5%, otherwise no  
 Total Freq Exceed >5%?: yes if total frequency of all samples (detected or not) exceeding Step 2 soil screening level exceeds 5%,  
 Ratio of Max Detect to SL >1?: yes if ratio of maximum detected concentration to Step 2 soil screening level exceeds 1, otherwise no  
 Ratio of Max MDL to SL >1?: yes if ratio of maximum method detection limit for samples classified as not detected to Step 2 soil screening level exceeds 1, otherwise no  
 Final COPC: final chemical of potential concern (yes/no)  
 Reason for Exclusion: rationale for eliminating a chemical as a COPC

Table D-1. Step 2 Soil Screening Summary (mg/kg)

Group	Chemical	Screening Level	Total Freq Exceed (%)	Freq Detect > 5%?	Total Freq Exceed > 5%?	Ratio of Max Detect to SL > 1?	Ratio of Max MDL to SL > 1?	Final COPC	Reason for Exclusion	
<b>Leaching</b>										
Metals	Arsenic	7.00E+00	36	Yes	Yes	Yes	No	Yes		
	Cadmium	1.00E+00	6	Yes	Yes	Yes	No	Yes		
	Nickel	3.80E+01	19	Yes	Yes	Yes	No	Yes		
PCBs	Total PCBs	1.20E-04	99	Yes	Yes	Yes	Yes	Yes		
SVOCs	Bis(2-ethylhexyl) phthalate	3.17E-02	46	Yes	Yes	Yes	No	Yes		
	Tetrachloroethene	1.10E-05	100	No	Yes	Yes	Yes	Yes	Though FOD not greater than 5%, 100% total frequency of exceedance, so analyte retained	
VOCs	Trichloroethene	1.87E-04	100	No	Yes	Yes	Yes	Yes	Though FOD not greater than 5%, 100% total frequency of exceedance, so analyte retained	
	Vinyl chloride	4.89E-06	100	No	Yes	Yes	Yes	Yes	Though FOD not greater than 5%, 100% total frequency of exceedance, so analyte retained	
<b>Direct Contact</b>										
Dioxins and furans	TCDD TEQ (ND = 1/2DL)	5.20E-06	56	Yes	Yes	Yes	No	Yes		
	Arsenic	7.00E+00	36	Yes	Yes	Yes	No	Yes		
Metals	Cadmium	3.60E+01		Yes	No	No	No	No	Max detect does not exceed SL	
	Chromium	1.35E+02		Yes	No	No	No	No	Max detect does not exceed SL	
	Chromium hexavalent	1.17E+02		Yes	No	No	No	No	Max detect does not exceed SL	
	Copper	5.50E+02	1	Yes	No	Yes	No	Yes		
	Lead	2.20E+02	3	Yes	No	Yes	No	Yes		
	Mercury	5.60E+00		Yes	No	No	No	No	Max detect does not exceed SL	
	Nickel	1.60E+03	1	Yes	No	Yes	No	Yes		
	Tin	4.70E+04		Yes	No	No	No	No	Max detect does not exceed SL	
	Zinc	5.70E+02	1	Yes	No	Yes	No	Yes		
	Acenaphthene	3.40E+03		Yes	No	No	No	No	Max detect does not exceed SL	
PAHs	Acenaphthylene			Yes	No	No	No	No	Max detect does not exceed SL	
	Anthracene	1.70E+04		Yes	No	No	No	No	Max detect does not exceed SL	
	Benzo(g,h,i)perylene			Yes	No	No	No	No	Max detect does not exceed SL	
	Fluoranthene	2.30E+03		Yes	No	No	No	No	Max detect does not exceed SL	
	Fluorene	2.30E+03		Yes	No	No	No	No	Max detect does not exceed SL	
	1-Methylnaphthalene	2.20E+01		Yes	No	No	No	No	Max detect does not exceed SL	
	2-Methylnaphthalene	3.10E+02	1	Yes	No	Yes	No	Yes		
	Naphthalene	3.60E+00	1	Yes	No	No	Yes	No	Max detect does not exceed SL	
	Phenanthrene			Yes	No	No	No	No	Max detect does not exceed SL	
	Pyrene	1.70E+03		Yes	No	No	No	No	Max detect does not exceed SL	
PCBs	BaP TEQ	1.50E-02	69	Yes	Yes	Yes	Yes	Yes		
	Total PCBs	2.20E-01	29	Yes	Yes	Yes	No	Yes		
	Diesel Range Hydrocarbons	2.00E+03	8	Yes	Yes	Yes	No	Yes		
Petroleum	Gasoline Range Hydrocarbons	30 <sup>a</sup>	17	Yes	Yes	Yes	Yes	Yes		
	Motor oil	2.00E+03	8	Yes	Yes	Yes	No	Yes		
SVOCs	TPH	2.00E+03	11	Yes	Yes	Yes	No	Yes		
	Bis(2-ethylhexyl) phthalate	3.50E+01	1	Yes	No	Yes	No	Yes		
	Butylbenzyl phthalate	2.60E+02		No	No	No	No	No	Max detect does not exceed SL, FOD not greater than 5%	
	Carbazole	5.00E+01		Yes	No	No	No	No	Max detect does not exceed SL	
	Dibenzofuran	7.80E+01		Yes	No	No	No	No	Max detect does not exceed SL	
	Dimethyl phthalate	8.00E+01		Yes	No	No	No	No	Max detect does not exceed SL	
	Di-n-octyl phthalate	1.60E+03		No	No	No	No	No	Max detect does not exceed SL, FOD not greater than 5%	
	Isophorone	1.10E+03		No	No	No	No	No	Max detect does not exceed SL, FOD not greater than 5%	
	Pentachlorophenol	3.00E+00		No	No	No	No	No	Max detect does not exceed SL, FOD not greater than 5%	
	Tributyl phosphate	5.30E+01		Yes	No	No	No	No	Max detect does not exceed SL	
SVOCs	Acetone	8.00E+03		Yes	No	No	No	No	Max detect does not exceed SL	
	Benzene	1.10E+00		Yes	No	No	No	No	Max detect does not exceed SL	
	Ethylbenzene	5.40E+00		Yes	No	No	No	No	Max detect does not exceed SL	
	Methylene chloride	1.10E+01		No	No	No	No	No	Max detect does not exceed SL, FOD not greater than 5%	
	Phenol	1.80E+04		Yes	No	No	No	No	Max detect does not exceed SL	
	VOCs	Tetrachloroethene	5.50E-01	2	No	No	No	Yes	No	Max detect does not exceed SL, FOD not greater than 5%

Table D-1. Step 2 Soil Screening Summary (mg/kg)

Group	Chemical	Screening Level	Total Freq Exceed (%)	Freq Detect > 5%?	Total Freq Exceed > 5%?	Ratio of Max Detect to SL > 1?	Ratio of Max MDL to SL > 1?	Final COPC	Reason for Exclusion
	Trichloroethene	2.80E+00		No	No	No	No	No	Max detect does not exceed SL, FOD not greater than 5%
	1,2,4-Trimethylbenzene	6.20E+01		Yes	No	No	No	No	Max detect does not exceed SL
	Vinyl chloride	6.00E-02	2	No	No	No	Yes	No	Max detect does not exceed SL, FOD not greater than 5%
	m,p-Xylene	6.30E+02		Yes	No	No	No	No	Max detect does not exceed SL
	o-Xylene	6.30E+02		Yes	No	No	No	No	Max detect does not exceed SL

Table D-2. Step 2 Groundwater Screening Summary (µg/L)

Group	Chemical	CAS No.	Screening Level	Total No. Samples	Total No. Detects	Freq Detect (%)	Min Detect	Max Detect	Ratio of Max Detect to SL	No. Detected Exceed	Freq Detected Exceed (%)	Min MDL	Max MDL	Ratio of Max MDL to SL	No. MDL Exceed	Freq MDL Exceed (%)	Total Freq Exceed (%)	Freq Detect > 5%?	Total Freq Exceed > 5%?	Ratio of Max Detect to SL > 1?	Ratio of Max MDL to SL > 1?	Final COPC	Reason for Exclusion
Metals	Arsenic	7440-38-2	1.20E+00	7	7	100	5.00E-01	3.40E+00	2.83E+00	2	29					0	29	Yes	Yes	Yes	No	Yes	
Metals	Cadmium	7440-43-9	2.50E-01	17	1	6	1.15E+00	1.15E+00	4.60E+00	1	100	1.00E-02	2.10E-01	8.40E-01			6	Yes	Yes	Yes	No	Yes	
Metals	Nickel	7440-02-0	8.20E+00	7	7	100	8.50E-01	3.30E+01	4.02E+00	1	14					0	14	Yes	Yes	Yes	No	Yes	
PAHs	Low Molecular Weight PAH	SMSLPAH		9	2	22	6.15E-01	1.63E+00				4.00E-02	4.00E-02					Yes	No	No	No	No	Lack of SL
PCBs	Total PCB (SMSPCB)	SMSPCB	1.53E-03	11	4	36	1.20E-02	4.30E+00	2.81E+03	4	100	3.20E-03	3.20E-03	2.09E+00	7	100	100	Yes	Yes	Yes	Yes	Yes	
SVOCs	Bis(2-ethylhexyl) phthalate	117-81-7	2.85E-01	19	1	5	1.70E+00	1.70E+00	5.97E+00	1	100	2.50E-01	1.00E+00	3.51E+00	8	44	47	No	Yes	Yes	Yes	Yes	
VOCs	Tetrachloroethene	127-18-4	2.06E-02	29	6	21	3.30E-02	1.20E-01	5.82E+00	6	100	4.00E-03	9.00E-02	4.37E+00	7	30	45	Yes	Yes	Yes	Yes	Yes	
VOCs	Trichloroethene	79-01-6	4.90E-01	29	10	34	4.40E-02	1.10E+00	2.24E+00	4	40	8.00E-03	8.00E-02	1.63E-01			14	Yes	Yes	Yes	No	Yes	
VOCs	Vinyl chloride	75-01-4	2.90E-02	29	1	3	2.80E-02	2.80E-02	9.66E-01			2.00E-03	8.00E-02	2.76E+00	7	25	24	No	Yes	No	Yes	Yes	

**Notes:**

CAS = Chemical Abstract Service  
 COPC = chemical of potential concern  
 Freq = frequency  
 MDL = method detection limit  
 PAH = polycyclic aromatic hydrocarbon  
 PCB = polychlorinated biphenyl  
 SVOC = semivolatile organic compound  
 SL = screening level  
 VOC = volatile organic compound

**Column headers:**

Group: chemical grouping  
 Chemical: chemical name  
 CAS No.: identification number assigned by the Chemical Abstracts Service  
 Screening Level: Step 2 groundwater screening level shown in Table C-3  
 Total No. Samples: total number of samples analyzed (not including duplicates and replicates)  
 Total No. Detects: total number of samples classified as detected  
 Freq Detect (%): frequency of detection  
 Min Detect: minimum detected concentration on site  
 Max Detect: maximum detected concentration on site  
 Ratio of Max Detect to Screening Level: ratio of maximum detected concentration on site to Step 2 groundwater screening level  
 No. Detected Exceed: number of samples classified as detected that exceed Step 2 groundwater screening level  
 Freq Detected Exceed (%): frequency of samples classified as detected exceeding Step 2 groundwater screening level  
 Min MDL: minimum method detection limit reported by lab for samples classified as not detected  
 Max MDL: maximum method detection limit reported by lab for samples classified as not detected  
 Ratio of Max MDL to Screening Level: ratio of maximum method detection limit for samples classified as not detected to Step 2 groundwater screening level  
 No. MDL Exceed: number of samples classified as not detected that exceed Step 2 groundwater screening level  
 Freq MDL Exceed (%): frequency of samples classified as not detected exceeding Step 2 groundwater screening level  
 Total Freq Exceed (%): frequency of all samples (detected or not) exceeding Step 2 groundwater screening level  
 Freq Detect >5%?: yes if frequency of detection exceeds 5%, otherwise no  
 Total Freq Exceed >5%?: yes if total frequency of all samples (detected or not) exceeding Step 2 groundwater screening level exceeds 5%, otherwise no  
 Ratio of Max Detect to SL >1?: yes if ratio of maximum detected concentration to Step 2 groundwater screening level exceeds 1, otherwise no  
 Ratio of Max MDL to SL >1?: yes if ratio of maximum method detection limit for samples classified as not detected to Step 2 groundwater screening level exceeds 1, otherwise no  
 Final COPC: final chemical of potential concern (yes/no)  
 Reason for Exclusion: rationale for eliminating a chemical as a COPC

## **APPENDIX E**

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### **DEVELOPMENT OF STEP 3 INTERIM ACTION LEVELS**

Table E-1. Soil TPH, Redox Conditions, and Groundwater Arsenic

Well	Date	Depth (ft)	TPH in Soil		Arsenic and Redox in Groundwater			
			Maximum TPH Saturated Zone (mg/kg)	Free Product Present?	Date	Maximum Arsenic (µg/L)	Redox (ORP) (mV)	pH
GTSP1			ND	NE	6/18/2010	1	228	NA
GTSP2	7/27/2006	8	11	NE	6/17/2010	0.5	11	NA
GTSP3	7/27/2006	6	15	NE	6/18/2010	0.9	59	NA
GTSP4	7/27/2006	7	27	No	6/18/2010	0.5	168	6.79
GTSP5	7/28/2006	6	120	Yes: stain, HC odor, possible sheen	6/18/2010	1.6	-44	6.78
GTSP6	6/16/2010	11	16,500	Yes: in saturated zone	6/18/2010	3.4	-45	6.75
LLATW01			NA			NA	NA	NA
LLATW02			NA	NA		NA	NA	NA
LLATW03			NA	NA		NA	NA	NA
LLATW04			NA	NA		NA	NA	NA
SYATW01			NE	NE		NE	NE	NE
FTATW01	1/21/2011	11	35,200	Yes: free product in well	11/16/2010	NA	NA	NA
FTATW02	1/21/2011	9.5	12,800	Yes: droplets of product in casing	11/16/2010	NA	-39	6.4
FTATW03	1/21/2011	11	4.1	No	11/16/2010	NA	-37	5.23

Notes:

HC = hydrocarbon

ORP = oxidation/reduction potential

NA = not analyzed

ND = not detected

NE = not evaluated

TPH = total petroleum hydrocarbons

It appears that reducing conditions exist ONLY in wells (GTSP5 and GTSP6) where arsenic in GW is elevated (above 1 ppb).

It appears that the reducing conditions exist at locations with elevated TPH except for FTATW03.

Table E-2. Method B Soil Interim Action Levels for Petroleum Calculated Using MTCATPH11

Carbon Chain Range	Area				Fuel Tank Area				Low Lying Area									
	Sample		FTASB02-9.5		FTASB02-9.5S		FTASB04-8		BH-11.0		LLASB02-5		LLATW01-5					
	Lab Result (ug/kg)	Data Entered (mg/kg)	Lab Result (ug/kg)	Data Entered (mg/kg)	Lab Result (ug/kg)	Data Entered (mg/kg)	Lab Result (ug/kg)	Data Entered (mg/kg)	Lab Result (ug/kg)	Data Entered (mg/kg)	Lab Result (ug/kg)	Data Entered (mg/kg)	Lab Result (ug/kg)	Data Entered (mg/kg)				
<b>MTCATPH11 Input</b>																		
Aliphatic C5-6 <sup>a</sup>	14,000	U	0	62,000	U	0	12,000	U	0	12,000	U	0	71,000	U	0	120,000	U	0
Aliphatic C6-8	14,000	U	7	62,000	U	31	12,000	U	6	120,000		120	71,000	U	36	120,000	U	60
Aliphatic C8-10	43,000		43	66,000		66	12,000	U	6	150,000		150	3,600		3.6	34,000		34
Aliphatic C10-12	340,000		340	460,000		460	12,000	U	6	570,000		570	96,000		96	260,000		260
Aliphatic C12-16	1,500,000		1,500	1,500,000		1,500	38,000		38	3,200,000		3,200	230,000		230	580,000		580
Aliphatic C16-21	1,600,000		1,600	1,600,000		1,600	180,000		180	4,200,000		4,200	38,000		38	150,000		150
Aliphatic C21-34	2,900,000		2,900	2,700,000		2,700	590,000		590	8,300,000		8,300	41,000		41	170,000		170
Aromatic C8-10	22,000		22	290,000		290	12,000	U	12	370,000		351	96,000		96	240,000		240
Aromatic C10-12	83,000		81	860,000		859	12,000	U	12	1,400,000		1,397	1,000,000		1,000	2,100,000		2,100
Aromatic C12-16	380,000		376	850,000		846	12,000	U	12	790,000		766	760,000		760	1,600,000		1,600
Aromatic C16-21	1,600,000		1,600	1,400,000		1,400	93,000		93	3,200,000		3,200	20,000		20	100,000		100
Aromatic C21-34	2,600,000		2,598.35	2,400,000		2,398	600,000		600	6,600,000		6,596	23,000		23	44,000		44
Benzene	13	U	0.0065	13	U	0.0065	1.3	U	0.0007	51		0.0510	15	U	0.0075	12	U	0.0060
Toluene	33	U	0.0165	32	U	0.0160	3.3	U	0.0017	66		0.0660	15	U	0.0075	12	U	0.0060
Ethylbenzene	13	U	0.0065	13	U	0.0065	1.3	U	0.0007	7,900		7.9000	15	U	0.0075	12	U	0.0060
Total xylenes	148		0.1480	277		0.2770	1.3	U	0.0007	11,600		11.6000	15	U	0.0075	25	U	0.0125
Naphthalene	2,500		2.5000	690		0.6900	180		0.1800	3,500		3.5000	20	U	0.0100	66	U	0.0330
1-Methylnaphthalene	3,500		3.5000	3,500		3.5000	50	U	0.0250	9,400		9.4000	20	U	0.0100	330		0.3300
2-Methylnaphthalene	690		0.6900	260		0.2600	69		0.0690	15,000		15.0000	20	U	0.0100	160		0.1600
<i>n</i> -Hexane <sup>a</sup>	1,400	U	0	6,200	U	0	1,200	U	0	1,200	U	0	7,100	U	0	12,000	U	0
Methyl-tert-butyl ether <sup>a</sup>	1,400	U	0	6,200	U	0	1,200	U	0	1,200	U	0	81	U	0	12,000	U	0
Ethylene dibromide <sup>a</sup>			0			0			0			0	81	U	0			0
Ethylene dichloride <sup>a</sup>			0			0			0			0	81	U	0			0
Benzo(a)anthracene	300	U	0.150	240	U	0.120	50	U	0.025	560		0.560	20	U	0.010	66	U	0.033
Benzo(b)fluoranthene	360	U	0.180	400	U	0.200	69	U	0.035	890	U	0.445	60	U	0.030	66	U	0.033
Benzo(k)fluoranthene <sup>b</sup>	0		0	0		0	0		0	0		0	0		0	0		0
Benzo(a)pyrene	300	U	0.150	240	U	0.120	50		0.050	620	U	0.310	20	U	0.010	66	U	0.033
Chrysene	870		0.870	880		0.880	55		0.055	2,800		2.800	20	U	0.010	66	U	0.033
Dibenz(a,h)anthracene	300	U	0.150	240	U	0.120	50	U	0.025	170	U	0.085	20	U	0.010	66	U	0.033
Indeno(1,2,3-cd)pyrene	300	U	0.150	240	U	0.120	50	U	0.025	170	U	0.085	20	U	0.010	66	U	0.033
Total TPH			11,075			12,157			1,555			28,900			2,343			5,338
Groundwater CUL to protect surface water			500			500			500			500			500			500
<b>Method B Interim Action Levels (mg/kg)</b>																		
Direct contact			3,219			3,022			2,621			3,372			2,004			2,058
Basis for IAL			HI=1			HI=1			cPAH			HI=1			HI=1			HI=1
Median for area						3,121									2,031			

Notes:

C5-6 = effective carbon chain range 5-6

cPAH = total cancer risk for carcinogenic polycyclic aromatic hydrocarbons set to 1x10<sup>-6</sup>

HI = hazard index

IAL = interim action level

TPH = total petroleum hydrocarbons

U = undetected, associated value is the method detection limit

<sup>a</sup>This constituent was never detected anywhere on site, therefore the concentration was assigned 0 mg/kg.

<sup>b</sup>The spreadsheet indicates that the b and k isomers of benzofluoranthene be entered separately, but the analytical results reported total benzofluoranthenes as the sum of the two. The total result was entered for the b isomer and 0 was assigned to the k isomer. Because both isomers have the same toxicity equivalency factor, this approach does not add uncertainty to the results.

Table E-3. Relationship between Soil and Groundwater Concentrations of PCBs

Location	Maximum Soil Concentration in Saturated Zone (mg/kg)		Maximum Soil Concentration in Entire Soil Profile (mg/kg)		Overall Maximum in Vadose or Saturated	Maximum Groundwater Concentration (µg/L)	
GTSP-1	0.033	U	0.035		V	0.0032	U
GTSP-2	0.033	U	0.26		V	0.0032	U
GTSP-3	0.069		3.8		V	0.0032	U
GTSP-4	0.033	U	0.54		V	0.0032	U
GTSP-5	1.2		1.2		S	0.24	
LLATW01	79		79		S	4.3	
LLATW02	0.66		1.6		V	0.0032	U
LLATW03	1.0		62		V	0.012	
LLATW04	8.1		16		V	0.157	
SYATW01(GW)/ SYASB01(SOIL)	0.012	U	0.012	U	S	0.0032	U

Notes:

- IAL = interim action level
- S = saturated zone
- U = not detected at associated concentration
- V = vadose zone