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GEORGETOWN STEAM PLANT INTERIM ACTION

Draft Technical Memorandum on Data Screening

Prepared for
Seattle City Light
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March 25, 2011

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ACRONYMS AND ABBREVIATIONS

ARAR	applicable or relevant and appropriate requirement
BaP	benzo(a)pyrene
BEHP	bis(2-ethylhexyl)phthalate
COC	chemical of concern
COPC	chemical of potential concern
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CUL	cleanup level
DRO	diesel-range organics
EPH	extractable petroleum hydrocarbon
EYA	east yard area
FTA	fuel tank area
GRO	gasoline range organics
GTSP	Georgetown Steam Plant
IAL	interim action cleanup level
LDW	Lower Duwamish Waterway
LLA	low lying area
LPAH	low molecular weight polycyclic aromatic hydrocarbon
MO	motor oil
MTCA	Model Toxics Control Act
NBF	North Boeing Field
PCE	tetrachloroethene
PQL	practical quantitation limit
SVOC	semivolatile organic compound
SYA	south yard area
TCDD	2,3,7,8-tetrachlorodibenzo-*p*-dioxin
TCE	trichloroethene
TEF	toxicity equivalence factor
TEQ	toxicity equivalent

TPH	total petroleum hydrocarbon
TSCA	Toxic Substances Control Act
VOC	volatile organic compound
VPH	volatile petroleum hydrocarbon

1 INTRODUCTION

This technical memorandum derives the remedial boundaries based on the screening of available soil and groundwater data, the development of interim action cleanup levels (IALs), and the application of those IALs to data collected from the Georgetown Steam Plant (GTSP) site. Hazardous substances that contribute the greatest percentage of the overall threat to human health and the environment were selected as the chemicals of concern (COCs) for purposes of defining site interim action requirements. The remedial boundaries for soil excavation were defined as those soils with chemical concentrations exceeding one or more of the soil IALs for COCs. Groundwater IALs were considered when defining remedial boundaries and will be used to evaluate the results of groundwater monitoring conducted after the interim action.

The data considered during screening included both the site characterization data collected by Integral in 2010 (Integral 2011a,b; data reports for August and November sample events in preparation) and historical data meeting the following criteria:

- Not greater than 10 years old
- Reasonable certainty about location of sample
- For soil samples, represents soils still present on site (not removed during an interim action).

The historical data are from Bridgewater (2002), Boeing (2005), DMD (2006), Integral (2006a,b) and Landau (2008).

COCs were selected using a three-step process, which is provided in greater detail below. Step 1 used draft screening levels provided by Ecology for sites along the Lower Duwamish Waterway (LDW) and focused on maximum detected concentrations in soil and groundwater. Analytes identified as requiring additional consideration based on the results of Step 1 are called preliminary chemicals of potential concern (COPCs) and were considered further in Step 2.

Step 2 used site-specific screening levels derived from those used in Step 1 and considered frequency of detection and maximum detected concentrations for soil and groundwater, consistent with WAC 173-340-703. Preliminary COPCs that were not eliminated during Step 2 are called final COPCs and were considered further in Step 3.

During Step 3, additive risks, practical quantitation limits (PQLs), and additional information on background concentrations were considered. Professional judgment concerning offsite sources of contamination, frequency of exceedance, and spatial patterns of detected concentrations was also used. Method B IALs from the Model Toxics Control Act (MTCA) were calculated for petroleum. Final COPCs that were not eliminated based on these considerations

are called COCs and will be monitored during the interim action. IALs were calculated for each of the COCs and the remedial boundary is based on where these IALs are exceeded.

WAC 173-340-703 provides the following list of criteria to be considered when selecting COPCs:

- ***Toxicological characteristics***: This was considered in both Step 1 and Step 2 by comparing maximum detected concentrations with risk-based screening levels.
- ***Tendency to persist in the environment***: Chemicals that tend to persist in soil, such as PCBs, are likely to remain onsite and would be detected during site characterization. The screening levels for chemicals that tend to accumulate in organisms, such as PCBs in fish, are set lower to account for uptake from surface water to fish and human consumption of fish.
- ***Tendency to move into and through environmental media***: Chemicals that tend to leach readily from soil to groundwater would be detected in groundwater during site characterization. Chemicals that exceed Step 2 groundwater screening levels were assigned more conservative Step 2 soil screening levels to account for this transport pathway. Although groundwater travels over 2,000 ft before it reaches Slip 4, it is possible that groundwater could infiltrate storm water pipes, thus reaching Slip 4 through a more direct route. To account for the potential storm water transport pathway, attenuation during transport was not considered when setting groundwater screening levels.
- ***Natural background concentrations***: If the risk-based screening level determined during Step 2 was lower than the natural background concentration of a chemical, the Step 2 screening level was adjusted up to the natural background concentration provided by Ecology in its tables (Tables A-1 and A-2, Edens 2010, pers. comm.). During Step 3, additional information on background concentrations was used to further adjust IALs.
- ***Thoroughness of testing***: Site characterization was conducted according to a work plan approved by Ecology. Samples from different site areas were analyzed primarily for the chemicals expected to be present in those site areas, based on knowledge of site history. A subset of samples from each site area was analyzed by the full suite of analytical methods. Thoroughness of testing was one of the issues considered when making professional judgments concerning retaining or eliminating COPCs during Step 3, as discussed in Section 4.1.
- ***Frequency of detection***: Chemicals not detected in more than 5 percent of soil samples were eliminated during the Step 2 soil screen, unless professional judgment concluded that this was inappropriate. There were insufficient groundwater samples to consider this criterion for groundwater.
- ***Degradation by-products***: Tetrachloroethene (PCE), trichloroethene (TCE), and their degradation by-product vinyl chloride have been detected in onsite soil and

groundwater. These chemicals appear to originate from offsite sources, as discussed in Section 4.1.3. The degradation pathways for other chemicals detected onsite yield by-products that would be detected during site characterization. For example, as petroleum and PCBs weather, they change in composition, but the weathered products can still be detected by petroleum and PCB analyses, respectively.

The screening levels and IALs were derived using a Method B approach. The site does not qualify for Method C IALs because current and expected future site use as a museum is inconsistent with MTCA's definition of industrial land use. The site does not qualify for Method A IALs because protection of surface water and sediment are important issues along the LDW that are not considered by Method A. Furthermore, several of the chemicals of interest at the site do not have Method A table values. Nevertheless, Method A table values were used to screen lead and petroleum in soil and petroleum in groundwater because of the complexity of developing Method B IALs for these chemicals. A Method B approach was ultimately used to develop soil IALs for petroleum when IALs were finalized during Step 3.

2 STEP 1: PRELIMINARY COPCS

2.1 STEP 1 SCREENING LEVELS

Ecology provided media-specific tables of screening levels for contaminants as a baseline for the GTSP-NBF site (Edens 2010, pers. comm.). These screening levels are considered by Ecology as a comprehensive listing of potential applicable or relevant and appropriate requirements (ARARs) for sites along the LDW.

Step 1 screening levels are summarized in Table 1. The details of the derivation of the Ecology screening levels are shown in Tables A-1 through A-4. Groundwater screening levels consider protection of sediment and, for some chemicals, protection of surface water. Soil screening levels considered protection of groundwater.

Some minor modifications were made to the screening levels provided by Ecology. The screening levels for GTSP COCs (Section 4) and relevant pathways were subjected to a quality assurance check, but most of the Step 1 screening levels for other analytes were not checked. Some errors were noted in Ecology's screening levels and were corrected as summarized in Table A-5. Ecology screening levels were not provided for all of the chemicals analyzed at the GTSP. For those chemicals that did not have Ecology screening levels but were detected in soil or groundwater at GTSP, screening levels were derived consistent with the approach used by Ecology (shown at the bottoms of Tables A-1, A-2, and A-4) and are included in Table 1.

Some analytes were not screened (Table B-1). If an analyte was not detected in soil or groundwater, and no screening level was available in the Ecology tables, a screening level was not derived and the analyte was not screened. Also, if ARARs and toxicity parameter values were not available for an analyte, then it was not possible to derive a screening level and the analyte was not screened. Total PCBs were screened rather than individual Aroclors.

Toxicity equivalents (TEQs) of 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD) were screened rather than individual dioxin/furan congeners reported on a dry weight basis. The TCDD TEQ for each sample analyzed for dioxins/furans was calculated by adjusting the measured concentration of each dioxin/furan congener by a toxicity equivalence factor (TEF) that represents the potency of the congener in relation to TCDD. The adjusted concentrations were then summed to produce the TCDD TEQ for the sample. Similarly, benzo(a)pyrene (BaP) TEQs were screened rather than individual carcinogenic polycyclic aromatic hydrocarbons (cPAHs). The TEFs for dioxin/furan congeners and cPAHs were obtained from MTCA Tables 708-1 and -2, respectively.

2.2 PRELIMINARY COPCS

Preliminary COPCs are defined as chemicals with maximum detected concentrations exceeding their Step 1 screening levels. Separate lists of preliminary COPCs were developed for soil and groundwater. The details of the selection process, including summary statistics, calculations, and decision logic, are provided in Tables B-2 and B-3 for soil and groundwater, respectively. Chemicals that were never detected in a medium were not selected as preliminary COPCs in that medium, even if their maximum detection limits exceeded their Step 1 screening levels. Chemicals that were never detected but have maximum detection limits above their screening levels are listed in Table B-4, along with a brief evaluation of the likelihood that they would be present on the GTSP site.

A total of 45 analytes were retained as preliminary soil COPCs following Step 1 (Table 2):

- TCDD TEQ
- Metals: 10 analytes
- PAHs: 12 analytes including all 7 cPAHs
- Total PCBs
- Petroleum hydrocarbons: 4 analytes
- Semivolatile organic compounds (SVOCs): 9 analytes
- Volatile organic compounds (VOCs): 8 analytes.

Nine analytes were retained as preliminary groundwater COPCs as follows (Table 2):

- Metals: arsenic, cadmium, and nickel
- PAHs: low molecular weight PAHs (LPAHs)
- Total PCBs
- SVOCs: Bis(2-ethylhexyl)phthalate (BEHP)
- VOCs: PCE, TCE, and vinyl chloride.

3 STEP 2: FINAL COPCS

3.1 STEP 2 SCREENING LEVELS

It is our understanding that the ARARs listed in the Ecology spreadsheet represent the broadest suite of ARARs that would be considered by Ecology at cleanup sites located along the LDW. For the purposes of Step 2, the soil, groundwater, and surface water ARARs in the Ecology file were evaluated for relevance to the GTSP site and ARARs not considered to be relevant to the GTSP site were eliminated. Groundwater screening levels considered protection of surface water and, for specific chemicals discussed below, protection of sediment. Soil screening levels considered leaching to groundwater for specific chemicals, as discussed below. In cases where health-based screening levels fell below the soil or groundwater natural background concentrations provided in the Ecology tables, Step 2 screening levels were adjusted up to the natural background concentrations. Step 2 screening levels are shown in Table 1.

When deriving Step 2 surface water and groundwater screening levels, protection of sediment was considered only for chemicals identified as exceeding sediment quality standards (SQS) in Slip 4. These chemicals are mercury, lead, zinc, PCBs, indeno(1,2,3-cd)pyrene, BEHP, and dioxin/furan TEQs (SAIC 2011).

When deriving Step 2 soil screening levels, leaching to groundwater was considered only for chemicals that exceed their Step 2 groundwater screening levels. These chemicals are arsenic, cadmium, nickel, PCBs, BEHP, PCE, TCE, and vinyl chloride. For these chemicals, both a leaching and a direct contact screening level were derived. For other chemicals, only a screening level based on direct contact was derived. Soil screening levels for the leaching pathway were calculated using the MTCA fixed parameter three-phase partitioning model (WAC 173-340-747(4)), based on default soil characteristics, chemical characteristics obtained from Ecology's on-line database CLARC,[1] and the Step 2 groundwater screening levels (Table C-1). Leaching screening levels were derived for both the vadose and the saturated zones, but only the screening levels for the saturated zone (which are more protective) were used for screening.[2] Screening levels for both the vadose and saturated zones were used for mapping purposes, as discussed in Section 4.1.

Details of the derivation of Step 2 screening levels are shown in Tables C-2 through C-3 for soil, groundwater, and surface water, respectively. The ARARs that were included and excluded are shown in Tables C-5 through C-7 for soil, groundwater, and surface water, respectively. Each Step 1 ARAR column in Table A-1 is listed in Table C-5, together with a notation of whether or

[1] Cleanup levels and risk calculation, available at: https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx.
[2] It was determined that the screening results would not change if the soil concentrations in the vadose zone had been screened using leaching screening levels specific to the vadose zone.

not it was included in the derivation of Step 2 soil screening levels and, if not, the rationale for not retaining the ARAR. The same format is used for Table C-6, which refers to the Step 1 groundwater ARARs listed in Table A-2, and Table C-7, which refers to the Step 1 surface water ARARs listed in Table A-4.

General themes that were considered when excluding ARARs from consideration for the GTSP site include the following:

- The site qualifies for neither Method A nor Method C, as discussed at the beginning of this section, but Method A cleanup levels (CULs) for soil and groundwater were used for screening lead and petroleum mixtures, which is a common practice. Method A groundwater CULs for petroleum were also used as screening levels for surface water (WAC 173-340-730(3)(b)(iii)(C)).
- ARARs based on potable water do not apply to the Lower Duwamish Waterway, the receiving surface water body for groundwater at the site, because the waterway is not rated for domestic water use (WAC 173-201A).
- Groundwater at the GTSP is potentially potable.
- The MTCATPH11 spreadsheet[3] was not used to calculate Method B petroleum IALs for the purposes of screening, but Method B petroleum IALs were considered during finalization of IALs (Section 4.2).
- Cleanup levels developed for the Terminal 117 early action site and the Boeing Plant 2 site are not necessarily relevant to the GTSP site because they reflect additive risk considerations for different lists of COCs. Also, portions of the groundwater at Terminal 117 and Boeing Plant 2 are tidally influenced by the LDW which is nonpotable, while all of the groundwater at the GTSP site is considered potentially potable.

Additional issues considered when excluding ARARs for soils include the following (Table C−5):

- The site qualifies for the simplified terrestrial ecological evaluation (TEE).
- The site qualifies for commercial land use as defined in the TEE (WAC 173-340-7490(3)(c)).
- California Environmental Protection Agency screening levels are not ARARs under MTCA (WAC 173-340-740(2)(b)).

Additional issues considered when excluding ARARs for groundwater include the following (Table C-6):

[3] Available at: http://www.ecy.wa.gov/programs/tcp/tools/toolmain.html.

- State groundwater quality criteria are not ARARs listed in MTCA. The listed ARARs are the State Board of Health criteria (WAC 173-340-720(3)(b)).
- Health-based screening levels from the U.S. Geological Survey are not a promulgated regulation and so are not ARARs under MTCA.

Additional issues considered when excluding ARARs for surface water include the following (Table C-7):

- National Pollutant Discharge Elimination System criteria are applicable to construction storm water during remedial activities at GTSP but not to groundwater screening levels.
- Toxic Substances Control Act (TSCA) waste water criteria are applicable to remediation wastes at GTSP but not to groundwater screening levels.
- The GTSP site is outside the boundaries of the Seattle Shoreline Master Plan.
- Results of whole effluent toxicity tests conducted for the Skykomish site are not relevant to the petroleum mixture present at GTSP. Differences in the petroleum mixtures are expected to result in different toxicity test results.

3.2 FINAL COPCS

Final COPCs are defined as follows:

- Maximum detected concentration exceeds Step 2 screening level
- For soil, detected in greater than 5 percent of samples tested[4].

The details of the selection process, including summary statistics, calculations, and decision logic, are provided in Tables D-1 and D-2 for soil and groundwater, respectively.

Only one chemical was eliminated as a final COPC during the Step 2 screen for groundwater (Table D-2). LPAHs were selected as a preliminary COPC during Step 1 but there was no Step 2 screening level available. The Step 1 screening level for LPAH is based on state groundwater quality criteria, which are not an ARAR under MTCA and were eliminated from Step 2 screening levels. LPAHs were screened out as a final groundwater COPCs during Step 2 due to lack of a screening level.

A total of 35 chemicals were eliminated as final COPCs during the Step 2 screen for soil (Table D-1). In some cases, professional judgment was used. According to the decision logic discussed above, PCE, TCE, and vinyl chloride would be eliminated as final COPCs because the frequency of detection for each of them was less than 5 percent. In each of these cases, however, the method detection limits did not meet the leaching screening levels and the total frequency of

[4] Insufficient groundwater samples are available to consider frequency of detection for groundwater.

exceedance (including both detected and nondetected results) was 100 percent. Because of the uncertainty introduced by elevated detection limits, these chemicals were retained as final soil COPCs and were considered further in Step 3. For each preliminary soil COPC that was excluded from the list of final soil COPCs, the rationale is provided in Table D-1.

The final groundwater COPCs and soil COPCs for the leaching pathway include the following (Table 2):

- Metals: arsenic, cadmium, and nickel
- Total PCBs
- BEHP
- VOCs: PCE, TCE, and vinyl chloride.

Of these chemicals, arsenic, nickel, total PCBs and BEHP are also final soil COPCs for direct contact with soil.

The additional final COPCs for direct contact with soil include the following (Table 2):

- TCDD TEQ
- Metals: copper, lead, and zinc
- PAHs: 2-methylnaphthalene and BaP TEQ
- Petroleum: Gasoline range organics (GRO), diesel range organics (DRO), motor oil (MO), and total petroleum hydrocarbons (TPH).

4 STEP 3: COCS AND IALS

Site specific information, including the frequency and locations of exceedances and the potential for offsite sources, was used to eliminate or consolidate some of the final COPCs (Section 4.1). The chemicals remaining at this point are called COCs, and for each of them, an IAL was developed (Section 4.2).

4.1 COCS

The list of final petroleum and metals COPCs was consolidated to fewer analytes that will be tracked during the interim action.

The final list of COCs includes the following:

- Soil only
  - TCDD TEQ
  - BaP TEQ
  - TPH
- Soil and groundwater
  - Arsenic
  - Total PCBs.

Each of the final COPCs that was eliminated from the COC list is discussed below.

4.1.1 Petroleum

GRO, DRO, MO, and 2-methylnaphthalene were eliminated as soil COCs. Only TPH was retained as a soil COC.

GRO, DRO, and MO were screened separately in soil and groundwater because the Method A screening levels for GRO are different from DRO and MO. All petroleum analytes were screened out of the COPC list for groundwater because they were never detected, though free product was observed in the fuel tank area (FTA). All petroleum analytes remained on the final COPC list for soil. Method B soil IALs, which includes all carbon chain ranges, were calculated for petroleum in Step 3, so GRO, DRO, and MO were eliminated from the soil COC list and only TPH was retained. The presence of free product is discussed in Section 4.2.2.

The petroleum component 2-methylnaphthalene was screened separately from petroleum mixtures (e.g., DRO) because chemical-specific screening levels are available for it. It was

retained as a final soil COPC based on a single exceedance out of 146 samples analyzed. However, this result (520 mg/kg at LLA-101 at 4.8–6.3 ft bgs) exceeded the screening level (310 mg/kg) by only a factor of 1.4. In addition, 2-methylnaphthalene is included in the IAL calculations of the MTCATPH11 spreadsheet. It was considered unnecessary to track 2-methylnaphthalene separately from TPH, so it was removed from the soil COC list.

4.1.2 Metals

Cadmium, copper, lead, nickel, and zinc were eliminated as COCs, as discussed below. Arsenic was retained as a Step 3 COC in soil, but it was eliminated as a COC in groundwater, as discussed below. The metals that were identified as Step 2 groundwater COPCs for GTSP (arsenic, cadmium, and nickel) are not the same as the metals identified as COCs for sediments in Slip 4 (lead, mercury, and zinc), suggesting that the GTSP site is not a significant source of metals recontamination to Slip 4.

Copper, lead, and zinc were retained as final COPCs in soil but not in groundwater[5]. Concentrations of these three metals exceeded their Step 2 direct contact soil screening levels in only one or two locations each. All three of them exceeded their soil screening levels at FTASB05 (6.5–8 ft bgs) in the FTA (Figures 1 through 3) by factors ranging from 5 to 13. This location is within the excavation prism for TPH in the fuel tank area (FTA) (see interim action work plan, in preparation). The lead result also exceeded its soil screening level at SYASB05 (0.5–2 ft bgs) in the south yard area (SYA) by a factor of 1.5. This area will have a clean soil cover and institutional controls to prevent direct contact with contaminated soils (see interim action work plan, in preparation). The soil detection limits for all metals were adequate to meet their Step 2 screening levels. The copper, lead, and zinc exceedances are infrequent and the lead exceedances are scattered, and they will be addressed by interim actions in the FTA and the SYA. Copper, lead, and zinc were eliminated as soil COCs because they do not pose a threat to groundwater and have limited exceedances of the direct contact screening levels.

Cadmium was retained as a final COPC in both soil and groundwater. Only one groundwater result exceeded its Step 2 screening level, by a factor of 4.8 (1.2 μg/L at GTSP-2 in June 2010, Figure 4). Cadmium was not detected in groundwater at this location in previous sampling rounds (detection limits below groundwater screening level). It is likely that the groundwater at this location is influenced by off-site sources. There are no onsite soil exceedances for cadmium upgradient of GTSP-2. It is also possible that this result is biased high, based on a concentration of 0.2 μg/L detected in the field blank associated with the sample, though data validation concluded that the result should not be flagged as undetected or estimated. None of the results for wells on the downgradient sides of the site exceed the groundwater screening

[5] Copper was screened out as a preliminary groundwater COPC so groundwater was not evaluated during Step 2. The Step 2 groundwater screening level was lower than the Step 1screening level, however, and one groundwater result at SYATW01 exceeds the Step 2 screening level (Figure 5-1). There are no detected copper concentrations in soil in the saturated zone upgradient of this location. Therefore, copper was not a COPC in groundwater.

level. Furthermore, none of the cadmium soil results exceeds the direct contact screening level. Cadmium was eliminated as a COC because no source has been found onsite for the single groundwater exceedance, groundwater at the downgradient boundaries of the site has acceptable concentrations, and soil concentrations do not exceed the direct contact screening level.

Nickel was retained as a final COPC in both soil and groundwater. Only one groundwater result exceeds its Step 2 screening level, by a factor of 4.0 (33 μg/L at GTSP-4 in June 2010). Nickel was not analyzed during previous rounds of groundwater sampling. The soil results at three locations potentially upgradient of GTSP-4 exceed the Step 2 soil screening level by factors ranging from 2 to 61 (FTASB05 at 6.5–8 ft bgs in the saturated zone, SYASB05 at 0.5–6.5 ft bgs in the vadose zone, and CCS2 at 0.5–2.5 ft bgs in the vadose zone) (Figure 5). The one exceedance in the saturated zone is included in the excavation prism for TPH in the FTA (see interim action work plan, in preparation). The soil results at six locations potentially upgradient of GTSP-4, including three in the saturated zone, do not exceed the Step 2 soil screening level (FTATW02, CCS4, SYASB10, CCS3, BD1, and FTASB05). In contrast, the groundwater results for GTSP-3 and GTSP-5 do not exceed the Step 2 groundwater screening level even though soil results at five locations upgradient, the three closest being in the saturated zone, exceed the Step 2 soil screening level (SYASB05, CCS2, LLASB05, SYASB01, and SYASB04). Only one soil result exceeds the direct contact screening level by a factor of 1.5 (2,330 mg/kg at SYASB05, 0.5–2 ft bgs); this location will have a clean soil cover and institutional controls to prevent direct contact with contaminated soils (see interim action work plan, in preparation). Nickel was eliminated as a COC because the scattered soil exceedances do not indicate an identifiable source area and are not consistently associated with groundwater impacts and because of limited exceedance of the soil direct contact screening level.

Arsenic was retained as a final COPC in both soil and groundwater. Exceedances of the Step 2 soil screening level are more widespread for arsenic than for the other metals, though most of the exceedances are less than twice the screening level. Groundwater results exceed the Step 2 screening level in two locations (GTSP-5 and GTSP-6, Figure 6), by factors of 1.3 and 2.8, respectively. These wells are in areas affected by petroleum in soil (Figures 7 and 8), but they are not close to the maximum soil concentration of arsenic (140 mg/kg at SYASB04, 3.5–5 ft bgs). The redox results for groundwater at these locations show strong reducing conditions (Table E−1). Strong reducing conditions exist also at FTATW02 and FTATW03, both of which are impacted by TPH, but no arsenic results are available for groundwater at these locations. Reducing conditions do not occur at the other locations where groundwater was analyzed and arsenic does not exceed its Step 2 groundwater screening level at these locations. It is commonly observed that arsenic dissolves from soil and rock following a shift toward the chemically reducing conditions typically observed at petroleum release sites (e.g., Masscheleyn et al. 1991). It appears that the elevated groundwater arsenic concentrations are due to reducing conditions caused by biodegradation of petroleum. If the arsenic in groundwater is due to reducing conditions, soil removal targeting arsenic is not an effective means of reducing arsenic

in groundwater. However, after the petroleum in soil is removed, the redox levels should eventually return to normal and arsenic groundwater concentrations should decrease, a process that may take years. Because arsenic is not a COC for Slip 4, and because the area is served by city water supplies, there are no exposure pathways to arsenic in groundwater at present. Arsenic was eliminated as a COC in groundwater, because the source of the elevated groundwater concentrations appears to be related to petroleum rather than arsenic itself, but it was retained as a COC for direct contact with soil.

4.1.3 VOCs

PCE, TCE, and vinyl chloride were eliminated as soil and groundwater COCs because they appear to be due to an offsite source.

There were scattered detections of PCE, TCE, and vinyl chloride in soil and groundwater. Out of 44 soil samples analyzed for these chemicals, one nondetected result for PCE, one nondetected result for vinyl chloride, and no results for TCE exceeded their screening levels for direct contact with soil. All of the PCE and vinyl chloride results exceeded their screening levels for leaching in the saturated zone, though only one result was detected for each (PCE at GTSP-4 [4.5–5.5 ft bgs], TCE at EYASB01 [12.5–14 ft bgs], and vinyl chloride at GTSP-2 [8–10 ft bgs], Figures 9, 10, and 11, respectively). All of the PCE and vinyl chloride results but none of the TCE results exceeded their screening levels for leaching in the vadose zone; one PCE result in the vadose zone was detected (GTSP-4 [5.5–7 ft bgs]). PCE, TCE, and vinyl chloride were detected either in the saturated zone or in soils immediately above it in three disparate locations around the site. Although the detection limits for PCE and vinyl chloride were not adequate to meet Step 2 soil screening levels, the pattern of detected concentrations indicates that there is not a source of these chemicals in onsite soils.

Out of 29 groundwater samples analyzed for PCE, TCE, and vinyl chloride, 13 PCE results (six of them detected), four TCE results (all detected), and eight vinyl chloride results (one detected) exceeded their screening levels. PCE and TCE were detected above their groundwater screening levels in the upgradient well GTSP-1 and PCE was detected above its screening level in GTSP-4 during the 2006-2007 sampling rounds but not in 2010 (Figures 9 through 11). TCE and vinyl chloride were detected above their screening levels in FTATW03 in 2010 (groundwater at this location was not sampled previously). The detections of PCE and TCE in the upgradient well are consistent with an off-site source of groundwater contamination. The detected exceedances of TCE and vinyl chloride in the FTA but nowhere else in 2010 suggest either that the offsite plume is in the process of crossing beneath the site or that the site is located on the southern edge of a plume.

4.1.4 Bis(2-ethylhexyl)phthalate

One groundwater result for BEHP exceeded its Step 2 screening level by a factor of 5.9 (1.7 μg/L in SYATW01, June 2010, Figure 12). Groundwater was not sampled at this location previously. This result is close to the detection limit of 1 μg/L and, while not flagged undetected or estimated, may nevertheless be unreliable. There are no detected exceedances in groundwater at the downgradient edges of the site, so the concentrations migrating off site are acceptable.

The locations of soil exceedances of the Step 2 screening levels are scattered around the site with no apparent source area. Review of the soil method blanks showed a routine low level of laboratory contamination of BEHP in the range of 10–30 μg/kg. Soil results up to 150 μg/kg are likely to be biased high due to laboratory contamination. Most of the soil exceedances are downgradient of SYATW01. The four highest soil concentrations, listed below, are not near SYATW01:

- 78,500 μg/kg at LLA101, 4.8–6.3 ft (saturated zone in LLA)
- 4,400 μg/kg at EYASB01, 0.5–2 ft (vadose zone in the EYA)
- 1,500 μg/kg at FTATW02, 6.5–8 ft (saturated zone in the FTA)
- 1,000 μg/kg at LLASB05, 6.5–8 ft (saturated zone in the LLA).

The maximum result at LLA101 is anomalously high compared to the results for the remainder of the site. There are no groundwater exceedances near or immediately downgradient of these locations. Two of these sample locations (LLA101 and LLASB05) are within the excavation prism for PCBs in the southwest corner of the site (see interim action work plan, in preparation). There is only one exceedance of the direct contact soil screening level (LLA101, 4.8–6.3 ft bgs) by a factor of 2.

BEHP was eliminated as a soil COC because there is no apparent soil source on site, there is no apparent relationship between soil concentrations and groundwater concentrations, groundwater at the downgradient edges of the site does not exceed the screening level, and there are minimal exceedances of the direct contact soil screening level.

4.2 IALS

The following issues were considered when finalizing IALs for the COCs:

- ARARs were evaluated to determine whether they are sufficiently protective as defined by MTCA.
- Method B soil IALs were calculated for petroleum.

- The relationship between soil concentrations and groundwater concentrations of PCBs was evaluated to identify a threshold soil concentration below which groundwater is not impacted.
- Additional information on background concentrations was evaluated to determine if any IALs needed to be adjusted up to background levels.
- If the Step 2 screening level was below the PQL for a COC, the IAL was adjusted up to the PQL (WAC 173-340-720(7)(c) and 740(5)(c)).
- The Step 2 soil screening level for BaP TEQ, which is considered mutagenic, was evaluated to determine whether it needed to be adjusted to account for exposures during early childhood ("early life exposures"), consistent with EPA guidance.
- Multiple IALs were specified for PCBs to account for areas of the site where leaching is considered a potential transport pathway and areas where leaching is not considered a potential transport pathway.
- Multiple IALs were specified for TPH, based on Method B direct soil contact, to account for differences in petroleum composition across the site.
- Additive noncancer hazards and cancer risks were evaluated across the list of COCs to ensure that the totals fall within MTCA targets.

Each of these issues is discussed below. The final IALs are summarized in Table 3.

4.2.1 Protectiveness of ARARs

The approach for deriving MTCA Method B CULs specifies that the minimum ARAR is used, rather than the Method B equation value, as long as the minimum ARAR is associated with a cancer risk level no greater than $1x10^{-5}$ and a noncancer hazard quotient no greater than 1.0.[6] The groundwater IALs (Table C-3) are based on natural background or the PQL, so this issue is not relevant to groundwater.

PCBs are the only soil COC with an ARAR available (TSCA). The TSCA CUL is relevant only to portions of the site where groundwater is not impacted and the soil IAL does not consider the leaching pathway, as discussed in Section 4.2.6. The TSCA CUL of 1 mg/kg is sufficiently protective because it is associated with a cancer risk of $2x10^{-6}$, so it formed the basis of the direct contact IAL used for portions of the site where leaching is not of concern (Table 3).

4.2.2 Method B IAL for Petroleum

Four samples from the FTA and two samples from the low lying area (LLA) were analyzed by the volatile petroleum hydrocarbon (VPH) and extractable petroleum hydrocarbon (EPH)

[6] WAC 173-340-720(4)(b)(iii) and (7)(b), -730(3)(b)(iii) and (5)(b), and -740(3)(b)(iii) and (5)(b).

methods, which provide detailed information on the composition of the petroleum mixture. The VPH/EPH results were evaluated using Ecology's MTCATPH11 spreadsheet[7] to calculate Method B IALs for TPH in these two areas (Table E-2). TPH has not been detected in the shallow groundwater anywhere on site. The underground storage tanks were removed more than 10 years ago (Bridgewater 2000). The only petroleum currently stored on site includes diesel stored in a 100-gal tank inside the building for a small boiler and gasoline in 5 gal containers for lawn equipment. These observations support an empirical demonstration that existing soil concentrations are protective of groundwater (WAC 173-340-747(9)), so Method B IALs were calculated only for the direct contact pathway. The Method B IALs for the FTA and the LLA are 3,000 (rounded) and 2,000 mg/kg, respectively (Table 3). Different Method B IALs were generated because the petroleum compositions in the FTA and LLA differ. Figures 7 and 8 compare site soil TPH concentrations to the IALs of 3,000 and 2,000 mg/kg, respectively.

In addition to the Method B IALs calculated based on direct contact with soil, the interim action must remove any soils saturated with petroleum to ensure that free product is not present in or on groundwater at the conclusion of the interim action (WAC 173-340-747(10)). This is applicable in the FTA.

4.2.3 Background Concentrations

When a soil or groundwater IAL falls below the natural background concentration, MTCA requires the IAL to be adjusted up to the natural background concentration (WAC 173-340-720(7)(c) and -740(5)(c)). This was considered during the development of the Step 2 screening levels and the IALs for arsenic in soil and groundwater.[8] The soil IALs for TCDD TEQ, BaP TEQ, and arsenic fall below concentrations typically observed in urban areas. While these concentrations cannot be considered natural background, they do form a lower bound on soil concentrations that realistically can be achieved at cleanup sites located in urban areas.

The soil IAL for TCDD TEQ in the adjacent streets and yards subarea of the T-117 early action area considered the likelihood that dioxins/furans had originated from a source other than the Malarkey Asphalt operations. Concentrations up to 50.1 and 84 ng/kg are not being remediated in the residential yards and the streets, respectively. The GTSP and T-117 sites are located near each other in South Seattle, so urban background concentrations are expected to be similar at the two sites. To be consistent with policy decisions regarding urban background concentrations at the T-117 site, the Step 2 soil screening level of 5.2 ng/kg (5.2×10^{-6} mg/kg) for TCDD TEQ, based on natural background, was adjusted up to 50 ng/kg (5×10^{-5} mg/kg) (Table 3). Soil sample results exceeding the IAL are shown in Figure 13.

[7] Available at: http://www.ecy.wa.gov/programs/tcp/tools/toolmain.html.
[8] The groundwater IAL for arsenic is actually based on the natural background concentration in surface water.

A study conducted by Bradley et al. (1994), and used by Ecology (2010) in considering BaP TEQ cleanup levels, measured cPAHs in 20 soil samples collected from each of three cities (Boston, Providence, and Springfield) in typical urban areas not located near known industrial sites or activities. The results of the three data sets were not considered to be statistically different, so they were combined for statistical purposes. The upper 95 percent confidence limit on the arithmetic mean concentration of the total data set of 60 samples is 3.3 mg/kg BaP TEQ. The Step 2 soil screening level of 0.015 mg/kg for BaP TEQ, based on EPA's regional screening level for residential soils, was adjusted up to 3.3 mg/kg (Table 3). Soil sample results exceeding the IAL are shown in Figure 14.

The GTSP site lies within the area affected by aerial releases from the Asarco Tacoma smelter and is subject to area-wide elevated concentrations of arsenic in soils. The Method A soil cleanup level of 20 mg/kg for unrestricted land use is based on a background data set that was influenced by releases from the Asarco smelter, so this value is applicable to the GTSP site. The Step 2 soil screening level of 7 mg/kg for arsenic, based on natural background, was adjusted up to 20 mg/kg (Table 3).

4.2.4 Practical Quantitation Limits

When a soil or groundwater IAL falls below the PQL, MTCA requires the IAL to be adjusted up to the PQL (WAC 173-340-720(7)(c) and -740(5)(c)). The PQL is 10 times the method detection limit (WAC 173-340-707(2)(a)). The method detection limit for PCBs in water is 0.0032 μg/L, so the PQL is 0.03 μg/L. 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 0.03 μg/L.

4.2.5 Early Life Exposure for Mutagens

The cPAHs are considered mutagenic, so a risk-based IAL for BaP TEQ should be adjusted to account for the additional cancer risk associated with exposures during childhood. As discussed in Section 4.2.3, however, the BaP TEQ was adjusted up to the urban background concentration, so it is not relevant to consider early life exposure (Ecology 2010e).

4.2.6 Area-Specific IALs for PCBs

PCBs have been detected in groundwater beneath the LLA and on adjacent Boeing-leased property (yellow dotted line in Figure 15), but not in the shallow groundwater beneath other areas of the GTSP site. The area with PCB groundwater contamination was historically a depression in the ground surface that received runoff from the GTSP, King County International Airport, and Boeing. PCB-containing products are not known to have been used at the site for GTSP operations, though some waste transformer oil was used as fuel prior to steam plant decommissioning in 1978. These observations support an empirical demonstration

that soils outside the LLA are protective of groundwater (WAC 173-340-747(9)). A soil IAL of 1 mg/kg, based on the TSCA CUL for direct contact, will be used for site areas outside the groundwater-impacted area (see Section 4.2.1).

To determine a soil concentration protective of the leaching pathway in the groundwater-impacted area, the relationship between groundwater concentrations of PCBs and maximum soil concentrations in the saturated zone was evaluated (Table E-3). PCBs have been detected in groundwater at GTSP-5 (up to 0.24 µg/L), LLATW01 (up to 4.3 µg/L), LLATW03 (up to 0.012 µg/L), and LLATW04 (up to 0.157 µg/L), but not in the other monitoring wells (Table E-3). Maximum soil concentrations in the saturated zone range from not detected (at 0.033 mg/kg) to 0.66 mg/kg in wells where PCBs were not detected and between 1.0 and 79 mg/kg in wells where PCBs were detected. The threshold soil concentration in the saturated zone associated with detected PCBs in groundwater lies between 0.66 and 1.0 mg/kg. Maximum soil concentrations from the entire soil profile range from not detected (at 0.012 mg/kg) to 3.8 mg/kg in wells where PCBs were not detected and between 1.2 and 79 mg/kg in wells where PCBs were detected. There is not a clear soil threshold when the entire soil column is considered, so the threshold in the saturated zone was applied to both the vadose and saturated zones. A soil IAL of 0.5 mg/kg provides an additional degree of conservatism to account for uncertainties associated with this soil threshold (Table 3).

4.2.7 Additive Risks

If the total cancer risk across all the IALs for a site exceeds $1x10^{-5}$, MTCA requires that one or more IALs be adjusted to bring the total risk down to $1x10^{-5}$ (WAC 173-340-708(5)). Similarly, if the total of noncancer hazard quotients (hazard index) across all IALs exceeds 1.0, one or more IALs must be adjusted to bring the hazard index down to 1.0.

The groundwater IALs are based on the natural background concentration (arsenic) or the PQL (PCBs), so they cannot be adjusted down (WAC 173-340-720(7)(c)). The additive cancer risk and hazard index were not evaluated for groundwater IALs.

The soil IALs for TCDD TEQ, arsenic, and BaP TEQ are based on background concentrations, so they cannot be adjusted down (WAC 173-340-740(5)(c)). Of the two remaining soil COCs, PCBs and the cPAH components of TPH[9] are considered carcinogenic. If the IALs of 0.5 and 1 mg/kg for PCBs (for the groundwater-impacted area and areas where leaching does not occur, respectively) are evaluated using MTCA equation 740-2 for carcinogens in soil, they yield cancer risks of $1x10^{-6}$ and $2x10^{-6}$, respectively. The MTCATPH11 spreadsheet calculated the Method B IALs for TPH so as to ensure that the total cancer risk for the cPAHs did not exceed $1x10^{-6}$. The total cancer risk across PCBs and the cPAH components of TPH is equal to or less

[9] Benzene, the other carcinogenic component of TPH, has not been detected on site.

than $3x10^{-6}$. This is less than the MTCA target of $1x10^{-5}$, so soil IALs were not adjusted based on cancer risks.

A reference dose for noncancer health effects is not available for PCBs. Although the Method B direct contact IALs for TPH differ for different portions of the site, each was calculated so as to ensure that the hazard index does not exceed 1.0. The hazard index for the TPH IALs is equal to or less than the MTCA target of 1.0, so soil IALs were not adjusted based on noncancer hazards.

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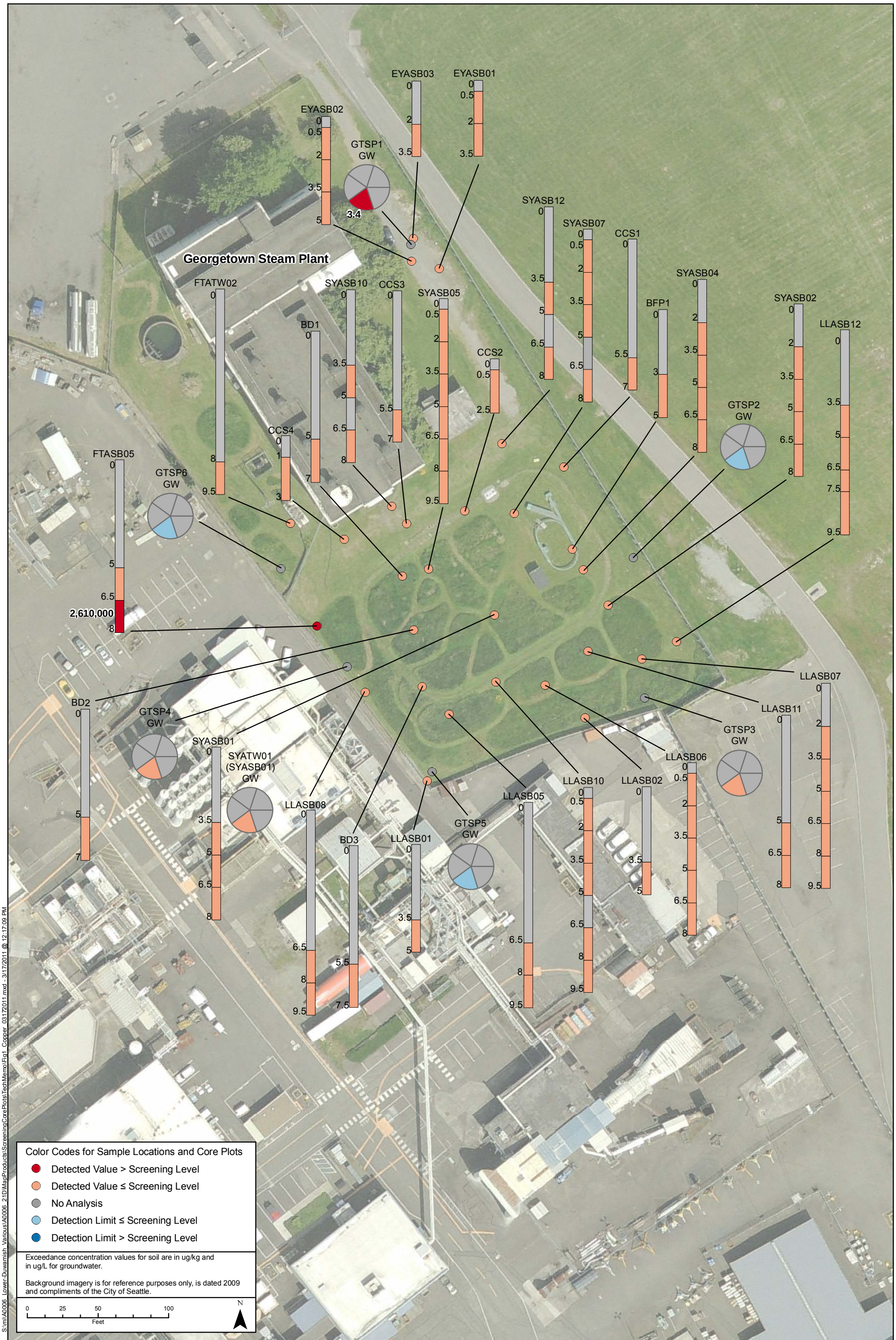
FIGURES



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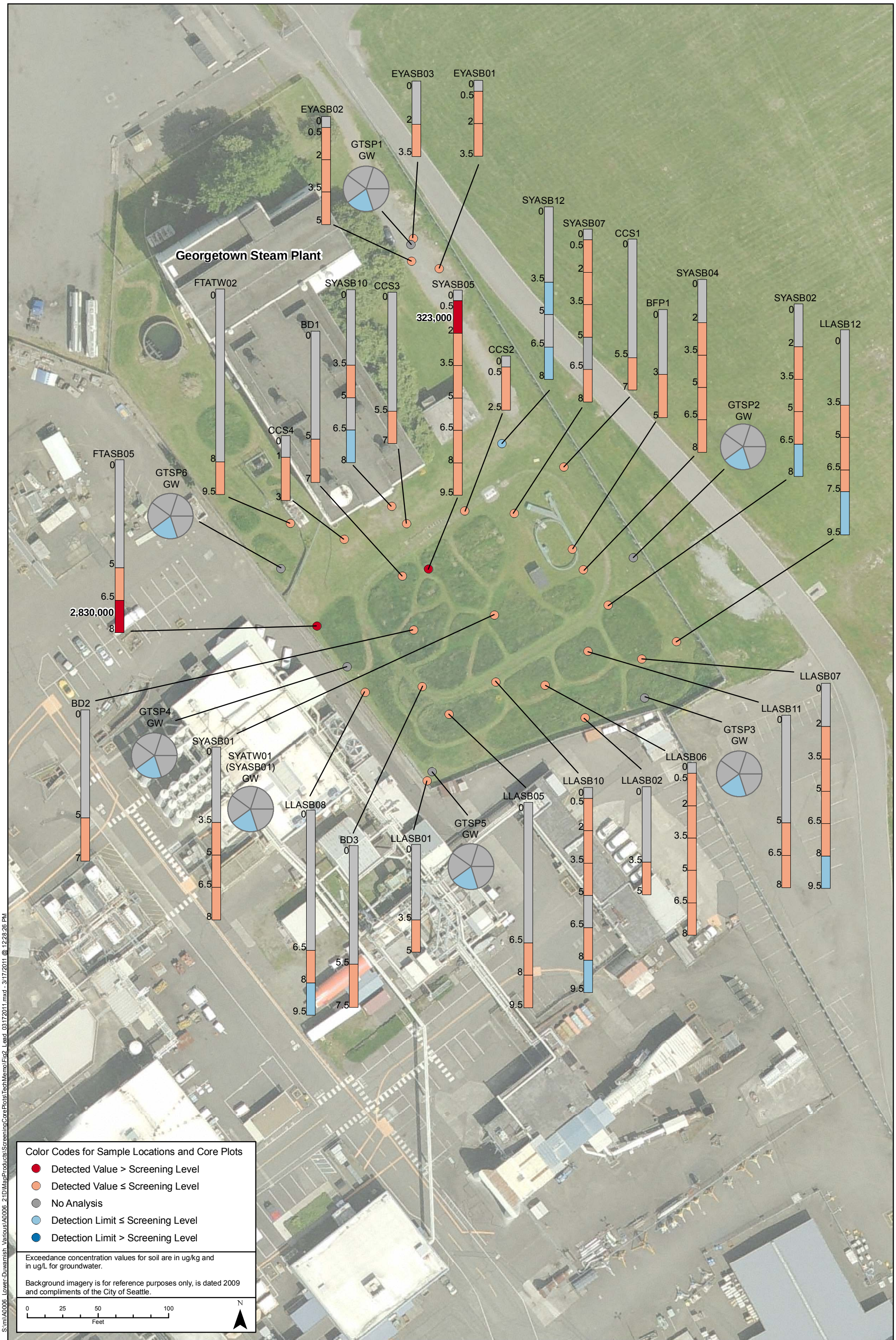
DRAFT **Figure 1.** GTSP Copper Concentrations Compared to Step 2 Screening Levels (Soil = 550,000 ug/kg; Groundwater = 2.4 ug/L)



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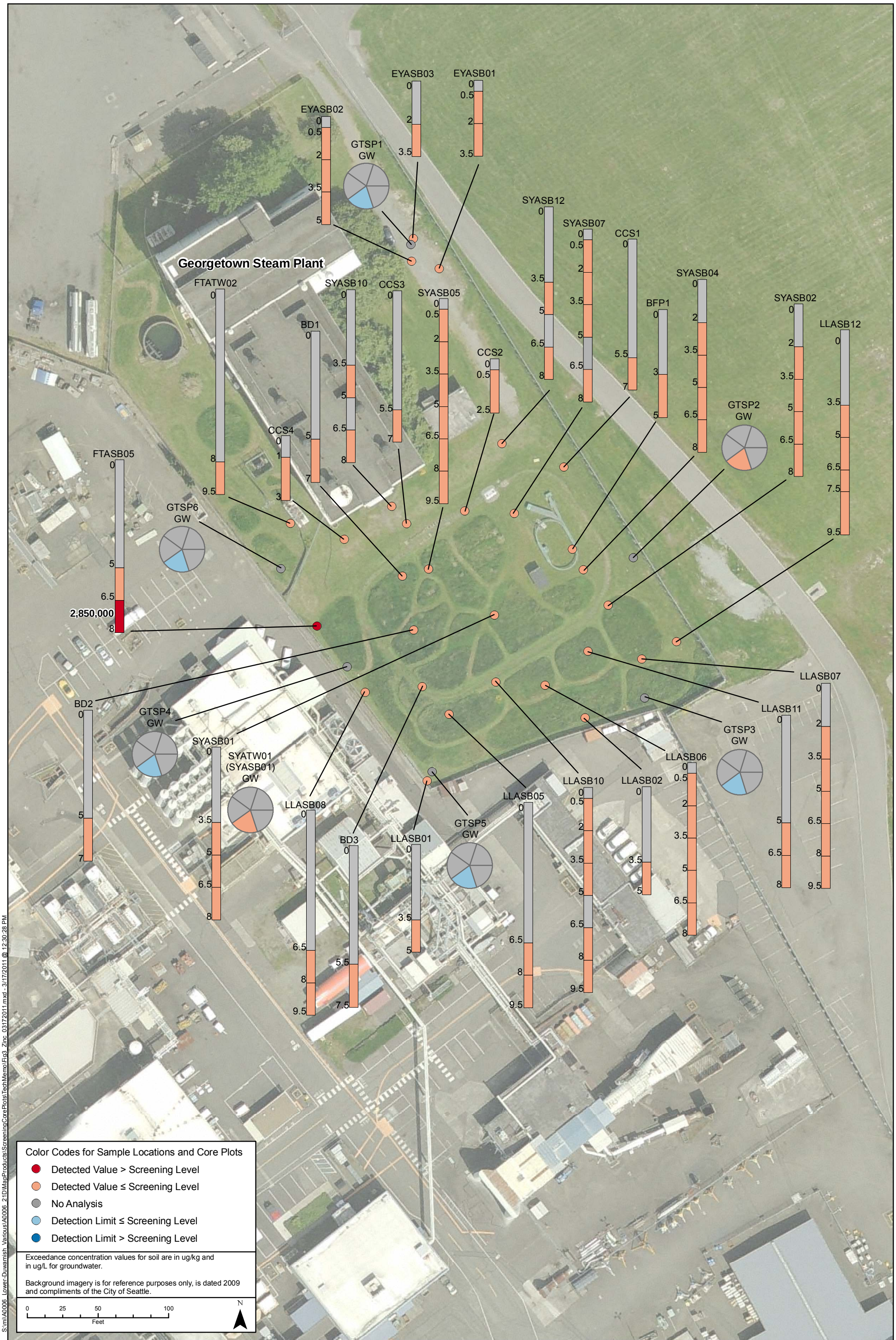
DRAFT **Figure 2.** GTSP Lead Concentrations Compared to Step 2 Screening Levels (Soil = 220,000 ug/kg; Groundwater = 0.54 ug/L)



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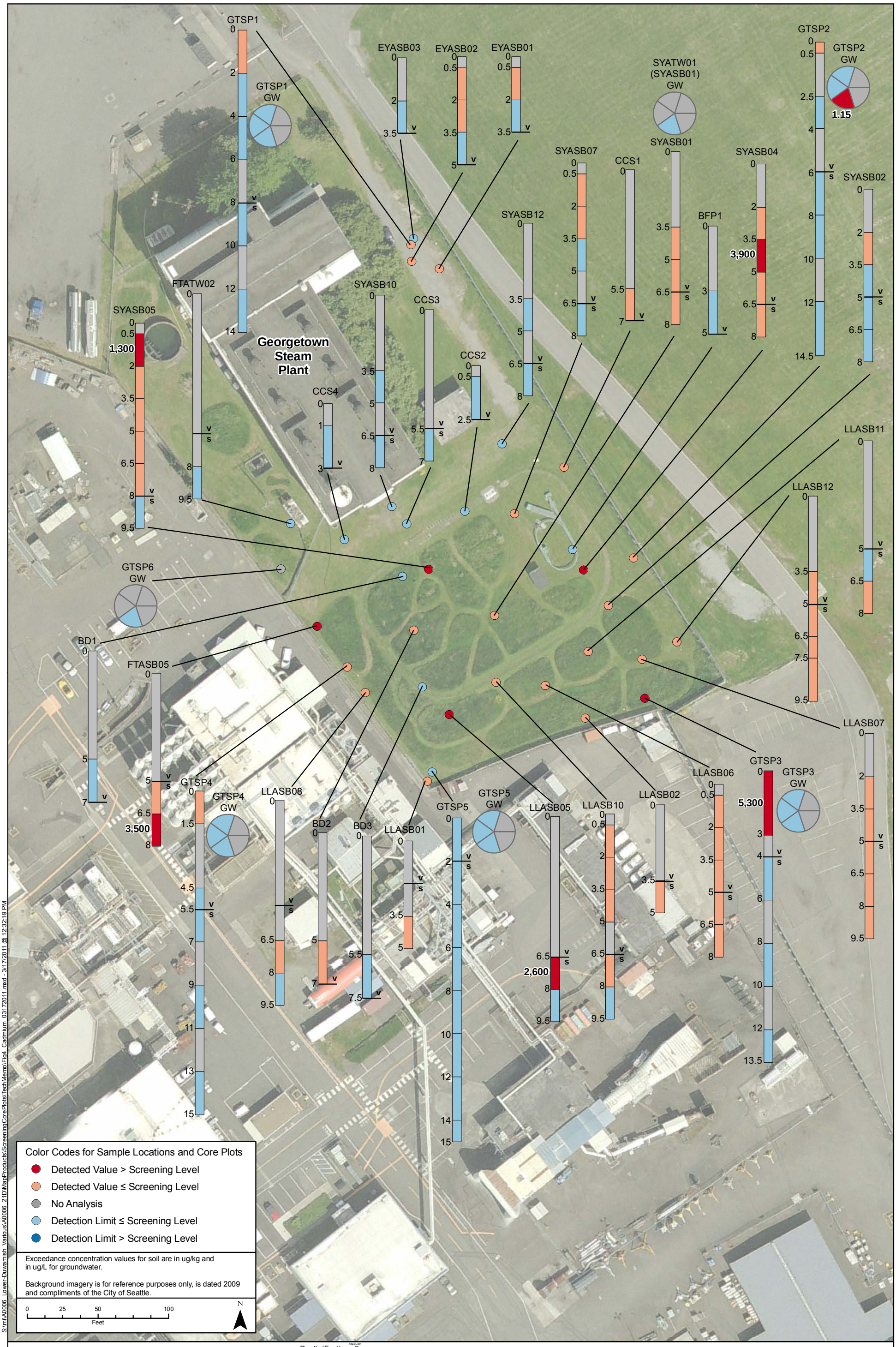
DRAFT **Figure 3.** GTSP Zinc Concentrations Compared to Step 2 Screening Levels (Soil = 570,000 ug/kg; Groundwater = 33 ug/L)



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DRAFT Figure 4. GTSP Cadmium Concentrations Compared to Step 2 Screening Levels (IAL Soil = 1,000 ug/kg; Groundwater = 0.25 ug/L)

Georgetown Steam Plant

EYASB02 EYASB03 GTSP1 GW EYASB01

SYASB12 SYASB07 CCS1 SYASB04

SYASB05 FTATW02 SYASB10 CCS3 CCS2 CCS4 BFP1

2,330,000 58,000 216,000 44,000 236,000 43,000 41,000 137,000

SYASB02 LLASB12

GTSP6 GW GTSP2 GW

BD1 FTASB05 BD2 GTSP4 GW LLASB07

33 88,000 45,500 64,000 97,500

SYASB01 SYATW01 (SYASB01) GW LLASB08 BD3 LLASB01 GTSP5 GW LLASB05 LLASB10 LLASB06 LLASB02 GTSP3 GW LLASB11

130,000

Color Codes for Sample Locations and Core Plots

- Detected Value > Screening Level
- Detected Value ≤ Screening Level
- No Analysis
- Detection Limit ≤ Screening Level
- Detection Limit > Screening Level

Exceedance concentration values for soil are in ug/kg and in ug/L for groundwater.

Background imagery is for reference purposes only, is dated 2009 and compliments of the City of Seattle.

0 25 50 100 Feet

N

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Groundwater Legend

Quarter 2 (2006/2007)
Quarter 1 (2006/2007)
2010 Sampling
Quarter 3 (2006/2007)
Quarter 4 (2006/2007)

* Color codes reflect the same values as noted for soils

Depth (Feet)

Exceedance Concentration Values

Vadose/Saturated Zone Assignment

* Sample intervals partially within the saturated zone was identified as saturated

DRAFT **Figure 5.** GTSP Nickel Concentrations Compared to Step 2 Screening Levels (Soil = 38,000 ug/kg; Groundwater = 8.2 ug/L)

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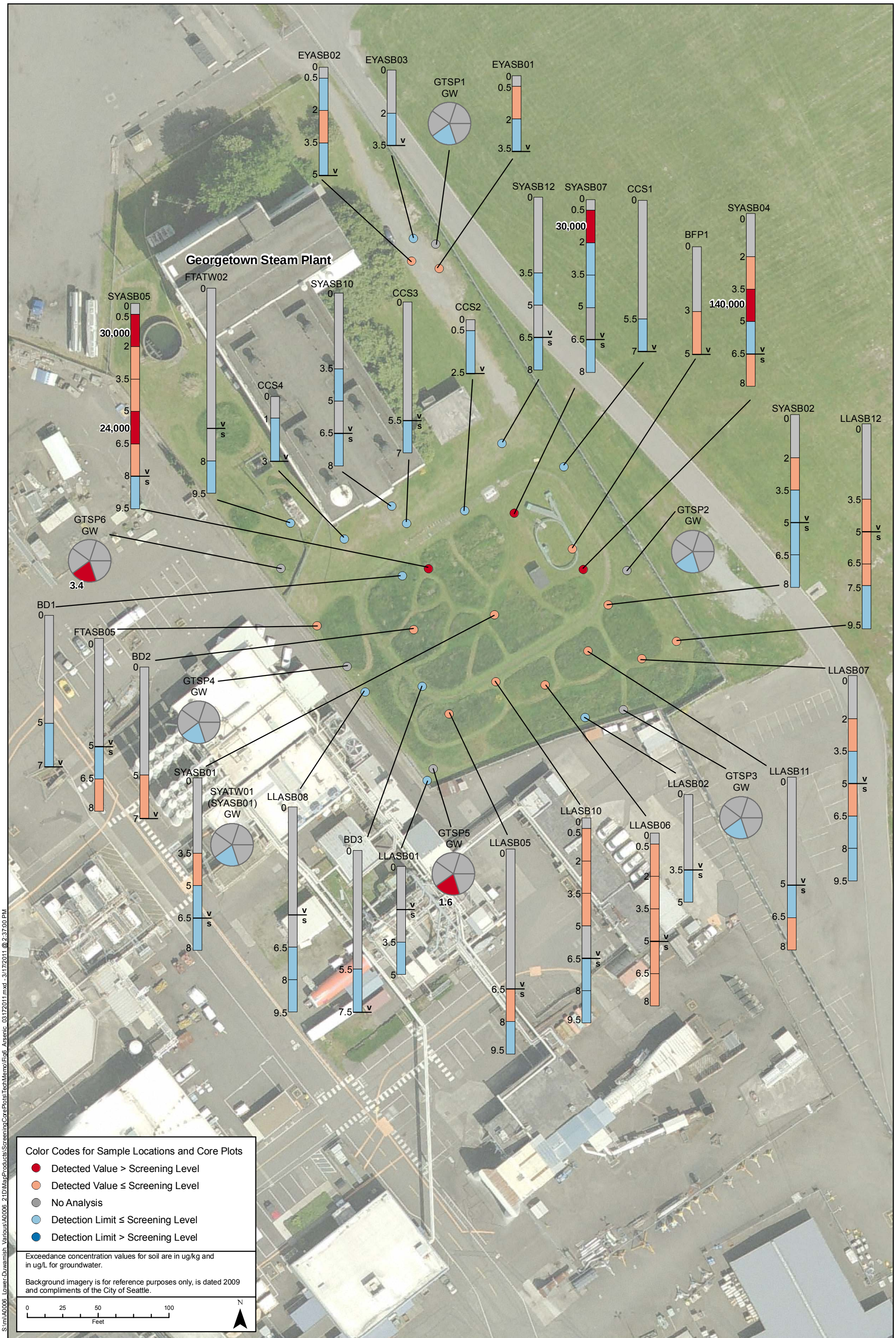

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Figure 6.

GTSP Arsenic Concentrations Compared to Interim Action Level for Soil and Step 2 Screening Level for Groundwater (Soil = 20,000 ug/kg; Groundwater = 1.2 ug/L)

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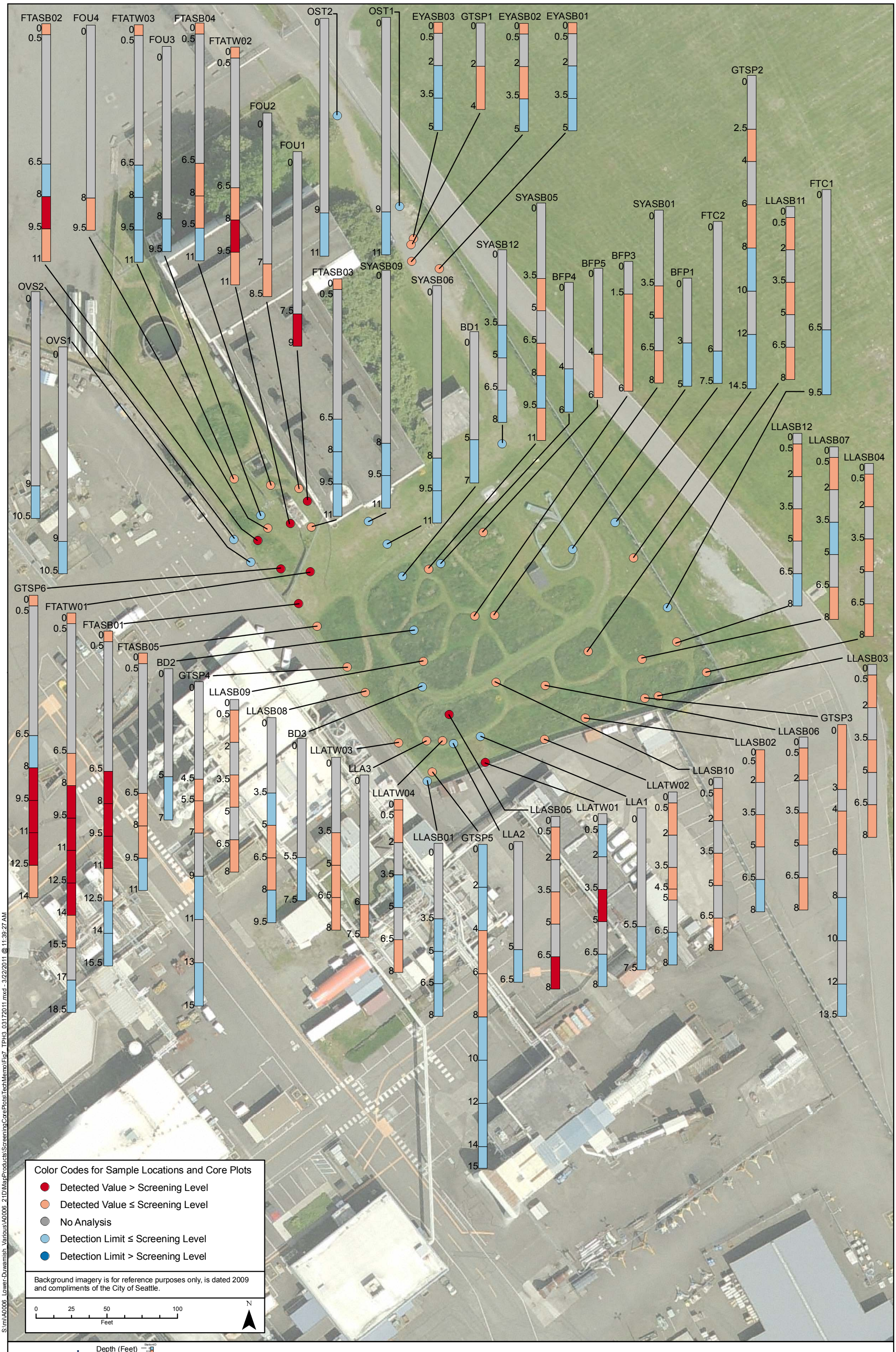

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DRAFT **Figure 7.** GTSP TPH Concentrations Compared to Interim Action Levels (Soil = 3,000,000 ug/kg)

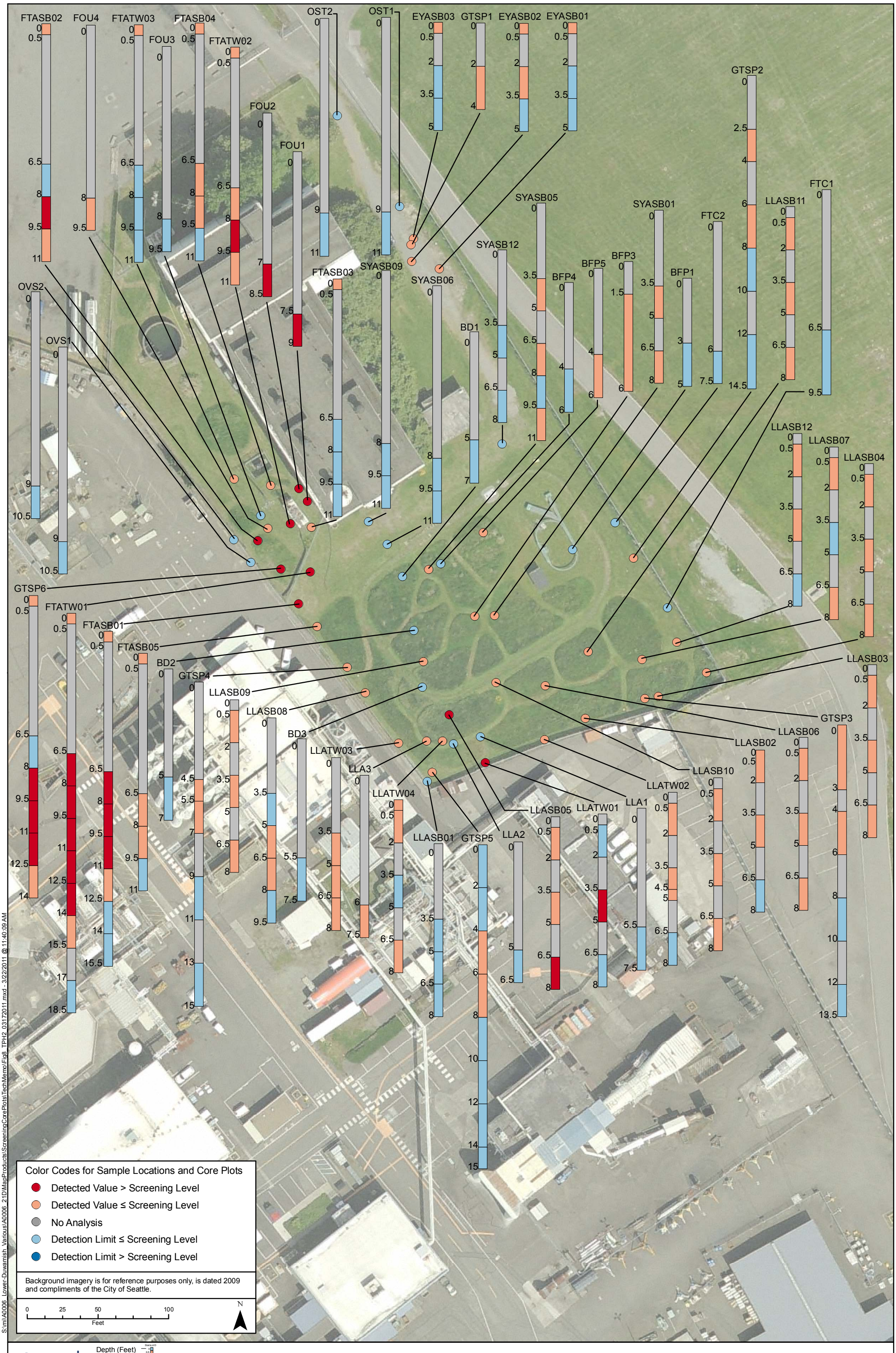

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Figure 8. GTSP TPH Concentrations Compared to Interim Action Levels (Soil = 2,000,000 ug/kg)

EYASB01
EYASB02
EYASB03
GTSP1
GTSP1 GW
0.033
0.036
0.048
SYASB12
GTSP2
GTSP2 GW
SYASB05
SYASB01
SYATW01 (SYASB01) GW
FTATW02
FTATW02 GW
FTATW03 GW
Georgetown Steam Plant
GTSP6
GTSP6 GW
GTSP4
GTSP4 GW
0.12
0.067
0.047
GTSP5
GTSP5 GW
LLASB01
LLATW02
LLASB02
GTSP3
GTSP3 GW

Color Codes for Sample Locations and Core Plots
- Detected Value > Screening Level
- Detected Value ≤ Screening Level
- No Analysis
- Detection Limit ≤ Screening Level
- Detection Limit > Screening Level

Exceedance concentration values for soil are in ug/kg and in ug/L for groundwater.

Background imagery is for reference purposes only, is dated 2009 and compliments of the City of Seattle.

0 25 50 100 Feet

N

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Groundwater Legend
Quarter 2 (2006/2007)
Quarter 1 (2006/2007)
2010 Sampling
Quarter 3 (2006/2007)
Quarter 4 (2006/2007)
* Color codes reflect the same values as noted for soils

Depth (Feet)
Exceedance Concentration Values
Vadose/Saturated Zone Assignment
* Sample intervals partially within the saturated zone was identified as saturated

DRAFT **Figure 9.**

GTSP Tetrachloroethene Concentrations Compared to Step 2 Screening Levels
(Vadose Soil = 0.22 ug/kg, Saturated Soil = 0.011 ug/kg; Groundwater = 0.021 ug/L)

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EYASB01
EYASB02
EYASB03
GTSP1
GTSP1 GW
0.96
0.97
1.1
1.1
SYASB12
GTSP2
GTSP2 GW
FTATW02
FTATW02 GW
Georgetown Steam Plant
SYASB05
SYASB01
SYATW01 (SYASB01) GW
FTATW03 GW
0.61
GTSP6
GTSP6 GW
GTSP4
GTSP4 GW
GTSP5
GTSP5 GW
LLASB01
LLATW02
LLASB02
GTSP3
GTSP3 GW
14.5
13.5

Color Codes for Sample Locations and Core Plots
- Detected Value > Screening Level
- Detected Value ≤ Screening Level
- No Analysis
- Detection Limit ≤ Screening Level
- Detection Limit > Screening Level

Exceedance concentration values for soil are in ug/kg and in ug/L for groundwater.

Background imagery is for reference purposes only, is dated 2009 and compliments of the City of Seattle.

0 25 50 100 Feet

N

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Groundwater Legend
Quarter 2 (2006/2007)
Quarter 1 (2006/2007)
2010 Sampling
Quarter 3 (2006/2007)
Quarter 4 (2006/2007)
* Color codes reflect the same values as noted for soils

Depth (Feet)
Exceedance Concentration Values
Vadose/Saturated Zone Assignment
* Sample intervals partially within the saturated zone was identified as saturated

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DRAFT **Figure 10.** GTSP Trichloroethene Concentrations Compared to Step 2 Screening Levels (Vadose Soil = 3.2 ug/kg, Saturated Soil = 0.19 ug/kg; Groundwater = 0.49 ug/L)

EYASB01
EYASB02
EYASB03
GTSP1
GTSP1 GW
SYASB12
SYASB05
SYASB01
SYATW01 (SYASB01) GW
GTSP2
GTSP2 GW
Georgetown Steam Plant
FTATW03 GW
FTATW02
FTATW02 GW
0.028
GTSP6
GTSP6 GW
GTSP4
GTSP4 GW
GTSP5
GTSP5 GW
LLASB01
LLATW02
LLASB02
GTSP3
GTSP3 GW

Color Codes for Sample Locations and Core Plots

- Detected Value > Screening Level
- Detected Value ≤ Screening Level
- No Analysis
- Detection Limit ≤ Screening Level
- Detection Limit > Screening Level

Exceedance concentration values for soil are in ug/kg and in ug/L for groundwater.

Background imagery is for reference purposes only, is dated 2009 and compliments of the City of Seattle.

0 25 50 100
Feet

N

Groundwater Legend

Quarter 2 (2006/2007)
Quarter 1 (2006/2007)
2010 Sampling
Quarter 3 (2006/2007)
Quarter 4 (2006/2007)
* Color codes reflect the same values as noted for soils

Depth (Feet)
Exceedance Concentration Values
Vadose/Saturated Zone Assignment
* Sample intervals partially within the saturated zone was identified as saturated

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DRAFT **Figure 11.**

GTSP Vinyl Chloride Concentrations Compared to Step 2 Screening Levels
(Vadose Soil = 0.1, Saturated Soil = 0.0049 ug/kg; Groundwater = 0.016 ug/L)

S:\mi\A0006_Lower-Duwamish_Various\A0006_21DMapProducts\ScreeningCorePlots\TechMemo\Fig11_VinylChloride_03172011.mxd - 3/22/2011 @ 11:42:40 AM

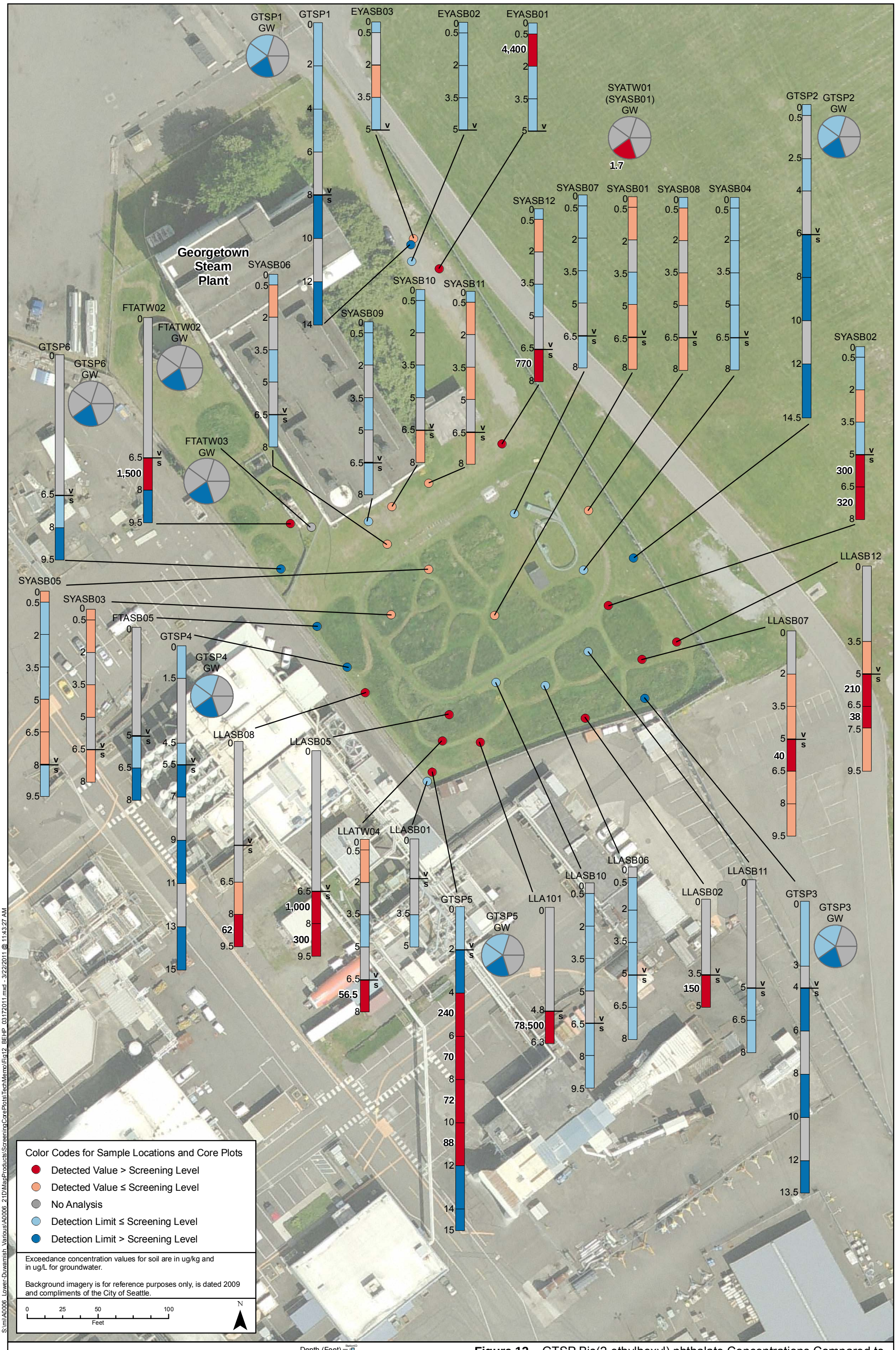

Figure 12. GTSP Bis(2-ethylhexyl) phthalate Concentrations Compared to Step 2 Screening Levels (Vadose Soil = 634 ug/kg, Saturated Soil = 32 ug/kg; Groundwater = 0.29 ug/L)

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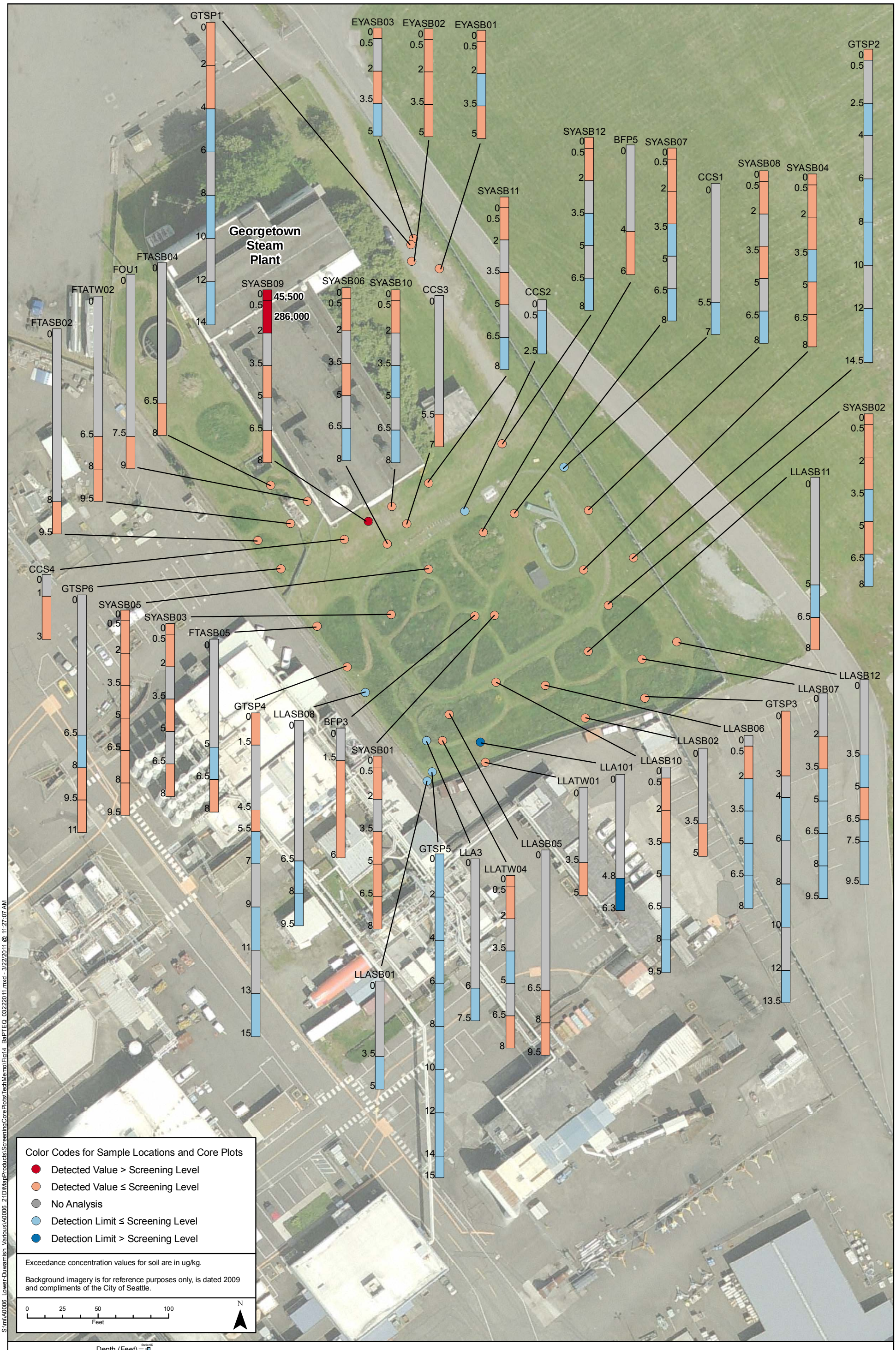
DRAFT **Figure 13.** GTSP TCDD TEQ Concentrations Compared to Interim Action Levels (Soil = 0.05 ug/kg)



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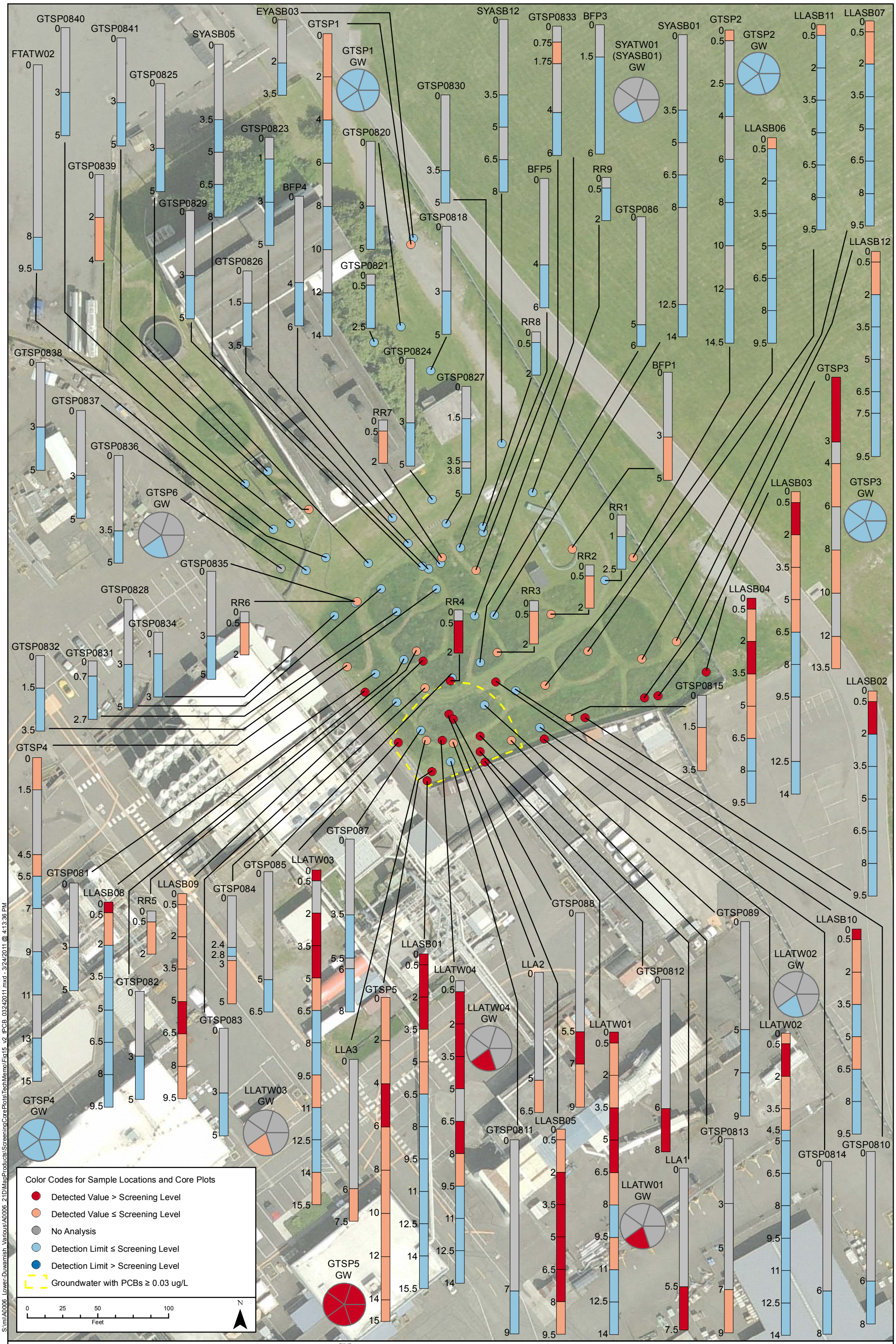
integral consulting inc.

DRAFT **Figure 14.** GTSP BaP TEQ Concentrations Compared to Interim Action Levels (Soil = 3,300 ug/kg)



DRAFT **Figure 15.** GTSP PCB Concentrations Compared to Interim Action Levels (Soil = 1,000 ug/kg; Groundwater = 0.03 ug/L)

TABLES

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

		Soil Screening Levels (µg/kg)			Groundwater Screening Levels (µg/L)	
			Step 2			
Group	Chemical	Step 1	Direct Contact	Leaching - Saturated Zone	Step 1	Step 2
Conventionals	Chloride	NV	NV	NA	230000	230000
	Sulfate	NV	NV	NA	250000	250000
Dioxins/furans	TCDD TEQ (ND = 1/2DL)	3.02E-08	0.0052	NA	2.06039E-10	2.06E-10
Metals	Arsenic	0.157807	7000	7000	0.0583	1.20
	Barium	82.86	1320000	NA	NV	NV
	Beryllium	3161.72	160000	NA	NV	NV
	Cadmium	1.4973	36000	1000	0.21	0.250
	Chromium	42000	135000	NA	100	74.0
	Chromium hexavalent	0.83	117000	NA	0.58	0.0430
	Copper	53.488	550000	NA	7.3	2.40
	Lead	5400.155	220000	NA	2.5	0.540
	Mercury	0.269883	5600	NA	0.005161594	0.00516
	Nickel	326.4333	1600000	38000	8.2	8.20
	Selenium	26.43333	800	NA	NV	NV
	Silver	13.15693	390000	NA	NV	NV
	Tin	50000	47000000	NA	9600	9,600
	Zinc	2028.518	570000	NA	32.56745762	32.6
PAHs	Acenaphthene	16.74946	3400000	NA	2.614379085	20.0
	Acenaphthylene	69.0915	NV	NA	10.78431373	NV
	Anthracene	223.0915	17000000	NA	10.78431373	199
	Benzo(g,h,i)perylene	31.00332	NV	NA	0.011584454	NV
	Fluoranthene	160.5341	2300000	NA	2.256699577	11.0
	Fluorene	23.56313	2300000	NA	2.03539823	45.2
	1-Methylnaphthalene	12	22000	NA	2.3	2.30
	2-Methylnaphthalene	43.21212	310000	NA	18.18181818	150
	Naphthalene	0.47	3600	NA	53.80434783	0.140
	Phenanthrene	101.3782	NV	NA	4.807692308	NV
	Pyrene	684.432	1700000	NA	9.8	9.83
	BaP TEQ	0.005187	15	NA	6.5888E-06	0.00320
	High Molecular Weight PAH	NV	NV	NA	0.01	NV
	Low Molecular Weight PAH	NV	NV	NA	0.01	NV
PCBs	Total PCBs	7.14E-07	220	0.12	2.30915E-05	0.00153
Pesticides	Aldrin	0.000609	29	NA	1.24351E-05	1.24E-05
	cis -Chlordane	0.010322	1600	NA	0.002	2.00E-04
	trans -Chlordane	0.010322	1600	NA	0.002	2.00E-04
	4,4'-DDD	0.003537	2000	NA	0.0000767	7.67E-05
	4,4'-DDE	0.004696	1400	NA	0.0000542	5.42E-05
	4,4'-DDT	0.03674	1700	NA	0.0000542	5.42E-05
	Dieldrin	0.000341	30	NA	1.32123E-05	1.32E-05
	alpha-Endosulfan	0.020242	370000	NA	0.0087	0.0087
	beta-Endosulfan	0.020242	370000	NA	0.0087	0.0087
	Endosulfan sulfate	0.020242	370000	NA	0.0087	0.0087
	Endrin	0.022482	18000	NA	0.002	0.002
	Endrin aldehyde	0.022482	18000	NA	0.002	0.002
	Heptachlor	0.000192	110	NA	1.95878E-05	1.96E-05
	Heptachlor epoxide	0.000809	53	NA	9.68626E-06	9.69E-06
	alpha-Hexachlorocyclohexane	0.002469	77	NA	0.001205401	0.00121
	beta-Hexachlorocyclohexane	0.010234	270	NA	0.004218903	0.00422
	gamma-Hexachlorocyclohexane	0.000356	520	NA	0.0002	2.00E-04
	Toxaphene	5.73E-05	440	NA	0.0000685	6.85E-05
	Total Chlordanes	0.010322	1600	NA	0.000200045	0.0002

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

		Soil Screening Levels (µg/kg)			Groundwater Screening Levels (µg/L)	
			Step 2			
Group	Chemical	Step 1	Direct Contact	Leaching - Saturated Zone	Step 1	Step 2
	Total DDTs	0.003537	1400	NA	5.41716E-05	5.42E-05
Petroleum	Diesel Range Hydrocarbons	2000000	2000000	NA	500	500
	Gasoline Range Hydrocarbons	100000	30000	NA	1000	1000
	Motor oil	2000000	2000000	NA	500	500
	TPH	2000000	2000000	NA	500	500
SVOCs	Benzoic acid	644.3179	240000000	NA	2242.926156	NV
	Benzyl alcohol	55.02114	6100000	NA	181.9923372	2400
	Bis(2-ethylhexyl) phthalate	47.08166	35000	31.7	0.284848485	0.285
	Butylbenzyl phthalate	3.954085	260000	NA	0.523504274	0.410
	Carbazole	16	50000	NA	4.4	4.4
	Dibenzofuran	15.36726	78000	NA	1.327433628	32
	Dibutyl phthalate	81.35635	6100000	NA	46.57806484	46.6
	1,2-Dichlorobenzene	3.788337	1900000	NA	5.191873589	370
	1,3-Dichlorobenzene	275.2	NV	NA	600	960
	1,4-Dichlorobenzene	0.41	2400	NA	7.142857143	0.740
	Diethyl phthalate	199.7831	49000000	NA	484.1269841	4240
	Dimethyl phthalate	40.95238	8.00E+04	NA	142.8571429	10700
	2,4-Dimethylphenol	2.026013	1200000	NA	2.020624303	82.4
	Di-n-octyl phthalate	0.548534	1600000	NA	0.295918367	320
	Hexachlorobenzene	0.000243	300	NA	0.112426036	6.62E-05
	Hexachlorobutadiene	1.28115	6200	NA	0.9	4.22
	Isophorone	15	1100000	NA	46	46.0
	2-Methylphenol	2.68544	3100000	NA	7.110609481	1800
	4-Methylphenol	22.1275	310000	NA	77.18894009	180
	n-Nitrosodi-n-propylamine	0.0030	69	NA	0.0096	0.00960
	n-Nitrosodiphenylamine	9.54138	99000	NA	1.593580667	1.48
	Pentachlorophenol	2.559468	3000	NA	0.729	0.698
	Tributyl phosphate	36	53000	NA	7.3	7.30
	2,4,6-Trichlorophenol	0.82238	44000	NA	3	0.558
VOCs	Acetone	230.9181	8000000	NA	800	800
	Benzene	0.21	1100	NA	0.795	0.41
	Carbon disulfide	266	820000	NA	800	800
	Carbon tetrachloride	0.536491	610	NA	0.247823653	0.2
	Chlorobenzene	11.09333	290000	NA	100	20
	Chloroethane	10.55383	15000000	NA	21000	34
	Chloroform	0.053	290	NA	4.3	0.19
	Chloromethane	1.014258	77000	NA	3.37	3.37
	1,1-Dichloroethane	0.69	3300	NA	2.4	2.4
	1,2-Dichloroethane	0.042	430	NA	0.48	0.15
	1,1-Dichloroethene	0.234524	240000	NA	0.729	3.2
	cis -1,2-Dichloroethene	21	160000	NA	70	70
	trans -1,2-Dichloroethene	29	150000	NA	100	100
	Ethylbenzene	1.7	5400	NA	700	1.5
	Methyl isobutyl ketone	450	5300000	NA	640	640
	Methylene chloride	1.2	11000	NA	5	4.8
	Methylethyl ketone	1500	28000000	NA	4800	4800
	Phenol	23.88097	18000000	NA	78.35820896	300
	Styrene	1.174521	33000	NA	1.46	1.46
	Tetrachloroethene	0.008108	550	0.011	0.020523086	0.0206
	Toluene	698	5000000	NA	1000	1000
	1,2,4-Trichlorobenzene	0.399773	22000	NA	1.128133705	2.3

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

		Soil Screening Levels (µg/kg)			Groundwater Screening Levels (µg/L)	
			Step 2			
Group	Chemical	Step 1	Direct Contact	Leaching - Saturated Zone	Step 1	Step 2
	1,1,1-Trichloroethane	2000	8700000	NA	200	200
	1,1,2-Trichloroethane	0.078	1100	NA	0.768	0.24
	Trichloroethene	0.03898	2800	0.187	0.49	0.49
	1,2,4-Trimethylbenzene	21	62000	NA	15	15
	1,3,5-Trimethylbenzene	50.985	780000	NA	45	45.2
	Vinyl chloride	0.0056	60	0.00489	0.016	0.016
	m,p-Xylene	200	630000	NA	1000	200
	o-Xylene	200	630000	NA	1000	200

Notes:

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

	Soil			Groundwater	
		Final			
Analyte	Preliminary	Direct Contact	Leaching	Preliminary	Final
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			
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

	Soil			Groundwater	
		Final			
Analyte	Preliminary	Direct Contact	Leaching	Preliminary	Final
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 = polycycylic 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

	Soil		Groundwater	
Chemical of Concern	IAL (mg/kg)	Basis	IAL (µg/L)	Basis
TCDD TEQ	5.0E-05	Urban background	--	
Arsenic	20	Area-wide background	--	
BaP TEQ	3.3	Urban background	--	
PCBs	0.5 in groundwater-impacted area	Leaching "threshold"	0.03	PQL
	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		
	Remove free product	Residual saturation limitation		

Notes:

-- = not a chemical of concern for this medium or in this site area
BaP = benzo(a)pyrene
IAL = interim action level
PCB = polychlorinated biphenyl
PQL = practical quantitation limit
TCDD = tetrachlorodibenzo-*p*-dioxin
TEQ = toxicity equivalent
TPH = total petroleum hydrocarbon

APPENDIX A

DEVELOPMENT OF STEP 1 SCREENING LEVELS

Table A-1. Soil Screening Level Deriva

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 **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**				

Table A-1. Soil Screening Level Deriva

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 **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**
nitrosodiphenylamine, N-							**0.227473352**	**0.011528793**	**0.227829375**	**0.227829375**	**0.011561091**	**0.011561091**				
PCB mixtures			**0.039618668**	**0.001984693**			**0.396186677**	**0.019846933**	**1.305844196**	**0.241078929**	**0.065415923**	**0.012076786**	**1.800848533**	**0.090213333**	**0.01260594**	**0.000631493**
PCB - Aroclor 1016	**0.611759881**	**0.030684267**			**1.33822474**	**0.067121833**			**1.309661255**	**0.241783616**	**0.065687577**	**0.012126937**				
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**				
trichlorethane, 1,1,1-	**44.58415697**	**2.414208**			**97.83745558**	**5.297845333**										
trichlorethane, 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**										

Table A-1. Soil Screening Level Deriva

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 **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**
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																
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 **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**
Screening Levels Added by Integ																
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 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 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 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**
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 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 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-													**0.41936428**	**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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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 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 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**
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**	**0.0000008**	**5.73333E-08**	**0.00292**	**0.000209267**	**0.0000008**	**5.73333E-08**	**0.00000112**	**8.02667E-08**	**0.00000112**

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

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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 HH - Fresh Water **Water & Organism Consumption NTR** - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10^{-6} 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^{-6} 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^{-6} 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^{-6} 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**
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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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 HH - Fresh Water **Water & Organism Consumption NTR** - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10^{-6} 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^{-6} 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^{-6} 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^{-6} 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**
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**						

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 HH - Fresh Water **Water & Organism Consumption NTR** - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10^{-6} 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^{-6} 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^{-6} 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^{-6} 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**
Screening Levels Added by Integ															
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**
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**

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**
nitrosodiphenylamine, N-	**99**	**350**							**0.075**	**0.090354028**		**0.012**		**8270D-SIM**	**0.011528793**
PCB mixtures	**0.22**	**0.74**				**0.089**	**0.3**	**1**	**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**
trichlorethane, 1,1,1-	**8700**	**38000**							**3.2**	**280.5908**		**0.00055**	**0.001**	**8260B-Low Soil**	**2**
trichlorethane, 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**				**30**	**380**		**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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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**		**0.00000026**	**0.0000045**	**0.0000052**	**0.000000008**		**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**

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**
Screening Levels Added by Integ															
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	--								--						--
cis -1,2-Dichloroethene	1.60E+02								2.10E-02						0.021
Isophorone	1.20E+04								2.30E-02						0.015348667
n -Nitrosodi-*n* -propylamine	6.90E-02								7.20E-06						2.9824E-06
Sulfate	--								--						--
trans -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 = regoinal 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						
PATHWAYS HH - Human Health Ecol- Ecological	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	5	*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						
PATHWAYS HH - Human Health Ecol- Ecological	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**
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						
PATHWAYS HH - Human Health Ecol- Ecological	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**
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		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)		*	0.0000006	0.00003	*0	0.00003	*0	*	*	0.00003	*0	0.00003	*0		0.00000058	*
		*						*	*							*
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						
PATHWAYS HH - Human Health Ecol- Ecological	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**
Heptachlor		*		**0.0004**	***0**	**0.0004**		*	*	**0.0004**	***0**	**0.0004**		**8**	**0.019444444**	*
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**	*
		*						*	*							*
Screening Levels Added by Integral																
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
PATHWAYS 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
PATHWAYS 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
PATHWAYS 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						**0.0000023**	**0.000005**	**8081B**
alpha-Endosulfan	*	*	**210**		*		8.70E-03						**0.0000012**	**0.000002**	**8081B**
beta-Endosulfan	*	*	**210**		*		8.70E-03						**0.00000051**	**0.000002**	**8081B**
Endosulfan Sulfate	*	*	**210**		*		8.70E-03						**0.00000012**	**0.0000005**	**8081B**
Endrin	*	*	**10.5**		*		2.30E-03						**0.00000084**	**0.000002**	**8081B**
Endrin Aldehyde	*	*	**10.5**		*		2.30E-03						**0.00000067**	**0.000002**	**8081B**

Table A-2. Groundwater Screening Lev

MEDIA - MTCA Standard		GW Method C				GW PATHWAY EVALUATION				ARAR's		Always Applicable			EPA Method
PATHWAYS 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**	**0.194444444**	*		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**
	*	*			*		*								
Screening Levels Added by Integr															
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	
PATHWAYS 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	
PATHWAYS 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	
PATHWAYS 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**
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, NWRQC
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	
PATHWAYS 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**
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)
Screening Levels Added by Integ		
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
trans -1,2-Dichloroethene	**100**	Ground Water Method B - HH Potable ARAR's WAC 173-340-720(4)(b)(i) Safe Drinking Water Standards - 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
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						***Screening Levels***	***Screening Levels****	***Screening Levels***
UNITS	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**µg/L**	**µg/L**
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	0.00012711
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
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						***Screening Levels***	***Screening Levels****	***Screening Levels***
UNITS	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**µg/L**	**µg/L**
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-06	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
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						***Screening Levels***	***Screening Levels****	***Screening Levels***
UNITS	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**µg/L**	**µg/L**
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
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						***Screening Levels***	***Screening Levels****	***Screening Levels***
UNITS	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**µg/L**	**µg/L**
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
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						***Screening Levels***	***Screening Levels****	***Screening Levels***
UNITS	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**µg/L**	**µg/L**
Screening Levels Added by Integral								
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 plycyclic 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										
PATHWAYS 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**
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										
PATHWAYS 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**
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										
PATHWAYS 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											
PATHWAYS 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**	**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**	
	*	*	*	*	*	*	*	*	*	*	*							
Screening Levels Added by Integral																		
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	
Tributyl phosphate												NV	NV	NV	NV	NV	NV	

Table A-4. Surface Water Screening Le

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 Consumtion 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**
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 Le

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 Consumtion 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**
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 Le

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 Consumtion 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**
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		*	*	*			*	*									
Nickel		*	*	*	**2758.077226**		*	*			**74**	**8.2**	**610**	**4600**		**470**	**52**
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)		*	*	*		**0.000000216**	*	*						**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 Le

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 Consumtion 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**
		*	*	*			*	*									
Screening Levels Added by Integr																	
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
cis -1,2-Dichloroethene									NV	NV	NV	NV		NV		NV	NV
Isophorone									NV	NV	NV	NV		960			NV
n -Nitrosodi-*n* -propylamine									NV	NV	NV	NV		NV		NV	NV
Sulfate									NV	NV	NV	NV		NV		NV	NV
trans -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 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 **Water & Organism Consumption NTR** - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10^{-6} Carc Risk	Surface Water HH - Fresh Water **Organism Consumption Only NTR** - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10^{-6} Carc Risk	Surface Water HH - Marine Water **Organism Consumption Only NTR** - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10^{-6} 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** 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**	**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 Le

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 **Water & Organism Consumption NTR** - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10^{-6} Carc Risk	Surface Water HH - Fresh Water **Organism Consumption Only NTR** - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10^{-6} Carc Risk	Surface Water HH - Marine Water **Organism Consumption Only NTR** - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10^{-6} 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** 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**	**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 **Water & Organism Consumption NTR** - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10^{-6} Carc Risk	Surface Water HH - Fresh Water **Organism Consumption Only NTR** - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10^{-6} Carc Risk	Surface Water HH - Marine Water **Organism Consumption Only NTR** - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10^{-6} 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** 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**	**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 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 **Water & Organism Consumption NTR** - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10^{-6} Carc Risk	Surface Water HH - Fresh Water **Organism Consumption Only NTR** - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10^{-6} Carc Risk	Surface Water HH - Marine Water **Organism Consumption Only NTR** - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10^{-6} 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** 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**	**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**								
Screening Levels Added by Integr																	
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	NV	NV	NV	NV	NV	NV	NV	NV									
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 L

MEDIA - MTCA Standard		**Always Applicable**			**EPA Method**	**ALWAYS APPLICABLE**	SW MOST STRINGENT	
PATHWAYS HH - Human Health Ecol- Ecological	Surface Water HH - **Child** Carcinogen Tribal Fish Consumption w/o Salmon **EPA RCRA** (using **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

MEDIA - MTCA Standard		**Always Applicable**			**EPA Method**	**ALWAYS APPLICABLE**	SW MOST STRINGENT	
PATHWAYS HH - Human Health Ecol- Ecological	Surface Water HH - **Child** Carcinogen Tribal Fish Consumption w/o Salmon **EPA RCRA** (using **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 L

MEDIA - MTCA Standard		Always Applicable			EPA Method	ALWAYS APPLICABLE	SW MOST STRINGENT	
PATHWAYS HH - Human Health Ecol- Ecological	Surface Water HH - **Child** Carcinogen Tribal Fish Consumption w/o Salmon **EPA RCRA** (using **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**
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 L

MEDIA - MTCA Standard		Always Applicable			EPA Method	ALWAYS APPLICABLE	SW MOST STRINGENT	
PATHWAYS HH - Human Health Ecol- Ecological	Surface Water HH - **Child** Carcinogen Tribal Fish Consumption w/o Salmon **EPA RCRA** (using **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**
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
					*			
Screening Levels Added by Integr								
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
cis -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-*n* -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-*n* -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
n -Nitrosodi-*n* -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
trans -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

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
Metals	Barium		x	Not analyzed in GW
	Beryllium		x	Not analyzed in GW
	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
PAHs	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
	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
Pesticides	Endrin ketone	x	x	Not detected, SL not provided by Ecology
	delta-Hexachlorocyclohexane	x	x	Not detected, SL not provided by Ecology
	Methoxychlor	x	x	Not detected, SL not provided by Ecology
SVOCs	Aniline	x	x	Not detected, SL not provided by Ecology
	Azobenzene	x	x	Not detected, SL not provided by Ecology
	Benzidine	x	x	Not detected, SL not provided by Ecology
	Bis(2-chloro-1-methylethyl) ether	x	x	Not detected, SL not provided by Ecology
	Bis(2-chloroethoxy) methane	x	x	Not detected, SL not provided by Ecology
	Bis(2-chloroethyl) ether	x	x	Not detected, SL not provided by Ecology
	4-Bromophenyl phenyl ether	x	x	Not detected, SL not provided by Ecology
	Butyl diphenyl phosphate	x	x	Not detected, SL not provided by Ecology
	4-Chloro-3-methylphenol	x	x	Not detected, SL not provided by Ecology
	4-Chloroaniline	x	x	Not detected, SL not provided by Ecology
	2-Chloronaphthalene	x	x	Not detected, SL not provided by Ecology
	2-Chlorophenol	x	x	Not detected, SL not provided by Ecology
	4-Chlorophenyl phenyl ether	x	x	Not detected, SL not provided by Ecology
	2-Chlorotoluene	x	x	Not detected, SL not provided by Ecology
	Dibutyl phenylphosphate	x	x	Detected but no ARARs or toxicity parameter values available
	3,3'-Dichlorobenzidine	x	x	Not detected, SL not provided by Ecology
	2,4-Dichlorophenol	x	x	Not detected, SL not provided by Ecology
	4,6-Dinitro-2-methylphenol	x	x	Not detected, SL not provided by Ecology
	2,4-Dinitrophenol	x	x	Not detected, SL not provided by Ecology
	2,4-Dinitrotoluene	x	x	Not detected, SL not provided by Ecology

Table B-1. Chemicals Not Screened During Step 1

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

Table B-1. Chemicals Not Screened During Step 1

Group	Chemical	Soil	Groundwater	Reason for Exclusion
	Isopropylbenzene	x	x	Not detected, SL not provided by Ecology
	Methyl iodide	x	x	Not detected, SL not provided by Ecology
	Methyl *n*-butyl ketone	x	x	Not detected, SL not provided by Ecology
	Methyl *tert*-butyl ether	x	x	Not detected, SL not provided by Ecology
	1-Methyl-4-isopropylbenzene	x	x	Not detected, SL not provided by Ecology
	Methylene bromide	x	x	Not detected, SL not provided by Ecology
	n-Propylbenzene	x	x	Detected but no ARARs or toxicity parameter values available
	Pyridine	x	x	Not detected, SL not provided by Ecology
	1,1,1,2-Tetrachloroethane	x	x	Not detected, SL not provided by Ecology
	1,1,2,2-Tetrachloroethane	x	x	Not detected, SL not provided by Ecology
	1,1,2-Trichloro-1,2,2-trifluoroethane	x	x	Not detected, SL not provided by Ecology
	1,2,3-Trichlorobenzene	x	x	Not detected, SL not provided by Ecology
	Trichlorofluoromethane	x	x	Not detected, SL not provided by Ecology
	1,2,3-Trichloropropane	x	x	Not detected, SL not provided by Ecology
	1,2,4-Trimethylbenzene		x	Not detected, SL not provided by Ecology
	Vinyl acetate	x	x	Not detected, SL not provided by Ecology
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 = semivolvolatile 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 (µg/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-08	9	9	0.141	4.67E+06			Yes	
Metals	Arsenic	7440-38-2	1.58E-01	69	31	140000	8.87E+05	7000	4.44E+04	Yes	
	Cadmium	7440-43-9	1.50E+00	96	49	5300	3.54E+03	1000	6.68E+02	Yes	
	Chromium	7440-47-3	4.20E+04	96	96	132000	3.14E+00			Yes	
	Chromium hexavalent	18540-29-9	8.30E-01	27	2	857	1.03E+03	246	2.96E+02	Yes	
	Copper	7440-50-8	5.35E+01	69	69	2610000	4.88E+04			Yes	
	Lead	7439-92-1	5.40E+03	69	61	2830000	5.24E+02	210	3.89E-02	Yes	
	Mercury	7439-97-6	2.70E-01	96	57	3300	1.22E+04	60	2.22E+02	Yes	
	Nickel	7440-02-0	3.26E+02	69	69	2330000	7.14E+03			Yes	
	Tin	7440-31-5	5.00E+04	69	14	79000	1.58E+00	1200	2.40E-02	Yes	
	Zinc	7440-66-6	2.03E+03	69	69	2850000	1.40E+03			Yes	
PAHs	Acenaphthene	83-32-9	1.67E+01	145	24	13000	7.76E+02	20000	1.19E+03	Yes	
	Acenaphthylene	208-96-8	6.91E+01	145	16	160	2.32E+00	20000	2.89E+02	Yes	
	Anthracene	120-12-7	2.23E+02	145	44	49000	2.20E+02	20000	8.96E+01	Yes	
	Benzo(g,h,i)perylene	191-24-2	3.10E+01	145	58	120000	3.87E+03	20000	6.45E+02	Yes	
	Fluoranthene	206-44-0	1.61E+02	145	89	440000	2.74E+03	20000	1.25E+02	Yes	
	Fluorene	86-73-7	2.36E+01	145	30	49000	2.08E+03	82	3.48E+00	Yes	
	1-Methylnaphthalene	90-12-0	1.20E+01	136	62	9400	7.83E+02	95	7.92E+00	Yes	
	2-Methylnaphthalene	91-57-6	4.32E+01	145	69	520000	1.20E+04	70	1.62E+00	Yes	
	Naphthalene	91-20-3	4.70E-01	150	49	3500	7.45E+03	20000	4.26E+04	Yes	
	Phenanthrene	85-01-8	1.01E+02	145	98	280000	2.76E+03	66	6.51E-01	Yes	
	Pyrene	129-00-0	6.84E+02	145	94	380000	5.55E+02	66	9.64E-02	Yes	
	BaP TEQ	BAPEQ	5.19E-03	145	85	286000	5.51E+07	20000	3.86E+06	Yes	
PCBs	Total PCBs	SMSPCB	7.14E-07	282	134	3800000	5.32E+12	94	1.32E+08	Yes	
Pesticides	Aldrin	309-00-2	6.09E-04	10	0			2	3.28E+03	No	Never detected
	cis-Chlordane	5103-71-9	1.03E-02	10	0			2.6	2.52E+02	No	Never detected
	trans-Chlordane	5103-74-2	1.03E-02	10	0			2.5	2.42E+02	No	Never detected
	4,4'-DDD	72-54-8	3.54E-03	10	0			5.3	1.50E+03	No	Never detected
	4,4'-DDE	72-55-9	4.70E-03	10	0			5.3	1.13E+03	No	Never detected
	4,4'-DDT	50-29-3	3.67E-02	10	0			5.3	1.44E+02	No	Never detected
	Dieldrin	60-57-1	3.41E-04	10	0			5.3	1.55E+04	No	Never detected
	alpha-Endosulfan	959-98-8	2.02E-02	10	0			2.5	1.24E+02	No	Never detected
	beta-Endosulfan	33213-65-9	2.02E-02	10	0			5.2	2.57E+02	No	Never detected
	Endosulfan sulfate	1031-07-8	2.02E-02	10	0			7.9	3.90E+02	No	Never detected
	Endrin	72-20-8	2.25E-02	10	0			4.8	2.14E+02	No	Never detected
	Endrin aldehyde	7421-93-4	2.25E-02	10	0			9	4.00E+02	No	Never detected
	Heptachlor	76-44-8	1.92E-04	10	0			2	1.04E+04	No	Never detected
	Heptachlor epoxide	1024-57-3	8.09E-04	10	0			2.7	3.34E+03	No	Never detected
	alpha-Hexachlorocyclohexane	319-84-6	2.47E-03	10	0			1.6	6.48E+02	No	Never detected
	beta-Hexachlorocyclohexane	319-85-7	1.02E-02	10	0			3	2.93E+02	No	Never detected
	gamma-Hexachlorocyclohexane	58-89-9	3.56E-04	10	0			1.6	4.49E+03	No	Never detected
	Toxaphene	8001-35-2	5.73E-05	10	0			1600	2.79E+07	No	Never detected
	Total Chlordanes	TOTCHLDANE	2.00E-01	10	0			2.6	1.30E+01	No	Never detected
	Total DDTs	TOTDDT	3.54E-03	10	0			5.3	1.50E+03	No	Never detected
	Diesel Range Hydrocarbons	DRH	2.00E+06	159	83	15000000	7.50E+00	50000	2.50E-02	Yes	

Table B-2. Step 1 Soil Screening Summary (µg/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	1.00E+05	146	36	4500000	4.50E+01	32000	3.20E-01	Yes	
	Motor oil	M09800000	2.00E+06	159	90	18000000	9.00E+00	100000	5.00E-02	Yes	
	TPH	TPH	2.00E+06	158	95	35200000	1.76E+01	100000	5.00E-02	Yes	
SVOCs	Benzoic acid	65-85-0	6.44E+02	127	6	210	3.26E-01	1500	2.33E+00	No	Max detect does not exceed SL
	Benzyl alcohol	100-51-6	5.50E+01	132	0			710	1.29E+01	No	Never detected
	Bis(2-ethylhexyl) phthalate	117-81-7	4.71E+01	133	49	78500	1.67E+03	310	6.58E+00	Yes	
	Butylbenzyl phthalate	85-68-7	3.95E+00	133	1	61	1.54E+01	20000	5.06E+03	Yes	
	Carbazole	86-74-8	1.60E+01	132	21	20000	1.25E+03	66	4.13E+00	Yes	
	Dibenzofuran	132-64-9	1.54E+01	145	65	24000	1.56E+03	73	4.75E+00	Yes	
	Dibutyl phthalate	84-74-2	8.14E+01	133	13	69	8.48E-01	55000	6.76E+02	No	Max detect does not exceed SL
	1,2-Dichlorobenzene	95-50-1	3.79E+00	137	0			100	2.64E+01	No	Never detected
	1,3-Dichlorobenzene	541-73-1	2.75E+02	137	0			220	7.99E-01	No	Never detected
	1,4-Dichlorobenzene	106-46-7	4.10E-01	137	0			380	9.27E+02	No	Never detected
	Diethyl phthalate	84-66-2	2.00E+02	132	12	42	2.10E-01	130	6.51E-01	No	Max detect does not exceed SL
	Dimethyl phthalate	131-11-3	4.10E+01	133	8	58	1.42E+00	20000	4.88E+02	Yes	
	2,4-Dimethylphenol	105-67-9	2.03E+00	127	0			280	1.38E+02	No	Never detected
	Di-n-octyl phthalate	117-84-0	5.49E-01	133	2	250	4.56E+02	20000	3.65E+04	Yes	
	Hexachlorobenzene	118-74-1	2.43E-04	132	0			120	4.94E+05	No	Never detected
	Hexachlorobutadiene	87-68-3	1.28E+00	137	0			100	7.81E+01	No	Never detected
	Isophorone	78-59-1	1.50E+01	132	4	5300	3.53E+02	95	6.33E+00	Yes	
	2-Methylphenol	95-48-7	2.69E+00	127	0			190	7.08E+01	No	Never detected
	4-Methylphenol	106-44-5	2.21E+01	128	0			20000	9.04E+02	No	Never detected
	n-Nitrosodi-*n*-propylamine	621-64.7	3.00E-03	27	0			330	1.10E+05	No	Never detected
	n-Nitrosodiphenylamine	86-30-6	9.54E+00	132	0			710	7.44E+01	No	Never detected
	Pentachlorophenol	87-86-5	2.56E+00	127	1	38	1.48E+01	970	3.79E+02	Yes	
	Tributyl phosphate	126-73-8	3.60E+01	48	10	540	1.50E+01	66	1.83E+00	Yes	
	2,4,6-Trichlorophenol	88-06-2	8.22E-01	127	0			400	4.86E+02	No	Never detected
VOCs	Acetone	67-64-1	2.31E+02	44	21	310	1.34E+00	3600	1.56E+01	Yes	
	Benzene	71-43-2	2.10E-01	50	8	73	3.48E+02	350	1.67E+03	Yes	
	Carbon disulfide	75-15-0	2.66E+02	44	6	2.8	1.05E-02	570	2.14E+00	No	Max detect does not exceed SL
	Carbon tetrachloride	56-23-5	5.36E-01	44	0			640	1.19E+03	No	Never detected
	Chlorobenzene	108-90-7	1.11E+01	44	0			160	1.44E+01	No	Never detected
	Chloroethane	75-00-3	1.06E+01	44	0			700	6.63E+01	No	Never detected
	Chloroform	67-66-3	5.30E-02	44	0			560	1.06E+04	No	Never detected
	Chloromethane	74-87-3	1.01E+00	44	0			150	1.48E+02	No	Never detected
	1,1-Dichloroethane	75-34-3	6.90E-01	44	0			210	3.04E+02	No	Never detected
	1,2-Dichloroethane	107-06-2	4.20E-02	44	0			560	1.33E+04	No	Never detected
	1,1-Dichloroethene	75-35-4	2.35E-01	44	0			300	1.28E+03	No	Never detected
	cis-1,2-Dichloroethene	156-59-2	2.10E+01	44	0			180	8.57E+00	No	Never detected
	trans-1,2-Dichloroethene	156-60-5	2.90E+01	44	0			330	1.14E+01	No	Never detected
	Ethylbenzene	100-41-4	1.70E+00	50	3	410	2.41E+02	140	8.24E+01	Yes	
	Methyl isobutyl ketone	108-10-1	4.50E+02	44	1	36	8.00E-02	1500	3.33E+00	No	Max detect does not exceed SL
	Methylene chloride	75-09-2	1.20E+00	44	2	4.6	3.83E+00	1100	9.17E+02	Yes	
	Methylethyl ketone	78-93-3	1.50E+03	44	5	27	1.80E-02	1500	1.00E+00	No	Max detect does not exceed SL
	Phenol	108-95-2	2.39E+01	128	21	33	1.38E+00	22000	9.21E+02	Yes	
	Styrene	100-42-5	1.17E+00	44	0			370	3.15E+02	No	Never detected

Table B-2. Step 1 Soil Screening Summary (µg/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-03	44	2	3	3.70E+02	640	7.89E+04	Yes	
	Toluene	108-88-3	6.98E+02	50	5	140	2.01E-01	360	5.16E-01	No	Max detect does not exceed SL
	1,2,4-Trichlorobenzene	120-82-1	4.00E-01	137	0			430	1.08E+03	No	Never detected
	1,1,1-Trichloroethane	71-55-6	2.00E+03	44	0			200	1.00E-01	No	Never detected
	1,1,2-Trichloroethane	79-00-5	7.80E-02	44	0			410	5.26E+03	No	Never detected
	Trichloroethene	79-01-6	3.90E-02	44	1	1.4	3.59E+01	820	2.10E+04	Yes	
	1,2,4-Trimethylbenzene	95-63-6	2.10E+01	44	4	2200	1.05E+02	9.2	4.38E-01	Yes	
	1,3,5-Trimethylbenzene	108-67-8	5.10E+01	44	1	14	2.75E-01	260	5.10E+00	No	Max detect does not exceed SL
	Vinyl chloride	75-01-4	5.60E-03	44	1	1.6	2.86E+02	250	4.46E+04	Yes	
	m,p-Xylene	179601-23-1	2.00E+02	50	6	800	4.00E+00	420	2.10E+00	Yes	
	o-Xylene	95-47-6	2.00E+02	50	5	660	3.30E+00	330	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

Table B-3. Step 1 Groundwater Screening Summary (µg/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
Conventionals	Chloride	16887-00-6	2.30E+05	6	6	3450	1.50E-02			No	Max detect does not exceed SL
	Sulfate	14808-79-8	2.50E+05	6	6	42450	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			0.000000866	4.20E+03	No	Never detected
Metals	Arsenic	7440-38-2	5.83E-02	7	7	3.4	5.83E+01			Yes	
	Cadmium	7440-43-9	2.10E-01	17	1	1.15	5.48E+00	0.21	1.00E+00	Yes	
	Chromium	7440-47-3	1.00E+02	17	0			0.6	6.00E-03	No	Never detected
	Chromium hexavalent	18540-29-9	5.80E-01	16	0			3	5.17E+00	No	Never detected
	Copper	7440-50-8	7.30E+00	7	4	3.4	4.66E-01	0.23	3.15E-02	No	Max detect does not exceed SL
	Lead	7439-92-1	2.50E+00	7	0			0.2	8.00E-02	No	Never detected
	Mercury	7439-97-6	5.16E-03	17	0			0.0089	1.72E+00	No	Never detected
	Nickel	7440-02-0	8.20E+00	7	7	33	4.02E+00			Yes	
	Tin	7440-31-5	9.60E+03	7	1	30	3.13E-03	1.8	1.88E-04	No	Max detect does not exceed SL
	Zinc	7440-66-6	3.26E+01	7	2	4.5	1.38E-01	0.81	2.49E-02	No	Max detect does not exceed SL
PAHs	Acenaphthene	83-32-9	2.61E+00	29	4	0.14	5.36E-02	0.02	7.65E-03	No	Max detect does not exceed SL
	Acenaphthylene	208-96-8	1.08E+01	29	0			0.02	1.85E-03	No	Never detected
	Anthracene	120-12-7	1.08E+01	29	0			0.03	2.78E-03	No	Never detected
	Benzo(g,h,i)perylene	191-24-2	1.16E-02	29	0			0.05	4.32E+00	No	Never detected
	Fluoranthene	206-44-0	2.26E+00	29	0			0.03	1.33E-02	No	Never detected
	Fluorene	86-73-7	2.04E+00	29	3	0.63	3.10E-01	0.03	1.47E-02	No	Max detect does not exceed SL
	1-Methylnaphthalene	90-12-0	2.30E+00	29	2	0.94	4.09E-01	0.5	2.17E-01	No	Max detect does not exceed SL
	2-Methylnaphthalene	91-57-6	1.82E+01	29	2	1.1	6.05E-02	0.02	1.10E-03	No	Max detect does not exceed SL
	Naphthalene	91-20-3	5.38E+01	29	10	0.29	5.39E-03	0.04	7.43E-04	No	Max detect does not exceed SL
	Phenanthrene	85-01-8	4.81E+00	29	1	0.54	1.12E-01	0.03	6.24E-03	No	Max detect does not exceed SL
	Pyrene	129-00-0	9.80E+00	29	0			0.04	4.08E-03	No	Never detected
	BaP TEQ	BAPEQ	6.59E-06	9	0			0.1	1.52E+04	No	Never detected
	High Molecular Weight PAH	SMSHPAH	1.00E-02	9	0			0.1	1.00E+01	No	Never detected
	Low Molecular Weight PAH	SMSLPAH	1.00E-02	9	2	1.63	1.63E+02	0.04	4.00E+00	Yes	

Table B-3. Step 1 Groundwater Screening Summary (µg/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
PCBs	Total PCB (SMSPCB)	SMSPCB	2.31E-05	11	4	4.3	1.86E+05	0.0032	1.39E+02	Yes	
Pesticides	Aldrin	309-00-2	1.24E-05	3	0			0.01	8.04E+02	No	Never detected
	cis -Chlordane	5103-71-9	2.00E-03	3	0			0.0082	4.10E+00	No	Never detected
	trans -Chlordane	5103-74-2	2.00E-03	3	0			0.0082	4.10E+00	No	Never detected
	4,4'-DDD	72-54-8	7.67E-05	3	0			0.019	2.48E+02	No	Never detected
	4,4'-DDE	72-55-9	5.42E-05	3	0			0.018	3.32E+02	No	Never detected
	4,4'-DDT	50-29-3	5.42E-05	3	0			0.017	3.14E+02	No	Never detected
	Dieldrin	60-57-1	1.32E-05	3	0			0.017	1.29E+03	No	Never detected
	alpha-Endosulfan	959-98-8	8.70E-03	3	0			0.0089	1.02E+00	No	Never detected
	beta-Endosulfan	33213-65-9	8.70E-03	3	0			0.014	1.61E+00	No	Never detected
	Endosulfan sulfate	1031-07-8	8.70E-03	3	0			0.024	2.76E+00	No	Never detected
	Endrin	72-20-8	2.00E-03	3	0			0.017	8.50E+00	No	Never detected
	Endrin aldehyde	7421-93-4	2.00E-03	3	0			0.016	8.00E+00	No	Never detected
	Heptachlor	76-44-8	1.96E-05	3	0			0.011	5.62E+02	No	Never detected
	Heptachlor epoxide	1024-57-3	9.69E-06	3	0			0.0079	8.16E+02	No	Never detected
	alpha-Hexachlorocyclohexane	319-84-6	1.21E-03	3	0			0.0085	7.05E+00	No	Never detected
	beta-Hexachlorocyclohexane	319-85-7	4.22E-03	3	0			0.0098	2.32E+00	No	Never detected
	gamma-Hexachlorocyclohexane	58-89-9	2.00E-04	3	0			0.016	8.00E+01	No	Never detected
	Toxaphene	8001-35-2	6.85E-05	3	0			0.22	3.21E+03	No	Never detected
	Total Chlordanes	TOTCHLDANE	2.00E-04	3	0			0.0082	4.10E+01	No	Never detected
	Total DDTs	TOTDDT	5.42E-05	3	0			0.019	3.51E+02	No	Never detected
Petroleum	Diesel Range Hydrocarbons	DRH	5.00E+02	19	0			20	4.00E-02	No	Never detected
	Gasoline Range Hydrocarbons	GRH	1.00E+03	19	0			70	7.00E-02	No	Never detected
	Motor oil	M09800000	5.00E+02	19	0			500	1.00E+00	No	Never detected
	TPH	TPH	5.00E+02	9	0			60	1.20E-01	No	Never detected
SVOCs	Benzoic acid	65-85-0	2.24E+03	19	0			5.1	2.27E-03	No	Never detected
	Benzyl alcohol	100-51-6	1.82E+02	19	0			2	1.10E-02	No	Never detected
	Bis(2-ethylhexyl) phthalate	117-81-7	2.85E-01	19	1	1.7	5.97E+00	1	3.51E+00	Yes	
	Butylbenzyl phthalate	85-68-7	5.24E-01	19	0			0.56	1.07E+00	No	Never detected
	Carbazole	86-74-8	4.40E+00	19	0			0.31	7.05E-02	No	Never detected
	Dibenzofuran	132-64-9	1.33E+00	29	1	0.11	8.29E-02	0.04	3.01E-02	No	Max detect does not exceed SL
	Dibutyl phthalate	84-74-2	4.66E+01	19	0			0.54	1.16E-02	No	Never detected
	1,2-Dichlorobenzene	95-50-1	5.19E+00	29	0			0.06	1.16E-02	No	Never detected
	1,3-Dichlorobenzene	541-73-1	6.00E+02	29	0			0.04	6.67E-05	No	Never detected
	1,4-Dichlorobenzene	106-46-7	7.14E+00	29	0			0.06	8.40E-03	No	Never detected
	Diethyl phthalate	84-66-2	4.84E+02	19	0			0.58	1.20E-03	No	Never detected
	Dimethyl phthalate	131-11-3	1.43E+02	19	0			0.53	3.71E-03	No	Never detected
	2,4-Dimethylphenol	105-67-9	2.02E+00	19	0			0.36	1.78E-01	No	Never detected
	Di-*n* -octyl phthalate	117-84-0	2.96E-01	19	0			0.51	1.72E+00	No	Never detected
	Hexachlorobenzene	118-74-1	1.12E-01	19	0			0.47	4.18E+00	No	Never detected
	Hexachlorobutadiene	87-68-3	9.00E-01	29	0			0.11	1.22E-01	No	Never detected
	Isophorone	78-59-1	4.60E+01	19	0			0.48	1.04E-02	No	Never detected

Table B-3. Step 1 Groundwater Screening Summary (µg/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
	2-Methylphenol	95-48-7	7.11E+00	19	0			0.53	7.45E-02	No	Never detected
	4-Methylphenol	106-44-5	7.72E+01	19	0			0.52	6.74E-03	No	Never detected
	n-Nitrosodiphenylamine	86-30-6	1.59E+00	19	0			2.6	1.63E+00	No	Never detected
	Pentachlorophenol	87-86-5	7.29E-01	19	0			2.4	3.29E+00	No	Never detected
	Tributyl phosphate	126-73-8	7.30E+00	19	5	4.15	5.68E-01	0.54	7.40E-02	No	Max detect does not exceed SL
	2,4,6-Trichlorophenol	88-06-2	3.00E+00	19	0			2.4	8.00E-01	No	Never detected
VOCs	Acetone	67-64-1	8.00E+02	29	1	3.6	4.50E-03	0.81	1.01E-03	No	Max detect does not exceed SL
	Benzene	71-43-2	7.95E-01	29	0			0.06	7.55E-02	No	Never detected
	Carbon disulfide	75-15-0	8.00E+02	29	0			0.09	1.13E-04	No	Never detected
	Carbon tetrachloride	56-23-5	2.48E-01	29	0			0.08	3.23E-01	No	Never detected
	Chlorobenzene	108-90-7	1.00E+02	29	0			0.04	4.00E-04	No	Never detected
	Chloroethane	75-00-3	2.10E+04	29	0			0.15	7.14E-06	No	Never detected
	Chloroform	67-66-3	4.30E+00	29	1	0.5	1.16E-01	0.08	1.86E-02	No	Max detect does not exceed SL
	Chloromethane	74-87-3	3.37E+00	29	0			0.1	2.97E-02	No	Never detected
	1,1-Dichloroethane	75-34-3	2.40E+00	29	0			0.05	2.08E-02	No	Never detected
	1,2-Dichloroethane	107-06-2	4.80E-01	29	0			0.08	1.67E-01	No	Never detected
	1,1-Dichloroethene	75-35-4	7.29E-01	29	1	0.058	7.96E-02	0.09	1.23E-01	No	Max detect does not exceed SL
	cis-1,2-Dichloroethene	156-59-2	7.00E+01	29	2	7	1.00E-01	0.1	1.43E-03	No	Max detect does not exceed SL
	trans-1,2-Dichloroethene	156-60-5	1.00E+02	29	1	0.76	7.60E-03	0.08	8.00E-04	No	Max detect does not exceed SL
	Ethylbenzene	100-41-4	7.00E+02	29	0			0.09	1.29E-04	No	Never detected
	Methyl isobutyl ketone	108-10-1	6.40E+02	29	0			0.38	5.94E-04	No	Never detected
	Methylene chloride	75-09-2	5.00E+00	29	0			0.39	7.80E-02	No	Never detected
	Methylethyl ketone	78-93-3	4.80E+03	29	0			0.81	1.69E-04	No	Never detected
	Phenol	108-95-2	7.84E+01	19	0			0.52	6.64E-03	No	Never detected
	Styrene	100-42-5	1.46E+00	29	0			0.07	4.79E-02	No	Never detected
	Tetrachloroethene	127-18-4	2.05E-02	29	6	0.12	5.85E+00	0.09	4.39E+00	Yes	
	Toluene	108-88-3	1.00E+03	29	0			0.06	6.00E-05	No	Never detected
	1,2,4-Trichlorobenzene	120-82-1	1.13E+00	29	0			0.1	8.86E-02	No	Never detected
	1,1,1-Trichloroethane	71-55-6	2.00E+02	29	0			0.09	4.50E-04	No	Never detected
	1,1,2-Trichloroethane	79-00-5	7.68E-01	29	0			0.04	5.21E-02	No	Never detected
	Trichloroethene	79-01-6	4.90E-01	29	10	1.1	2.24E+00	0.08	1.63E-01	Yes	
	1,3,5-Trimethylbenzene	108-67-8	4.50E+01	29	0			0.06	1.33E-03	No	Never detected
	Vinyl chloride	75-01-4	1.60E-02	29	1	0.028	1.75E+00	0.08	5.00E+00	Yes	
	m,p-Xylene	179601-23-1	1.00E+03	29	0			0.14	1.40E-04	No	Never detected
	o-Xylene	95-47-6	1.00E+03	29	0			0.06	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

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 commerically 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.
	cis-Chlordane	Soil and Groundwater	Formerly produced and used as an insecticide; direct release to the environment.	
	trans-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 shapoos; 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 formely 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 emergencyy 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 shapoos; 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 agricutlural 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-*n*-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.
	n-Nitrosodi-*n*-propylamine	Soil	Not commercially produced. Identified as a contaminant in the substituted dinitrotrifluralin herbicides; direct release to the environment, spills and indutrial waste streams.	Pesticides are not known to have been used at the GTSP site.
	n-Nitrosodiphenylamine	Soil and Groundwater	Produced and used as vulcanization retarder in rubber processing, and for the production of *p*-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 Chloraline. 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, municpal 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 scavanger, 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 plasdtics, 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

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	Soil SL (mg/kg) 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	θw	unitless	0.43	0.3
Air-filled soil porosity	θa	unitless	0	0.13
Soil fraction organic carbon	foc	unitless	0.001	0.001
Dry soil bulk density	ρb	kg/L	1.5	1.5

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

Inorganic chemicals $\text{Soil SL} = \text{GW SL} \times \text{UCF} \times \text{DF} [\text{Kd} + (\theta w + \theta a \times \text{Hcc}) / \rho b]$

Organic chemicals $\text{Soil SL} = \text{GW SL} \times \text{UCF} \times \text{DF} [(\text{Koc} \times \text{foc}) + (\theta w + \theta a \times \text{Hcc}) / \rho b]$

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)
- θa = air-filled soil porosity
- θw = water-filled soil porosity
- ρb = dry soil bulk density

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

	Original Column Letter in Ecology Table														
	B	E	F	G	--	--	BK	BL	BN	BS	BT	BV	Step 2 Soil Screening Levels		
	Method A		Method B		Pathway Evaluation			Applicable or Relevant and Appropriate Requirements							
Chemical	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
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)

	Original Column Letter in Ecology Table														
	B	E	F	G	--	--	BK	BL	BN	BS	BT	BV	Step 2 Soil Screening Levels		
	Method A		Method B		Pathway Evaluation			Applicable or Relevant and Appropriate Requirements							
Chemical	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
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			6.60E-01	5.00E+00	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			1.30E-03	7.00E+00	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			1.40E+00	1.00E+00	3.60E+01	1.00E+00	1.00E+00
Chromium (VI)				2.40E+02				2.90E-01			8.30E-04	1.17E+02	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			5.10E+01	3.60E+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			3.00E-02	7.00E-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			4.80E+01	3.80E+01	1.60E+03	3.80E+01	3.80E+01

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

	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							
Chemical	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			9.50E-01		8.00E-01		
Silver				4.00E+02				3.90E+02			1.60E+00		3.90E+02		
Tin								4.70E+04			5.50E+03		4.70E+04		
Thallium				5.60E+00									5.60E+00		
Vanadium								3.90E+02			1.80E+02		3.90E+02		
Zinc		5.70E+02		2.40E+04				2.30E+04			6.80E+02	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)

	Original Column Letter in Ecology Table														
	B	E	F	G	--	--	BK	BL	BN	BS	BT	BV	Step 2 Soil Screening Levels		
	Method A		Method B		Pathway Evaluation			Applicable or Relevant and Appropriate Requirements							
Chemical	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)

	Original Column Letter in Ecology Table											
	B	K	L	M	N	O	P	Y	Z	--	AB	AC	
	Method A	Method B						Pathway Evaluation			ARARs		
Chemical	Method A Table 720-1	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	EPA Regional Screening Level Tap Water	Natural Background Level	Step 2 Groundwater Screening Level for Protection of Drinking Water and Surface Water
acetone						8.00E+02				1.10E+05	2.20E+04		8.00E+02
acenaphthene						9.60E+02				2.00E+01	2.20E+03		2.00E+01
acenaphthylene										NV			NV
anthracene						4.80E+03				1.99E+02	1.10E+04		1.99E+02
benzene		5.00E+00	*0	5.00E+00	*0	3.20E+01	7.95E-01			2.03E+00	4.10E-01		4.10E-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	4.80E+00		2.85E-01
butyl benzyl phthalate						3.20E+03				4.10E-01	3.50E+01		4.10E-01
carbon tetrachloride		5.00E+00	*0	5.00E+00	*0					2.48E-01	2.00E-01		2.00E-01
chlorobenzene		1.00E+02	1.00E+02	1.00E+02	1.00E+02	1.60E+02				2.00E+01	9.10E+01		2.00E+01
chloroethane (ethyl chloride)										3.40E+01	2.10E+04		3.40E+01
chloroform (trichloromethane)							7.17E+00			4.30E+00	1.90E-01		1.90E-01
chloromethane (methyl chloride)							3.37E+00			2.03E+01	1.90E+02		3.37E+00
dibenzofuran						3.20E+01				NV			3.20E+01
di-butyl phthalate (di-*n*-butyl phthalate)						1.60E+03				4.66E+01	3.70E+03		4.66E+01
dichlorobenzene, 1,2-		6.00E+02	6.00E+02	6.00E+02	6.00E+02	7.20E+02				4.35E+02	3.70E+02		3.70E+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	2.40E+00		2.40E+00
dichloroethane, 1,2-		5.00E+00	*0	5.00E+00	*0	1.60E+02	4.80E-01			3.55E+00	1.50E-01		1.50E-01
dichloroethylene, 1,1-		7.00E+00	7.00E+00	7.00E+00	7.00E+00	7.20E+01				3.20E+00	3.40E+02		3.20E+00
diethyl phthalate										4.24E+03	2.90E+04		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	1.50E+00		1.50E+00
fluoranthene						6.40E+02				1.10E+01	1.50E+03		1.10E+01
fluorene						6.40E+02				4.52E+01	1.50E+03		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	7.10E+03		4.80E+03
methylene chloride (dichloromethane)		5.00E+00	*0	5.00E+00	*0		5.83E+00			6.14E+01	4.80E+00		4.80E+00
methylnaphthalene, 2-										NV	1.50E+02		1.50E+02
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)

	Original Column Letter in Ecology Table											
	B	K	L	M	N	O	P	Y	Z	--	AB	AC	
	Method A	Method B						Pathway Evaluation			ARARs		
Chemical	Method A Table 720-1	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	EPA Regional Screening Level Tap Water	Natural Background Level	Step 2 Groundwater Screening Level for Protection of Drinking Water and Surface Water
naphthalene						1.60E+02				1.12E+02	1.40E-01		1.40E-01
nitrosodiphenylamine, N-										1.48E+00	1.40E+01		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	1.10E+03		9.83E+00
tetrachloroethylene (perchloroethylene)		5.00E+00	*0	5.00E+00	*0	8.00E+01	8.10E-02			2.06E-02	1.00E-01		2.06E-02
trichlorobenzene, 1,2,4-		7.00E+01	7.00E+01	7.00E+01	7.00E+01					1.61E+01	2.30E+00		2.30E+00
trichlorethane, 1,1,1-		2.00E+02	2.00E+02	2.00E+02	2.00E+02	7.20E+03				4.60E+04	9.10E+03		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	2.40E-01		2.40E-01
trichloroethylene		5.00E+00	*0	5.00E+00	*0	2.40E+00	4.90E-01			7.39E-01	2.00E+00		4.90E-01
trimethylbenzene, 1,3,5-						4.00E+02				4.52E+01	3.70E+02		4.52E+01
toluene		1.00E+03	1.00E+03	1.00E+03	1.00E+03	1.60E+03				1.29E+03	2.30E+03		1.00E+03
vinyl chloride (chloroethylene)		2.00E+00	*0	2.00E+00	*0		2.90E-02			5.33E-01	1.60E-02		1.60E-02
xylene (dimethylbenzene)		1.00E+04	1.00E+04	1.00E+04	1.00E+04	1.60E+04				1.58E+03	2.00E+02		2.00E+02
benzoic acid										NV			NV
benzyl alcohol						2.40E+03				NV			2.40E+03
dimethylphenol, 2,4-										8.24E+01	7.30E+02		8.24E+01
methylphenol, 2- (*o*-cresol)										3.05E+03	1.80E+03		1.80E+03
methylphenol, 4- (*p*-cresol)										3.34E+02	1.80E+02		1.80E+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	1.10E+04		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	1.50E+01		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	4.50E-02	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	7.30E+03		2.00E+00
Beryllium		4.00E+00	4.00E+00	4.00E+00	4.00E+00	3.20E+01				1.25E+01	7.30E+01		4.00E+00
Cadmium		5.00E+00	5.00E+00	5.00E+00	5.00E+00	8.00E+00				2.50E-01	1.80E+01		2.50E-01
Chromium (VI)						4.80E+01				1.23E-01	4.30E-02		4.30E-02

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

	Original Column Letter in Ecology Table											
	B	K	L	M	N	O	P	Y	Z	--	AB	AC	
	Method A	Method B						Pathway Evaluation			ARARs		
Chemical	Method A Table 720-1	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	EPA Regional Screening Level Tap Water	Natural Background Level	Step 2 Groundwater Screening Level for Protection of Drinking Water and Surface Water
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	1.50E+03		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	8.80E+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	5.70E-01		5.16E-03
Mercury (organic)										4.55E-04	3.70E+00		4.55E-04
Molybdenum										NV			NV
Nickel				1.00E+02		3.20E+02				8.20E+00	7.30E+02		8.20E+00
Selenium		5.00E+01	5.00E+01	5.00E+01	5.00E+01	8.00E+01				5.00E+00	1.80E+02		5.00E+00
Silver		1.00E+02	1.00E+02	1.00E+02		8.00E+01				1.90E+00	1.80E+02		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	2.60E+00		2.60E+00
Zinc		5.00E+03		5.00E+03		4.80E+03		7.63E+01	3.26E+01	3.26E+01	1.10E+04		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	5.20E-07		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)

	Original Column Letter in Ecology Table											
	B	K	L	M	N	O	P	Y	Z	--	AB	AC	
	Method A	Method B						Pathway Evaluation			ARARs		
Chemical	Method A Table 720-1	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	EPA Regional Screening Level Tap Water	Natural Background Level	Step 2 Groundwater Screening Level for Protection of Drinking Water and Surface Water
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	1.50E+01		1.50E+01
1-Methylnaphthalene		NV	NV	NV	NV	1.12E+03	3.02E+00	NV	NV	NV	2.30E+00		2.30E+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	1.00E+03		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	7.30E+01		7.00E+01
Isophorone		NV	NV	NV	NV	1.60E+03	4.60E+01	2.36E+02	NV	NV	7.10E+01		4.60E+01
n-Nitrosodi-*n*-propylamine		NV	NV	NV	NV	NV	NV	1.28E-01	NV	NV	9.60E-03		9.60E-03
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	1.10E+02		1.00E+02
Tributyl phosphate		NV	NV	NV	NV	3.20E+03	9.51E+00	NV	NV	NV	7.30E+00		7.30E+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)

	Original Column Letter in Ecology Table													
	M	N	O	P	Q	R	AA	AB	AC	AD	AF	AG	AH	AI
	Method B													
Chemical	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			
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														

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

	Original Column Letter in Ecology Table													
	M	N	O	P	Q	R	AA	AB	AC	AD	AF	AG	AH	AI
	Method B													
Chemical	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
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	9.00E+00
Iron														1.00E+03
Lead								5.40E-01	2.10E+02	8.10E+00			6.50E+01	2.50E+00
Manganese											1.00E+02			
Mercury							2.10E+00	1.20E-02	1.80E+00	2.50E-02			1.40E+00	7.70E-01
Mercury (organic)											3.00E-01			
Molybdenum														
Nickel	1.10E+03	3.58E+02	1.65E+02						7.40E+01	8.20E+00	4.60E+03		4.70E+02	5.20E+01
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	1.20E+02

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

	Original Column Letter in Ecology Table													
	M	N	O	P	Q	R	AA	AB	AC	AD	AF	AG	AH	AI
	Method B													
Chemical	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
LPAH														
HPAH														
Total petroleum hydrocarbons														
Gasoline														
Gasoline (with benzene)														
Diesel														
Heavy oil														
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

	Original Column Letter in Ecology Table															
	AJ	AK	AL	AM	AN	AO	AQ	AR	AX	AY	AZ	BA	AV	AW	BB	BF	
	Applicable or Relevant and Appropriate Requirements												Pathway Analysis				
Chemical	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 Organisms Only Freshwater	National Toxics Rule Human 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	Step 2 Surface Water Screening Level
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
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

	Original Column Letter in Ecology Table															
	AJ	AK	AL	AM	AN	AO	AQ	AR	AX	AY	AZ	BA	AV	AW	BB	BF	
	Applicable or Relevant and Appropriate Requirements												Pathway Analysis				
Chemical	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 Organisms Only Freshwater	National Toxics Rule Human 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	Step 2 Surface Water Screening Level
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

	Original Column Letter in Ecology Table															
	AJ	AK	AL	AM	AN	AO	AQ	AR	AX	AY	AZ	BA	AV	AW	BB	BF	
	Applicable or Relevant and Appropriate Requirements												Pathway Analysis				
Chemical	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 Organisms Only Freshwater	National Toxics Rule Human 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	Step 2 Surface Water Screening Level
LPAH																	NV
HPAH																	NV
Total petroleum hydrocarbons																	NV
Gasoline																	NV
Gasoline (with benzene)																	NV
Diesel																	NV
Heavy oil																	NV
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
1-Methylnaphthalene	NV	NV	NV	NV	NV	NV	NV	NV					NV	NV			NV
Carbazole	NV	NV	NV	NV	NV	NV	NV	NV					NV	NV			NV
Carbon disulfide	NV	NV	NV	NV	NV	NV	NV	NV					NV	NV			NV
Chloride	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
Isophorone	NV	NV	NV	NV	NV	NV	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			1.28E-01
Sulfate	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			4.80E+03
Tributyl phosphate	NV	NV	NV	NV	NV	NV	NV	NV					NV	NV			NV

Notes:

CLARC = cleanup level and risk calculat
CSL = cleanup screening level
HPAH = high molecular weight polycyc
LDW = Lower Duwamish Waterway
LPAH = low molecular weight polycyclic
NV = no value available
PCB = polychlorinated biphenyl
SQS = sediment quality standard
TMCL = total maximum contaminant lc

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

Media Column Title[a]	Column Letter	Pathway Column Title[a]	Included? Yes	Included? No	Comments
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 **Plants**		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 **Soil Biota**		X	Site-specific TEE not required for this site
	L	Soil Terrestrial Method B-Ecol WAC 173-340-740(3)(b)(ii); WAC 173-340-7493 Table 749-3 **Wildlife**		X	Site-specific TEE not required for this site
Soil Method C	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[a]	Column Letter	Pathway Column Title[a]	Included? Yes	Included? No	Comments
	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 **SWQS**:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) **Fresh - Acute** 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 **SWQS**:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) **Fresh - Acute** 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 **SWQS**:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) **Fresh - Chronic** 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 **SWQS**:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) **Fresh - Chronic** 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 **SWQS**:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) **Marine - Acute** 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 **SWQS**:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) **Marine - Acute** 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 **SWQS**:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) **Marine - Chronic** 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 **SWQS**:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) **Marine - Chronic** 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[a]	Column Letter	Pathway Column Title[a]	Included? Yes	Included? No	Comments
	AM	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Saltwater Acute 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 Saltwater Chronic 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 Saltwater Chronic 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 Freshwater 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
	AQ	Soil to Surface Water Protection WAC 173-340-740(1)(d) NRWQC Freshwater Acute 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 Freshwater Chronic 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 Freshwater Chronic 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 HH-Consumption; 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 HH-Consumption; 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 HH-Consumption 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 HH-Consumption 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, **NTR** - 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, **NTR** - 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, **NTR** - 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, **NTR** - 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[a]	Column Letter	Pathway Column Title[a]	Included? Yes	Included? No	Comments
	BB	Soil to Surface Water Protection Aquatic Life Marine/Acute, **NTR** - 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, **NTR** - 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, **NTR** - 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, **NTR** - 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 **Water & Organism Consumption NTR** - 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 **Water & Organism Consumption NTR** - 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 **Organism Consumption Only NTR** - 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 **Organism Consumption Only NTR** - 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		
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 Sbustances Pollution Contingency Plan (NCP) - 40 CFR 300 Peliminary Remediation/Cleanup Goals (2007)	X		
	BO	Soil Protection of Surface Water HH-**Organoleptic Effects** CWA §304 **NRWQC** 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-**Organoleptic Effects** CWA §304 **NRWQC** 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 **Residential** Screening Levels		X	CalEPA SLs are not an ARAR for Washington sites
	BR	CA EPA OEHHA HH-Direct Exposure **Industrial** Screening Levels		X	CalEPA SLs are not an ARAR for Washington sites
	BS	Soil - Toxic Substances Control Act **(TSCA)** 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	The values in this column are from Boeing Plant 2 and are not necessarily applicable to GTSP because of differences in additive risk due to different lists of COCs.

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

Media Column Title[a]	Column Letter	Pathway Column Title[a]	Included? Yes	Included? No	Comments
Always Applicable	BV	Natural **Background** Levels Ch. 173-340 WAC	X		If derived screening level is below this value, screening level is adjusted to this value
	BW	Applicable **DL (MDL)** Ch. 173-340 WAC		X	Not used in Step 2
	BX	Applicable **PQL (RL)** 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 = ?
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

[a]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[a]	Column Letter	Pathway Column Title[a]	Included? Yes	Included? No	Comments
Groundwater Method A	B	Groundwater Method A-HH **Potable** (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 **Potable ARARs** WAC 173-340-720(3)(b)(ii)		X	Values in this column are USGS health-based screening levels, which are not regulatory values and therefore not ARARs
	D	Groundwater State Quality Criteria WAC 173-340-(3)(b)(ii); WAC 173-200-040(3) **Table 9.1**		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) **MCL**		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) **MCLG (Non-Zero Goals)**		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) **MCL**		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) **MCG**		X	Site does not qualify for Method A
	I	Groundwater Method A-**Potable** 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 — **MCLs**	X		
	L	Groundwater Method B-HH Potable ARARs WAC 173-340-720(4)(b)(i) Safe Drinking Water Standards — **MCGs**	X		
	M	Groundwater Method B-HH Potable ARARs WAC 173-340-720(4)(b)(i) State Department of Health Standards — **MCLs**	X		
	N	Groundwater Method B-HH Potable ARARs WAC 173-340-720(4)(b)(i) State Department of Health Standards — **MCGs**	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[a]	Column Letter	Pathway Column Title[a]	Included? Yes	Included? No	Comments
	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 lALs
	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 necessarily applicable to GTSP because of differences in additive risk due to different lists of COCs
	X	Groundwater Non-Potable Surface Water Protection WAC 173-340-720(6)		X	Groundwater is potable
	Y	Groundwater to Sediment Protection Ecology **CSL** 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 **SQS** 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 necessarily applicable to GTSP because of differences in additive risk due to different lists of COCs
ARAR's (Not Applied)	AB	EPA Tap Water Residential Screening Levels (5/2010)	X		
Always Applicable	AC	Natural **Background** Levels Ch. 173-340 WAC	X		If derived screening level is below this value, screening level is adjusted to this value
	AD	Applicable **DL (MDL)** Ch. 173-340 WAC		X	Not used in Step 2
	AE	Applicable **PQL (RL)** 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[a]	Column Letter	Pathway Column Title[a]	Included? Yes	Included? No	Comments
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

[a]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[a]	Column Letter	Pathway Column Title[a]	Included? Yes	Included? No	Comments
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		

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

Media Column Title[a]	Column Letter	Pathway Column Title[a]	Included? Yes	Included? No	Comments
	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		
	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 necessarily applicable to GTSP because of differences in additive risk due to different lists of COCs
	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
Surface Water Method C	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 Consumtion 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 **SWQS**:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) **Fresh - Acute**	X		
	AB	Surface Water Aquatic Life **SWQS**:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) **Fresh - Chronic**	X		
	AC	Surface Water Aquatic Life **SWQS**:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) **Marine - Acute**	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[a]	Column Letter	Pathway Column Title[a]	Included? Yes	Included? No	Comments
	AD	Surface Water Aquatic Life **SWQS**:RCW 90-48; Ch. 173-201A-240 per MTCA WAC 173-340-730(2)(b)(i)(A) **Marine - Chronic**	X		
	AE	Surface Water HH-**Consumption; Water + Organism** CWA §304 **NRWQC**		X	Lower Duwamish Waterway not rated for drinking water
	AF	Surface Water HH-**Consumption; Organism Only** CWA §304 **NRWQC**	X		
	AG	Surface Water HH-**Organoleptic Effects** CWA §304 **NRWQC**	X		
	AH	Surface Water Aquatic Life Fresh/Acute CWA §304 **NRWQC**	X		
	AI	Surface Water Aquatic Life Fresh/Chronic CWA §304 **NRWQC**	X		
	AJ	Surface Water Aquatic Life Marine/Acute CWA §304 **NRWQC**	X		
	AK	Surface Water Aquatic Life Marine/Chronic CWA §304 **NRWQC**	X		
	AL	Surface Water Aquatic Life Fresh/Acute **NTR** - 40 CFR 131.36	X		
	AM	Surface Water Aquatic Life Fresh/Chronic **NTR** - 40 CFR 131.36	X		
	AN	Surface Water Aquatic Life Marine/Acute **NTR** - 40 CFR 131.36	X		
	AO	Surface Water Aquatic Life Marine/Chronic **NTR** - 40 CFR 131.36	X		
	AP	Surface Water HH-Fresh Water **Water & Organism Consumption NTR** - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10-6 Carc Risk		X	Lower Duwamish Waterway not rated for drinking water

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

Media Column Title[a]	Column Letter	Pathway Column Title[a]	Included? Yes	Included? No	Comments
	AQ	Surface Water HH-Fresh Water **Organism Consumption Only NTR** - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10-6 Carc Risk	X		
	AR	Surface Water HH-Marine Water **Organism Consumption Only NTR** - 40 CFR 131.36 (WAC 173-201A-040[5]) HH - 10-6 Carc Risk	X		
Surface Water ARAR	AS	Surface Water Discharge **(NPDES)** 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 **(TSCA)** 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 **CSL** 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 **SQS** 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		
	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 **Background** Levels Ch. 173-340 WAC	X		If derived screening level is below this value, screening level is adjusted to this value
	BC	Applicable **DL (MDL)** Ch. 173-340 WAC		X	Not used in Step 2
	BD	Applicable **PQL (RL/RDL)** Ch. 173-340 WAC		X	Not used in Step 2

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

Media Column Title[a]	Column Letter	Pathway Column Title[a]	Included? Yes	Included? No	Comments
	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

[a]From Ecology's (2010) Draft LDW ARARs & CULs v12-17-2010

APPENDIX D

RESULTS OF STEP 2 SCREEN

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

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 (µg/kg)	Max MDL (µg/kg)
Leaching													
Metals	Arsenic	7440-38-2	7.00E+03	69	31	45	6000	140000	2.00E+01	25	81	310	7000
	Cadmium	7440-43-9	1.00E+03	96	49	51	200	5300	5.30E+00	6	12	20	1000
	Nickel	7440-02-0	3.80E+04	69	69	100	3000	2330000	6.13E+01	13	19		
PCBs	Total PCBs	SMSPCB	1.20E-01	282	134	48	24	3800000	3.17E+07	134	100	3.00E-05	94
SVOCs	Bis(2-ethylhexyl) phthalate	117-81-7	3.17E+01	133	49	37	11	78500	2.48E+03	32	65	8.3	310
VOCs	Tetrachloroethene	127-18-4	1.10E-02	44	2	5	1.4	3	2.73E+02	2	100	0.43	640
	Trichloroethene	79-01-6	1.87E-01	44	1	2	1.4	1.4	7.49E+00	1	100	0.55	820
	Vinyl chloride	75-01-4	4.89E-03	44	1	2	1.6	1.6	3.27E+02	1	100	0.17	250
Direct Contact													
Dioxins and furans	TCDD TEQ (ND = 1/2DL)	TEQ_DIOXIN.5	5.20E-03	9	9	100	0.0001299	0.141	2.71E+01	5	56		
Metals	Arsenic	7440-38-2	7.00E+03	69	31	45	6000	140000	2.00E+01	25	81	310	7000
	Cadmium	7440-43-9	3.60E+04	96	49	51	200	5300	1.47E-01			20	1000
	Chromium	7440-47-3	1.35E+05	96	96	100	9300	132000	9.78E-01				
	Chromium hexavalent	18540-29-9	1.17E+05	27	2	7	135	857	7.32E-03			115	246
	Copper	7440-50-8	5.50E+05	69	69	100	5300	2610000	4.75E+00	1	1		
	Lead	7439-92-1	2.20E+05	69	61	88	2000	2830000	1.29E+01	2	3	180	210
	Mercury	7439-97-6	5.60E+03	96	57	59	20	3300	5.89E-01			0.78	60
	Nickel	7440-02-0	1.60E+06	69	69	100	3000	2330000	1.46E+00	1	1		
	Tin	7440-31-5	4.70E+07	69	14	20	1000	79000	1.68E-03			180	1200
	Zinc	7440-66-6	5.70E+05	69	69	100	11500	2850000	5.00E+00	1	1		
PAHs	Acenaphthene	83-32-9	3.40E+06	145	24	17	11	13000	3.82E-03			1.4	20000
	Acenaphthylene	208-96-8		145	16	11	6.5	160				1.3	20000
	Anthracene	120-12-7	1.70E+07	145	44	30	4.9	49000	2.88E-03			1.3	20000
	Benzo(g,h,i)perylene	191-24-2		145	58	40	8.4	120000				1.9	20000
	Fluoranthene	206-44-0	2.30E+06	145	89	61	9.9	440000	1.91E-01			1.3	20000
	Fluorene	86-73-7	2.30E+06	145	30	21	7.9	49000	2.13E-02			1.3	82
	1-Methylnaphthalene	90-12-0	2.20E+04	136	62	46	4.8	9400	4.27E-01			1.2	95
	2-Methylnaphthalene	91-57-6	3.10E+05	145	69	48	5.5	520000	1.68E+00	1	1	1.9	70

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

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 (µg/kg)	Max MDL (µg/kg)
	Naphthalene	91-20-3	3.60E+03	150	49	33	5.3	3500	9.72E-01			0.1	20000
	Phenanthrene	85-01-8		145	98	68	6.2	280000				1.3	66
	Pyrene	129-00-0	1.70E+06	145	94	65	4.7	380000	2.24E-01			1.3	66
	BaP TEQ	BAPEQ	1.50E+01	145	85	59	2.47	286000	1.91E+04	70	82	4.6	20000
PCBs	Total PCBs	SMSPCB	2.20E+02	282	134	48	24	3800000	1.73E+04	82	61	3.00E-05	94
	Diesel Range Hydrocarbons	DRH	2.00E+06	159	83	52	5400	15000000	7.50E+00	12	14	5.2	50000
Petroleum	Gasoline Range Hydrocarbons	GRH	3.00E+04	146	36	25	7000	4500000	1.50E+02	24	67	5.6	32000
	Motor oil	M09800000	2.00E+06	159	90	57	13000	18000000	9.00E+00	12	13	10	100000
	TPH	TPH	2.00E+06	158	95	60	10700	35200000	1.76E+01	17	18	10	100000
	Bis(2-ethylhexyl) phthalate	117-81-7	3.50E+04	133	49	37	11	78500	2.24E+00	1	2	8.3	310
	Butylbenzyl phthalate	85-68-7	2.60E+05	133	1	1	61	61	2.35E-04			3.9	20000
	Carbazole	86-74-8	5.00E+04	132	21	16	10	20000	4.00E-01			2.3	66
	Dibenzofuran	132-64-9	7.80E+04	145	65	45	4.8	24000	3.08E-01			1.5	73
SVOCs	Dimethyl phthalate	131-11-3	8.00E+04	133	8	6	15	58	7.25E-04			3.5	20000
	Di-*n*-octyl phthalate	117-84-0	1.60E+06	133	2	2	13	250	1.56E-04			5	20000
	Isophorone	78-59-1	1.10E+06	132	4	3	35	5300	4.82E-03			2.5	95
	Pentachlorophenol	87-86-5	3.00E+03	127	1	1	38	38	1.27E-02			26	970
	Tributyl phosphate	126-73-8	5.30E+04	48	10	21	12	540	1.02E-02			5.4	66
	Acetone	67-64-1	8.00E+06	44	21	48	10	310	3.88E-05			5.2	3600
	Benzene	71-43-2	1.10E+03	50	8	16	1.3	73	6.64E-02			0	350
	Ethylbenzene	100-41-4	5.40E+03	50	3	6	5.8	410	7.59E-02			0	140
	Methylene chloride	75-09-2	1.10E+04	44	2	5	3.7	4.6	4.18E-04			0.76	1100
	Phenol	108-95-2	1.80E+07	128	21	16	15	33	1.83E-06			3.6	22000
VOCs	Tetrachloroethene	127-18-4	5.50E+02	44	2	5	1.4	3	5.45E-03			0.43	640
	Trichloroethene	79-01-6	2.80E+03	44	1	2	1.4	1.4	5.00E-04			0.55	820
	1,2,4-Trimethylbenzene	95-63-6	6.20E+04	44	4	9	2.05	2200	3.55E-02			0.13	9.2
	Vinyl chloride	75-01-4	6.00E+01	44	1	2	1.6	1.6	2.67E-02			0.17	250
	m,p-Xylene	179601-23-1	6.30E+05	50	6	12	2.3	800	1.27E-03			0	420
	o-Xylene	95-47-6	6.30E+05	50	5	10	2.6	660	1.05E-03			0	330

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

Group	Chemical	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
Leaching											
Metals	Arsenic	1.00E+00			36	Yes	Yes	Yes	No	Yes	
	Cadmium	1.00E+00			6	Yes	Yes	Yes	No	Yes	
	Nickel			0	19	Yes	Yes	Yes	No	Yes	
PCBs	Total PCBs	7.83E+02	145	98	99	Yes	Yes	Yes	Yes	Yes	
SVOCs	Bis(2-ethylhexyl) phthalate	9.78E+00	29	35	46	Yes	Yes	Yes	No	Yes	
VOCs	Tetrachloroethene	5.82E+04	42	100	100	No	Yes	Yes	Yes	Yes	Though FOD not greater than 5%, 100% total frequency of exceedance, so analyte retained
	Trichloroethene	4.39E+03	43	100	100	No	Yes	Yes	Yes	Yes	Though FOD not greater than 5%, 100% total frequency of exceedance, so analyte retained
	Vinyl chloride	5.11E+04	43	100	100	No	Yes	Yes	Yes	Yes	Though FOD not greater than 5%, 100% total frequency of exceedance, so analyte retained
Direct Contact											
Dioxins and furans	TCDD TEQ (ND = 1/2DL)			0	56	Yes	Yes	Yes	No	Yes	
Metals	Arsenic	1.00E+00			36	Yes	Yes	Yes	No	Yes	
	Cadmium	2.78E-02				Yes	No	No	No	No	Max detect does not exceed SL
	Chromium			0		Yes	No	No	No	No	Max detect does not exceed SL
	Chromium hexavalent	2.10E-03				Yes	No	No	No	No	Max detect does not exceed SL
	Copper			0	1	Yes	No	Yes	No	Yes	
	Lead	9.55E-04			3	Yes	No	Yes	No	Yes	
	Mercury	1.07E-02				Yes	No	No	No	No	Max detect does not exceed SL
	Nickel			0	1	Yes	No	Yes	No	Yes	
	Tin	2.55E-05				Yes	No	No	No	No	Max detect does not exceed SL
	Zinc			0	1	Yes	No	Yes	No	Yes	
PAHs	Acenaphthene	5.88E-03				Yes	No	No	No	No	Max detect does not exceed SL
	Acenaphthylene					Yes	No	No	No	No	Max detect does not exceed SL
	Anthracene	1.18E-03				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	8.70E-03				Yes	No	No	No	No	Max detect does not exceed SL
	Fluorene	3.57E-05				Yes	No	No	No	No	Max detect does not exceed SL
	1-Methylnaphthalene	4.32E-03				Yes	No	No	No	No	Max detect does not exceed SL
	2-Methylnaphthalene	2.26E-04			1	Yes	No	Yes	No	Yes	

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

Group	Chemical	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
	Naphthalene	5.56E+00	1	1	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	3.88E-05				Yes	No	No	No	No	Max detect does not exceed SL
	BaP TEQ	1.33E+03	30	50	69	Yes	Yes	Yes	Yes	Yes	
PCBs	Total PCBs	4.27E-01			29	Yes	Yes	Yes	No	Yes	
	Diesel Range Hydrocarbons	2.50E-02			8	Yes	Yes	Yes	No	Yes	
Petroleum	Gasoline Range Hydrocarbons	1.07E+00	1	1	17	Yes	Yes	Yes	Yes	Yes	
	Motor oil	5.00E-02			8	Yes	Yes	Yes	No	Yes	
	TPH	5.00E-02			11	Yes	Yes	Yes	No	Yes	
	Bis(2-ethylhexyl) phthalate	8.86E-03			1	Yes	No	Yes	No	Yes	
	Butylbenzyl phthalate	7.69E-02				No	No	No	No	No	Max detect does not exceed SL, FOD not greater than 5%
	Carbazole	1.32E-03				Yes	No	No	No	No	Max detect does not exceed SL
	Dibenzofuran	9.36E-04				Yes	No	No	No	No	Max detect does not exceed SL
SVOCs	Dimethyl phthalate	2.50E-01				Yes	No	No	No	No	Max detect does not exceed SL
	Di-*n*-octyl phthalate	1.25E-02				No	No	No	No	No	Max detect does not exceed SL, FOD not greater than 5%
	Isophorone	8.64E-05				No	No	No	No	No	Max detect does not exceed SL, FOD not greater than 5%
	Pentachlorophenol	3.23E-01				No	No	No	No	No	Max detect does not exceed SL, FOD not greater than 5%
	Tributyl phosphate	1.25E-03				Yes	No	No	No	No	Max detect does not exceed SL
	Acetone	4.50E-04				Yes	No	No	No	No	Max detect does not exceed SL
	Benzene	3.18E-01				Yes	No	No	No	No	Max detect does not exceed SL
	Ethylbenzene	2.59E-02				Yes	No	No	No	No	Max detect does not exceed SL
	Methylene chloride	1.00E-01				No	No	No	No	No	Max detect does not exceed SL, FOD not greater than 5%
	Phenol	1.22E-03				Yes	No	No	No	No	Max detect does not exceed SL
VOCs	Tetrachloroethene	1.16E+00	1	2	2	No	No	No	Yes	No	Max detect does not exceed SL, FOD not greater than 5%
	Trichloroethene	2.93E-01				No	No	No	No	No	Max detect does not exceed SL, FOD not greater than 5%
	1,2,4-Trimethylbenzene	1.48E-04				Yes	No	No	No	No	Max detect does not exceed SL
	Vinyl chloride	4.17E+00	1	2	2	No	No	No	Yes	No	Max detect does not exceed SL, FOD not greater than 5%
	m,p-Xylene	6.67E-04				Yes	No	No	No	No	Max detect does not exceed SL
	o-Xylene	5.24E-04				Yes	No	No	No	No	Max detect does not exceed SL

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

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 (ug/kg)	Max MDL (ug/kg)	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	0.5	3.4	2.83E+00	2	29					0	29	Yes	Yes	Yes	No	Yes	
Metals	Cadmium	7440-43-9	2.50E-01	17	1	6	1.15	1.15	4.60E+00	1	100	0.01	0.21	8.40E-01			6	Yes	Yes	Yes	No	Yes	
Metals	Nickel	7440-02-0	8.20E+00	7	7	100	0.85	33	4.02E+00	1	14					0	14	Yes	Yes	Yes	No	Yes	
PAHs	Low Molecular Weight PAH	SMSLPAH		9	2	22	0.615	1.63				0.04	0.04					Yes	No	No	No	No	Lack of SL
PCBs	Total PCB (SMSPCB)	SMSPCB	1.53E-03	11	4	36	0.012	4.3	2.81E+03	4	100	0.0032	0.0032	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	1.7	1.7	5.97E+00	1	100	0.25	1	3.51E+00	8	44	47	No	Yes	Yes	Yes	Yes	
VOCs	Tetrachloroethene	127-18-4	2.06E-02	29	6	21	0.033	0.12	5.82E+00	6	100	0.004	0.09	4.37E+00	7	30	45	Yes	Yes	Yes	Yes	Yes	
VOCs	Trichloroethene	79-01-6	4.90E-01	29	10	34	0.044	1.1	2.24E+00	4	40	0.008	0.08	1.63E-01			14	Yes	Yes	Yes	No	Yes	
VOCs	Vinyl chloride	75-01-4	1.60E-02	29	1	3	0.028	0.028	1.75E+00	1	100	0.002	0.08	5.00E+00	7	25	28	Yes	Yes	Yes	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

APPENDIX E

DEVELOPMENT OF STEP 3 INTERIM ACTION LEVELS

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

	TPH in Soil				Arsenic and Redox in Groundwater			
Well	Date	Depth (ft)	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

Area	Fuel Tank Area												Low Lying Area					
Sample	FTASB02-9.5			FTASB02-9.5S			FTASB04-8			BH-11.0			LLASB02-5			LLATW01-5		
Carbon Chain Range	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)
MTCATPH11 Input																		
Aliphatic C5-6 [a]	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
Alkphatic 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
n-Hexane [a]	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 [a]	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 [a]			0			0			0			0	81	U	0			0
Ethylene dichloride [a]			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 [b]	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
Method B Interim Action Levels (mg/kg)																		
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 $1x10^{-6}$

HI = hazard index

IAL = interim action level

TPH = total petroleum hydrocarbons

U = undetected, associated value is the method detection limit

[a] This constituent was never detected anywhere on site, therefore the concentration was assigned 0 mg/kg.

[b] 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