STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Region Office
PO Box 330316, Shoreline, WA 98133-9716 • 206-594-0000

Electronic Copy

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Luke Thies
Weyerhaeuser
105 Mills Drive
Columbia Falls, MT 59912
(Luke.Thies@weyerhaeuser.com)

Brent Laws
MAP2, LLC
805 80th St SW
Everett, WA 98203
(blaws@pacifictopsoils.com)

Re: Comments on Supplemental Upland Remedial Investigation Report and requirement for additional investigation

- **Site Name:** Weyerhaeuser Everett Mill E
- **Site Address:** 515 E Marine View Dr, Everett, WA 98201
- **Agreed Order:** DE 16129
- **Facility/Site ID:** 12
- **Cleanup Site ID: 2903**

Dear Luke Thies and Brent Laws:

Thank you for submitting the Supplemental Upland Remedial Investigation (SRI) Report for review by the Department of Ecology (Ecology).[1] Ecology's comments on the SRI are provided below. Additional comments on the SRI Report are attached. **Additional SRI work must be performed in order to address data gaps, as outlined below and in attached comments.** Please prepare and submit a work plan for Ecology's review and subsequent approval.

Comments on the SRI

1. **Potential Upper and Lower Sand Aquifer Seeps:** Previous investigations at the Site documented contaminant migration pathways not fully evaluated in the SRI. The 1994 remedial investigation at the Site concluded that, "The primary migration pathway for contaminants is from soil to groundwater to

[1] Floyd | Snider. 2023. *Supplemental Upland Remedial Investigation Report,* July 11.

the Snohomish River; secondary pathways are from seeps and storm water to the river. Contaminant receptors (and secondary contaminant transport pathways) are the Snohomish River and its sediments."[2] Previous investigations at the Site documented historical seeps from the bulkhead pile wall, the base of bulkhead pilings, as well as directly from sediments during lower tidal stages.[2]

As shown in the SRI Report, current groundwater arsenic concentrations exceed MTCA-based screening levels within 50 feet of the Snohomish River at MW-04S, MW-05S, MW-06S, MW-03D, MW-04D, and MW-05D. The SRI work did not include an assessment of potential seeps at the Site, as groundwater quality near the shoreline had not been evaluated. Ecology agrees that arsenic concentrations in groundwater should attenuate toward the Snohomish River; however, the degree of that attenuation has not been characterized. Additionally, seeps may be acting as preferential pathways that allow for contaminant migration with less attenuation than predicted.

Given the elevated concentrations of arsenic in groundwater near the Snohomish River, the presence of historical seeps at the Site, and the lack of information regarding any potential current seeps at the Site, this potential transport pathway has not been sufficiently characterized.

2. **Potential Lower Sand Aquifer Impacts to Sediment and Surface Water:** The SRI and previous investigations have documented that the Lower Sand Aquifer groundwater discharges to the Snohomish River. Groundwater samples collected from the Lower Sand Aquifer during the SRI contained concentrations of arsenic above MTCA-based screening levels within 50 feet of the Snohomish River at MW-03D, MW-04D, and MW-05D.

   Sediment sampling conducted in 1992 adjacent to the uplands area found heterogeneous sediment characteristics. Sediment at the sampling locations varied in hydrogen sulfide odor, reducing sediments at the surface, orange mottling in the sediment, iridescent sheen from the sediment, and indications of wood decay processes.[2] Additionally, discharge pathways from the Lower Sand Aquifer to the Snohomish River varied, with localized seeps documented upwards from the base of pilings as well as directly from sediments at lower tidal stages.[2]

   Ecology commends the effort that went into the development of an arsenic fate and transport model at the Site. The model has been valuable for evaluating arsenic transport and understanding key processes at the Site. Additionally, Ecology is encouraged that the model predicts arsenic concentrations in Lower Sand Aquifer groundwater will significantly attenuate before reaching nearby sediment and surface water; however, the actual amount of attenuation of arsenic in groundwater as it approaches the Snohomish River is not known. Additionally, observations of seep occurrences and sediment characteristics demonstrate complexity in the groundwater to sediment and surface water pathways along the shoreline that may result in less attenuation than predicted. The influence of this complexity on arsenic fate and transport is not definitively captured in the fate and transport model.

   As communicated in Ecology's initial comments on the SRI Report, groundwater modeling of contaminant concentrations downgradient of the shoreline wells alone is not sufficient to rule out the

[2] EMCON. 1994. *DRAFT Remedial Investigation Report for Former Mill E/Koppers Facility Everett, Washington*. *Volume 1 (Report).* September 23.

groundwater to sediment or groundwater to surface water pathways at the Site. Thus, these potential transport pathways have not been sufficiently characterized.

3. **Arsenic Attenuation in Groundwater:** As noted above, groundwater samples collected during the SRI contained concentrations of arsenic near the Snohomish River above MTCA-based screening levels. The SRI has documented that the Lower Sand Aquifer groundwater discharges to the Snohomish River. Groundwater geochemical results (Na+Cl) from the SRI show surface water and groundwater communication between the Upper Sand Aquifer and Snohomish River, across the bulkhead pile wall.

   Ecology agrees that arsenic concentrations in groundwater are expected to attenuate toward the Snohomish River, downgradient of the shoreline wells. The SRI Report concludes that this process is an important factor in the ultimate fate and extent of arsenic contamination at the Site.

   In areas where a groundwater discharges to surface water, and attenuation is assumed downgradient of upland wells, Ecology recommends collecting data to confirm the accuracy of natural attenuation estimates[3]. Understanding the arsenic attenuation in groundwater is necessary to characterize the extent of contamination at the Site. Additionally, it is necessary to evaluate point of compliance and compliance monitoring options in the Feasibility Study.

Next Steps

The above data gaps represent significant uncertainty regarding potential impacts to sediment and surface water at the Site. The SRI will need to address these data gaps to fulfill the Agreed Order, and to select cleanup standards for the Site that are protective of human health and the environment and select an appropriate cleanup remedy. **Please submit a work plan for Ecology review within 60 days or receipt of this letter to address the data gaps identified in the above comments.** Please consider the following recommendations as you prepare the work plan:

Potential Upper and Lower Sand Aquifer Seeps:
A seep survey should be conducted to look for potential seeps from the bulkhead pile wall and the sediment below the wall. Identified seeps should be sampled for laboratory analysis. Sediment that contacts discharging seep water should be sampled for potential laboratory analysis, contingent on the results of the seep water analysis.

Potential Lower Sand Aquifer Impacts to Sediment and Surface Water:
Groundwater in the Lower Sand Aquifer downgradient of MW-3D, MW-4D, and MW-5D should be sampled below the base of the sediment biologically active zone (BAZ). A site-specific BAZ for sediment should be determined where groundwater downgradient of MW-3D, MW-4D, and MW-5D is expected to discharge. Sediment should be sampled for potential laboratory analysis, contingent on the results of the groundwater analysis.

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[3] Ecology. 2017. *Developing Conditional Points of Compliance at MTCA Sites Where Groundwater Discharges to Surface Water, Implementation Memorandum No. 16.* July 25.

Arsenic Attenuation in Groundwater:
Groundwater sampling below the BAZ, as recommended above, would allow for the degree of arsenic attenuation in the Lower Sand Aquifer to be evaluated. To assess the degree of attenuation in the Upper Sand Aquifer, groundwater samples should be collected downgradient of the existing SRI wells, if possible.

If you have any questions or would like to meet to discuss the scope of additional SRI activities before you submit your workplan, please contact me at 425-466-8732 or chris.deboer@ecy.wa.gov.

Sincerely,

Chris DeBoer

Chris DeBoer, LHG
Cleanup Project Manager
Toxics Cleanup Program, NWRO

Enclosure: Initial Draft RTC_Mill E SRI_response

cc: Lynn Grochala, Floyd | Snider, (Lynn.Grochala@floydsnider.com)
Victoria Banks, Office of the Attorney General, (victoria.banks@atg.wa.gov)
Kimberly Wooten, Ph.D., Ecology, (kim.wooten@ecy.wa.gov)
Dhroov Shivjiani, Ecology, (dhroov.shivjiani@ecy.wa.gov)
Ecology Site File

Comment Number	Section	Page Number	Ecology Review Comment	Weyerhaeuser Response	Ecology Response
					Thank you for the responses to Ecology's comments and edits to the SRI report. Ecology appreciates the substantial revisions and information provided in your responses. Based on the revised SRI and the current understanding of the nature and extent of contamination at the Site, Ecology has additional comments on the results of the SRI work.
A	General				Regarding text discussing barrier wall performance. The SRI showed that the Upper Aquifer goes dry adjacent to the barrier wall in the areas of MW-02S and MW-03S during the summer. The wells inside the barrier wall all had enough water to be sampled in the September 2020 field event. This means that for some portion of the year, the head elevations inside the barrier wall are greater than outside the eastern wall. Please add text noting that although the annual PCMP monitoring results showed interior head elevations lower than exterior, the SRI results revealed this is not the case year round.
B	General				An aerial photo of the Site from 2018 (Snohomish County Online Property Information Map) shows water from the Snohomish River west of the wooden structures at various points along the southern half of the shoreline, including near MW-03S, MW-04S, MW-05S, and MW-06S. See the included photos to the right of this comment. Additionally, Ecology coordinated access to the Property via the owner and was present at the property during high tide in Jan. 2024. Groundwater was observed adjacent to the shoreline beyond any visible wooden structures. Based on 2022 aerial images showing lower tidal conditions, it appears that these wooden structures may be the bulkhead wall. If the visible wooden structures were not the bulkhead pile wall appeared to be submerged. See the included photos to the right. Ecology reviewed the tidal data for the river and the upstream river stage data from December 2023 through the dated of the site visit. The high tide observed during the visit was not anomalous. In light of the degree to which high tide inundates these wooden structures, this should be noted in the SRI. It would be helpful for Ecology's review to better understand what wooden structures adjacent to the Property actually comprise the bulkhead pile wall. It would be helpful if the SRI could describe shoreline elevations, so that Ecology could better understand how far westward high tide encroaches. The SRI should also address this of this as part of the pathway between the Upper Sand Aquifer - Surface Water.
C	2.3.4.4	2-7			Thank you for adding the substantial text regarding seeps in this section.
D	4.2.1	4-2			Regarding selecting 13.6 ug/L as the natural background value for arsenic in groundwater at the site, Ecology requests the inclusion of additional text along the lines of: "Ecology evaluated several methods to determine a natural background value for arsenic at the Site. Based on the available data, Ecology agrees that the use of 13.6 ug/L is the most applicable value for this Site." The Snohomish basin covers a large area and it may be more appropriate to use a subset of the study data to determine a more applicable natural background value. This approach has already been utilized at other sites within the study area. Ecology reviewed the study locations and determined that there was not a sufficient data set to perform the same evaluation at the Mill E Site. Therefore, Ecology agrees that the broader natural background value of 13.6 ug/L is the most applicable value for the Site. Ecology requests the additional text to document that the decision to select this value at the Site included a site-specific evaluation, and not just default adoption.

E	4.2.1	4-3			Regarding the use of a modified 3-phase model: It looks like the modified 3-phase modeling used the 2015 memo from Pete Kmet titled, Groundwater cleanup levels for upland sites along the Lower Duwamish Waterway. That is, you modified the 3-phase model as described in the memo with a targeted concentrations of 11mg. This calculation results in a concentration of 351 ug/L. If this is not correct, please clarify for Ecology the modifications made to the 3-phase model. Ecology does not object to the use of the value of 351 ug/L for the purposes of evaluating potential cleanup levels in the SRI. However, Ecology notes that this calculation utilizes values that were determined specifically for the LDW in order to allow modification of the 3-phase model for that area. If the concentration calculated for the SRI is used in the future, e.g. to evaluate cleanup action alternatives, it will have to be backed up by empirical data from the Site that confirms the "protectiveness" of the calculated concentration.
F	4.2.2	4-3			Regarding selecting 20 mg/kg as the natural background value for arsenic in soil at the Site, Ecology requests the inclusion of additional text along the lines of: "Additional natural background values for soil metals concentrations are provided in Ecology's 1994 publication #94-115. However, the value of 20 mg/kg was determined to be the most appropriate value for the Site in consultation with Ecology. This value is consistent with natural background values selected for the Everett Smelter site lowlands area." The Ecology 1994 publication, Natural Background Soil Metals Concentrations in Washington State provides additional background metals concentrations for WA. These concentrations may be, and have been, used as the background values at sites. Ecology requests the additional text to document that the decision to select this value at the Site included a site-specific evaluation, and not just default adoption.
G	6.3.2	6-6			Regarding the statement. "but as much of the discharging water is bank storage, this pathway does not result in a significant quantity of Upper Sand Aquifer groundwater discharge to the Snohomish River" Please add text clarifying that any discharges from the Upper Sand Aquifer are considered groundwater. The above statement is potentially true, in that discharge of groundwater/bank storage may not result in a significant quantity of water, or that the makeup of the discharged water would be mostly sourced from the river. However, though water from the river may enter the ground at high tide and then discharge at lower tide, this water is still groundwater and would be considered "Upper Sand Aquifer groundwater". This is not clear from the language used. This policy is covered in Ecology's Implementation Memo #16 Developing Conditional Points of Compliance at MTCA Sites Where Groundwater Discharges to Surface Water.
H	6.3.2	6-6			The SRI report utilizes observations of Upper Sand Aquifer seeps from the 1994 RI report to help evaluate the Upper Sand Aquifer to surface water pathway. The text in section 2.3.4.4 of this SRI cites the 1994 report noting, "Based on specific conductance of the seep water and comparison to groundwater and surface water values, the seeps were interpreted to be largely a result of bank storage discharges from tidal fluctuations (EMCON 1994). In Section 6.3.2 the SRI follows up on the above observation, concluding, "This transport pathway is potentially active, but as much of the discharging water is bank storage, this pathway does not result in a significant quantity of Upper Sand Aquifer groundwater discharge to the Snohomish River, and therefore is de minimis and not considered active." However, the 1994 report says, "Seeps were observed at the bulkhead and along the west bank of the Snohomish River adjacent to the site. The total volume of water discharging from the seeps was not quantified. Based on a comparison of the specific conductance of the seep water, groundwater, and river water, the seeps appear largely to result from bank storage discharges from tidal fluctuations in the river. **The seeps represent a transport pathway for contaminants from groundwater and soil to the Snohomish River**." (emphasis added). Ecology agrees with the conclusions of the 1994 RI report, that seeps from the upper aquifer represent a potential transport pathway for contaminants to the river. Ecology does not agree that this pathway has been sufficiently characterized to conclude that it is incomplete.

(	6.3.2	6-6			Regarding completion of the Upper and Lower Sand Aquifer pathways to surface water and/or sediment: Additional work is needed to sufficiently characterize these pathways. This section should be reviewed after the additional work is conducted and revised, if necessary.
J	6.3.2	6-7			Regarding the conclusion: "Therefore, the pipe should be considered a potential preferential pathway for groundwater." Ecology agrees. Because the pipe extends out of Property shoreline, it follows then, that the pipe *may* represent a preferential pathway for groundwater to surface water and sediment. Additional work is needed to sufficiently characterize this pathway.
K	6.4	6-7			Regarding the aquatic/benthic exposures and human exposure from surface water: Additional work is needed to sufficiently characterize these pathways. This section should be reviewed after the additional work is conducted and revised, if necessary.
L	6.4	6-9			The SRI report states: ..."geochemical modeling demonstrates that Site groundwater does not discharge arsenic at elevated concentrations through the transitional zone to the Snohomish River and cannot be the source of the measured arsenic concentrations in river sediment"... Additional work is needed to characterize the Site, and the data gathered by those efforts may support this overall conclusion. However, Ecology comments that the geochemical modeling provides a 'prediction', rather than a 'demonstration' of groundwater concentrations. Additionally, groundwater discharge via seeps from the lower aquifer (historically known at the Site), and varying sediment conditions documented in the 1994 RI, may result in discharge concentrations that conflict with model predictions.
M	6.4	6-9			Last paragraph. Ecology does not agree with this argument. However, additional work is needed to characterize the Site and should provided data to evaluate this issue. See comments on Section 7
N	7.0	7-1			Additional work is needed to characterize the Site and may require revisions to this section. Because the soil leaching to groundwater pathway is complete, soil CULs must be set at concentrations that does not cause an exceedance of groundwater CULs (with the condition that the CUL is not set lower than natural background).
O	8.0	8-1			Additional work is needed to characterize the Site and may require revisions to this section.
1.	General		Widespread arsenic contamination from the Everett smelter is seen through out the lowland area. The concentrations at The Mill E site are higher than seen in the surrounding area of the lowland. The onsite source of arsenic contamination is significantly more than the surrounding area. The report repeatedly points to upgradient Arsenic soil and groundwater concentrations. The report repeatedly states that airborne As releases from the Everett Smelter are located on Site to diminish the onsite source.	Comment noted. We acknowledge that there is arsenic contamination associated with onsite sources and there are also offsite (smelter) sources and potential contributions. Per our discussion on May 12, our team has made minor modifications in the text to clarify.	Comment addressed.
2.	General		There is discussion of soil and groundwater and not a lot about sediments which is the item with surface water that we are protecting. There is discussion of historic sampling in 3.1.1 but no current information.	Our team conducted an EIM search and the historical sediment data presented in Sections 3.1.1 and 3.1.2 are the most recent data in the Site vicinity.	Comment sufficiently addressed, and no changes needed. For clarity, EIM seems to have a few issues displaying locations recently. The 2008 Port Gardner sediment study has data from 2 locations in the vicinity of the Site (A2-34 and A2-34B). Theses locations are shown on the SRI figure A.3. Because 3.1.1 and 3.1.2 cover previous remedial investigations, the data from the Port Gardner locations don't add much, and the 2 locations are included in the Previous Arsenic Data in Sediment figure, no additional revisions are required.
3.	General		All data summarized here should be included.	Per our discussion on May 12, we have included figures and tables that present historical groundwater, soil, seep, and sediment data in a new Appendix (Appendix A).	Comment addressed.
4.	Title page		Should include FSID 12 and CSID 2903.	This information has been moved from Section 1.1 and is now included in the introduction to Section 1.	Comment addressed.
5.	1.1	1-1	First paragraph, last sentence. The CD defines the Site boundary as the property boundary. The AO added, “and includes any area beyond the Mill E Property on which releases form that property have come to be located	A footnote has been added (footnote 1) to this sentence to clarify.	Comment addressed.
6.	1.2	1-3	The CD is about liability, the AO is about the work they agree to do for cleanup. The site is where the contamination is. That is why this CD is quirky. The New AO IS to remedy that.	Comment noted. Edits to the text in this section are not warranted.	--
6a.	1.2	1-3	Add in, “, including groundwater near former monitoring well HC-3.” To be consistent with the AO	The requested text to address the comment provided in the pdf (not a numbered comment) has been added.	Comment addressed.
7.	2.2	2-2	Second to last paragraph. Use the full legal name for “Amazon”	The text has been revised as requested with Amazon.com, Inc.	Comment addressed.

8.	2.3.3.2	2-4	Request that the discussion of the stormwater pipe infrastructure include the description of the other pipe that ran to the junction box and was traced north to within 10 feet of the barrier wall.	Text has been added to Section 2.3.3.2 to include this requested information and a more robust discussion of the pipe investigation and findings was added to Section 3.5.3.	Thank you for adding the text. It provides a good accounting and description of the stormwater pipe investigation
9.	2.3.4.3	2-6	First paragraph last sentence. Reword to clarify that the lower confined aquifer measured elevations are not a "water table" and that the "saturated thickness" does not change.	The text has been clarified as requested.	Comment addressed.
10.	2.5.1	2-9	TEE-The scoring in Table 2.1 is likely OK but since you only analyzes for you don't know if the listed chemicals are present. Some have been detected in the past.	Comment noted. Because pentachlorophenol was an IHS that was previously detected in soil and data for other listed chemicals are not available, Table 2.1 was updated to be conservative. As noted, the updated scoring did not affect the outcome.	Thank you for modifying the scoring to be more conservative based on the lack of data. Comment addressed.
11.	3.1	3-1	First paragraph. Use the legal name for the former "Hart Crowser".	The early investigations were completed by Hart Crowser (their legal name at that time) and the reference is accurate. Their legal name changed in subsequent years. Text was not revised as requested.	Thank you for the information and correction. Comment addressed.
12.	3.1.2	3-3	Third paragraph, second sentence. By the AO's definition the As detected in PZ-3B would be considered part of the Site.	Comment noted. This section describes pre-AO activities, removed "near the Site".	Comment addressed.
13.	3.1.2	3-4	First bullet, Noted that for most of their data they use a convention of rounding to 2 sig figs, However, here some of these data have been rounded from the original report and some have not. Please check and correct for consistency.	Resolved values in Section 3.1.2 to be 2 significant figures.	Comment addressed.
14.	3.1.2	3-4	Second bullet, Clarify that the provided concentrations are dissolved As, and report the higher total As values. MTCA requires total.	Adjusted text to reference total arsenic values.	Comment addressed.
15.	3.3.1	3-4	First paragraph. Change 'CPOC' to 'POC' to be consistent with the CAP definition.	Text was updated as requested for consistency with the CAP.	Comment addressed.
16.	--		No Ecology comment, this comment number was skipped.		
17.	3.3.3	3-6	First paragraph, last sentence. Clarify that CULs established for As in the Consent Decree are only for media within the containment area.	Added footnote to Section 3.3.3 that CULs were only established for within the containment area.	Comment addressed.
18.	3.4.1	3-7	Last paragraph. The summary of the groundwater concentration trends inside the containment area says they "decreased gradually following cleanup action implementation in 1999 and have been stable or decreasing over time.". Any increasing or decreasing trends are difficult to discern by looking at the graphs, and at best can be described as appearing stable. I don't think it's worth doing Mann-Kendall analysis. But I'd guess that it wouldn't support the conclusion of a decreasing trend.	Removed the word "decreasing" from the sentence.	Comment addressed.
19.	3.4.2	3-8	First paragraph, last sentence. Section does not discuss another one of the performance criteria for the containment system which is that the interior Upper Sand Aquifer water table is at approximately the average elevation of the hydraulic head in the Lower Sand Aquifer.	Additional text was added to Section 3.4 to clarify that this performance criteria is being assessed through the PCMP monitoring program. It is important to note that prior to the PCMP Addendum in 2017, piezometers located in the lower sand aquifer were not monitored. Updated Section 3.4.2 Header to "Summary of Barrier Wall Performance 1999-2016". The additional assessment to evaluate this performance criteria is described in Section 3.5.1/3.5.2.	Thank you for adding text in several sections. Agree that it adds valuable explanation and context to the performance monitoring. Comment addressed.
20.	3.5.2	3-9	Second paragraph. Discussion of other criteria missing. One of the performance criteria for the containment system is that the interior Upper Sand Aquifer water table is at approximately the average elevation of the hydraulic head in the Lower Sand Aquifer.	Refer to the response to the comment in Section 3.4.2 on this topic. This performance criteria is being assessed through the PCMP monitoring program under the CD, as described in Section 3.5. It was decided in coordination with Ecology as part of the PCMP Addendum process to not install lower aquifer piezometers within the barrier wall to ensure that the integrity of the aquitard was not compromised.	Thank you for adding text in several sections. Agree that it adds valuable explanation and context to the performance monitoring. Comment addressed.
21.	3.5.3	3-10	Third paragraph. Add in a discussion of the second pipe located on the north side of the junction box. Include that it was traced north to within 10 feet of the barrier wall, and was broken in several places along its run. Request the sentence describing the water sampling inside the junction box be moved to the appropriate chronological point in the paragraph.	Added requested text to Section 3.5.3 to describe the northern pipe and moved water sampling sentence lower in section to maintain chronological order.	Please add in the observations that the 8-inch concrete pipe was found to be broken in several places and that the 4-inch sanitary sewer pipe was also identified separate from the 8-inch concrete pipe. From the Dec 13, 2017 report Revised Pipe Exploration Summary for Storm Drain Associated with Outfall LLO-07: "This concrete pipe (previously assumed to be associated with the sanitary pressure pipe) was traced in a relatively straight line north towards the barrier wall (refer to Figure 4). It was verified within 10 feet of the barrier wall (continuing towards the wall), and it is assumed this unknown pipe was abandoned and cut prior to installation of the barrier wall in 1999. The concrete pipe was observed to be broken in several locations; no water was observed flowing from the pipe. The 4-inch steel sanitary pipe was also located in close proximity to the concrete pipe approximately 15 feet from the barrier wall, and was observed to be corroded and broken." The SRI report is likely to be a first stop for information about the Site, before digging back through the numerous historical documents for additional details. These observations need to be included to provide and accurate description of the configuration and condition of the current subsurface infrastructure at the Site.

22.	3.5.3	3-10 to 3-11	Outfall 07 looks to be set 1-2 feet below the Upper Sand Aquifer into the silt aquitard where it discharged. This could create a preferential flow path for groundwater to seep out around it. Nearby groundwater in the Upper Sand Aquifer has As concentrations on the order of 1,000 ug/L nearby. Ecology has concerns about potential discharges there and it's impacts to sediments during lower tidal stages. This wasn't evaluated and should be addressed. There is an inconsistency with the acknowledgment that the outfall pipe should be considered a preferential pathway but not including Upper Aquifer discharges near MW-05S (> 1,000 ug/L) as a potential pathway to sediment and surface water.	Comment noted. We have expanded the discussion of the fate and transport of Upper Sand Aquifer groundwater in the document (Sections 2 and 6) and included historical seep observations and sampling efforts. We have also considered Upper Sand Aquifer discharges to Snohomish Surface Water and Sediment as a potential arsenic transport pathway (Section 6.3.2). Based on prior tidal studies, the Upper Sand Aquifer does not have a strong hydraulic connection with the Snohomish River, except that river water enters the bank during high tides and mixes with groundwater as bank storage. High Na and Cl concentrations in Upper Sand Aquifer shoreline wells (relative to wells located further upland) provide support for a significant amount of river water being stored in the bank throughout the tidal cycle. Therefore, we believe that discharge from the bulkhead is therefore mostly river water. Near MW-05S and Outfall 07, the aquitard is thin and potentially disturbed by the pipe and groundwater arsenic transport may be less inhibited by adsorption to aquitard soil. Therefore, it is possible that in this location, Upper Sand Aquifer groundwater has discharged to the Snohomish River through downward migration into the Lower Sand Aquifer. In this case, attenuation calculations based on site-specific data presented in Appendix C demonstrates that the high sorption capacity of transitional zone soil effectively retains groundwater arsenic and predicts steady-state porewater and sediment concentrations that are less than applicable criteria.	Based on observations of the pipe size and depth near the shoreline and the boring logs for MW-05S and MW-05D, the outfall pipe appears to be set 1-2 feet below the Upper Sand Aquifer into the silt aquitard. As depicted in Figure 8.3, the pipe appears to be below the water table at times. The pipe abandonment memo included photos of the exposed pipe where it was abandoned near the shoreline and water is shown in the excavation (although the report doesn't address the source of the water). In addition to disturbing the aquitard, fill material surrounding pipes are potential preferential pathways for groundwater flow. Given that the pipe appears to sit into the aquitard and penetrate the face of the shoreline below the water table, and the nearby well MW-05S has arsenic concentrations > 1,000 ug/L, potential seeps of water around the pipe should be considered as a potential pathway in the CSM. This has not been sufficiently addressed by the SRI and requires additional characterization.
23.	3.5.3	3-11	Last paragraph. The pipe abandonment was conducted in April 2018. Check the date.	The date has been corrected.	Comment addressed.
24.	4.2.1	4-3	Last paragraph. Ecology understands that it is common in the industry to use 'PQL' synonymously with other reporting limits. However, 'PQL' as used in MTCA and in the evaluation of CULs is based on a value determined by Ecology from a survey of labs. It appears from the tables that the PQL value used here is based on the laboratory reporting limit from Fremont Analytical. Replace 'PQL' with something like laboratory reporting limit, or method reporting limit.	The text has been revised with PQL replaced with laboratory reporting limit (RL).	Comment addressed.
25.	5.2.1	5-3	Third bullet, (second on this page). Corrected a value from 270 to 130 ug/L.	The text has been corrected.	Comment addressed.
26.	5.2.2	5-3	First bullet, Second sub-bullet. Remove the reference to a 'possible stagnation zone' here. The potential for this area to potentially contain 'stagnant' water was identified in the AO. Groundwater contouring of the elevation data collected in the wet season indicate groundwater flow to the north through this area.	We have revised the text to remove reference to a "possible stagnation zone."	Comment addressed.
27.	5.2.2.	5-3	First bullet, Third sub-bullet. The inferred eastward flow direction in the Upper Sand Aquifer indicates movement of groundwater across the property. Add a brief comment about inferred fate of that water, or potential fate if that component of the Upper Sand Aquifer hydrology is not well understood at this point in the RI.	The text has been revised to discuss the fate of Upper Sand Aquifer groundwater. Upper Sand Aquifer groundwater flows in a zone of relatively thin (average dry season and wet season thicknesses of 2.5 and 4.5 feet, respectively) zone of saturated thickness east across the property to the shoreline area, where it mixes with Snohomish River surface water that is stored in the bank (from temporary gradient reversals during high tides). The relatively insignificant saturated thickness of the Upper Sand Aquifer recharges the Lower Sand Aquifer below, through the leaky aquitard, and a component of the mixed groundwater and surface water stored in the bank ultimately discharges to the Snohomish River through the bulkhead at low tides. This interpretation is consistent with the inferred fate of Upper Sand Aquifer groundwater in the Hart Crowser 1991 Phase 1c Site Characterization Report as well as SRI Na and Cl data from shoreline monitoring wells.	Comment addressed.
28.	5.2.2	5-4	First bullet, Fourth sub-bullet. 1) Are you referring to the flat gradient between MW-02S and PZ-3B as the 'hydraulically isolated' area? The groundwater contouring presented in the RI show a gradient between MW-04S and MW-02S, thus implying groundwater flow from the southern portion of the Upper Sand Aquifer through that area. 2) It's not clear what you mean that the dry wells indicate that the barrier wall 'effectively blocks groundwater flow to this area'. The boring logs indicate that the top of the silt layer at the location of MW-03s is shallower than to the north or south along the shoreline and that the bottom of the well screen was set at the top of the Upper Silt. The wet season Upper Sand Aquifer contours indicate groundwater flows from the south to the north through that area. Wouldn't that imply that the lack of precipitation in this area during the summer of 2022 resulted in the Upper Sand Aquifer water table dropping below the elevation of the Upper Silt at MW-03S? 3) As commented previously, the wet season groundwater contouring indicate groundwater is flowing from the southern portion of the Upper Sand Aquifer near MW-04S, northward where it converges with water along the north side of the barrier wall in the area of MW-01S. This shows the area is not 'isolated from the rest of the Upper Sand Aquifer'. 4) For the statement that groundwater in that area of the Upper Sand Aquifer is 'not appreciably discharging into the Snohomish River.', if you mean during the summer of 2022 then that's correct. If you mean that as a general condition throughout the year, then it's not clear. 5) additional questions : a) Do you have any thoughts on the groundwater geochemistry of MW- 01S? The results are significantly different than the rest of the results, with relatively high concentrations of sodium, chloride, TDS, and relatively low TOC and DOC. b) Do you have any thoughts on why MW-01S and PZ-3B have different geochemistry results and (in the wet season) groundwater elevations? They look to be approximately 13 feet apart.	1) Comment noted, and the statement has been revised to indicate that during the wet season, there is a small component of Upper Sand Aquifer groundwater flowing northward between MW-04S and MW-02S. The flat gradients between PZ-3B and MW-02S indicate this is a zone with slow groundwater movement with limited exchange with surrounding groundwater. 2) We have revised the text here to clarify that the barrier wall disrupts the natural east to west Upper Sand Aquifer groundwater flow paths that were documented in the 1994 RI. The presence of the barrier wall likely contributes to the condition during the dry season where the area is not hydraulically connected to the Upper Sand Aquifer, when heads are lower than the top of the Upper Silt Aquitard at MW-03S. We also agree that the Upper Sand Aquifer is sensitive to precipitation and local recharge. 3) The text has been revised to add that Upper Sand Aquifer groundwater does not flow into this area during the dry season. 4) Based on our data, we believe that this statement is accurate as much of the water in the Upper Sand Aquifer is a result of bank storage and therefore Upper Sand Aquifer groundwater is not appreciably discharging to the river. Refer to the response to comment #27 above. This is supported by Na and Cl values in shoreline wells as well as previous Site characterization efforts (see response to 5, below, and Figure 5.4). 5) High Na and Cl values at MW-01S relative to Site groundwater indicate that there is likely a high degree of Snohomish River surface water intrusion and mixing with Upper Sand Aquifer groundwater at MW-01S. More broadly, Na and Cl concentrations are elevated at shoreline wells screened in the Upper Sand Aquifer (relative to upland wells) and indicate that Snohomish River water is stored in the portion of the Upper Sand Aquifer adjacent to the bank throughout the tidal cycle (Figure 5.4). Also, PZ-3B is screened from 2 to 3.6 feet bgs (the bottom of the screen is above the top of the aquitard) while MW-01S is screened from 4.5 to 9.5 feet (screen set at top of aquitard). This difference in screened interval elevations appears to explain the differences observed in water level elevations. MW-01S is saturated year-round and appears to receive more bank storage from the Snohomish River, which would explain the difference in geochemistry results (i.e., higher Na and Cl).	Thank you for the substantial revision to section 5.2.2. The additional information is appreciated and well presented. 1) -5) comment addressed

29.	5.2.2	5-4	Second Bullet, first sub-bullet. Revise the wording to remove the potential confusion about "seasonal maximum and minimum".	The text has been revised as requested.	Comment addressed.
30.	5.2.2	5-4	Third Bullet. Agree that the maintenance of head differences across a 1- to 12-foot aquitard could be described as "limited hydraulic connection". However, that observation alone doesn't demonstrate that the aquitard "effectively impedes appreciable" downward flow. That's unsupported by any other data, and the head differential provides gradient to drive potential downward flow. Calculations of flow and travel time through the aquitard using stable Upper Sand Aquifer head pressures and tidal minimum/tidal average Lower Sand Aquifer head pressures would present better support, if the intent is to keep this statement. Additionally, the use of 'effectively' is a little confusing here (in effect vs does so well).	The text has been revised to provide flow and travel time calculations for groundwater moving down from the Upper Sand Aquitard through the aquitard. Using aquifer properties from the RI and heads from the SRI, we estimate that the rate of Upper Sand Aquifer groundwater discharging through the upper silt aquitard is approximately 70 cm^3/second, which accounts for less than 1 % of the total horizontal flow in the Lower Sand Aquifer across Site (inputs will be included in a footnote in the text). We note that although there is a strong downward vertical gradient between the Upper and Lower Sand Aquifers, the high hydraulic conductivity in the Upper Sand Aquifer (relative to the aquitard) will drive most of the flow horizontally rather than vertically. 'Effectively" has been removed from the text.	Thank you for providing the calculation and analysis. Comment addressed.
31.	5.2.3	5-4	First Bullet. Correct reported minimum value for total As results.	The text has been corrected.	Comment addressed.
32.	5.2.4	5-5	This sections say that groundwater geochemical conditions are 'reducing'. This is a simplistic summary which should be expanded in section 5.4	The short general section on geochemical results has been deleted and replaced with a more specific discussion of redox conditions in Section 5.4. A sentence has been added to Section 5.2.1 referring the reader to Appendix C (formerly Appendix B) and Section 5.4.	Thank you for the summary. The information is well presented and provides a clean and concise summary of the general redox conditions. Comment addressed.
33.	5.4	5-6	This section should expand the discussion on the groundwater geochemical conditions being 'reducing'. Iron Eh-pH stability fields show variability in the stability of Fe(II) and Fe(III) between the seasons, and the As Eh-pH stability fields show stable geochemical conditions for arsenate. Additionally, the Eh values were > 0.0 and dissolved oxygen was measured at concentrations > 0.5 mg/L in all wells except 2 (for both sampling events). Appendix B referenced the USGS Workbook for Identifying Redox Processes in Ground Water. Evaluating the full suite of parameters using the workbook results in a 'Mixed(oxic-anoxic)' category. Suggest noting something about the redox environment being complex and referring the reader to the appendix for further discussion.	The discussion of site redox conditions and its implications for fate and transport have been expanded with more specific findings in the first bullet of Section 5.4. This discussion also replaces the short summary section previously presented in Section 5.2.4.	Regarding the statement "Site groundwater geochemical results in both the Upper and Lower Sand Aquifers are classified as anoxic according to the USGS classification of redox processes, and are dominated by iron-reducing conditions." The USGS Workbook for Identifying Redox Processes in Ground Water (Jurgens et al. 2009; also used in the geochemical report), results in a mixed(oxic-anoxic) redox category, indicating a mix of both oxic and anoxic redox processes. Using the geochemistry data provided in the geochemical modeling report and the excel workbook, 2 of the 29 results were "anoxic". The other 27 results were "Mixed(oxic-anoxic)". Please correct the text to reflect the results of the USGS classification for redox at the Site.
34.	6.1	6-2	Second to last paragraph. "Sediment sampling from the 2016 Everett Smelter Lowland Area SRI showed detected arsenic in all samples confirming elevated arsenic concentrations are prevalent in the Snohomish River near the former smelter." This statement makes is seem like extensive sediment sampling was conducted in the river which is not true. The sediment samples collected in the lowland RI were collected below outfalls. Reword the text to be clear that the river was not sampled.	The text has been revised as requested.	Comment addressed.
35.	6.2	6-2	First paragraph. Recommend removing the description of the area between the barrier wall and the bulkhead as a 'stagnation zone', as in 'a body of water having no flow or movement'. If you mean to convey something else, different verbiage might be acceptable. The flow around barrier wall alone does not result in that area going dry. The barrier wall prevents water from flowing to that area from the east and limits the points where that area connects to the rest of the Upper Sand Aquifer. The water table lowering to an elevation below the top of the Upper Silt layer at MW-03S, then cuts off that area from the rest of the aquifer. Recommend revising the note about the area going dry during the dry season to include something like, 'going dry when there's lack of sufficient recharge to the aquifer'. The months leading up to the dry season monitoring event in 2022 were unusually 'dry' with negligible rainfall. Agree that this area may go dry in future dry seasons based on rainfall totals and that future sampling might even demonstrate it's a regular phenomenon. But because this is the only 'dry season' monitoring event for the Site and it was an unusually dry summer, this shouldn't be put forth as a regular seasonal occurrence until additional seasonal data is available.	The text has been revised to clarify that this area dries up during the dry season, as indicated by heads not measured above the top of the Upper Silt Aquitard layer at MW-03S. We have also incorporated the reviewer's suggestion about the area going dry when there is lack of sufficient recharge from precipitation. While we agree that 2022 was a dry year, we believe the data presented are relatively representative of the normal condition. Previous PCMP monitoring has showed that PZ-3B, located in the NW corner of the Site, has been dry during previous PCMP monitoring events in 1999, 2002, 2009, 2018, and 2019 (note 2020 and later monitoring events were conducted in October instead of September), indicating that Upper Sand Aquifer wells in this area tend to dry up during the dry season.	Thank you for the revision. Agree that the area may go dry periodically, or may be a normal condition. Thank you for the response providing your line of thinking. Comment addressed.
36.	6.2	6-2	Second paragraph. The geochemical modeling and its results looked at As transport through the Upper Silt Aquitard. The rate of lateral and vertical groundwater flow through the aquifers should be evaluated using the aquifer properties and flow calculations, and not just be a result of the modeling. Maybe this meant that the work report in Appendix B included calculation of the flow rates? Please clarify. Additionally, it's unclear what is meant by 'minimal' downward groundwater flow.	To assess As transport through the Upper Silt Aquitard, the geochemical model (Appendix C, formerly Appendix B) uses aquifer properties from the 1994 RI and 1998 CAP that were derived from Site aquifer testing (no hydrogeologic/aquifer properties were derived from a model). These parameters are consistent with those used in our Darcy flow through the aquitard estimate, provided as response to comment #30. Together, these data indicate that lateral groundwater fluxes and tidal action are much more significant than slow leakage through the aquitard.	Thank you for the additional text. Comment addressed.
37.	6.3.1	6-3	Third paragraph. Is there any data from the RI that's being used to include nearshore wells at the Site in the tidally influenced transitional zone? The statement is fine, But curious about what the basis for that was.	We have replaced "nearshore" with "shoreline" to clarify that wells within approximately 50 feet of the shoreline are included within the tidally influenced transitional zone. Na and Cl results from the shoreline wells indicate some degree of more-saline Snohomish River surface water mixing with both Upper and Lower Sand Aquifer groundwater.	Comment addressed.

38.	6.3.2	6-4	Second Bullet. Regarding the noted exception of areas requiring and anthropogenic course, PZ- 1B and PZ-2B were not considered in the model and have dry season As concentrations that would plot above the modeled concentrations. Revise 'likely highly localized'. It's not clear why that's 'likely'. The transport modeling results concluded transport up to 220 feet was possible over 100 years with expected sources withing 150 feet. And five different locations in the southern portion of the property had concentrations of As in soil equal or greater than 100 mg/kg. Concluding concentrations in MW-08S are 'likely' from upgradient and off site, with no soil data at MW-08S in the saturated zone is not supported.	Ecology's comment that dry season concentrations at PZ-1B and PZ-2B would plot above the modeled concentration that could be explained by partitioning from natural background arsenic concentrations in soil is noted. We have revised the text to note that these piezometers, were not included in the model analysis, and to acknowledge that the statements about MW-05S, MW-07S, and MW-08S could also apply to other locations. As requested, we have changed the language to indicate that soil sources of arsenic to groundwater are possibly explained by localized sources, instead of likely explained by localized sources. We have also revised the discussion of MW-08S, indicating that the concentrations are consistent with upgradient monitoring results and potentially a nearby soil source.	Comment addressed.
39.	6.3.2	6-5	Fourth bullet. Exceedances of the PCUL. The text notes a possible explanation for exceedances of the PCUL at MW-04D and MW-05D, but what about MW-03D? As pointed out in the Appendix B report, historical Lower Sand Aquifer concentrations in HC-15D were 3,100 ug/L. Given the modeled lower aquifer transport rates and inferred flow directions, why is this not mentioned as a possible source of the relatively higher As concentrations in MW- 03D, MW-04D, and MW-05D?	Comment noted. The text has been updated to provide an explanation for the exceedances observed at MW-03D. As the reviewer notes, this well is located downgradient of an area where the Upper Silt Aquitard has been historically observed to be thin (Figure 2.3) and arsenic exceedances present in the lower sand aquifer (HC-15D).	Comment addressed.
40.	6.3.2	6-6	When discussing the origin of the conveyance piping, add in the piping that runs north to the barrier wall.	Added text to Section 6.3.2 to include the north pipe that runs towards the barrier wall.	Comment addressed.
41.	6.4	6-7	Under exposure pathways and receptors. The exposure pathways should consider discharges from the Upper Aquifer through seeps in the bulkhead wall. The bulkhead wall was reportedly constructed in the early 1900's. During the 1994 RI, at least one seep was observed discharging continuously from the Upper Aquifer. Additionally, the 1996 report describing the 1995 sediment sampling noted that the original location of SR-05 couldn't be sampled because 'the wooden bulkhead had partially collapsed". Additionally, the Upper Sand Aquifer groundwater contours infer groundwater flow in the southern portion of the property toward the bulkhead and river. a) Because the bulkhead functions to restrict discharges to the river (and sediments during lower tidal stages), historical, current, and future discharges through the bulkhead should be evaluated. b) The exposure pathways should consider discharges from the Upper Aquifer through seeps around Outfall LLO-07. The RI report acknowledges that fill around the plugged pipe could act as a preferential pathway for groundwater. Additionally, the pipe decommissioning report says that the pipe is approximately 8 feet bgs, 25 feet from the shoreline. The nearby boring for MW-05S encountered the Upper Silt Aquitard at 5.5 feet bgs, indicating the pipe is inset into or through part of the silt layer. Because the groundwater concentrations from MW-05S are the highest measured during the SRI and almost 100x the Proposed CUL, discharges from the Upper Aquifer at this location should be evaluated. c) When discussing the transitional zone adsorbing arsenic, note that the modeling report says that the depth this attenuation occurs is no known.	a) We have added additional information throughout the document about historical seep discharges through the bulkhead. There is likely a small quantity of Upper Sand Aquifer groundwater that discharges to the Snohomish River (in the area between the barrier wall and bulkhead, only during the wet season) through the bulkhead. Based on the sampling and observations in the Hart Crowser 1991 Phase 1c report, the 1994 RI, and Na and Cl results from this SRI, the Upper Sand Aquifer groundwater mixes with Snohomish River surface water that enters the aquifer through the bulkhead during high tide. Therefore, most discharge to the Snohomish through the bulkhead results from bank storage. b) Comment noted. We have included an additional exposure pathway in the text in Section 6.3.2 that considers groundwater flowing from the Upper Sand Aquifer to Snohomish River surface water. We note, however, that seeps were not identified in the vicinity of LLO-07 during the Everett Smelter Lowland seep surveys in 2012. c) Comment noted. The model predicts that this attenuation occurs at a depth of approximately 3 feet below the sediment-water interface.	Additional work is needed to characterize the Site and may require revisions to this section.
42.	6.4	6-8	The use of only modeling to demonstrate the groundwater to sediment and surface water pathway from the lower aquifer is incomplete is not sufficient. Historical Upper Aquifer seep discharges is a potential current pathway to surface water and sediment. Concluding that the leaching pathway from soil to GW isn't 'active' and should not be discarded.	The evaluation of the pathway from groundwater to Snohomish River surface water and sediment is based on several site data sources and observed processes at the site. The analysis performed to evaluate arsenic transport from the Lower Sand Aquifer to the river using the reactive transport model PHAST (refer to Appendix C, formerly Appendix B) is based on the measured arsenic concentrations at MW-04D, measured aquifer hydraulic conductivity, and measured hydraulic gradients. The attenuation processes used in the analysis have been confirmed and quantified with site data collected for this purpose. The presence of iron oxyhydroxides (which are generally ubiquitous in iron-rich shallow groundwater) and iron oxide minerals providing adsorption sites in site soil was confirmed through X-ray diffraction (XRD) mineralogical analysis and scanning electron microprobe (SEM) and X-ray fluorescence (XRF) results showing iron-rich coatings on mineral grains and identifying specific minerals. The role of iron oxyhydroxides and other minerals in adsorption and co-precipitation of arsenic was confirmed through measurement of adsorbed arsenic species, identification of the arsenic phase adsorbed to iron oxyhydroxides or co-precipitated with amorphous iron oxides and iron mineral through sequential extraction procedure (SEP) testing, and direct measurement of the adsorbed phase and available adsorption sites through batch adsorption testing (BAT) with site soil and groundwater. These geochemical results from site data collection were evaluated relative to predicted stable phases for site conditions and found to be consistent, providing a robust basis for a geochemical conceptual site model. The PHAST model	Ecology understands that the model inputs were derived from Site measurements and calibrated against additional Site data. Ecology appreciates the scale and quality of work that has gone into developing a well-informed fate and transport model for arsenic at the Site. Model simulations of soil and groundwater sorption/desorption provide important information on the potential sources of arsenic at the Site and help inform transport rates. Model simulations predicting significant arsenic attenuation in the hyporheic zone are encouraging, and Ecology agrees that concentrations are expected to attenuate downgradient of the shoreline wells. However, Ecology remains concerned about potential discharges of arsenic in from the Upper and Lower Sand Aquifer to the Snohomish River and sediments, and concludes that the use of modeling alone is not sufficient to characterize the Site. Please see the attached letter for additional comments regarding Site characterization.
43.	6.4	6-8	First paragraph, suggest revising 'Exceptions to this are' to 'Known exceptions to this are'. There are other locations at the Site (e.g. SB-100) with elevated As concentrations in soil where this analysis was not conducted. Also suggest rewording 'highly localized'. See previous comment from section 6.3.2.	The text has been revised as requested.	Comment addressed.
44.	7.1.2	7-2	The soil leaching to groundwater pathway should not be discarded. Arsenic adsorption/desorption to/from soil is the fundamental process regulating contaminant fate and transport at the Site. As such it's fundamental to the evaluation of exposure pathways and should be considered in the development of cleanup standards for the Site.	The text in Section 7.1.2 has been revised to clarify that the soil to groundwater pathway is a fundamental process for arsenic fate and transport and explaining that the soil to groundwater pathway is not considered in the development of cleanup levels because the discharge of groundwater to surface water and sediment pathway was determined to be incomplete and site groundwater is subject to usage restrictions under an environmental covenant and the groundwater cleanup level is evaluated at a CPOC downgradient of site soil sources.	Additional characterization work is needed to sufficiently characterize the Site, including the groundwater to sediment and groundwater to surface water pathways. As such, it is premature to conclude these pathways are incomplete. These sections will need to be reevaluated for accuracy after the Site is sufficiently characterized.

45.	7.1.2.1	7-2	The Proposed CUL for soil of 88 mg/kg (based on Method C direct contact), should be based on protection of surface water and sediment	Refer to the response above for Section 7.1.2. Additional text was added to Sections 7.1.2 and 7.1.2.1 that supports the selection of 88 mg/kg as the Proposed CUL for arsenic in soil.	Additional characterization work is needed to sufficiently characterize the Site, including the groundwater to sediment and groundwater to surface water pathways. As such, it is premature to conclude these pathways are incomplete. These sections will need to be reevaluated for accuracy after the Site is sufficiently characterized.
46.	8.1	8-1	For the barrier wall performance: Per the AO and DC PCMP: "If water levels inside the wall decline and reach a new equilibrium at approximately the average elevation of the hydraulic head in the lower aquifer, it can be presumed that the containment system (barrier wall and asphalt cap) is functioning as designed." This has not been demonstrated in this SRI.	Previous comments regarding the barrier wall performance in Section 3 have been addressed to provide additional detail. Refer to Sections 3.4.2, 3.5.1, and 3.5.2. The AO is specific to arsenic outside of the barrier wall and therefore the specific data associated with documenting this performance is not included herein. Those data are reported to Ecology annually in PCMP reports.	Comment addressed.
47.	8.1.1	8-2	Suggest revising 'are likely attributable to either an off-site soil and/or groundwater source.' to "are attributable to either a potential"…	The text has been updated with the suggested phasing.	Comment addressed.
48.	8.4	8-4	First Paragraph, last sentence " Arsenic is present in soil and groundwater as a result of former Site operations and former off-site smelter operations and area wide deposition of slag and airborne particulates. " This statement is not accurate. There was not areawide deposition of slag.	The text has been updated with "localized" instead of "area-wide."	Comment addressed.
49.	Table (2.1)		Box number 3 should be given a score of 1 to be consistent with the process described in MTCA. The first footnote (a) for WAC 173-340-900 Table 749-1 (which describes the scoring process for a simplified TEE), says that if the evaluation is not conducted by an experienced field biologist, Box 3 should be given a score of 1. This will change the final total to 9, but not the results of the evaluation.	The number in Box 3 has been updated to 1. Additional updates to Table 2.1 were made to address Comment 10 and the final total updated to 6.	Comment addressed.
50.	Table (4.1)		'PQL' should be method reporting limit 'MRL' or something similar. (See comment on usage of PQL vs MRL in report text.)	The table has been revised with PQL replaced with laboratory reporting limit (RL).	Comment addressed.
51.	Table (4.2)		'PQL' should be method reporting limit 'MRL' or something similar. (See comment on usage of PQL vs MRL in report text.)	The table has been revised with PQL replaced with laboratory reporting limit (RL).	Comment addressed.
52.	Figures (general)	General	Cross section along the shoreline should be included	We include a shoreline cross section (C-C'), noted on Figure 2.2 and shown as Figure 8.3. This is classified as a "CSM cross section", but other than a different vertical exaggeration and showing groundwater data, it is identical to the geologic cross-sections.	Comment addressed.
53.	Figures (general)	General	The additional outfall connection that runs north to the barrier wall should be added to figures that show the piping configuration and on cross sections that intercept.	The additional outfall connection has been added to the CSM (Figure 6.1).	Comment addressed.
54.	Figures (2.4)		The highest observed water level for PZ-3B looks to be errantly high. Cross section B-B' crosses an pipe that runs from the outfall connection north to the barrier wall. The line should be added to the cross section at the invert.	The highest observed water level for PZ-3B has been corrected. The decommissioned pipe was not added to this geologic cross section as requested as the purpose of this section is to provide geologic and hydrogeologic information. This pipe was added to Figures 2.5 and 6.1, as requested.	Comment addressed.
55.	Figures (2.5)		Outfall connection that runs north to the barrier wall should be added to figure	This outfall connection has been added to the figure.	Comment addressed.
56.	Figures (5.4)		Outfall connection that runs north to the barrier wall should be added to figure	The stormwater features were irrelevant and therefore removed from this figure.	Comment addressed.
57.	Figures (6.1)		Outfall connection that runs north to the barrier wall from the connection box should be added to the Conceptual site model	This outfall connection has been added to the figure.	Comment addressed.
58.	Appendix A		Can you clarify why the anoxic soil sample locations are not included in the boring logs?	The anoxic samples have been added to the boring logs in Appendix B (formerly Appendix A).	Comment addressed.
59.	App. B 3.1.2.1	3.2	First paragraph, revise 'MW-10S through MW-10S' to 'MW-01S through MW-09S'.	Comment accepted.	Comment addressed.
60.	3.1.2.1	3.2	Second paragraph, it says the wet season data are presented in Table 3-1. They are presented in Table 3-2.	Comment accepted.	Comment addressed.
61.	3.1.2.2	3.3	Footnote 9 lists 'MW-10S'. Revise to 'MW-09S'.	Comment accepted.	Comment addressed.
62.	3.2.1	3-5	Revise 'less than 2 m/kg' to ' less than 2 mg/kg'.	Comment accepted.	Comment addressed.
63.	3.2.1	3-5	Last paragraph. The text refers to 'site-specific background concentrations determined during the Site Remedial Investigation'. The 1994 report discusses As concentrations in the surrounding lowland area as reflecting potential releases from the Everett Smelter. No studies have established natural background or area background arsenic concentrations that would be specific to the lowland area. The Everett Smelter RI uses the MTCA Method A background of 20 mg/kg for arsenic. Remove references to off-Site arsenic concentrations in soil as 'site-specific background' to avoid confusion.	Consistent with MTCA, an area background concentration of arsenic in soil was calculated as part of the 1994 RI for the Site (see Section 3.8.1 of the RI). The text in Section 3.2.1 was modified to refer to this as site-specific "area background" and to remove reference to the Smelter to avoid confusion.	Comment addressed.
64.	Table (3-2)		Missing data- the table doesn't include MW-08S results.	Data added.	Comment addressed.
65.	Table (3-3)		The table has the sample from MW-05 at 4.2 to 5.2 ft bgs with As, Fe, and Mn listed as '—' not analyzed. The lab report has sample MW-05D_4.5-5.2 with As, Fe, and Mn with concentrations of 103 mg/kg, 27700 mg/kg, and 371 mg/kg, respectively.	Data added.	Comment addressed.
66.	Figure (3-1)		Figure shows incorrect data, the ME-05S wet season concentration as 2,000 µg/L instead of 1,200 µg/L.	This figure has been updated with the correct data.	Comment addressed.