Site Name: East Waterway Operable Unit

Document: Technical Memorandum, Anthropogenic Background Evaluation, Prepared by Anchor QEA, March 2021

Reviewer: Jing Liu, Priscilla Tomlinson, Rick Thomas & Chance Asher

Comment Date: 4/7/2021

Comment Number	Section	Page Number and Paragraph	Review Comment
1	General		**Issue: Anthropogenic background media is not consistent with the SMS.** Sediment cleanup levels for the site must be consistent with the SMS. The legal definition of sediment and surface sediment in the SMS rule WAC 173-204-505(22) is: *settled particulate matter located at or below the ordinary high water mark, where the water is present for a minimum of six consecutive weeks, to which biota (including benthic infauna) or humans may potentially be exposed, including that exposed by human activity (e.g., dredging).* In other words, bedded sediment. The data used to calculate AB values excluded all bedded sediment and relied solely on suspended solids collected through centrifugation. A sediment cleanup level (or RAO/PRG) must comply with the legal and substantive provisions in the SMS rule regardless of the basis of the cleanup level (i.e., risk or background). According to the SMS rule, bedded sediment is consistent with the state's legal definition but suspended solids are not. **Recommendation:** Base anthropogenic background on bedded sediment. Ecology's preferred recommendation is to collect bedded sediment samples specifically to calculate anthropogenic background and ensure the sampling stations are consistent with the SMS regional background provision (i.e., away from the direct influence of point sources and identifiable sources). Due to EPA's compressed schedule which appears non-negotiable, this may not be a favorable option for EPA. A second, but less preferred, recommendation is to include previously collected bedded sediment samples, which could be combined with <u>all</u> suspended solids data since this represents a part of the load flowing downstream.

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2	General		**Issue: Anthropogenic background media appears to be inconsistent with EPA guidance.** Both EPA's 2018 Frequently Asked Questions About the Development and Use of Background Concentrations at Superfund Sites: Part One, General Concepts guidance and EPA's 1992 Soil Background guidance state: *For sites being evaluated under the HRS for possible placement on the NPL, "[b]ackground and release samples must be from the same medium (e.g., soil, water, tissue) and should be as similar as possible. Similar sampling methods should be used to obtain background and release samples (US EPA, 1992b).*" Since "release samples" is assumed to mean site sediment, the use of suspended solids to establish anthropogenic background is inconsistent with EPA guidance. **Recommendation:** Base anthropogenic background for the sediment site on bedded sediment.
3	General		**Anthropogenic background media is inconsistent with natural background.** Puget Sound sediment natural background was established through a collaborative effort between Ecology, EPA, DNR, and the Army Corps of Engineers (SCUM, Chapter 10). Both EPA and Ecology have agreed to use this dataset at our respective MTCA and CERCLA sites in Puget Sound, with the exception of how the final values are established (e.g., identification of outliers, statistical metrics). This natural background data set media is bedded sediment which is inconsistent with the EPA's decision to exclusively use suspended solids to establish anthropogenic background for the sediment site. Recommendation: Base anthropogenic background for the sediment site on bedded sediment.
4	General		**Issue: Questionable assumptions of recontamination potential.** Based on EPA's guidance anthropogenic background and recontamination values could be the same under certain circumstances, and it appears there was a predetermined assumption that anthropogenic background and recontamination values were the same for the site. However, this assumption does not appear to be supported or validated by robust data, reasoning, or documentation. **Recommendation:** Clearly detail what work was done to reliably predict and validate the assumption that the resulting anthropogenic values are the actual recontamination values. To validate this assumption, further sampling may be necessary. Considering the site receives 4.2 cm/year of depositional material and the site-wide average deposition rate is 1.2 cm/year—after contamination from lateral loads is controlled and cleanup is conducted—analyzing the top 2 cm of site sediment focused on where the majority of deposition

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			occurs would reasonably represent recent deposition and analyzing suspended solids where they enter the site may reliably validate this assumption. However, since this would be done after the ROD is finalized and cleanup levels established, it seems premature to establish cleanup levels at anthropogenic background based on assumptions of recontamination at that level.
5	General		**Issue: Data was biased high by inappropriate data screening.** There was a detailed data screening process (e.g., samples were limited to two locations, excluding bedded sediment, and removing larger grain size suspended solids data) which resulted in a narrow dataset to calculate final values. This data screening appeared to be focused on screening out data with lower concentrations which inappropriately biased the resulting values high. **Recommendation.** To establish anthropogenic background use bedded sediment media and appropriate statistical outlier analysis to screen data. At the very least, include all bedded sediment and suspended solids data with appropriate statistical outlier analysis to screen data.
			EPA's definition of anthropogenic background is inconsistent with the SMS. According to EPA's guidance, anthropogenic background represents concentrations unrelated to the site. And, the guidance does not appear to exclude point sources (e.g., upstream contaminated sites or identifiable releases) from anthropogenic background. If EPA's anthropogenic background will be used as a cleanup level, then it must comply with the SMS, specifically the definition of regional background WAC 173-204-505(16): *the concentration of a contaminant within a department-defined geographic area that is **primarily attributable to diffuse sources**, such as atmospheric deposition or stormwater, **not attributable to a specific source or release**.* EPA's past responses to this issue that "…EPA is not trying to establish regional background for the site" does not resolve this issue. **Recommendation:** Clearly show how the sampling locations comply with this provision by identifying all sources and releases (point and nonpoint) that may impact these locations, how the concentrations in the data set are not primarily impacted by point sources and identifiable releases, and how this data set was determined to be primarily impacted by diffuse sources (i.e., nonpoint sources).
6	General		There's several percentages given throughout the sections. Please add the amounts of what the percentages represent.

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7	ES	ES-1/3rd Bullet	It should be noted that the dioxins/furans sediment cleanup level under SMS is established based on TEQ, not individual congeners.
8	1.2	2/1	As commented above, it appears that the CERCLA program normally does not set cleanup levels below anthropogenic concentrations due to consideration of cost effectiveness, technical practicability, and the potential of recontamination from adjacent areas with elevated background concentrations. However, the cleanup levels established under SMS only considers technical possibility and net adverse environmental impact, not cost.
9	1.2	2/3	The term "point source" means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture. Clean Water act section 502. Please explain the use of point source in a CERCLA context verses the Clean Water Act context.
10	1.3	2/1	Please remove our name from the sentence. Keep the foot about Ecology's attendance of informational meetings.
11	2.1	4/1	The reference to watershed should be Fig 2-4, not Fig 2-3.
13	2.1	5/1	It's Fig 2-7, not 2-6 that presents the average daily flows information.
14	2.1	5/2	It's Fig 2-8, not 2-7 that presents the precipitation data.
15	2.2	5/1	The EW and LDW lateral drainage basins are shown in Fig 2-6, not Fig 2-8.
16	2.2	6/1	Typo, "though" should be "through"
17	2.3	7/1	Though sediment mass input from LDW resuspended bedded sediments to East Waterway is relatively small, the percentage contribution of chemical loading from it might increase following completion of active remedial actions and implementation of further source control measurements at LDW. Additional information should be provided to support why LDW bed loading is not included in the AB evaluation.
18	3	8, 4	CERCLA releases were considered but not MTCA releases. There are 5 MTCA sites waiting to be cleaned up and 11 MTCA sites that have begun but not completed cleanup on or near the Green River between river mile 10.4 and the turning basin. These sites could have been reviewed to determine if they are potential sources of PCBs, dioxins/furans, or arsenic to the river.
19	3.2	13/1	The lateral input from RM 5.0-10.4 can't be simply eliminated, additional information should be provided.
20	3.2	13/1	Add a discussion about how the upstream, above river mile 10.4, urbanized environmental contaminates contributions.

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21	3.2	13/3	The sentence is accurate as a statement however sufficiently controlled to proceed with cleanup has nothing to do with the subject matter. Ecology's sufficiency criteria is intended to meet various RAL's. Anthropogenic background deals with achieving cleanup levels which are different from the RAL's.
22	3.2	13/3	At least for the LDW, the lateral inputs (point sources) are considered part of the CERCLA release, due to the language EPA used when listing the site. Which essentially states the site is defined as beginning at the South end of harbor island, extending upstream and all sources entering the site.
23	4.2.2	16/Table 4-3	UCL95 should also be calculated and compared using each of the four non-detect treatments and included in the table since AB is established using UCL95.
24	4.2.2	16/3	It states that applying 0 as the non-detect treatment for the dataset is to remain consistent with the EW SRI and FS. This statement is not appropriate since the goal of conducting RI and FS is different. Other justification needs to be provided.
25	4.4	18/2	If the partitioning behavior and mobility of arsenic is significantly influenced by biogeochemical conditions, then it is not appropriate to simply use the suspended solids data collected more than 10 miles upstream to calculate the EW anthropogenic background.
26	4.6	21/1	Please provide the range of %fines in the EW bedded sediment.
27	4.6.2	22/1	The equation assumes that all contaminant mass is in the fine grained fraction of suspended solids. This assumption overestimates the %fines that entering and settling down within EW from upper stream, and might result in higher anthropogenic background concentrations.
28	4.6.3	22/3	The second sentence is grammatically incorrect.
29	5.1	25/2	Please explain why using the "mean concentrations", not the 95 UCL in the sensitivity analysis.
30	5.1	25/ 3	In the third sentence, "in" should be replaced by "an" as follows: ...positive percentages indicate **an** increase in...