STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Central Region Office
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July 14, 2023

Sent via email and hard copy

Shane DeGross
BSNF Railway Company
605 Puyallup Avenue
Tacoma, WA 98421

RE: Ecology comments on Draft Sediment Remedial Investigation Report

- **Site Name:** BNSF Track Switching Facility a.k.a. Wishram Railyard
- **Site Address:** 500 Main Street, Wishram
- **Facility Site ID:** 1625461
- **Cleanup Site ID:** 230

Dear Shane DeGross:

Thank you for the submittal of the above-referenced draft report in accordance with Agreed Order DE 12897. Below are the Department of Ecology's (Ecology) comments on the draft Sediment Remedial Investigation Report.

The bulk of Ecology's comments are attached as a memorandum issued by Ecology Sediment Lead, Chance Asher. I have added additional comments, numbered below, regarding the investigation findings of the submerged NAPL in the offshore area.

1. The text in **Section 4.4.2** appears to contain either erroneous or incomplete information regarding NAPL emplacement and its applicability to NAPL mobility. Reference is made to Table 1 of ASTM E-3282-22, which is titled *"Key Characteristics for Different NAPL Emplacement Mechanisms."* The text in the draft Sediment RI report states "Disconnected NAPL is immobile at the pore scale and will not migrate at the NAPL body scale." Per the ASTM, this characteristic applies when the emplacement mechanism is OPA, or oil-particle aggregate deposition and the emplacement condition is NAPL location in strata. OPA refers to deposition through the water column, for example, as shown in Figure X1.7 of the companion standard, ASTM E3248-20. In this figure, there is direct LNAPL discharge from an outfall into a surface water body. The resulting sheen is the source of the formation of oil beads which can increase in density such that these beads eventually settle through the water column to be deposited on the sediment surface. In contrast, one of the main alternative emplacement mechanisms is advection from the uplands which enters the water body from a NAPL seep in the substrate.

The lines of evidence do not support advective transport as a current NAPL transport mechanism for the more viscous NAPL, although it may have been a historical one. In any case, the point made in Table 1, ASTM E3282-22, about NAPL mobility does not necessarily apply. It makes more sense to discuss NAPL mobility in terms of pore entry pressure and the NAPL body reaching equilibrium. However, as recognized in Section 4 of ASTM E3248-20, the transport mechanisms for NAPL in sediments are different from those in upland environments. Note that Section 9.7.1 of ASTM E3282-22 does have discussion about immobile saturation when a NAPL body becomes disconnected from its original source.

As the draft report states in Section 4.3 (fourth paragraph), the primary sources of the currently submerged NAPL in Lake Celilo are unknown. However, there is evidence that the emplacement of a significant portion of the NAPL occurred prior to the inundation that happened in the period from the initial construction up to the completion of the Dalles Dam in 1957. Historical correspondence indicates that a significant release occurred in 1950. Thus, ASTM E3248-20 which refers to conceptual models for emplacement and advection for NAPL in sediment, does not likely apply to the initial release that forms the bulk of the NAPL body. In this case, the release impacted the portion of then-exposed dry land near the shoreline with a substrate that consisted primarily of sand. NAPL can travel relatively easily in air-filled pore spaces though the viscosity of the product may have increased in the time required for the NAPL body to reach equilibrium and to stop spreading, which will typically occur when addition of NAPL source mass ceases and the NAPL head dissipates.

2. What we do not understand is how or why the NAPL body extended westward roughly parallel to the shoreline from the main NAPL accumulation area. This pattern may possibly be related to the gradual filling of Lake Celilo during the construction of the lower dam. What do you think accounts for this lateral distribution pattern of the NAPL, e.g., is this an extension of the major release or does this fit a pattern of multiple releases along the shoreline?

3. Cross section B-B' shows two vertically distinct layers at location, G320-TG, separated by about two feet in profile. Based on the intensity of the fluorescence signal, the majority of the NAPL occurs deeper in the sediment at about 6 to 9 feet below the sediment surface (bss). However, some NAPL exists at a shallower depth from sediment surface down to about 2 feet bss. What are some reasons that we see this shallow NAPL? Does it represent a later release, or does it represent vertical upwards movement of the NAPL?

4. Dakota's TarGOST report (Appendix G-1) states that log F390-TG resembles a middle distillate fuel-like NAPL. This representative wavelength pattern is most prominent in the log from 5 to 7 feet bss with the maximum %RE expressed at 6.42 feet bss. The character of the wavelength pattern changes below 7 feet bss.

The main Sediment RI Report confirms that the analysis of the core sample collected from that location show diesel-range organics in addition to motor oil-range organics. Appendix D-1 of the main Sediment RI Report states that the portion of the core that was sampled for chemical analysis was collected from the interval at 6.2 to 7.2 feet. The issue is how well the depth represented in the direct push collected sample aligns with the LIF profile. The LIF tool advancement is more likely to represent actual depth while the core sample collection by direct push may be somewhat off due to sediment compaction as the core barrel is advanced or conversely by expansion of the sediment core by percussion hammering. The question is whether the analytical result represents the chemical composition of the deeper NAPL found near 7 feet bss or if it is characteristic of the "middle-distillate"-appearing NAPL. One potential implication is that this location may depict a later release by diesel from the uplands as opposed to the heavy oil release that occurred earlier.

Ecology welcomes a discussion of the comments. If you have any questions regarding this letter, you can reach me at (509) 731-9613 or John.Mefford@ecy.wa.gov.

Sincerely,

John Mefford
Cleanup Project Manager
Toxics Cleanup Program
Central Region Office

Enclosure: Memorandum by Chance Asher to John Mefford

cc: Elena Ramirez Groszowski, Yakama Nation

Enclosure

Memorandum by Chance Asher, Ecology to John Mefford, Ecology

WASHINGTON DEPARTMENT OF ECOLOGY

June 23, 2023

TO: John Mefford, CRO, TCP

FROM: Chance Asher, Information and Policy Section, TCP

SUBJECT: Comments on the BNSF/Wishram Railyard *Draft Sediment Remedial Investigation Report, May 2023*

This memo is in response to your request for technical review of the Sediment Remedial Investigation Report (RI). This was a review with an emphasis on ensuring consistency with the approved RI Work Plan, compliance with the Sediment Management Standards (SMS), and consistency with the Sediment Cleanup User's Manual (SCUM). Below are the issues I identified followed by suggested recommendations:

1. Developing Cleanup Levels. Cleanup levels should be developed consistent with the SMS rule and SCUM. Specifically, the benthic chemical criteria (WAC 173-204-563) should be used as cleanup levels to protect the benthic community and compared site-specifically on a station-by-station basis. The preliminary natural background values should be used as cleanup levels to protect human health and higher ecological trophic levels--if they are higher than the practical quantitation limit and risk-based concentrations--and compared to a site-specific SWAC rather than on a site-specific station-by-station basis. The RI Report does not make this clear so I recommend doing so.

2. Background Values.

    a. Background nomenclature. As discussed earlier, the background results are not considered official natural background values under the SMS rule and SCUM. Instead, they are the best we can do until Ecology establishes natural background for the Lower Columbia River. Given this, these results can still be used to develop cleanup levels as a surrogate for natural background as we do not expect any official natural background values established in the future to be significantly different. I recommend labeling these background values "preliminary natural background".

    b. Statistical metric. Considering the high number of non-detected values in the background samples, use of a 90/90 UTL is not the most appropriate statistical metric. I recommend simplifying the process and just using the maximum values for each chemical as the preliminary natural background value to establish cleanup levels and compare to site specific concentrations.

c. Inconsistent metrics. The report is inconsistent with the explanation of how background was established. In the text of the report, it states that a 90/90 UTL was used, but in the footnotes of some tables it states that the maximum PQL was used. I recommend using the maximum detected background values as the preliminary natural background value. If all samples are non-detects, then this should be clearly explained in the RI Report and either the PQLs in SCUM, Chapter 11, Table 11 should be used as the cleanup level or a site-specific PQL-based cleanup level can be established using the process in SCUM, Chapter 11.

3. Dioxin-like PCBs.

   a. The dioxin-like PCB results appear to be missing from tables (e.g., F-1, F-3, etc.)

   b. The sum TEQ for dioxin-like PCB congeners should be summed and displayed separately from dioxins/furans.

   c. PCB congeners 156 and 157 are missing from Table F-3 and there does not appear to be an explanation as to why.

4. Carcinogenic PAHs (cPAHs).

   a. The individual cPAHs were calculated using EPA's relative potency factors (RPFs) which is inconsistent with MTCA/SMS and SCUM. The reasoning stated was that SCUM was out of date, which is inaccurate. cPAHs should be calculated using the TEFs in SCUM, Chapter 6, Table 6-1 and reported and displayed as a sum TEQ. Use of RPFs is acceptable if it provides value to the analysis, but not as a substitute for the TEF/sum TEQ approach in SCUM. In addition, if RPFs are used they should be the EPA or CalEPA approved RPFs rather than the ones cited in the RI Report which have not been finalized as the EPA suspended this update.

   b. The sum TEQ appears to be calculated using the RPF approach above and tables show the sum TEQ as "unitless", both of which are inappropriate. The sum TEQ should be calculated using the TEFs as stated above and reported as sum TEQ ppb.

   c. It is unclear if early life exposure calculations were performed for cPAHs to develop risk-based concentrations for the beach play, clam digging, and net fishing exposure pathways. If this is the case, these calculations should be re-done using the equations and parameters in SCUM, Chapter 9, and Table 9-2.

5. Mercury. Mercury does not appear to be included in Appendix L as a chemical that poses risks to human health, and there is no explanation as to why. We recommend including mercury as a chemical of concern for human health and analyzing the site-specific risks.

6. Human Health Risk Evaluation.

    a. Subsistence fishing scenarios should be used to calculate risk-based concentrations for all exposure pathways to define the reasonable maximum exposure scenario. These include both current and *potential future* scenarios [SMS WAC 173-204-561(2)(b)(i)(A)]. References are made in the RI Report that both the fish/shellfish consumption and the clam digging exposure pathways are not complete because edible clams were not observed during the RI field activities and the contamination is in deep water. However, this statement does not consider future exposure scenarios if the site is restored and habitat is conducive to clamming and fishing. In addition, future exposure scenarios must be considered when developing the feasibility study.

    b. Risk-based concentrations for the fish/shellfish consumption exposure pathway were not calculated or estimated, which is appropriate since the concentrations will be lower than any preliminary background- or PQL-based cleanup levels. However, it should be noted that if risk-based concentrations are calculated in the future, consultation with the Yakama Nation must be done to define an appropriate fish consumption rate.

    c. There are several statements throughout the RI Report that further human health risk assessment or evaluation is not warranted, which can inadvertently imply that there are no risks to human health. Ecology has clearly stated the extent of risk assessment and evaluation necessary to characterize the site which will be reflected in the finalized RI Report. We recommend removing these types of statements and rely on the results to speak for themselves.

7. Data Visualization. GIS figures should be developed to display the concentrations of bioaccumulative chemicals (i.e., dioxins/furans, cPAHs, dioxin-like PCBs, arsenic, cadmium, and mercury). These should be surface average weighted concentrations (SWACs) and displayed using Inverse Distance Weighting (SCUM, Chapter 6).

8. NAPL immobility. There are several statements in the RI Report confirming the immobility of NAPL in sediment. However, the statements need to be more fully supported with evidence and a robust explanation. Confirming sources of contaminants, releases, fate and transport into the environment, and whether the sources of contamination have been controlled is critical to develop a protective remedy. Convening a meeting between BNSF, Ecology, and the Yakama Nation so BNSF can fully explain the reasoning behind the statements, answer our questions, and identify next steps will be helpful.