REGION 10
SEATTLE, WA 98101

April 23, 2024

MEMORANDUM

SUBJECT: EPA Comments on Updated Groundwater Source Control Evaluation
Willamette Cove, Portland, Oregon
ECSI # 2066
December 5, 2023

FROM: Laura Hanna, RG, Remedial Project Manager
Superfund and Emergency Management Division

TO: Erin McDonnell, Project Manager
Northwest Region Cleanup Program, Oregon Department of Environmental Quality

The following are the U.S. Environmental Protection Agency's (EPA's) comments on the document titled *Updated Groundwater Source Control Evaluation* (Updated GW SCE). The Updated GW SCE was prepared by Apex Companies, LLC (Apex) for the Port of Portland. The Willamette Cove Upland Facility (Facility) is listed as Environmental Cleanup Site Information (ECSI) #2066. The 24-acre Facility is located on the east bank of the Willamette River between river miles 6.5 and 7 and is upland of the Willamette Cove remedial design project area within the Portland Harbor Superfund Site (PHSS).

EPA understands the Updated GW SCE is intended to be comprehensive, incorporating the original and revised SCEs (Apex, 2019 and Apex, 2020a, respectively); the draft Hydrogeologic Conceptual Site Model (Apex 2020b); groundwater and porewater data collected by both the upland and in-water performing parties since prior submittals; and revisions in response to comments on the prior submittals from DEQ, EPA, and the Tribes.

EPA understands the primary objective of the Updated GW SCE is to evaluate the potential for groundwater to recontaminate the Portland Harbor Superfund Site (PHSS) Record of Decision (ROD) in-water remedy and adversely impact Willamette River sediments or surface water. EPA's comments are categorized as "Primary," which identify concerns that must be resolved to achieve the objective; and "To Be Considered," which, if addressed or resolved, would reduce uncertainty, improve confidence in the document's conclusions, and/or best support the objectives.

Primary Comments

1. There are recontamination concerns if groundwater contamination has the potential to increase porewater concentrations in the Willamette River such that sediment cleanup levels (CULs) are exceeded over the long term. Recontamination is not just based on remedial action levels (RALs) and principal threat waste (PTW) threshold exceedances. Figures 23 through 37 present results inconsistently against screening levels, CULs, RALs, PTW thresholds, and non-PHSS ROD regional background. Since the purpose of this document is to evaluate recontamination potential of the PHSS ROD in-water remedy, revise the figures to consistently present sample results screened against the applicable CULs established in PHSS ROD Table 17. Additional contours/color bins can be added to the surface sediment figures for chemicals of potential concern (COPCs) with RALs and/or PTW thresholds.

2. The presence of elevated COPC exceedances in other locations and media of the Facility outside of areas of upland groundwater contamination does not necessarily mean that observed impacts are not spatially correlated or associated with adjacent and noted groundwater impact areas (i.e., the former log pond area). Provide additional rationale that explains how spatial distribution of COPC exceedances in other locations and media sampled negate, or diminish, the correlation seen between groundwater concentrations with sediment and porewater concentrations in the west parcel area. Absent this further explanation, EPA does not agree with the "lack of correlation" statements and conclusions. EPA also notes that the area offshore of the West Parcel is identified as erosional and as a result, the porewater samples are likely more representative of upland groundwater concentrations and less likely to be representative of concentrations imparted from deposited contaminated sediment.

3. EPA believes that the 0.4 assumption for the porosity of the various soil types present at the Facility (i.e., silt, silty sand, and sand) used in the groundwater velocity calculation is inappropriate. In addition, the document does not recognize or state that **effective** porosity for these soil types is what is being used, which is a separate porosity value representative of water released from the pore spaces in the context of groundwater movement. As a result, the porosity used in the velocity calculation presented in Table 3 is at the very high end of effective porosity published for these soil types. For the soil types present in the project area (i.e., silt, silty sand, and sand), effective porosity values ranging from 0.15 to 0.23 are more appropriate (Woessner and Poeter, 2020). Using these values in the calculation would result in higher groundwater velocities that need to be corrected throughout the subsequent calculations that utilize the groundwater velocity results and propagate into the mass flux and attenuation factor estimates.

4. The calculations performed in Section 6.3.5 to evaluate horizontal distances traveled for a theoretical water particle from a monitoring well at the Facility are oversimplified. EPA recommends the paragraph and associated figure (Figure 17) be removed from the document. The movement of water particles is a more complex evaluation than a simple cumulative summation of water movement based on the gradient condition between the river stage and a monitoring well. It is also unclear what conclusions are being made from this evaluation.

5. The approach for developing attenuation factors appears to be biasing the attenuation factors high and should be reevaluated. Based on the groundwater flow net in Figure 22, it appears that the monitoring well groundwater samples and the sediment porewater samples used in the calculations were not collected from the same flow path. Based on Figure 22, the upland groundwater mass flux is based on monitoring wells screened in the shallow flow path, but the offshore sediment mass flux is based on porewater samples from locations representing a deeper flow path (>50 feet). To avoid the discordant flow paths and bias present in the calculation, porewater samples within 25 feet of the riverbank should be installed and sampled in the western area (i.e., the area of greatest COPC concentrations) or seep samples collected and these concentrations should be used for the mass flux in the river sediment to derive more representative attenuation factors along similar flow paths between upland groundwater and in-river discharge. This additional porewater sampling effort is consistent with the recommendation stated in Section 8.8 to collect additional samples between the West Parcel upland monitoring wells and the porewater sampling locations offshore of the West Parcel. Additionally, EPA requests that the upland party outline, in a simple decision logic diagram, the next steps based on the results of the future porewater sampling, including whether the additional, closer-to-shore sampling verifies the presence or absence of COPCs.

6. Based on the information presented in this report, EPA believes the former log pond area in the western parcel could be a source of upland groundwater contamination that may be causing elevated COPC concentrations discharging to the river above ROD CULs. The former log pond area is not a naturally formed subsurface feature and its presence was introduced by past land use practices. As a result, the contaminants being introduced by this feature from groundwater flux and geochemical processes may be contributing to arsenic and other COPCs leaching. Due to the result of these processes and short flow paths to the river, additional analysis of COPCs identified in Table 4 (i.e., arsenic, carcinogenic polycyclic aromatic hydrocarbon (cPAHs; BaP eq), polychlorinated biphenyls (PCBs), and DDx) should be conducted as part of the planned porewater sampling to support a more robust evaluation of the potential impacts to the river.

To Be Considered Comments

1. The conclusion section should include a summary table with quantitative lines of evidence and comparisons in the context of potential groundwater recontamination from upland sources. Revise discussions and conclusions for individual COPCs accordingly.

References

Apex. 2019. *Groundwater Source Control Evaluation and Alternatives Analysis, Willamette Cove Upland Facility.* June 21.

Apex. 2020a. *Revised Groundwater Source Control Evaluation and Alternatives Analysis, Willamette Cove Upland Facility.* January 20.

Apex. 2020b. *Draft Hydrogeologic Conceptual Site Model, Willamette Cove Upland Facility.* September 4.

Woessner, William W. and Eileen P. Poeter. 2020. *Hydrogeologic Properties of Earth Materials and Principles of Groundwater Flow.* The Groundwater Project, Guelph, Ontario, Canada. https://www.un-igrac.org/sites/default/files/resources/files/hydrogeologic-properties-of-earth-materials-and-principles-of-groundwater-flow.pdf

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