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February 18, 2025 *via electronic delivery*

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RE: Draft Basis of Design Report
Willamette Cove Uplands
ECSI# 2066

Dwight:

DEQ staff reviewed the *Draft Basis of Design Report, Willamette Cove Upland Facility* ("site") prepared by Apex on behalf of the Port of Portland (Port) and dated September 27, 2024. The Willamette Cove property is situated on the east bank of the Willamette River between River Miles 6 and 7. The approximate 19-acre site is comprised of the upland area, or Uplands, located above top of riverbank (or TOB) of the Willamette Cove property. USEPA is lead agency for cleanup of the adjacent Willamette River and sediment, and the Willamette Cove riverbank (below TOB). DEQ's March 2021 Record of Decision (ROD) documents the selected remedial action to address soil contamination in the Uplands and corresponding site-specific remedial action objectives (RAOs) to achieve protectiveness of human health, ecological receptors, and beneficial uses. The selected remedial action requires a pre-remedial design investigation to support remedial design/remedial action (RD/RA) and residual risk assessment of the constructed remedy, both which are of critical importance for this project. The Willamette Cove property, under Metro ownership, will be redeveloped as a nature park with recreational uses.

DEQ appreciates the attention and consideration that went in preparation of the draft BODR. DEQ met with the Port and Metro regularly in the last year with the intent to find common agreement and unity in development of this BODR. Draft materials to support the BODR preparation were also shared through a series of emails and discussed during subsequent technical meetings. DEQ provided feedback on the collective of materials and related technical discussions via email July 3, 2024 (titled DEQ draft comments for discussion purposes - Willamette Cove Uplands Pre-BODR Handouts). DEQ has the following comments on the draft BODR and accordingly we request a revised BODR. While there are several comments pertaining to specific evaluations and details presented in the draft BODR, the remedial approach in terms of substantial soil excavation (for offsite disposal) and capping provides a comprehensive framework for a protective cleanup.

We welcome the continued coordination as we move towards completion of the remedial design process and proceed to implementation of a protective cleanup.

General Comments

Overall, we are in general agreement with many remedial elements presented in the draft BODR, with exceptions. DEQ has the following fundamental expectations:

1. All human health hot spots and ecological non-dioxin/furan hot spots (i.e., metal hot spots) will be removed as required by the ROD.

2. The remedial design investigation (RDI) results are representative of the decision unit (DU) and depth interval from which they were collected, and should not be further interpolated to refine removal extents. Specifically, DEQ recommends complete removal of DUs containing hot spots. If further refinement of the removal extents is pursued, additional sampling should be performed during design to support DU refinement both laterally and vertically. DEQ does not support further refinement during construction.

3. A comprehensive sampling approach will be necessary to demonstrate deeper subsurface material is below the upland cleanup levels and suitable for reuse onsite, particularly as cap material.

4. The BODR should be revised to adequately address ecological cumulative contaminant risk, in addition to individual contaminant risk to inform soil excavation and capping scenarios. The following is expected to address excess ecological risk for an individual contaminant hazard quotient (HQ) and a cumulative contaminant hazard index (HI):
    a. Three-foot cap with demarcation for HQ >5.
    b. Additional removal or three-foot cap for HI >10.
    c. One foot top soil with no demarcation layer would be acceptable in areas with HQ < 5 and HI <10.
5. A demarcation layer is required in all areas with a HQ >5 to manage ecological residual risk, in addition to other considerations for long-term site management. It is imperative that the future underlying contaminated soil left in place is easily identifiable in perpetuity.

6. With the introduction of more active uses under consideration for the future Willamette Cove park than previously identified by Metro, DEQ reviewed previous risk assessment assumptions to ensure consistency with the ROD. DEQ is comfortable with more active recreational uses if evaluated and managed properly. As Metro's master planning for the property evolves, "active" use areas (e.g., play areas, picnicking, etc.) when identified, will need to consider potential risk over refined exposure areas to determine whether additional engineering or institutional measures are necessary to ensure protectiveness. At minimum, residual human risk (based on the refined spatial area respective to the special and/or more intense use) will require a minimum three-foot soil cap (or hardscape) with an underlying demarcation layer.

7. There are numerous footnotes which also run into subsequent pages and makes it difficult for the reader to follow and many are important to the report content. Please limit footnotes.

Specific Comments

Section 2.1.1, Extent of the Site. EPA is providing oversight of the riverbank remediation/stabilization; however, the current scope is limited to the Portland Harbor Superfund in-water cleanup criteria. DEQ has recommended on several occasions to EPA that upland (human health and ecological) risk-based criteria for anticipated uses at the Willamette Cove site be evaluated during the in-water remedial design to inform the extent of cleanup necessary for riverbanks to ensure one comprehensive cleanup is implemented for the Willamette Cove riverbanks. While remedial design of the riverbanks continues to evolve under EPA oversight, it is DEQ's current understanding that upland cleanup levels are not being considered and there is no commitment by the combined in-water parties at this time to provide a leave surface on riverbanks that would also be protective of future park users and wildlife. Accordingly, DEQ has requested that the Port and Metro conduct a parallel evaluation as information comes available to identify potential riverbank areas that may not achieve upland cleanup levels and may require additional cleanup (after or in coordination with the in-water cleanup). This evaluation is also contingent upon a rigorous leave surface evaluation that includes comparison of remaining riverbank soil concentrations to upland cleanup levels. The BODR should acknowledge these potential gaps to satisfy upland/in-water cleanup criteria in overlapping riverbank areas and coordination that will be required to ensure the combined cleanup projects align to achieve protective conditions that satisfy upland cleanup levels, in addition to in-water criteria.

Section 2.1.5, Surrounding Properties. DEQ is seeking additional information regarding the North Richmond Avenue parcel which is also owned by Metro and borders the West Parcel Willamette Cove site. It is our current understanding this lot will be incorporated as part of the planned Willamette Cove nature park and/or will function as supporting infrastructure.

Section 2.1.6, Cultural Resources. Per recent discussions with the State Historic Preservation Offices (SHPO), a new/updated Independent Discovery Plan (IDP) is recommended every few years and updating the notification list every 2-3 months during earth-disturbing activities.

Section 2.1.8, Existing Conditions and Site Use. The report describes anticipated future uses as low-impact recreational activities; however, some of the listed activities DEQ considers to be moderate to high use. Metro previously identified that the property would be redeveloped as a nature park that encourages habitat uses with a regional trail across the site but would not include attractive features that would increase human uses beyond the paved regional trail (e.g., no picnic tables, play areas, etc.). These uses are consistent with what DEQ considers to be low-impact or "passive" uses evaluated in the upland risk assessment. More recent information shared by Metro, including preliminary park master planning and public community outreach conducted in 2024, considers uses that are substantially more dynamic than previously articulated passive nature park uses. The vision for the nature park has evolved and it's our understanding may include attractive features, greater site access including paths/trails to the Willamette River and dock(s), and interactive orientated uses. DEQ would consider picnic and play areas to be "active" moderate to high use areas. DEQ can accommodate changes in site use if the use areas are clearly identified and appropriate actions are followed.

DEQ reviewed previous risk assessment assumptions used to inform the feasibility study and ROD. Specifically, previous human health risk evaluations have been conducted assuming passive park uses and accordingly human risk has been assessed over larger exposure areas, generally parcel-wide. Therefore, DEQ recommends when more active and/or special uses are incorporated as part of forthcoming park development or future site improvements, human health risk is reevaluated over the appropriate spatial scale of the planned use (e.g., where exposure occurs) for comparison to the upland cleanup levels, or a three-foot soil cap (or hardscape) with underlying demarcation layer is constructed. Note, the preliminary cap thickness presented in the BODR (and shown on Figure 13) identifies a three-foot soil cap for a large portion of the site.

Identify in the revised BODR how more active park uses will be considered during RD/RA to ensure cleanup is protective at construction completion and long-term. This will require Metro to identify potential active use areas and ensure expanded uses will be built into master planning (and future park improvements) to retain site protectiveness following construction completion of the remedy. This may warrant additional focused soil removal or more robust caps in active use areas, and greater emphasis on monitoring and maintenance of caps.

Section 2.2, Remedial Design Dataset: The PDI data collected is of high quality and systematic; however, inherently there will be variability to consider. Independent field replicate samples (offset locations) were collected from each depth interval in 20 percent (or 10 DUs) to determine the error associated with the measured mean concentrations. Relative Standard Deviations (RSDs) for the decision units with replicates are identified in Table 1-1 of *Remedial Design Investigation Evaluation Report Willamette Cove Upland Facility Portland, Oregon* (RDIR). Data uncertainty in relation to the replicate RSD should be recognized in the BODR and used in the interpretation of the data for remedial design decisions. DEQ has provided previous direction (see July 2024 Specific Comment 1), including using the maximum concentration of replicate DUs.

Section 2.3.2, Vertical Concentration Trends. The RDI results are representative of the DU and depth interval from which they were collected, and DEQ recommends making decisions by DU using the already high quality data collected. Specifically, DEQ recommends complete removal of DUs containing hot spots.

Accordingly, we do not support further interpolation to refine removal extents. We also find several flaws and uncertainty with the vertical trend analysis presented. Variability in the dataset as demonstrated by the RSDs for replicates, does not support conclusions for several DUs (particularly West and Central Parcels) that risk driver contaminants of concern (COCs) demonstrate reliable assumptions of decreasing concentration with depth. In contrast to what is presented, the CSM does suggests that deeper contamination may be present due to historical fill placement and operations, particularly the West and Central Parcels. In general, this section if retained should also be revised to account for data uncertainty including mean concentrations. For example, sampling depths and COCs with RSD >35% for mean concentrations are summarized and shown below. The largest uncertainty is found within the Central Parcel, where several COCs have RSDs>35%, particularly within the 1-2 ft interval.

If a defensible rationale is provided and partial excavation is pursued, the remaining DU layer left behind will require comprehensive sampling (i.e., incremental sampling methodology and the depth interval left behind of 0.5 feet). Iterative sampling events is least preferred and may also result in the same outcome. DEQ does not support further refinement during construction.

Section 2.3.3, Preliminary Assessment of On-Site Borrow Potential. It is reasonable to explore potential sources of clean soil onsite that could be repurposed (rather than importing clean fill) for the cleanup and future park redevelopment but DEQ cautions it is too early to strongly advocate or rely on potential onsite borrow sources. Extrapolation contains high uncertainty and is not an acceptable approach to demonstrate material is suitable for reuse onsite. In general, the estimated potential borrow volume appears optimistic in absence of sufficient data at greater depths. DEQ recommends a conservative approach and proactive planning including identifying potential onsite sources but also offsite.

Reuse of soil onsite will require comprehensive sampling, preferably to the extent possible collected in advance to assess appropriateness for reuse onsite. We recommend scoping early in the remedial design stages what would be sufficient data to assess potential reuse of onsite soils to ensure we are on common ground the extent of sampling that may be necessary.

Section 2.4, Data Gap Evaluation. For berms other than under DU-41, additional soil piles are present along the east edge of the East Parcel within DU-30 and DU-31, and Central Parcel DU-21. These soil piles were not independently characterized as part of the PDI incremental sampling. Unless above-grade piles in this area are slated for removal, sampling is also necessary to determine their final placement (on- or off-site). Please clarify.

Section 3.1, Preliminary Remedial Design. Please correct footnote 3 which currently states: ROD does not require off-site disposal of dioxin/furan ecological hot spots, but those hot spots are required to be excavated and placed into the consolidation cell. The ROD identified a preference for dioxin/furan ecological hot spots to be placed in the consolidation area with the engineering cap; however, also allowed for in-place capping.

Section 3.2.1, Remedial Action Objectives. ROD RAOs should be used verbatim. If there is need to provide further explanation for the reader, additional context be presented in the following paragraphs. Update RAO 1 to reflect what is identified in the ROD.

Section 3.2.2, Cleanup Levels (CULs).

a. As previously discussed, please use an alternative to CULs to prevent confusion with in-water PHSS CULs. DEQ recommends "Remediation Goals" but is open to other considerations.

b. Lead cleanup levels documented the ROD and respective tables occurred prior to EPA's more recent updates regarding the human health risk value for lead which has a profound impact for children. It is DEQ's understanding that the planned remedial action will adequately address lead to EPA's protective levels and correspondingly it would be helpful to document this intention.

c. The plant and invertebrate RBCs for chromium are for chromium VI and therefore are well below background when compared to total chromium. This mis-match is skewing the analysis of plant and invertebrate risk and the presentation of magnitude of risk exceedance (e.g., hazard quotients at 50 to 100x), cumulative risk, and hot spot identification for DU-1 and DU-5 where ISM mean concentrations are only slightly elevated above background for total chromium (41.3 to 53.3 mg/kg; background ISM background 39 mg/kg). The plant and invertebrate RBCs are from DEQ's 2001 guidance tables, which were not clear that the RBCs were based on chromium VI, which is the more toxic form. DEQ's updated 2020 tables clearly distinguish between RBCs for plants and invertebrates for total chromium (not available) and chromium VI (4 ppm plants and 3.4 ppm invertebrates). Since the analytical characterization and background results are based on total chromium, please remove the chromium VI plant and invertebrate RBCs as RGs for use in the HQ and HI analysis and use ISM background for chromium of 39 mg/kg. The bird and mammal values should remain the same. If chromium VI is likely to be present, future analytical results should target this form specifically to accurately evaluate the risk.

d. For ecological risk, defaulting to the lowest receptor specific PRG to inform remedial actions is one approach to simplify the application of multiple PRGs for different species. Remedial decision making using this approach over a pre-determined area or "decision unit" (0.5 acres in this case) simplifies the assessment. However, this section describes using a residual risk assessment to inform the remedial decision process without a risk screening of the data collected in the *Remedial Investigation Evaluation Report, 2023*. Tables and maps should be provided showing comparison of each COC to the PRG and associated hazard quotients and hazard indices (cumulative risk) for each decision unit and depth interval under baseline and residual risk conditions. Baseline screening provided in Appendix G of the 2023 report should be re-presented here. Please include tables and figures of exceedances of PRGs, some of which has already been provided following submittal of the draft BODR, including:

    i. Comparison of each COC concentration to each receptor specific PRG. Present exceedances for each COC for plants, invertebrates, birds and mammals.

ii. Cumulative risk for multiple chemicals (hazard index) should be presented for each receptor group separately, including plants, invertebrates, birds and mammals.

Section 3.2.3, Hot Spots. Excess cumulative risk should also be assessed using a hazard index approach and defined as locations where the hazard index is ≥10. Present HIs for each receptor of concern (birds, mammals, invertebrates, plants).

Section, 3.3.1, Site Clearing.

a. DEQ is highly supportive of tree preservation where it makes sense; however, it is not acceptable to perform a cleanup that leaves contamination exposed around/below trees that pose a current or future risk to humans and environment. DEQ has expressed concerns that limiting soil excavation around/below trees during the 2015-2016 removal action potentially contributed to contamination being left behind and may explain observations of higher concentrations of contamination detected in previous tree preservation DUs that were also subject to the previous removal action. Future fallen trees (or pulled stumps) that have matured in contaminated soil also contain the potential to expose underlying contamination in subsoil.

b. Tree preservation is proposed in decision units where planned excavation depths are 1 foot or less and the basis for this proposal needs further explanation as unacceptable risk would remain. Tree preservation should not be considered where hot spots for any receptor are present, or the hazard index is greater or equal to 10 in a depth interval. Of the ten decision units proposed for only 0 to 1 foot removal, only one appears to meet these criteria (DU-42) and under the concrete in DU-16.

c. Clarify the meaning of the statement "Tree preservation will be limited to maintain human health risks at acceptable levels". Any tree preservation considered should be designed to maintain ecological risk at acceptable levels, not limited to human health.

d. In terms of vegetation disposal and reuse onsite more detailed protocol should be provided than discretion of the contractor and how it would be determined cleared vegetation does not contain contaminated soil.

Section 3.3.2.1, Human Health and Ecological Hot Spot Excavation.

a. There are several DUs where no removal is proposed (nor partial removal) where hot spots or hazard indices ≥10 are present. The approach is generally acceptable at these DUs as risk would be addressed with a 3-foot cap. However, there are a couple exceptions where a 2.5-foot cap is proposed including DU-20 and DU-25, which DEQ recommends a 3-foot cap based on expectations provided in this comment letter.

b. The practicability assessment provided is confusing. The balancing factors cited in footnote 10 (effectiveness, reliability, implementability, short-term impacts, and cost) are intended for remedy selection and misapplied here (to validate the tradeoff between the impacts of doing unnecessary excavation versus the impacts of conducting additional rounds of verification sampling and potentially additional excavation). Remedial design must adhere to the selected remedy documented in the ROD. The PDI has documented that soil contamination is present site-wide posing unacceptable risk to depths of 3 feet and it is acknowledged that it is not practicable to excavate all soil contamination or additional soil excavation at depth that does not result in reasonable risk reduction. In general DEQ is not advocating for excavations greater than 3 feet based on the RDI results but there may be special cases/focused areas based on post-removal confirmation sampling in DUs excavated to 3 feet (e.g., where there is no RDI data below 3 feet). DEQ will continue to work with the Port and Metro what is appropriate and practical in terms of excavation depths.

c. In terms of proposed partial layer excavations, as previously expressed by DEQ, an ISM sample result is representative of the whole DU. The following statements are not defensible and should be removed:

"*For practical reasons, the RDI data were collected over depth intervals of 1 foot, but there is no expectation that the vertical extent of contamination conforms to those depth intervals*" and "*the extent that the soil data suggests that contamination may extend only partially through a layer*". DEQ recommends making decisions on the high quality data already documented by DU layer and accordingly full removal of DU layers with hot spots.

d. Regarding buried hot spots, concentrations detected in DU-2 include 558 ppb total PCBs in the 1-2 feet interval (with 118 ppb at 0-1 foot). This is connected to the adjacent hot spot in DU-1 in the same depth layer and should be delineated.
   i. DU-6 detections of mercury are generally at hot spot concentrations down to 3 feet, with hazard indices equal or greater than 10.
   ii. DU-30 contains hot spot concentrations for mercury and HI>10. This DU is adjacent to the berm decision unit DU-41 along the northern side and a large unsampled berm within the eastern side which was not independently characterized. Both berms and DU-30 should be removed and confirmation samples taken. Note that the east side berm extends to DU-33.
   iii. As noted above, the berm characterized as DU-41 should be removed down to baseline elevation and confirmation samples taken as compared to only the proposed 1 foot removal in the berm area adjacent to DU-29 and DU-30.

Section 3.3.2.2, Additional Excavation to Address Excess Human Health Risk.

a. For Step 3, if this process is followed, soil targeted for removal should be based on risk, not concentration, although that will result in the same response if the unacceptable risk is from only one chemical.

b. Step 4 can be adjusted to include focusing the risk evaluation on localized areas of active park use. If future plans are not known, the risk evaluation could be completed at the scale of a decision unit.

Section 3.3.2.3, Additional Excavation of Address Higher Relative Ecological Risk. Previous discussions did not include using rank-order curves to determine extent of soil excavation. The knee of the curve does not correlate with residual risk by decision until and should not be used to determine what risk is acceptable to be left behind. DEQ did request that cumulative risk be assessed to prioritize potential DUs intervals that should be considered for additional soil excavation, in addition to individual contaminants. Hazard quotients and hazard indices should be presented for each receptor and depth interval to support this section (see also comment above). Hot spots (HQs≥10) or hazard indices (HIs ≥10) should be identified as areas that may require additional excavation or capping to address higher relative ecological risk (note that ODEQ, 2020 identifies an HQ factor of 5 for consideration of lethal effects).

Section 3.3.2.5, Residual Risk Screening. Residual ecological risk text and Figures 8-11 should describe cumulative hazard index residual risk for plants, invertebrates, birds, and mammals in addition to individual hazard quotients. It should be clear in the title of Figures 8 through 11 that these are the maximum individual COC residual hazard quotients. The figures should be expanded to include the cumulative hazard indices. Include tables with both hazard quotients and indices for baseline and residual risk for each decision unit and sample depth.

Section 3.3.3, Capping (and Figure 12).

a. DEQ has the following expectations related to capping:
   i. Capping scenarios need to account for elevated HQs and HIs.
   ii. 3-foot cap with demarcation for HQ >5
   iii. 3-foot cap for HI >10

iv. 1 foot top soil with no demarcation layer would be acceptable in areas with HQ < 5 and HI <10.

v. Demarcation will be necessary in all areas containing ecological risk with HQ>5 and any human health residual risk, if any remain. The necessity for demarcation is reinforced by data uncertainty and future uses that may need to consider smaller exposure areas.

b. It is improbable that mixing by natural process would occur in a homogenous or thorough manner, or within a suitable timeframe. The mixing model to address excess ecological risk is not supported by science or engineering and therefore not an acceptable approach.

c. Table B-3: If a cap is needed to protect against unacceptable exposure, the presence of trees should not dictate the cap thickness or the use of topsoil versus the use of general fill. It is possible that trees will need to be removed to achieve appropriate capping depth.

d. Capping scenarios do not consider human health risk because it is assumed all human risk will be addressed through excavation which was reasonable given the information previously provided by Metro. As noted above, future more active uses may need to consider exposure scenarios representative of that respective use and refined area of exposure, including additional institutional or engineering controls that may be necessary if not already capped with 3 feet of clean soil (or hardscape).

e. Present of hazard indices by receptor group from the residual risk screening to support capping scenarios.

Section 3.3.4, Imported Soil and Onsite Burrow.

a. The use of the term of clean fill should be consistent throughout the document and the report may benefit by describing what is appropriate reuse/import fill earlier in the document. Any onsite soil that is intended to be used onsite must meet the protectiveness requirements outlined in the ROD. For instance, onsite soil that is reused and placed within the top 3 feet must achieve RAOs (i.e., below human and ecological health acceptable risk levels identified in the ROD). Imported clean fill must meet the DEQ's Solid Waste Program definition and guidance on "clean fill" (and future updates anticipated to rectify out-of-date risk-based values). Verify in the BODR that any imported or reuse of onsite soil as part of the upper 3 feet of the site will be below cleanup levels, and protective against other contaminants not previously identified as COCs.

b. Also note gravel from virgin sources intended to be used onsite typically requires a minimum initial screening for metals.

Section 3.3.6, Site Restoration. Note that the upland cleanup levels are not designed to be protective of some of the listed site uses such as shallow water and off-channel habitats. This would require additional risk evaluation of residual concentrations.

Section 3.4, Institutional and Engineering Controls. Please clarify the following two sentences which as written appear contradictory: "*Metro will agree to place restrictions on property deeds that limit site uses to passive recreation activities. Park uses will be unrestricted.*" As noted above, clarity is also needed on what is considered passive versus active reactional activities.

Figure 5. Expand and provide additional figures showing ecological hazard indices for each decision unit and depth interval.

Figures 8 - 11, Plant, invertebrate, bird and mammalian hazard quotients. Present the residual hazard index (sum of COC hazard quotients) on maps by depth interval to illustrate the distribution of cumulative ecological risk. Note that several DUs have hot spots remaining for birds (DU-6 and DU-30) that should be considered for removal. As noted above DEQ does not support partial excavation of DUs.

Figures A-2 and A-3. The figures should clarify that the values shown are calculated excess cancer risk, not hazard quotients.

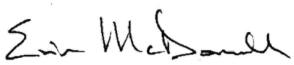
Appendix B, Preliminary Evaluation of Cap Requirements for Ecological Risk. Present the equation used to estimate residual hazard indices.

Next Steps

Please submit a revised BODR and a response to comments indicating how comments are being addressed. Thank you for working closely with DEQ on this comprehensive endeavor to support the cleanup project.

Please contact me anytime about the project at erin.k.mcdonnell@deq.oregon.gov or (503)229-6900.

Sincerely,



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