

MEMORANDUM | July 26, 2019

**TO** Erin McDonnell, Oregon Department of Environmental Quality

**FROM** Peter Shanahan, HydroAnalysis, Inc.; Jennifer Hart, Gail Fricano, and Rachel DeVecchio, Industrial Economics, Inc.

**SUBJECT** Comments on the *Groundwater Source Control Evaluation and Alternatives Analysis, Willamette Cove Upland Facility, Portland, Oregon*

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This review of the Source Control Evaluation (SCE) and Alternatives Analysis for the Willamette Cove Upland Facility has been prepared on behalf of the Five Tribes.<sup>1</sup>

#### OVERALL EVALUATION

The SCE recommends that additional sampling be conducted to determine if contaminants are migrating to surface water and sediment via the groundwater pathway. If that sampling shows no contaminant migration, then the SCE recommends the no-action alternative. If migration is occurring, the SCE recommends an in-river reactive sediment cap.

We provide the following comments with respect to these recommendations:

1. The conclusion of the SCE is based entirely on the proposed groundwater and surface water sampling; however, details for the sampling design are not provided. We request that an outline of the sampling plan and its rationale, including the spatial distribution and number of samples, be provided along with a preliminary map of sampling locations and a schedule for completion of the sampling program. The SCE is incomplete without some description of this aspect of future source control at this site.
2. The no-action alternative should be approved only after a thorough and rigorous sampling program demonstrates no contaminant migration to the river and those findings are confirmed for future years by equally thorough and rigorous modeling. Selection of the no-action alternative is a drastic step and should only be considered with strong assurance that the site poses no future risk to the river. Furthermore, the SCE must provide clear justification for this decision. Page 35 indicates that sampling alone will justify a decision. Page 24 more appropriately but still not definitively says “sampling, modeling, etc.” We recommend the SCE include a more complete statement regarding decision making for the no-action alternative and clearly identify the data that will inform that decision.

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<sup>1</sup> The five tribes are the Confederated Tribes of The Grand Ronde Community of Oregon, the Nez Perce Tribe, the Confederated Tribes of Siletz Indians, the Confederated Tribes of the Umatilla Indian Reservation, and the Confederated Tribes of the Warm Springs Reservation of Oregon.

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3. As discussed below under our specific comments, historic sampling on the East Parcel has shown a pattern of elevated concentrations of multiple metals. The individual metals are assessed in the SCE and each metal is then dismissed as not requiring further assessment. However, the previously observed pattern of consistent contamination by a suite of metals suggests a more serious groundwater contamination problem exists. We recommend that the East Parcel also be considered a Potential Groundwater Source Area and that it be included in any future pore-water sampling program. Metals should be included in the list of chemicals of potential concern (COPCs) for the groundwater source control pathway on page 21 and carried through in the discussion in Sections 8 through 11 of the report.

#### SPECIFIC COMMENTS

1. In Appendix B, the data tables are titled “Riverbank Soil Analytical Results.” These data appear to be groundwater analytical results.
2. On pages 16 through 18, most metals are not retained for further evaluation due to low numbers of CUL exceedances and other factors. Samples from SE/E-1, SE/E-2, SE/E-3, SE/E-4, SE/E-5, and SE/E-17 in the East Parcel show markedly higher concentrations of chromium, copper, lead, nickel, and zinc than seen elsewhere on site. These locations also show arsenic above CULs. In light of the observed pattern of contamination, we recommend these locations be further evaluated to consider all elevated metals.
3. On Figures 5 through 9, the first two items in the legend include symbols that indicate “Groundwater Concentrations Above CL.” Since the SCE consistently uses the acronym CUL rather than CL, these legends should be revised for consistency.
4. Figures 10 through 14 show isoconcentration contour lines for various contaminants exceeding CULs in groundwater. The text should provide more information on how these contours were drawn. Based on the data shown in the figures, it appears they were drawn using only concentrations measured at groundwater monitoring wells MW-1 through MW-9. If that is the case, the two-dimensional contour lines have virtually no validity since they are based on few data from an essentially one-dimensional array of monitoring wells. We recommend providing further clarification whether the contours were drawn based on monitoring well samples only and not data available from grab samples. While those grab samples are older, they provide additional spatial resolution unavailable from the monitoring wells. Further, the grab samples show that concentrations are highly variable over space—which is unsurprising given the likely heterogeneous character of the fill soils. The spatial variability is a further indication that the observed concentrations do not lend themselves to representation by contour lines.
5. On page 23, the text states with respect to PAHs that “Figure 12 shows the groundwater contours in a configuration that suggests the higher concentrations could be reaching surface water.” Given the limited validity of the contour lines,

it is inappropriate to use the contours as a basis to draw technical conclusions such as this. That is not to say that the inference is wrong; the observed concentrations in wells near the river and the fact that groundwater flows towards the river support the conclusion that PAHs could be reaching the river, but that conclusion should be drawn without reference to the contour maps.

6. Figure 15 indicates that only the West Parcel is considered to have potential adverse effects on sediment and surface water. Based on the consistent patterns of contamination by multiple metals on the East Parcel, the East Parcel also has the potential to have adverse effects on sediment and surface water. We recommend that the East Parcel be considered further for potential effects on sediment and surface water and should be designated as such in Figure 15.
7. On page 29, the discussion of the cutoff wall is inconsistent with the physics of groundwater flow. A linear wall cannot prevent groundwater from flowing from the higher heads inland to the lower heads at the river. Absent extraction wells, a linear wall can only delay that flow. We suspect that supplemental pumping of groundwater will be necessary unless the combined effects of longer travel times and high adsorption coefficients lead to very long contaminant travel times.