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MEMORANDUM | August 30, 2024

TO	Wes Thomas and David Lacey, Oregon Department of Environmental Quality (DEQ)
FROM	Peter Shanahan, HydroAnalysis LLC (HALLC); Jennifer Hart and Gail Fricano, Industrial Economics, Inc. (IEc)
SUBJECT	Five Tribe review of "2023 Hydraulic Control and Containment System Annual Report," dated July 11, 2024

This memorandum, submitted on behalf of the Five Tribes,[1] reviews the *2023 Hydraulic Control and Containment System Annual Report* (2023 Annual HC&C Report) prepared by Anchor QEA on behalf of NW Natural (Anchor QEA 2024).

Substantive Comments

1. In Sections 1 and 1.2 there is an inherent ambiguity in references to "Alluvium WBZs [water-bearing zones]." Alluvium WBZs would seem to include the Upper, Lower, and Deep Lower Alluvium WBZs, but a caveat is added that full capture of the Deep Lower Alluvium WBZ is not necessary and no extraction wells are identified as withdrawing from this subunit. This leaves ambiguous whether the Deep Lower Alluvium subunit is or is not included in subsequent references to "Alluvium WBZs." We recommend that the report include a specific definition for "Alluvium WBZs."
2. Related to Comment #1 above, the "Deep Lower Alluvium WBZ" is not clearly defined and not designated in the cross sections in Appendix D. Section 1 refers to Anchor QEA (2012) for the definition of the water-bearing zones, but that report does not include the term "Deep Lower Alluvium WBZ." We recommend that the water-bearing zones be defined more clearly. At a minimum, the Revised Source Control Addendum Report (Anchor QEA 2023) is a more appropriate reference than Anchor QEA (2012) for site hydrogeology.
3. Section 2.1 indicates that a packer was installed above the screen in extraction well PW 10Lb and that the well was then returned to service. We recommend that the character of the packer be explained in more detail. It is unclear how a well could be pumped if a conventional packer was installed above the screen.

[1] 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.

4. Section 2.2 indicates that the annual volume extracted from the Upper Alluvium WBZ has decreased over the years of operation but increased in the Lower Alluvium WBZ. We recommend that the report explain the cause or causes of these changes.
5. Table 2.3 shows monthly concentrations of contaminants in the influent to the NW Natural Pretreatment Plant. Benzene and total volatile organic compounds (VOCs) are dramatically higher in March than in other months of the year. We recommend that the report provide an explanation for this increase.
6. Figures 2-5, 2-6, and 2-9 show significantly greater mass of polycyclic aromatic hydrocarbons (PAHs) and semi-volatile organic compounds (SVOCs) were removed in 2018 and 2019 than in prior and subsequent years. We recommend that the report provide an explanation for this increase.
7. Figure 2-10 shows a dramatic increase in the mass of copper in the influent to the NW Natural Pretreatment Plant in 2022 and 2023. We recommend that the report provide an explanation for this increase.
8. Section 6 reports the mass of various contaminants removed by the HC&C in 2023 and cumulatively. These quantities are potentially misleading. As indicated elsewhere in the report, mass removal is not a remedial action objective (RAO) for the system and thus these quantities have no relevance to system effectiveness. Moreover, despite the mass removed, concentrations of contaminants in groundwater have remained stable over the years (as reported in Section 5.3), implying that far greater mass of contaminants remains in the aquifer. We recommend that the reported mass removals be qualified appropriately in this summary.
9. In Appendix B, the figures showing "Contours of Water Elevation Difference Between Deep Lower Alluvium WBZ and River" (which carry the suffix c on the figure number) show the extent of the Deep Aquitard differently than the data are depicted in Figure 2-2 of the Revised Source Control Addendum Report (Anchor QEA 2023). We recommend that this discrepancy be corrected or at least explained.

Editorial Comments

10. Figures C.3.a.1, C.3.b.1, C.3.c.1, C.3.d.1, and C.4.a.8 show well MW-06-32 (but not well MW-05-32). Table 1-1 and Appendix C1 show the opposite and the Revised Source Control Addendum Report (Anchor QEA 2023) shows no well MW-06-32 on site. It appears that MW-06-32 is a typo.

References

Anchor QEA. 2012. Revised Groundwater Source Control Construction Design Report, NW Natural Gasco Site. Prepared for NW Natural. January.

Anchor QEA. 2023. Revised Source Control Addendum Report. Prepared for NW Natural. November 2.

Anchor QEA. 2024. 2023 Hydraulic Control and Containment System Annual Report. Prepared for NW Natural. July 11.