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MEMORANDUM | August 30, 2022

TO Erin McDonnell 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 "Semi-Annual Groundwater Source Control Measure Performance Monitoring Report, Quarters 1 & 2, 2022," dated July 29, 2022

This memorandum, submitted on behalf of the Five Tribes,[1] reviews the *Semi-Annual Groundwater Source Control Measure Performance Monitoring Report, Quarters 1 & 2, 2022* prepared by ERM on behalf of Burgard, A Series of MMGL LLC (ERM 2022a).

GENERAL COMMENTS

1. Overall, the current semiannual report describes concentrations of contaminants in groundwater as having decreased compared to those observed historically; however, those findings do not appear to be supported by the trend plots in Appendix D. Several examples are provided in the specific comments below.

2. In the Quarters 3 & 4, 2021 report (ERM 2022b), several operational recommendations were proposed related to timing and flow rates of the air sparging wells. Section 6.2 of the current report (ERM 2022a) indicates that at least some of these changes were implemented; however, the report does not discuss whether they were effective in improving performance. We recommend that future semiannual reports discuss any operational changes implemented and impacts on system performance.

SPECIFIC COMMENTS

3. Page 1 states "Results are measured against performance screening levels defined in the PMP [Performance Monitoring Plan] and detailed in this report." The PMP (ERM 2017) does not define "screening levels" but rather defines "performance evaluation criteria" in Section 2.2 and Table 2. The groundwater analytical data tables that accompany this monitoring report also use the terminology "performance evaluation criteria." We recommend that the undefined term "screening levels" be replaced by "performance evaluation criteria" throughout the monitoring report for consistency.

4. Page 9 states "Detected concentrations of benzene, TPH-GRO [total petroleum hydrocarbon gasoline range organics], TPH-DRO [total petroleum hydrocarbon diesel range organics], and manganese have decreased since the baseline event to

[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.

below the applicable screening levels…" We find this assertion dubious with respect to manganese, which appears to fluctuate near its performance evaluation criterion rather than showing a clear decreasing trend. We recommend that manganese not be included in this sentence.

5. Page 9 states "The calculated B(a)PE [benzo(a)pyrene] values are generally below the screening levels, as shown on Tables Q1-11 and Q2-11…" This statement is not accurate since method detection limits exceed the performance evaluation criterion. We recommend the sentence be deleted.

6. Page 11 states "LNAPL [light non-aqueous phase liquid] occurrence is sporadic…" In fact, LNAPL was found persistently in MW-43 during Quarters 1 & 2 in 2022 (six out of eight measurements) and was detected multiple times per year in 2019, 2020, and 2021 (ERM 2022a, Appendix C). It is therefore incorrect to characterize LNAPL as sporadic for at least this one well. Page 19 also describes LNAPL observations as sporadic. We recommend more precise language to describe the regular occurrence of LNAPL in MW-43.

7. Pages 14 and 15 characterize concentrations of C10-C12 aliphatic hydrocarbons, arsenic, manganese, and polycyclic aromatic hydrocarbons (PAHs) in shallow wells as "an overall decrease relative to historical results." These statements do not align with Figures D-12, D-14, D-15, and D-13, respectively. We recommend more precise language and that any claims of historical trends be supported by references to specific data.

8. Because LNAPL was present in well MW-43, it was not sampled during Quarters 1 & 2 in 2022, which is a gap in the water quality data for this well. In the bullet list of key trends on page 16, the omission of MW-43 biases the general characterizations that are provided. For example, review of Figure D-11 suggests that the concentration of TPH-DRO in MW-43 would likely have remained above its performance evaluation criterion if it could have been measured, yet page 16 lists MW-39 and MW-36 as the only outside wells above the performance evaluation criterion. We recommend that the summaries on page 16 for benzene, TPH-GRO, and TPH DRO acknowledge that MW-43 may still exceed performance evaluation criteria.

9. Page 17 indicates that the deep zone sparging system was operated at 50 percent capacity to prevent air bubbling in the International Slip. Page 21 makes the seemingly contradictory statement that the bubbling is not believed to have a negative effect on air sparging operations; however, reducing to 50 percent capacity seems to be a negative consequence. The report includes no discussion of potential negative effects on the International Slip. We recommend that the report explain why air bubbling in the International Slip is considered sufficiently problematic as to necessitate a 50 percent reduction in deep-zone air sparging.

10. Page 21 includes a recommendation that analysis of C10-C12 aliphatic hydrocarbons be conducted with only the volatile petroleum hydrocarbons (VPH) method rather than the VPH and extractable petroleum hydrocarbons (EPH)

methods. The report explains some practical and cost issues with the EPH method but fails to describe why the two methods are used and what each is intended to monitor. The original PMP (ERM 2017) specified only the EPH method for C10-C12 aliphatic hydrocarbons, and only the EPH method was used in the Quarter 3, 2018 sampling (ERM 2018; the first performance monitoring report available on DEQ's website). The next performance monitoring report for Quarter 4, 2018 (ERM 2019) added the VPH method without explanation. We recommend that the request to eliminate the EPH method, which is specified in the PMP, include a more complete explanation of what each of the two methods is believed to measure and how those different measurements relate to site contaminants and history.

EDITORIAL COMMENTS

11. Reference citations throughout the report are incomplete. As one example, footnote 2 fails to cite the journal name for the paper by Serfes.

12. Pages 418 through 682 of the pdf file are out of order.

REFERENCES

ERM. 2017. Revised Final Performance Monitoring Plan – Groundwater Source Control Measure, Premier Edible Oils, Portland, Oregon. ERM, Portland, Oregon. April 2017.

ERM. 2018. Quarter 3, 2018 Groundwater Source Control Measure Performance Monitoring Report (July through September 2018), MMGL / Premier Edible Oils Site. ERM, Portland, Oregon. November 27, 2019.

ERM. 2019. Quarter 4, 2018 Groundwater Source Control Measure Performance Monitoring Report, (October through December 2018), MMGL / Premier Edible Oils Site. ERM, Portland, Oregon. November 8, 2019.

ERM. 2022a. Semi-Annual Groundwater Source Control Measure Performance Monitoring Report, Quarters 1 & 2, 2022. ERM, Portland, Oregon. July 29, 2022.

ERM. 2022b. Semi-Annual Groundwater Source Control Measure Performance Monitoring Report, Quarters 3 & 4, 2021. ERM, Portland, Oregon. February 4, 2022.