EPA Comments on Final Revised In Situ Stabilization and Solidification Field Pilot Study Work Plan, Gasco Sediments Project Area Dated November 3, 2023

Comments dated December 14, 2023

The following are the U.S. Environmental Protection Agency's (EPA's) comments on the Final Revised In Situ Stabilization and Solidification Field Pilot Study Work Plan (Final Revised FPSWP), prepared by Anchor QEA, LLC (Anchor), Sevenson Environmental Services, Inc and Hahn and Associates, Inc. on behalf of NW Natural and dated November 3, 2023. The Final Revised FPSWP has been prepared under the Administrative Settlement Agreement and Order on Consent (ASAOC; Docket No. CERCLA 10-2009-0255) and Statement of Work – Gasco Sediments Site (EPA 2009).

General Comments on FPSWP:

1. **Contaminant of Concern Simulation within Habitat Layer:** Provide an explanation why modeling diffusion through the cover material over a 100-year period using the results of the Phase IV bench-scale testing would not more appropriately simulate aqueous concentrations within the habitat layer over time-scales applicable to remedy performance requirements. Several sections and Appendices of the Final Revised FPSWP emphasize that an "important objective of the post-construction sampling will be to simulate aqueous concentrations within a habitat layer placed directly on the ISS-treated surface." It is unclear how well sampling over a few months will simulate accumulation of contaminants of concern (COCs) in the habitat layer that may occur over the next several decades.

2. **Habitat Layer Thickness:** A simulated habitat layer thickness of 2 feet is included in the sampling port design. While this is an acceptable assumption for the pilot study, EPA expects that future design deliverables will include evaluations to determine habitat layer and cap/cover design thicknesses.

3. **Reporting:** Revise the Final Revised FPSWP to identify the deliverable(s) in which the post-construction field pilot study sampling results and evaluations will be reported in.

Specific Comments on FPSWP:

1. **Section 4.4 Sampling Port Installation and Analysis Schedule, pages 55-57:** The purpose or potential layout of the temporary berms, if needed, to limit sediment deposition is unclear. Revise the document to better explain the temporary berm concept, consider including figures showing conceptual layouts for the berms relative to the sample port locations.

2. **Section 4.4 Sampling Port Installation and Analysis Schedule, first bullet point, page 56:** If water quality monitoring exceedances are observed, clarify what best management practices (BMPs) will be deployed since it is unsafe for divers to work inside a moonpool. Revise the text to discuss a contingency plan, including applicable BMPs, in case of water quality exceedances.

3. **Section 4.4 Sampling Port Installation and Analysis Schedule, second bullet point, pages 56 and 57:** Remove the text for the scenario "If significant deposition is documented". Removal of significant amount of deposited sediment using an excavator is considered a removal action that

cannot take place during the in-water work window. If significant deposition is documented, EPA will be notified via a field change request (FCR) and further coordination with the agency will be required to determine an appropriate path forward.

4. **Section 4.4 Sampling Port Installation and Analysis Schedule, second to last paragraph, page 57:** The Appendix M cutsheet states the polypropylene supersack bag consists of woven polypropylene which EPA understands is not impermeable. If this is the case then revise the text accordingly. See also the general comment on Appendix M.

To Be Considered Comments on FPSWP:

1. **Post Construction Sampling Data Use**: Revise the document to provide more information about planned post-construction sampling data use (e.g., how results will be used to estimate diffusive flux, what equations will be used, how specifically these data will be used in conjunction with bench-scale laboratory results, what specific factors and data will be used to evaluate whether cover amendment is warranted). This information can be provided in the forthcoming Gasco Basis of Design Report.

2. **Toxicity Characteristic Leaching Procedure (TCLP) Data Interpretation:** The November 7, 2023 Weekly Summary Report for the ISS Field Pilot Study indicates that TCLP results for an ex-situ Portland cement-treated sample of comingled ISS-treated swell material and untreated depositional sediment indicated a toxic hazardous characteristic for benzene. While it is acknowledged that 1) the original comingled sample included untreated sediment, and 2) TCLP testing is too aggressive to represent long-term benzene diffusion from ISS treated sediments, the TCLP result should be considered as another line of evidence when determining whether cover amendment is warranted. Revise the document accordingly.

Specific Comments on Appendix K, In Situ Stabilization and Solidification Field Pilot Study Post Construction Field Sampling Plan (FSP):

1. **Section 1 Introduction, page 1:** Edit the text in the first sentence as follows: "This In Situ Stabilization and Solidification Field Pilot Study Post-Construction Sampling Field Sampling Plan (FSP) has been prepared as Appendix K to the Final Revised In Situ Stabilization and Solidification Field Pilot Study Work Plan (Work Plan), which has been prepared ~~**jointly**~~ under the Administrative Settlement Agreement and Order on Consent (Docket No. CERCLA 10-2009-0255) and Statement of Work – Gasco Sediments Site (SOW; EPA 2009) between NW Natural and EPA ~~**and the Voluntary Agreement (Oregon Department of Environmental Quality [DEQ] No. WMCVM-NWR-94-13, as amended October 11, 2016; DEQ 2016)**~~." Also remove similar text in the introduction (Section 1, page 1) to the Final Revised FPSWP.

2. **Section 3.1.1 Passive Sampler Preparation, page 4:** Revise the text to describe the deoxygenation process, presumably using nitrogen gas purging.

3. **Section 3.1.2 Passive Sampler Deployment Methods, pages 4-5:** This section indicates that divers will report visual observations about the sampling port, such as damage, but does not describe procedures if sample ports are found to be damaged. Revise the text to clarify.

4. **Section 3.1.4 Passive Sampler Processing Methods, page 6**: Pouring the dual membrane passive diffusion bag (DMPDB) water samples into sample jars is likely to oxygenate the samples. It is important to know whether the samples are anoxic or not and this information can be used to determine the reliability of the sampling port seals. Before pouring the sample into

sample jars, measure dissolved oxygen (DO) and/or oxidation reduction potential (ORP) using a reliable and pre-calibrated DO/ORP measurement probe. Care must be taken to avoid introducing oxygen by using a thin diameter probe and opening the sampler cap just enough to insert the probe. Revise the text accordingly.

5. **Section 4.1 Field Documentation, page 9:** The text states that a record of all modifications to the procedures and plans will be included in field documentation. Revise the text to clarify that any proposed deviations from the EPA-approved FSP will be reported to EPA via FCRs for review and approval prior to implementing the proposed change.

6. **Section 5 Passive Sampling Analytical Testing, page 11:** Revise the text to acknowledge that if it is infeasible to achieve method detection limits specified in the Post Construction Sampling Quality Assurance Project Plan (QAPP), this will be reported to EPA via an FCR.

7. **Attachment K-1, Standard Operating Procedures, In Situ Low-Density Polyethylene (LDPE) Sampling for Measurement of Freely Dissolved Concentrations of Hydrophobic Organic Contaminants, Detection Limits Calculation, page 4:** Clarify in the text the minimum amount of sample media required for this method, the corresponding detection and reporting limits for that amount, and the largest volume of sample media that can be used.

8. **Attachment K-1, Standard Operating Procedures, In Situ Low-Density Polyethylene (LDPE) Sampling for Measurement of Freely Dissolved Concentrations of Hydrophobic Organic Contaminants, Preparation of Sampler Assembly, pages 6 and 7:** Clarify in the text the temperature at which the samplers would be considered compromised prior to deployment.

9. **Attachment K-1, Standard Operating Procedures, In Situ Low-Density Polyethylene (LDPE) Sampling for Measurement of Freely Dissolved Concentrations of Hydrophobic Organic Contaminants, Sampler Processing Following Retrieval, Item No. 7, page 8:** If the analytical laboratory will be weighing the LDPE sheets, NW Natural should confirm that the lab has experience handling LDPE samples. If not, EPA recommends recording the mass of LDPE sheets at Anchor QEA's Environmental Geochemistry Laboratory. Revise Appendix K main text to provide clarification.

10. **Attachment K-1, Standard Operating Procedures, In Situ Low-Density Polyethylene (LDPE) Sampling for Measurement of Freely Dissolved Concentrations of Hydrophobic Organic Contaminants, Data Analysis, page 9:** Equation 2 identifies polydimethylsiloxane (PDMS) in some of the equation parameters. Revise the equation to identify LDPE because a PDMS sampler is not being used for this effort.

11. **Attachment K-1, Standard Operating Procedures, In Situ Low-Density Polyethylene (LDPE) Sampling for Measurement of Freely Dissolved Concentrations of Hydrophobic Organic Contaminants, Data Analysis, page 9:** Revise equation 3 to provide the values for parameters a and b, and include a citation for the selected parameters. This information should be reported for each analyte.

12. **Attachment K-1, Standard Operating Procedures, Procedure for use of Dual Membrane Passive Diffusion Samplers (DMPDBs) in Groundwater Monitoring Wells (document from EON Products, Inc):** EPA agrees with the use of DMPDBs for the COCs identified in Final Revised FPSWP Section 4.3; however, the DMPDB standard operating procedure (SOP) is specific to groundwater monitoring wells. Revise the SOP to identify any modifications that may be necessary for the proposed application. If it is infeasible to get a revised SOP from the vendor, revise the text to describe any proposed modifications. For example, membrane diffusion-based

sediment porewater samplers typically use bromide as a tracer to determine fraction of equilibrium achieved during deployment which should be incorporated in the sampler design.

Editorial Comments Appendix K, In Situ Stabilization and Solidification Field Pilot Study Post Construction Field Sampling Plan (FSP):

1. **Section 3.3.1 Sample Identification, first bullet, page 7:** The text references riverbank soil sample locations. Riverbank soil samples are not included in the proposed scope of work. Revise the text accordingly.

2. **Figure K-3:** The diagram on the left of the figure is titled "Conceptual Overview of ISS Sediment Remedy" but focuses on the sampling port design on top of the ISS sediment remedy. Consider retitling this diagram as "Conceptual Overview of Sampling Port Design."

To Be Considered Comments Appendix K, In Situ Stabilization and Solidification Field Pilot Study Post Construction Field Sampling Plan (FSP):

1. **Section 3.1.3 Passive Sampler Retrieval Methods, pages 5-6:** EPA suggests adding text to provide the rationale for selecting 1 to 2-month deployment periods and summarizing the information that will be used to determine actual deployment durations.

2. **Section 6 Field Sampling Schedule. Pages 12:** EPA suggests that NW Natural clarify the need to delay sample port deployment until after compressive strength has stabilized. Sample ports could be placed before achieving long-term compressive strength if the treated sediments have achieved sufficient strength to support their weight.

Specific Comments on Appendix L In Situ Stabilization and Solidification Field Pilot Study Post Construction Sampling Quality Assurance Project Plan (QAPP):

1. **Distribution List, page ii:** Confirm the appropriate title for Tim Stone. The Distribution List and Figure L-1 shows him as On-Site Health and Safety Lead. Table L-1 shows him as Construction Quality Assurance Officer.

2. **Section 2.5, Special Training Requirements/Certifications, First Paragraph, Page 4:** The acronym for field coordinator (FC) should be defined in this section. Information should be provided on the process of documentation for all the trainings listed in this paragraph. Additionally, this section mentions subsurface sediment and soil core sampling. Revise the text to reflect the passive sampling scope.

3. **Section 2.6.2, Sample Preparation and Analytical Chemistry Records, pages 6-8:** EPA has the following comments on this section:

    a. EPA recommends that data validation be completed at Stage 2B for 90% of the data and Stage 4 for 10% of the data. These data will inform the performance of the ISS pilot study remedy and warrant Stage 4 validation. Revise this section and Section 5 accordingly.

    b. Inductively coupled plasma (ICP) serial dilutions, interference check standards, instrument performance checks (organic/inorganic) and laboratory duplicates, if applicable, should be added to the bullets as they are part of a Stage 2B review.

c. It should be clarified that the data validation reports and analytical data reports will be maintained by Anchor QEA.

4. **Section 3.4.2, Accuracy, page 11:** ICP serial dilutions should also be added to the first paragraph regarding accuracy review.

5. **Section 3.4.5 Completeness, Page 12:** The completeness goal for the number of samples collected versus what was planned should be discussed in this section. Revise this section to identify both sample completeness and analytical completeness.

6. **Section 3.4.7 Sensitivity, page 13:** Revise this section to acknowledge that some of the analytical methods proposed in QAPP Table L-2a do not have laboratory method detection limits (MDLs) or reporting limits (RLs) less than the Record of Decision (ROD) Table 17 groundwater cleanup levels (CULs). Additionally, revise this section to state whether the proposed analytical methods represent the appropriate and most sensitive, regularly available commercial laboratory analytical methods, or propose alternative analytical methods with greater sensitivity. Describe how the sensitivity data quality objective will be met for analytical methods where the MDLs or RLs are greater than CULs. Lastly, it should be noted that the laboratory data package and EDD should present data that is detected, and between the MDL and MRL, as estimated with a "J" qualifier.

7. **Section 3.5.2, Laboratory Quality Control, page 16:** Quality control samples such as ICP serial dilutions, interference check standards and surrogates should be added to this section.

8. **Section 5.1, Data Review, Validation, and Verification, page 22:** Information should be provided in this paragraph discussing that a data validation report will be provided for each sample delivery group.

9. **Section 5.2, Validation and Verification Methods, pages 22 and 23:** Laboratory duplicates, internal standards, instrument performance checks (organic/inorganic) and field blanks should be added to the bulleted list.

10. **Table L-2a:** EPA has the following comments on this table:

    a. The Groundwater CUL for cis-1,2-Dichloroethene is 70 ug/L. Confirm and update the table accordingly.

    b. **Table L-2a:** Footnotes 2 and 5 should be removed and footnote number 4 should become footnote 2 (i.e. the footnote starting with total xylenes should be the new footnote 2). Confirm the applicability of the contaminant groups, e.g. cPAH, total PAHs, total PCBs, and DDx. Acronyms should also be confirmed and updated; for example, BaPEq is not applicable.

11. **Table L-2b:** EPA has the following comments on this table:

    a. Provide clarification whether the freely dissolved concentrations corresponding to the target detection limits provided in mass of analyte in LDPE are expected to be below CULs.

b. Footnote 3 discuss total PAH. This is not listed in the table. Revise the table notes and acronyms to remove total PAH and only contain the pertinent information for the analyses proposed.

c. CUL is listed as an acronym but the ROD Table 17 groundwater CULs are not listed in the table. Add the ROD Table 17 groundwater CULs to the table if that was the intent. Acronyms should be confirmed, for example ug/L is not applicable to the table and ng/L should be added to the list.

12. **Table L-3:** Revise Table 3 to state that 2 field blanks will be collected, one during deployment and one during retrieval, consistent with QAPP Section 3.5.1.4.

13. **Figure L-1:** Delete the DEQ Project Manager box.

Editorial Comments Appendix L, In Situ Stabilization and Solidification Field Pilot Study Post Construction Sampling Quality Assurance Project Plan (QAPP):

1. **Abbreviations, pages v and vi:** Some listed acronyms are not in the QAPP such as LEAF and SPLP for example. Confirm and update the list accordingly.

2. **Section 2.2 Problem Definition/Background, page 3:** The following phrase should be revised for clarity: "are provided in the Work Plan the FSP (Appendix K of the Work Plan)."

3. **Section 3.5, Quality Assurance and Quality Control, page 13:** The full title of the EPA Contract Laboratory Program National Functional Guidelines for Data review should be presented in this paragraph.

4. **Section 3.5.1.4, Field Quality Assurance Sampling, Top of page, page 16:** In the last sentence there is discussion of the field blank "being processed in EGL." This term should be defined and added to the acronym list.

5. **Section 5, Data Validation and Usability, page 22:** The EPA reference for 2020c should be added to the first paragraph.

6. **Section 6.0, References, page 24:** The Guidance for Quality Assurance Project plans should have December added to the date; EPA National Functional Guidelines for Inorganic Superfund Methods Data Review EPA reference is EPA 542-R-20-006 instead of EPA 540-R-20-006; and the National Functional Guidelines for High Resolution Superfund Methods Data Review should be italicized.

General Comments on Appendix M Temporary Berm Supporting Information:

1. Laboratory analyses should be performed on the sand used to fill the polypropylene supersack bags. The results of analytical testing should include all contaminants that have River Bank Soil/Sediment Cleanup Levels in Table 17 of the Record of Decision and analytical results should be compared with the applicable Portland Harbor Cleanup Levels. Earlier in 2020, ROD Table 17 was modified in an errata memorandum that can be found on EPA's website:

https://semspub.epa.gov/work/10/100200076.pdf. The Errata #2 Table 17 supersedes the ROD Table 17. Appropriate analytical methods should be used to ensure that laboratory reporting levels are below ROD Errata #2 Table 17 Cleanup Levels to allow for a meaningful comparison to the data. If adequate documentation can be provided to EPA Cleanup substantiating that the sand is being sourced from a clean quarry free of anthropogenic inputs, then analytical testing of metals will only be required in lieu of the full list of ROD Table 17 COCs. Tabulated lab data and analytical reports are to be provided to EPA a minimum of five business days prior to temporary berm placement. Data tabulation should follow Section 6 of the Portland Harbor Program Data Management Plan which can be found at EPA's website: http://ph-public-data.com/document/DMP2021/

References

EPA, 2009. Statement of Work – Gasco Sediments Site. U.S. Environmental Protection Agency Region 10. September 9, 2009.