

# **EPA Comments and Responses on Draft In Situ Stabilization and Solidification Field Pilot Study Work Plan (dated June 9, 2023) and Revised In Situ Stabilization and Solidification Field Pilot Study Work Plan (dated August 21, 2023), Gasco Sediments Project Area**

## **EPA Response dated September 8, 2023**

This is U.S. Environmental Protection Agency's (EPA's) conditional approval of the revised In Situ Stabilization and Solidification Field Pilot Study Work Plan (FPSWP). Approval is conditioned on NW Natural adequately addressing EPA's responses as described below and providing a final version of the document. The revised FPSWP was prepared by Anchor QEA, LLC (Anchor QEA) on behalf of NW Natural. The FPSWP is a deliverable prepared for NW Natural under the Administrative Settlement Agreement and Order on Consent, CERCLA Docket No. 10-2009-0255, executed between EPA and NW Natural. EPA understands field pilot study (FPS) mobilization will start the week of September 11, 2023 with construction beginning the week of September 18, 2023. Approval of the revised FPSWP is conditioned on NW Natural adequately addressing EPA's responses as described below prior to September 18, 2023.

### **EPA Comments on the Revised FPSWP**

Unless otherwise noted, NW Natural's responses to EPA's comments on the draft FPSWP and updates to the revised FPSWP are acceptable. However, clarification and supplemental information is provided below for the following comments: General Comments 6 and 9 and Specific Comments 7b, 8a, 9, 10b, 24, and 32k. In addition, EPA has 12 comments on new redlined text in the document as well as one new comment.

#### **EPA General Comment 6**

**Habitat and Residuals Management Layers:** The FPS should incorporate application of a habitat layer after ISS treatment and clarify whether a residuals management layer is required or not. The FPSWP text discusses monitoring in the "simulated habitat layer." Appendix E goes onto state that no habitat layer will be placed at ISS FPS completion due to "recontamination from adjacent sediments." While that potential is acknowledged, it is important to place a habitat layer to avoid assessment of compensatory mitigation for the intervening years (leaving a concrete treated surface unsuitable as benthic habitat for an extended period of time) before complete remedial action will take place. Even if only meant to serve as temporary habitat until remedial action, placement of a habitat layer at the completion of the FPS will also help inform the ability of this material to remain in place over the broader site for full-scale ISS implementation. As noted in the Feasibility Study Appendix L 404(b)(1) analysis, "If monitoring or site-specific modeling demonstrate that a sand/gravel surface can be maintained long term, this may be considered by EPA when determining if the compensatory mitigation proposed during remedial design is adequate." Further, as noted in the ISS Remedial Technology Information for Portland Harbor Superfund Site Programmatic Biological Assessment dated February 22, 2023, "Placement of a habitat layer over the top of the ISS surface during construction would accelerate the recolonization process. Revise the FPSWP to include removal of swell to accommodate the elevation of a residuals management layer (if needed) and habitat layer at the conclusion of FPS work per ROD Section 14.2.3, 14.2.4, and 14.2.9.2 to avoid assessment of compensatory mitigation and to help evaluate the longevity of placed habitat layers in the

project area. Also include design thicknesses and engineering basis for any residual management and/or habitat layers.

*NW Natural Response (August 21, 2023)*

The text has been revised to state that a residual management layer is not warranted given any residuals generated by the field pilot study will be treated and contain lower chemical concentrations than the existing sediments, so there is no increase in risk.

NW Natural recognizes the importance of an effective habitat layer for the final remedy. The post-construction surface of the final remedy can be configured to assure a stable foundation for a habitat layer design. However, NW Natural cannot place temporary habitat material on the pilot footprint for the following reasons:

- Consistent with response to EPA General Comment 3, the slopes in the majority of the field pilot footprint are too steep to allow for direct placement of non-angular (or even semi-angular) habitat material without slope failures and/or loss of the material in the downslope direction. The final sediment remedy will be designed so slope angles are appropriate for long-term stability of habitat layer placement (including the FPS area).
- As noted in the first bullet, due to the steep slope in the FPS area, a temporary habitat layer would not be stable and would not “inform the ability of this material to remain in place over the broader site for full-scale ISS implementation.” For the same reason, recolonization would also not occur. The post-construction surface of the final remedy will be configured for stable habitat placement to facilitate recolonization.
- We do not want to attract aquatic receptors to an isolated area that is surrounded by significantly elevated chemical concentrations exceeding ROD remedial action levels and cleanup levels that are expected to migrate into the pilot study footprint following construction, contaminating the habitat material.

NW Natural further proposes conducting a comprehensive mitigation evaluation for the field pilot study and final remedy in accordance with the Mitigation Evaluation Work Plan (to be revised and resubmitted as part of the forthcoming Revised Pre-remedial Design Basis of Design Report).

*EPA Response (September 8, 2023)*

NW Natural’s response is noted though EPA would also like to note that disturbance of this area and an extended duration until habitat replacement (temporal loss) will need to be evaluated in the project’s overall mitigation requirements.

**EPA General Comment 9**

Approach for Post-Construction Field Pilot Study Sampling: EPA’s review of the post-construction sampling is focused on the limited discussion of the proposed sampling approach provided in Section 4 (see specific comments on Section 4). EPA expects to provide additional comments on the approach once the associated Field Sampling Plan (FSP) and Quality Assurance Project Plan (QAPP) documents (intended to provide details regarding the sampling port design, porewater sampling procedures and timing, and laboratory analyses) are submitted for EPA review/approval.

*NW Natural Response (August 21, 2023)*

Section 4 in the FPSWP has been revised to provide significantly more information regarding the post-construction field pilot study sampling. NW Natural is in the process of finalizing the sampling port fabrication details with the fabricator, so the FSP and QAPP will be submitted to EPA slightly later than the remainder of the FPSWP documents. NW Natural requests that EPA provide approval of the sampling port design based on the level of detail provided in the FPSWP so NW Natural can proceed with ordering the longer lead time equipment for fabrication of the sampling ports. NW Natural understands that EPA may have additional comments on sampling procedures, timing, and laboratory analysis when the FSP and QAPP are submitted.

*EPA Response (September 8, 2023)*

EPA has the following comments on the additional post-construction sampling details provided in FPSWP Section 4, to be revised in the FPSWP and/or addressed in the forthcoming FSP and QAPP:

- a) The slotted stainless steel permeable base reduces the open area by 50%. Consider other base screen options that allow maximum flux through the sampling ports.
- b) The first and second main bullet points have conflicting information. Both bullet points should be revised to clarify that the cover will prevent exchange of particulates and dissolved constituents.
- c) Provided standard operating procedures (SOPs) for each type of passive sampler in the forthcoming FSP and QAPP. EPA will use this information to confirm the deployment durations and analyte lists for each type of passive sampler.
- d) Revise the duration between sampling rounds to allow for data collection at three distinctly different time steps. Considering these are time-integrated samples collected over a 1- to 2-month period, collecting back-to-back passive sampling data may not provide a reasonable measure of changes in concentrations over time. Alternatively, provide justification for the proposed sampling rounds in light of the intended data use to allow evaluation of temporal trends.

**EPA Specific Comment 7b**

**Section 3.3.1 Timber Dolphin Removal, page 9:** EPA has the following comments on this section and the FPSWP should be revised accordingly:

- b. EPA recommends using a "variable drive" vibratory hammer which allows the contractor to have more control by dialing into specific frequencies. A clean sand cover should be applied over the pile extraction footprint for residuals management. The sand should be placed at a radius of 15 feet around each pile (or 15-foot buffer around a grouping of piles) at an approximate thickness of six inches above the mudline (bathymetric surveys are unnecessary).

*NW Natural Response (August 21, 2023)*

- b. Text discussing variable moment vibratory method versus excavator has been added to Section 3.3.1. Consistent with the rationale provided in response to General Comment 3 for not placing fringe cover and habitat materials, the slope in the dolphin area is too steep to allow for direct placement of clean sand cover without slope failures and/or loss of the material in the downslope direction.

*EPA Response (September 8, 2023)*

- b. Placement of a sand cover after dolphin removal is required. Unlike the ISS treated surface, pile removal is likely to expose and/or resuspend contaminated material. Revise the text accordingly.

### **EPA Specific Comment 8a**

**Section 3.3.2 Bathymetric Surveys, page 9:** EPA has the following comments on this section and the FPSWP should be revised accordingly:

- a. Once the surveying contractor is finalized, EPA expects that a detailed FSP will be provided for the surveying techniques discussed in this section.

*NW Natural Response (August 21, 2023)*

- a. The text has been revised to include additional detailed means and methods for surveying techniques. More surveying details are provided in Section 3.3.2.3. A detailed FSP for surveying techniques is not proposed for the FPS.

*EPA Response (September 8, 2023)*

- a. EPA recommends binning at a maximum 0.5 foot by 0.5 foot accuracy for steeply sloped areas to achieve data quality objectives of the FPS.

### **EPA Specific Comment 9**

**Section 3.3.2.3 Acquisition of Multibeam Echosounder Data, page 10:** Revise the text to indicate what International Hydrographic Organization (IHO) classification is being targeted for the overall bathymetry data collection data quality objective.

*NW Natural Response (August 21, 2023)*

The text in Section 3.3.2.3 has been revised consistent with the comment.

*EPA Response (September 8, 2023)*

The section has been revised to reference the IHO standard but does not include a classification that would meet DQO requirements or the intent of the original comment. Revise the text to include a specific classification (or better) that would meet project needs.

### **EPA Specific Comment 10b**

**Section 3.3.5 ISS Equipment, page 12:** EPA has the following comments on this section and the FPSWP should be revised accordingly:

- b. Revise the text to clarify that the drill parameter monitoring data will be logged during the FPS and reported to EPA as a quality assurance measure and that completion reporting will discuss observations or lessons learned regarding maintaining ISS equipment position and verticality, achieving the desired penetration depths, and amendment addition rates.

*NW Natural Response (August 21, 2023)*

- b. The text in Section 3.3.5 has been revised consistent with the comment.

*EPA Response (September 8, 2023)*

- b. The revised text states that, "All drill rig and grout plant data will be logged and compiled during the FPS. This information will be reported to EPA during RD." It is unclear what stage of RD this sentence is referring to. Revise the last sentence to state that drill rig and grout plant data will be included in periodic reports provided to EPA during the pilot study.

## **EPA Specific Comment 24**

**Section 3.7.1.1 Operational Controls, page 27:** Revise the BMP list to include the following operator controls [request in following stand-alone paragraph]:

Additionally, revise the last bullet to indicate that if Willamette River currents exceed one foot per second, operations will stop until currents are below this velocity. Information could also be collected to inform EPA of possible variation to this requirement for full-scale implementation.

*NW Natural Response (August 21, 2023)*

Regarding the maximum current requirement, the 1 foot per second requirement is not relevant to the ISS pilot study. That parameter applied to the 2005 Early Action because the full-length silt curtain design had an anchoring limitation. This limitation does not apply to the mobile moonpool silt curtain system proposed for the pilot study. This system was designed to allow for velocities up to about 2 feet per second. The same moon pool system was successfully used at the PGM site during the September and October timeframe and associated river velocities.

*EPA Response (September 8, 2023)*

Revise the text to note that the moon pool enclosure has a maximum operating current speed of approximately 2 feet per second and what will be done if that current speed is reached, e.g. stop work pending slower current speed.

## **EPA Specific Comment 32k**

**Section 4 Post-Construction Field Pilot Study Sampling, pages 38-39:** EPA has the following comments on this section and the FPSWP should be revised accordingly:

- k. This section states that porewater samples will be analyzed for the full suite of Table 17 groundwater constituents, and in parentheses includes pesticides and herbicides and dioxins/furans. The section states that results will be compared to the groundwater cleanup levels. Table 17 does not have groundwater cleanup levels for dioxins/furans and for some pesticides such as aldrin, dieldrin, and lindane. Revise the text in this section to clarify what porewater sample results will be compared to for contaminants that do not have groundwater cleanup levels.

*NW Natural Response (August 21, 2023)*

- k. The text has been revised consistent with the comment.

*EPA Response (September 8, 2023)*

- k. It appears that text regarding analysis of dioxins/furans has been removed. Revise Section 4.3 text to include analysis of dioxins/furans. The results should be compared with the 2,3,7,8-TCDD equivalent surface water CUL for informational purposes.

## **EPA Comments on New Redlined Text and New Appendices (and one new comment)**

1. **Section 3.1, Field Pilot Study Area and Volumes, pages 5-7:** The Revised FPSWP indicates that the DOC near the field pilot study footprint was determined based on the results of work performed in accordance with the *Final Revised Additional Depth of Contamination Characterization Addendum within the Gasco Sediments Site Project Area*. Revise the FPSWP to report the full analytical results of the DOC characterization cores, particularly in the vicinity of the FPS footprint. This information is needed to support determination of the ISS application depth.

2. **Section 3.2 Summary of ISS Bench Scale Treatability Study Results Completed to Date and Recommended FPS Grout Composition, pages 7-9:** EPA notes that consideration of Phase III testing results was included in the Draft FPSWP (dated June 9, 2023) and subsequently excluded in the Revised FPSWP (dated August 21, 2023). EPA understands that Phase III testing results are not available at this time; however, it is expected that Phase III and Phase IV leachability testing results will be used to inform the full scale ISS application. Revise the text to clarify why Phase III leachability testing results are not needed to inform the grout composition and dosage selection for the field pilot study. Also discuss how Phase III and Phase IV testing results will be evaluated in conjunction with post-construction sampling results to achieve adequate reduction in contaminant leachability.
3. **Section 3.3 Summary of ISS Treatment Scope of Work, page 11:** The last paragraph discusses 28 ISS columns and an additional 18 columns. The text goes on to state that the target goal is 48 columns. Revise the text or clarify if the proposed target is 46 columns (28 minimum + 18 additional) instead of 48.
4. **Section 3.3.8.2, Performance Objectives and Criteria, first bullet point, page 20:** The revised performance objective the grout will be completely mixed with no unmixed sediment clumps greater than 3 inches. Revise the text to provide the rationale for changing this performance standard and the basis for using 3 inches as a threshold clump size.
5. **Section 4.2 Sampling Port Design, page 54:** Revise the text to clarify that EPA approved the use of the proposed habitat material in the long-term sampling ports for the FPS; however, a full remedial design evaluation will be needed to determine the suitable habitat material for the final ISS-treated surfaces in the Gasco Project Area.
6. **Section 3.3.8.2 Performance Objectives and Criteria, page 21 and Section 3.3.8.3 Verification of Performance Objectives and Criteria, pages 21-22:** Provide the technical basis for revising the “100% mixing” performance objective to no unmixed sediment clumps greater than 3 inches. Also state in the text that the discrete sampling device used to obtain post-treated ISS samples is of sufficient diameter to allow for visual confirmation of complete mixing (i.e., no unmixed sediment clumps greater than 3 inches in diameter).
7. **Appendix C, Section 3.6.4.3.2 Swell Barge Dewatering and Amendment, page 27 (editorial comment):** Bullets 3 and 4 are redundant; delete bullet 3.
8. **Appendix C, Table 1 Summary of Monitoring Stations and Locations for the Pilot Study Area by Tidal Stage:** Change the Ebb background location to 300 feet upcurrent of the Site (not 150 feet).
9. **Appendix E, Section 9.2.1 Swell Barge Loading and Transport, page 29:** Consistent with changes to FPSWP Section 3.7.3, revise the 2<sup>nd</sup> bullet to indicate barges would be filled to less than 85% capacity.
10. **Appendix H, General Comment:** Revise Appendix H to discuss any observations related to swell. For example, the time period for swell generation should be identified if known. This information will be used to inform the timing of swell removal and post-construction bathymetry surveys.

11. **Appendix H, Table 1.** Revise Table 1 by adding a column that describes the sampled materials and includes grain size information, organic carbon content, and any notable observations of substantial product.
12. **Appendix H, Conclusions, page 7:** The text indicates that selecting two grout dosages for the FPS will provide data regarding diffusive mass flux from the ISS-treated surface. EPA agrees that this information can be used to inform diffusive flux; however, the post-construction samples for the two doses will not provide similar quality data as the leachability tests being performed in a controlled laboratory environment. EPA concurs with the water/cement ratio, grout composition, and grout dosage proposed for the FPS based on Phase I and Phase II treatability testing results for location ISSTS-003. Revise the text to provide a schedule for completion and reporting of Phase III and Phase IV data for this location.
13. **New Comment on Appendix C Revised In Situ Stabilization and Solidification Field Pilot Study Water Quality Monitoring and Quality Assurance Plan:** Add text to include monitoring of pH and temperature within the moon pool at the beginning and completion of each ISS column (prior to moving to next column location). These measurements should be collected at the same three water column depths presented in Appendix C Section 3.3.2. This data will be collected for informational purposes only.