EPA Comments on Draft Sufficiency Assessment
Gasco Sediments Site
Dated June 16, 2020

Comments dated December 30, 2020

The following are the U.S. Environmental Protection Agency (EPA) comments on the *Gasco Sediments Site Sufficiency Assessment* (SA), prepared by Anchor QEA, LLC on behalf of NW Natural and dated June 16, 2020. The SA is a deliverable not included in the 2009 Gasco Sediment Site Statement of Work (SOW), but NW Natural has prepared the SA to align with EPA's model remedial design (RD) SOW for the Portland Harbor Superfund Site (PHSS).

General Comments on SA Report:

1. **Recontamination Potential Chemicals Screening**: EPA acknowledges the River Mile 11E Recontamination Assessment Report (RAR) dated November 2018 was the first work product generated for a Portland Harbor project area that evaluated the status of upland source control and in-water pathways. Subsequent to development of the RAR, EPA developed a sufficiency assessment process per Section 3.1 of the model remedial design SOW. NW Natural may elect to refer to the RAR as a guide for the Gasco SA; however, EPA does not endorse the surface sediment contaminant of concern (COC) screening process/approach presented in the RAR but recognizes its utility in evaluating the potential for recontamination at a project area from uncontrolled sources. While the surface sediment COC screening process/approach may be utilized, it does not remove the need to screen data from all media (e.g. surface sediment, subsurface sediment, groundwater, stormwater, and riverbanks) against Portland Harbor Record of Decision (ROD) criteria to identify sources that may pose a recontamination threat. In addition, should the COC screening process/approach be used, it only applies to identification of recontamination potential chemicals (RPCs) for evaluating recontamination and not identification of potential driver COCs for RD. All contaminants from Table 17 (e.g., for capping effectiveness or dredging leave surface) and Table 21 of the ROD must be considered during RD and future performance monitoring and included in data tables in the SA.

2. **Upland Source Control**: Revise the upland source control portion of the SA to focus on upland sources that are likely to contribute COCs to the Gasco Sediments Site (Gasco Project Area)**.** Upland sources identified in Section 5.1 that do not have a complete migration pathway to the Gasco Project Area should be removed from the SA. Sufficiency assessments will be conducted at all the EPA-identified project areas to evaluate upland and in-water sources of contaminants to determine whether they have been adequately investigated and sufficiently controlled such that remedial action can proceed. If potential sources remain, the sufficiency assessments will identify how those sources will be addressed or integrated into the in-water design.

3. **Conceptual Site Model:** The conceptual site model (CSM) needs to be updated in the SA. Contamination in the Gasco Project Area must be described, including sediment samples with contaminant concentrations above remedial action levels (RALs), principal threat waste (PTW) thresholds, and cleanup levels (CULs) from the ROD (EPA 2017). The sources of these contaminants should be identified (if known) and a discussion of fate and transport should be provided. All migration pathways to and from the Gasco Project Area need to be

identified, and this information should be used to support the evaluation of source control and potential for recontamination that is presented in Sections 4 and 5.

4. **In-Water Recontamination Potential Evaluation:** The discussion in Section 5 should focus on upriver project areas with potential to recontaminate the Gasco Project Area based on migration pathways identified in the CSM. Project areas without a direct migration pathway to the Gasco Project Area should be removed from Section 5 to allow for a more focused and thorough discussion of relevant in-water sources.

5. **Sufficiency Assessment Summary Tables:** As described in the *Remedial Design Guidelines and Considerations* (EPA 2020a), "the goal of this table is to serve as the basis for EPA's sufficiency determination in informing respondents whether cleanup can go forward, and if potential sources remain, how those sources should be integrated into the in-water design." The project areas identified in Table 6-2 are already being evaluated as part of the in-water design under EPA oversight. Table 6-2 should be revised to identify sources specific to the Gasco Project Area and evaluate the status of those sources. Similarly, Table 6-1 must be updated to identify the upland sites that potentially contribute contamination to the Gasco Project Area and evaluate the status of source control at those sites based on the evaluation presented in the SA. EPA recommends combining these two tables into a single sufficiency assessment summary table. An example sufficiency assessment summary table is provided as Appendix E of the *Remedial Design Guidelines and Considerations*.

6. **Remedy Sequencing**: EPA recognizes that consideration of remedy sequencing will be a component of remedy implementation, as described in Section 14.2.11 of the ROD. Remedy implementation under EPA oversight will consider appropriate sequencing of remedial actions and operational best management practices (BMPs) such that recontamination potential from upstream sources is minimized during remedy construction. Specific decisions on remedy sequencing are not within the scope of the SA. The text in Section 5.4 and 6 should be revised to focus on discussions relative to evaluation of upland and in-water sources of contaminants and determining whether they have been adequately investigated and controlled.

7. **Newfields Data:** EPA expects NW Natural to review the Newfields data in relation to RALs and PTW thresholds to determine if there are any impacts to the evaluation of recontamination potential in the SA. On page 9, NW Natural describes that the SA does not include the 2014-2015 Newfields data and provides rationale for that decision. After collection of the 2014-2015 Newfields data, EPA reviewed and approved the dataset for use during RD and it was posted on the interim data portal. NW Natural may not entirely agree with the source assessment data quality objectives but use of the data should be considered for making RD decisions in this project area.

8. **Sufficiency Assessment Summary:** For "C" status sites, the Sufficiency Assessment Summary (Tables 6-1 and 6-2) should differentiate between uncontrolled sources and sources where additional assessment is recommended, perhaps using a C(u) for uncontrolled sources and a C(a) for sites for which additional assessment is recommended.

9. **Former Rhone Poulenc Site Groundwater Plume:** The SA report should include an evaluation of the Rhone Poulenc groundwater plume that may discharge to the Gasco project area. The Oregon Department of Environmental Quality's (DEQ's) 2015 Rhone-Poulenc Remedial Investigation Report: Addendum – RI/SCE Report (November 19, 2010) shows the lower alluvium gravel and basalt groundwater extending across the Siltronic Site to the Gasco project area.

10. **ROD Table 16 Chemicals**: EPA recommends that NW Natural consider chemicals of potential concern from ROD Table 16 when evaluating potential recontamination and during remedial design, as applicable to the Gasco project area. As noted in footnote 9 of Table 17 in the Portland Harbor ROD Errata #2, Table 16 should be consulted in the development of remedial actions because of the potential impacts these chemicals have on ecological receptors and because they will be compared with post-remedial action conditions to evaluate protectiveness consistent with ROD Section 8.2.5.

Specific Comments on SA Report:

1. **Section 2.2 In-Water Sediments Potential Recontamination Pathways, pages 7-8**: This section title should be changed because the content of this section does not include a discussion of potential recontamination pathways. The text in this section lists focused COCs that were identified in the ROD and references the RALs and PTW thresholds for these focused COCs and does not describe recontamination pathways. Additionally, the first sentence should be replaced with text that is consistent with Section 14.2 of the ROD, which states "The Selected Remedy addresses all areas where contaminant concentrations exceed the cleanup levels through a combination of dredging, capping, enhanced natural recovery, monitored natural recovery, and institutional controls."

2. **Section 3 Recontamination Conceptual Site Model and Source Identification, pages 11-22:** A description of surface and subsurface sediment contamination at the Gasco Project Area must be provided in this section. The CSM needs to identify which contaminants are present in surface and subsurface sediment at concentrations exceeding RALs and PTW thresholds, and the SA should provide information on the magnitude and frequency of RAL exceedances. Additionally, a description of how sediment concentrations may have changed over time due to natural and anthropogenic activities and actions already taken at the site would be helpful to improve understanding of contamination at the site and support the discussion of recontamination potential.

3. **Section 3.1.2.1 Bedrock, Section 3.1.2.2 Alluvial Deposits, and Section 3.1.2.3 Fill Deposits, page 12**: These sections provide high-level overviews of the uplands geology and should be supplemented to provide additional site-specific geologic characterization. The SA should either be revised to incorporate additional geologic information or reference previous submittals and DEQ review comments that discuss uplands geology more fully (i.e., equivalent to the Gasco draft interim feasibility study [FS] and DEQ's August 15, 2019 comments).

4. **Section 3.1.3 Hydrogeologic Setting, pages 13 and 14 and Figure 3-9:** The following statement should be clarified in the SA: "The HC&C system operation is strongly influencing the offshore transect area (see Figure 3-9) by varying net pumping to reverse upward hydraulic gradients; therefore, seasonal variations in net seepage flux are eliminated." The area described as the "offshore transect area" should be defined and the text should be revised to describe which areas and hydrogeologic units are represented by the seepage meter data. The last three paragraphs of the section describe evaluations of the influence of the hydraulic containment and control (HC&C) system on the interaction between groundwater and the river. The findings of these evaluations are the subject of EPA comments in Appendix A of the Technical Evaluations Work Plan. EPA anticipates the Basis of Design Report will include information that resolves the comments.

5. **Section 3.1.3 Hydrogeologic Setting, page 13**: The SA states that the HC&C system results in groundwater flow from the Gasco Project Area towards the upland, which prevents

groundwater in the Upper, Lower, and Deep Lower Alluvium water-bearing zones (WBZs) from discharging to the Willamette River. The discussion of the HC&C system should be revised to clarify that the HC&C system maintains hydraulic gradients in the Upper Alluvium WBZ and Lower Alluvium WBZ from the river towards the uplands, and that the assessment of HC&C influence on the Deep Lower Alluvium WBZ is ongoing.

6. **Section 3.1.3 Hydrogeologic Setting, page 13 and Figures 3-7a through 3-7c**: The SA should provide potentiometric surface contour figures for the entire uplands area instead of limiting the maps to the strip of uplands near the top of the riverbank and in close proximity to the shoreline (Figures 3-7a through 3-7c). The updated figures will provide a more complete depiction of the hydrologic setting and the text in Section 3.1.3 should be revised as needed to incorporate discussion of updated figures.

7. **Section 3.2.1 Project Area Riverbank Conditions, page 15:** The SA should discuss riverbank contamination data for the portion of riverbank at the Siltronic property that is identified as potentially maintaining the current reconfiguration when the remedy is implemented. Potential for recontamination must consider both physical and chemical characterization of riverbank soils, and the riverbank pathway cannot be dismissed because RD will evaluate riverbank erosive mechanisms.

8. **Section 3.3 Portland Harbor In-Water Physical Conditions, pages 17-23 and Figures 3-11, 3-12, 3-13, 3-14, 3-15a through 3-15f:** The in-water conditions presented in Section 3.3 need to be updated to include more area-specific information for the Gasco Project Area. Section 3.3 presents useful information on site-wide in-water physical conditions but needs to also include a focused discussion for the Gasco Project Area. The physical conditions at the Gasco Project Area should be described in relation to the CSM to support the evaluation of potential sediment recontamination from upland and in-water sources. EPA suggests updating Figures 3-11, 3-12, 3-13, 3-14, and 3-15a through 3-15g to focus on the Gasco Project Area and areas immediately adjacent to the Gasco Project Area (e.g., add inset maps or provide additional maps showing just the Gasco Project Area and areas directly upstream and downstream).

9. **Section 3.3.1 Bathymetry, page 16**: The results of the integrated multibeam bathymetry and LiDAR survey that was performed at the Gasco Project Area in April 2019 should be included in the SA.

10. **Section 3.3.2 Hydrodynamic Conditions, pages 16-17:** The hydrodynamic conditions described in this section must be incorporated into the Gasco Project Area CSM to inform evaluations of potential sources of recontamination. Site-specific hydrodynamics have a major impact on potential sediment transport that could result in recontamination and should be used in conjunction with suspended sediment data to support evaluation of whether a complete migration pathway exists from other project areas and upland sources to the Gasco Project Area.

11. **Section 3.3.4 Wind- and Vessel-Generated Waves, pages 18-19:** An area-specific discussion of the impact of wind- and vessel-generated waves on the Gasco Project Area should be included in this section. As shown on Figure 3-13, wind- and vessel-generated waves occur within the Gasco Project Area and the impact this has on sediment resuspension and transport within the Gasco Project Area should be described.

12. **Section 3.3.5 Vessel Propeller Wash, page 19:** The statement that "Propeller wash was identified in the River Mile 11 East Project Area but limited to non-existent in the other in-water project areas" seems to contradict what is shown on Figure 3-14, which indicates that a

portion of the Gasco Project Area is a potential propeller wash area. Revise the text to be consistent with Figure 3-14 and provide area-specific information on propeller wash if available. Potential resuspension of sediments from vessel propeller wash should be described and assessed in Section 5.

13. **Section 3.3.6 Riverbed Elevation Changes, pages 20-21:** The discussion in the last paragraph in this section regarding sediment deposition should be revised. While the sediment bed elevation assessment presented does indicate that the sediments in the Gasco Project Area are mostly net neutral or depositional, this alone does not suggest that contaminated sediment from other project areas may accumulate in the Gasco project area and does not account for periodic erosion/deposition. A complete migration pathway of contaminated sediment from other project areas has not been demonstrated in the CSM (i.e., erosion of contaminated sediment at other project areas and deposition of that sediment at the Gasco Project Area).

14. **Section 4.1 Stormwater, pages 23-36:** The discussion of the interpretation of 1200-Z stormwater monitoring data must be revised in this section. Stormwater monitoring data from 1200-Z permits can be used as a line of evidence to support the evaluation of the stormwater pathway, but compliance with permit criteria is not sufficient to conclude that stormwater is being appropriately controlled and unlikely to pose a sediment recontamination concern. Sample collection and data evaluation should conform to the Joint Source Control Strategy (JSCS) (DEQ and EPA 2005) and DEQ's *Guidance for Evaluating the Stormwater Pathway at Upland Sites* (DEQ 2010).

15. **Section 4.1.3.7 LNG Tank Containment Basin Retrofit, page 29**: Revise this section to clarify that seasonal groundwater levels in the fill WBZ near the LNG Basin are still many feet above the bottom of the basin but that the liner prevents groundwater seepage into the basin.

16. **Section 4.1.4.2 Siltronic Subbasin Groundwater Intrusion Evaluation, page 30:** The results of the groundwater intrusion sampling should be provided in the SA to support the conclusion that groundwater intrusion is not a pathway of concern.

17. **Section 4.1.5.1 Stormwater Monitoring Data, page 31**: The relevance of past monitoring data from 2007 to 2010 should be clarified. If these data are representative of stormwater discharges from the Gasco Uplands Site, they should be provided in the SA. However, as described in General Comment 1 on recontamination potential chemicals, these data should not be used to eliminate certain analytes form source control evaluation. All ROD Table 17 and 21 contaminants should be evaluated in the SA.

18. **Section 4.1.5.2 Storm Solids Sampling Data, pages 31-32**: Stormwater solids data should be provided, or supplemental information should be included to support the statement that solids data are no longer representative of current conditions at the property. The text indicates that comprehensive line and sump cleaning have been completed and for this reason storm solids data is not representative of current site conditions. However, Figure 4-3 only shows that a portion of the storm drains have been cleaned and there is insufficient evidence that the source of the contaminated solids removed from the stormwater infrastructure has been identified and controlled. If the available stormwater solids data are no longer representative, this should be identified as a data gap and the SAR should describe whether additional stormwater solids data are needed to address this data gap.

19. **Section 4.1.6 Stormwater Recontamination Lines of Evidence pages 32-33**: In additional to the lines of evidence presented in this section, the evaluation should include additional relevant

lines of evidence from Section 5.3 of the JSCS (DEQ and EPA 2005) and Section 5.3 of DEQ's *Guidance for Evaluating the Stormwater Pathway at Upland Sites* (DEQ 2010).

20. **Section 4.1.6.2 Comparison with Other Industrial Sites in Portland Harbor, page 33:** The discussion of the cumulative distribution curves (i.e., rank order curves) for industrial stormwater in Portland Harbor should be revised. These rank order curves are a tool to be used as a line of evidence to support evaluation of the stormwater pathway and do not provide conclusive evidence that there is no recontamination potential. As described in DEQ's *Guidance for Evaluating the Stormwater Pathway at Upland Sites,* "interpretations made using these charts should be corroborated by other lines of evidence and should not be presumed to provide conclusive evidence of the presence or absence of contamination at a site. Furthermore, the determination that contaminant concentrations are "typical" is not the same as determining the discharges will not cause or contribute to risk in the waterbody."

21. **Section 4.1.7 Stormwater Screening for Sediment Recontamination Potential, Arsenic, page 34**: Removal of arsenic from the uplands source control program does not dictate whether or not arsenic is monitored under the 1200-Z permit. Revise the text accordingly.

22. **Section 4.1.7 Stormwater Screening for Sediment Recontamination Potential, Dioxins/Furans, pages 35-36**: There is insufficient information presented in the SA to conclude that dioxins and furans are not a recontamination risk to the Gasco Project Area. Surface sediment samples collected in the Gasco Project Area have contained the following dioxins and furans at concentrations above RALs and/or PTW thresholds: 1,2,3,4,7,8-HxCDF, 1,2,3,4,8-PeCDD, and 2,3,7,8-TCDD. The lack of dioxins/furans data in stormwater should be considered a data gap and the SA should identify a plan to address the data gap.

23. **Section 4.1.8 Data Gaps Identification, page 36:** There is insufficient evidence presented in the SA to conclude the stormwater pathway is not a potential source of sediment recontamination to the Gasco Project Area. Section 4.1.5 indicates that based on source control measures (SCMs) that have been implemented at the Gasco Uplands Site, stormwater solids data collected in 2007 and 2009 and stormwater samples collected before November 2019 are no longer representative of site conditions. EPA acknowledges that overland flow discharges have not been sampled, but have been eliminated. The only data provided in the SA to support the assessment of the stormwater pathway are samples collected from the remaining stormwater discharges since November 2019 as part of NPDES 1200-Z permit monitoring. These data have the following limitations that should be described in the SA and considered when identifying data gaps:

    - Storm event conditions (e.g., antecedent dry period, rainfall volume, duration of storm event, and timing of sample collection) are not provided so EPA could not determine how to weight these sample results in conformance with the JSCS weight-of-evidence guidance.

    - Detection limits are not provided in Tables 4-2a and 4-2b. Therefore, EPA cannot assess whether detection limits were low enough to provide meaningful comparison to CULs and rank order curves.

    - The 1200-Z permit analyte list does not include all of the constituents in Table 17. The lack of data for all relevant COCs should be identified as a data gap in the SA.

24. **Section 4.1.9 Stormwater Recontamination Potential Assessment Conclusions, page 36**: The discussion about DEQ's conclusion on the stormwater pathway should include the caveat

that EPA's review of DEQ's stormwater strategy update report identified technical limitations in the evidence presented in the report that limits the scope of the conclusions that can be drawn from the evaluation (EPA 2020b). Additionally, the cited report notes that site-specific evaluation is needed to determine recontamination potential in localized areas. Revise the text accordingly.

25. **Section 4.2.2 Siltronic Wastewater Effluent, page 37**: Additional information should be provided on the permitted industrial wastewater that is discharged through Outfall 001 (WR-66). The industrial process producing the waste should be described, and the reasoning that COCs are not expected in the discharge should be clarified.

26. **Section 4.2.3.1 Description of GTP Direct Discharge, pages 37-38**: Revise the text in this section to clarify that volatile organic compounds (VOCs) treated by the air stripper include VOCs associate with the trichloroethene release and VOCs associated with contamination from the manufactured gas plant.

27. **Section 4.2.4.2 NPDES Permit Benchmarks and Impairment Reference Concentrations, page 39**: The discussion of the interpretation of compliance with NPDES Individual Permit discharge limits must be revised in this section. Compliance with permit limits does not provide definitive evidence that discharges are not likely to pose a sediment recontamination source. Discharge concentrations must be compared to surface water CULs and evaluated using a lines of evidence approach.

28. **Section 4.2.5 Direct Discharge Screening for Sediment Recontamination, page 39**: This section should be revised as needed to include a discussion of contaminants that were not identified as RPCs. As described in General Comment #1 and the specific comment on Table 4-4, analytical data should be screened against all CULs. Instances where detection limits are higher than CULs for analytes that were not detected should be discussed and considered when evaluating data.

29. **Section 4.2.6 Data Gaps Identification, Section 4.2.7 Direct Discharge Recontamination Potential Assessment Conclusions, and Section 4.2.8 Future Site Conditions Assessment, page 40**: To the extent modifications to Section 4.2.2, 4.2.3, 4.2.4, and 4.2.5 necessitate any changes to Section 4.2.6, 4.2.7, and 4.2.8, those changes should be made.

30. **Section 4.3 Groundwater, pages 40-48**: The SA should describe groundwater contamination in the Fill WBZ, Upper Alluvium WBZ, Lower Alluvium WBZ, and Deep Lower Alluvium WBZ. At a minimum, groundwater concentrations in nearshore wells should be provided and discussed (e.g., concentrations of groundwater COCs compared to ROD Table 17 CULs and magnitude and frequency of CULs exceedances described in text). Although the hydraulic data presented in the SA suggest that the HC&C system is controlling the hydraulic gradient and preventing discharge of groundwater in the Upper Alluvium WBZ and Lower Alluvium WBZ to the Willamette River, chemical data should be included to provide a complete assessment of site conditions and potential for recontamination (e.g., if there was a failure in the HC&C system). If there are ongoing sources of contamination to groundwater, these sources should be identified, and source control status should be described.

31. **Section 4.3.1 Groundwater Characteristics**, **pages 40-41**: This section provides high-level overviews of the uplands hydrogeology and should be supplemented to provide more detailed site-specific information for the Fill WBZ, Lower Alluvium WBZ, Lower Alluvium WBZ, Deep Lower Alluvium WBZ, and Basalt WBZ. The SA should either be revised to incorporate additional hydrogeologic information or reference previous submittals and DEQ review

comments (e.g., the Gasco draft Interim FS and DEQ's August 15, 2019 comments)that discuss uplands hydrogeologic conditions more fully (i.e., equivalent to the Gasco draft interim FS and DEQ's August 15, 2019 comments). Discussion of the Basalt WBZ should be provided in this section to clarify the recontamination potential of that hydrogeologic unit. Section 4.3.1 identifies three major hydrogeologic units, but the subsequent sections only provide source control discussions for groundwater in the fill and alluvium (and not the Basalt WBZ). The SA should clarify whether the Basalt WBZ discharges to the Willamette River and assess whether it could impact the in-water remedy.

32. **Section 4.3.1 Groundwater Characteristics, page 41**: This section states that "Hydrographs demonstrating the relationship between the river water elevation and groundwater elevation in the Alluvium WBZ are routinely provided to DEQ and EPA as part of the HC&C system operational reporting." EPA recommends providing representative hydrographs between the Willamette river and each hydrostratigraphic unit to support discussion of groundwater provided in the SA.

33. **Section 4.3.2.1 Alluvial Groundwater, pages 42-43**: The expected duration of the HC&C system should be described in this section.

34. **Section 4.3.2.1 Alluvial Groundwater, page 42**: The last two sentences in the second paragraph describe the design objectives of the HC&C system. EPA recommends these sentences be replaced with DEQ's August 15, 2019 directive comment to the draft Gasco OU interim FS regarding the HC&C design objective: "Along the portion of the shoreline where DNAPL occurs, the HC&C system includes extraction wells in the Upper Alluvium WBZ and Lower Alluvium WBZ. The design objective is to induce horizontal gradients from the river towards the wells and upward vertical gradients from the Lower Alluvium WBZ to the Upper Alluvium WBZ. Gradients toward the uplands and upwards are intended to hydraulically control and contain groundwater while not exacerbating mobilization of DNAPL due to system operations."

35. **Section 4.3.2.1 Alluvial Groundwater, page 43**: This section states that DEQ considers alluvial WBZ groundwater within the HC&C capture zone to be controlled. DEQ has clarified that it considers groundwater in the Upper Alluvium WBZ and Lower Alluvium WBZ to be hydraulically controlled and that an effectiveness demonstration for the Deep Lower Alluvium WBZ is ongoing. Revise the text accordingly.

36. **Section 4.3.2.2 Shallow Fill Groundwater, page 43:** Additional discussion on the fill WBZ should be provided in the SA. The SA concludes that because the fill WBZ will be incorporated into the in-water remedy that it is not a potential recontamination source after remedy implementation. While this may be true, the Fill WBZ is currently uncontrolled and the SA should identify contaminants that are discharging at concentrations above groundwater CULs to provide a more transparent assessment of the status of upland source controls. Additionally, the SA is intended to identify current status of potential recontamination sources and assess the degree to which the in-water remedy will address upland groundwater discharge. Until the remedy is fully implemented the groundwater pathway cannot be considered controlled.

37. **Section 4.3.2.2 Shallow Fill Groundwater, page 43**: This section should be revised to include a description of the Fill WBZ source control technologies that were identified in the April 2015 SCM alternatives evaluation. Additionally, the text should clarify that the interim measure is specific to the LNG Basin and the final remedial measure for the Fill WBZ has not been determined.

38. **Section 4.3.2.3 Enhanced In Situ Bioremediation Removal Action, pages 43-44**: The performance of the enhanced in situ bioremediation (EIB) removal action should be described in this section. The analytes that are targeted for remediation, the effectiveness of the EIB at achieving removal action objections (including data), and status of ongoing monitoring are needed to support the evaluation of the groundwater pathway in the SA.

39. **Section 4.3.4 Data Gaps Identification, page 47**: Data gaps should be re-evaluated after data is screened against all CULs as described in General Comment 1 and the specific comment on Section 4.3. This section should be updated as needed to identify gaps in chemical and/or hydrogeologic data and describe how these data gaps will be addressed.

40. **Section 4.4 Upland DNAPL Mobility, pages 48-50**: The text states that "DNAPL has accumulated at measurable quantities at 19 of the 74 nearshore wells" and that "DNAPL accumulation is observed and routinely monitored at several pumped HC&C extraction wells and unpumped monitoring wells." The discussion in Section 4.4 has limited data and does not provide definitive evidence that dense nonaqueous phase liquid (DNAPL) is controlled and is not migrating in the subsurface towards the Willamette River. The text should be revised to describe that the migration of DNAPL is a data gap or additional data should be provided to support the statement that "DNAPL within the Gasco Upland Site does not present a potential recontamination risk to the Project Area." The conclusion that DNAPL does not present a recontamination risk should be considered premature and is currently unsupported by the data and analysis presented.

41. **Section 4.4 Upland DNAPL Mobility, pages 48-50**: Revise this section to clarify that the HC&C system is not designed to control DNAPL migration in the Upper and Lower Alluvium WBZ and does not influence groundwater in the Fill WBZ. Accumulation of DNAPL in some HC&C system extraction wells is incidental to system operation, and because the network of monitoring wells was not designed to monitor DNAPL, there are limitations associated with available data. Observations of DNAPL in extraction wells and/or monitoring wells may not be sufficient to characterize DNAPL mobility and the potential for recontamination.

42. **Section 4.4 Upland DNAPL Mobility, pages 48-50**: The SA should be revised to include the current status of DNAPL investigations and assessments. Appendix H of the draft Gasco OU interim FS includes an assessment of DNAPL information and properties for the Gasco Upland Site. The SA should be supplemented with information from that document, including DEQ input on the limitations of the DNAPL assessment and data gaps related to DNAPL in the alluvium. Figures depicting the nature and extent of manufactured gas plant (MGP) residuals in the fill and alluvium, such as Figures 4-1a through 4-1j from the draft interim FS revised per DEQ's August 15, 2019 comments, should be included in the revised SA to provide visual context to horizontal and vertical distribution of MGP residuals and DNAPL in the Gasco uplands area.

43. **Section 4.4 Upland DNAPL Mobility, page 50:** The text states that: "PTW-NAPL in offshore sediment within the Project Area appears to have been emplaced due to historical overland discharges or upland runoff." Discuss data or provide a reference to an existing document that confirms this statement regarding the likely DNAPL emplacement mechanism in sediments. In the absence of substantiating information this sentence should be revised to state that: "PTW-NAPL in offshore sediment within the Project Area may have been emplaced due to historical overland discharges or upland runoff."

44. **Section 4.4 Upland DNAPL Mobility, pages 48-50 and Figures 3-2a through 3-6**: DEQ indicated that Figures 3-2a through 3-6 and text in Section 4.4 are derived from the draft

interim FS for the Gasco Uplands Site, and that DEQ provided comments on the draft interim FS on August 15, 2019. EPA requests that NW Natural incorporate DEQ's comments into revised versions of the figures and associated text for the next SA submittal.

45. **Section 4.5 Riverbank Sources, page 50:** Additional discussion on the riverbanks at the Gasco Project Area should be provided in the SA. The SA concludes that because the riverbanks will be incorporated into the in-water remedy, they do not present a risk of recontamination following remedy implementation. While this may be true, the SA should still summarize previous investigation results and identify contaminants that are present in riverbank soils at concentrations above RALs, PTW thresholds, and CULs to provide a more transparent assessment of the status of upland source controls. Until the remedy is implemented, riverbanks could be an uncontrolled source to the river that should be identified in the SA.

46. **Section 4.6.3.2 Overwater Operations, page 52:** Examples of the BMPs used to prevent releases or spills during transfer of marine fuels should be described in this section. Section 4.6.6 states that "BMPs are in place to prevent or minimize the impact of leaks or spills to the river" but these BMPs are not described in the SA.

47. **Section 4.7 Summary of Recontamination Potential Evaluation Conclusions for the Gasco Upland Site, page 53:** The source control outcome categories should be refined based on the comments provided herein. Based on its review of the SA, EPA recommends the source control pathways and status (as summarized in Table 6-1) be as follows:

    - Stormwater – C(a): As described in the specific comment on Section 4.1.8, there is not enough evidence presented in the SA to determine that stormwater is adequately controlled.
    - Direct Discharge – B: This pathway is considered conditionally controlled pending the information requested in the specific comment on Section 4.2.2.
    - Fill Groundwater – C(u): Section 4.3.2.2 of the SA describes the Fill WBZ as a high-priority contaminant transport pathway that will be addressed by an uplands SCM prior to or concurrently with in-water remedy implementation. Until the pathway is addressed, it is considered uncontrolled.
    - Alluvial Groundwater – B: The alluvial groundwater pathway is considered conditionally controlled, contingent on continual successful implementation of the HC&C system.
    - Upland DNAPL – C(a): As described in the specific comments on Section 4.4, there is insufficient evidence presented to determine that DNAPL is controlled.
    - Riverbanks Sources – C(u): The ROD identified the Gasco Project Area as having known contaminated riverbanks (EPA 2017) and Section 4.5 of the SA describes that riverbanks will be included as part of the in-water remedy. Until the pathway is addressed, it is considered uncontrolled.
    - Existing In-water structures and Overwater Activities – A: No change from the SA.

48. **Section 5 In-Water Recontamination Potential Evaluation, page 54:** The first paragraph states, in part, that "this Sufficiency Assessment assumes that upland sources to other project areas would have the potential to enter the Project Area as suspended sediments in surface water, bedload sediments transported into the Project Area through river flow, or by sediment disturbance associated with remediation or maintenance dredging in other project areas." This

type of statement is not appropriate and must be substantiated by a complete migration pathway identified in the CSM, and preferably with site-specific data that provides evidence of potential recontamination. If a complete migration pathway is not identified, much of the discussion presented in Section 5.1 should be removed from the SA.

49. **Section 5.1 Upland Sources to Other Project Areas, pages 54-77**: The conclusions derived from the information presented in this section should be provided in the SA. The information provided in this section is a summary of upland pathway status presented in the *Portland Harbor Upland Source Control Summary Report* (DEQ 2016) and supporting data or updates to source control status since 2016 are not provided. The relevance of this information to the Gasco Project Area is not described and there is no description of a complete migration pathway from these upland sources to the Gasco Project Area. Upland sources with a complete migration pathway to the Gasco Project Area should be described in Section 4 and not in the in-water pathway evaluation, and relevant upland facilities should be included in the recontamination evaluation summary presented in Table 6-1. If the updated CSM does not identify a complete transport pathway (see General Comment 2), then this information is not needed and should be removed from the SA.

50. **Section 5.1.16 Harbor-Wide Stormwater Sources, pages 76-77**: The discussion of Oregon Department of Transportation (ODOT) outfalls should be updated in this section to incorporate the outfall basin information described in ODOT's source control effectiveness monitoring report (Herrera 2020). The location of ODOT outfalls and COC concentrations in stormwater are provided in Herrera 2020. Note that none of the ODOT outfalls described discharge to the Gasco Project Area.

51. **Section 5.2 Sediment Bedload Migration, pages 77-81:** Bedload transport refers to sediment transported along or very close to the riverbed, whereas suspended load refers to sediments in the water column. Sediment traps are typically designed to capture suspended sediment. The terminology in this section should be revised as appropriate to describe the sediment transport mechanisms that are evaluated.

52. **Section 5.2.1 Sediment Trap Data Evaluation, page 78 and Figures 5-2a through 5-2h:** The figures referenced in Section 5.2.1 (i.e., Figures 5-2a through 5-2h) should be revised to incorporate the following changes:

    a. The ROD defines the Downtown Reach as RM 11.8 to RM 16.6 and the Upriver Reach as RM 16.6 to RM 28.4 (EPA 2017). The figures should be revised to show the correct boundaries.

    b. Applicable CULs should be shown for each figure to allow for comparison of sediment trap data to CULs.

    c. EPA recommends that "Upriver Portland Harbor Superfund Site" be changed to upstream to more clearly differentiate the portion of the Portland Harbor Superfund Site being discussed from the Upriver Reach.

53. **Section 5.2.2 Depositional Sediment Data Evaluation, pages 80-81 and Table 5-2**:

    - The text in this section should clearly state that the early action pilot cap is surrounded by SMAs in the Gasco Project Area that have not been remediated. The COCs that exceed RALs and PTW thresholds in depositional sediment are all COCs in the surrounding Gasco Project Area, suggesting the concentrations observed in

depositional sediment are likely impacted by the surrounding sediment in the Gasco Project Area. Additionally, as noted in Footnote 5, polycyclic aromatic hydrocarbon concentrations could be impacted by porewater transport before implementation of the HC&C system. For these reasons, these data may not be applicable for evaluating recontamination potential after the remedy has been implemented across the entire Gasco Project Area.

- Clarify which data were used in Table 5-2. Section 5.2.2 states that depositional sediment data was collected in 2006-2009 and 2019. It is not clear which data set(s) were used to generate the table.

54. **Section 5.3 Sediment Erosion and Remediation Dredging Impacts, pages 81-94:** The impact of the exceedances of RALs, PTW thresholds, and CULs summarized in this section should be discussed. Without a complete migration pathway that would result in potential sediment recontamination in the Gasco Project Area, the relevance of these summaries is unclear.

55. **Section 5.4 Recontamination Potential Assessment, page 94-95:** The assessment presented in this section does not accurately reflect the information presented in the SA. Although Section 5.3 presents frequencies of RAL and PTW exceedances, there is no discussion of whether these exceedances occur in erosive areas. Section 5.1 summarizes source control status at upland facilities throughout the site (as of 2016), but the SA does not describe the migration pathway of those sources to the project area. Revise the text as appropriate.

56. **Section 5.6 Data Gaps Identification, page 95:** Specific data gaps needed to evaluate the current sufficiency of upland and in-water source controls must be identified in the SA. It is not appropriate to defer identification of data gaps until RD has progressed and sufficiency assessments are completed at other project areas. Identification of data gaps and a description of how data gaps will be addressed are requirements for the SA, as described in the SOW. A summary table should be added to the SA that lists each data gap and suggests a method to address the data gaps.

57. **Section 6, Summary of Recontamination Potential Evaluation, page 96:** Per the SOW, the SA needs to consider the general magnitude of any potential recontamination effects and discuss implications to the selected remedy for the Gasco Project Area. Accordingly, Sections, 4, 5, and 6 of the report should be revised to generally describe the magnitude of potential recontamination sources.

58. **Section 6, Summary of Recontamination Potential Evaluation, page 96, and Section 2, Approach for Evaluating Potential for Sediment Remedy Recontamination and Assessment of Long-Term Cleanup Level Exceedances, page 5:** The following statement is out of the scope of the SA and should be removed: "To the extent sediments exceeding CULs migrate into and persist in the Project Area, delay in or failure to meet the CULs does not indicate failure of the Project Area remedy and would not serve as a basis for enhanced monitoring of the Project Area remedy or other potential contingency measures associated with Project Area remedy performance." The goal of the SA is to evaluate upland and in-water sources of contamination to determine whether they have been adequately investigated and sufficiently controlled or considered such that the remedial action can proceed. Post-construction monitoring will be designed to distinguish between recontamination and assessing whether the remedy is functioning as intended to demonstrate long-term performance of the remedy across appropriate temporal and spatial scales.

59. **Table 3-1 Summary of Erosional Areas in Project Areas – Comparison of 2002 and 2018 Bathymetry:** Add the Gasco Project Area to this table.

60. **Tables 4-2a, 4-2b, 4-4**:

    a) The detection limit should be provided for analytes that were not detected to support evaluation of whether laboratory detection limits were appropriate for comparison against CULs.

    b) All available data should be provided in these tables. As described in General Comment 1, data should not be screened out and excluded from analytical data tables.

61. **Table 6-1 Recontamination Evaluation Summary – Upland Pathways Summary:** Refer to the comment on Section 4.7 for EPA's recommended source control status for the Gasco and Siltronic Site.

62. **Table 6-2 Recontamination Evaluation Summary – In-Water Summary :** The source control status ratings (i.e., A, B, or C) presented in Table 6-2 must be revised based on the comments presented herein. There is insufficient evidence presented in this SA to assign each of the project areas outside of the Gasco Project Area a "C" rating and it is not within the scope of the SA to comment on the status of other project areas if a direct migration pathway has not been established. The presence of contaminated sediment in other portions of the river does not necessarily suggest these areas represent uncontrolled sources with the potential to impact the Gasco Project Area. Refer to General Comment 5 for discussion on the intent of this table and General Comment 6 for a discussion on remedy sequencing.

63. **Figures 5-4a through 5-4i and Appendix C Figures C-2a through C-2z:** Additional explanation should be provided for the information and symbols presented in the boxplot figures.

    - The values represented by the white circles should be identified in the legend.

    - The values represented by the boundaries of the blue box should be defined in the legend.

    - The values represented by the limits of the "whiskers" on the boxplots should be defined in the legend.

    - The reasoning for excluding non-detects in the statistical evaluation should be described. When the detection limit is sufficiently low, non-detections are important information for characterization and should not be excluded from the dataset without appropriate statistical reasoning. Excluding non-detects where detection limits are low would bias the dataset high and could lead to an erroneous conclusion that recontamination potential is higher than it is. However, if detection limits are not sufficiently low (e.g., near or above RALs) then non-detects do not provide meaningful data and it is likely appropriate to exclude these data. EPA recommends using methods described in Helsel, 2004.

64. **Figures 5-5a through 5-6i:** The sampling locations within the Gasco Project Area with sediment concentrations that exceed RALs and PTW thresholds should be shown on these figures. It is not appropriate to exclude concentrations from the Gasco Project Area and state that they will be addressed during RD. Understanding the current distributions and trends in

contaminant concentrations within the Gasco Project Area is important for understanding the site and potential recontamination. For example, if COCs from Table 21 of the ROD were detected at concentrations above RALs and/or PTW thresholds during 2018 pre-RD/baseline sediment sampling but not during previous sampling, this would be a line of evidence for an uncontrolled source and potential recontamination.

Editorial Comments on SA Report:

1. **Section 4.1 Stormwater, pages 23 to 36:** The SA should be revised as needed to clarify the discussion of Outfall 001. As shown on Figures 1-3, 1-4, and 4-2, two outfalls are designated as Outfall 001 in the Gasco uplands. In most appearances in the text, the Siltronic outfall is referenced as "Outfall 001 (WR-66)," but there are instances when the text refers to this outfall as "Outfall 001" and Figure 4-4a and 4-4b refer to the outfall as "Siltronic WR-66." The SA should be consistent when referring to this outfall and the naming should distinguish the Siltronic outfall 001 from the Gasco outfall 001.

2. **Section 4.1.5.1 Stormwater Monitoring Data, page 31**: Revise the discussion on the Siltronic Outfall 001 (WR-66) NPDES 1200-Z permit to describe that Siltronic obtained coverage in 2018 under the revised 1200-Z permit.

3. **Section 4.2 Direct Discharges, pages 37 to 40:** Note that stormwater is a subset of direct discharges. Retitling this section should be considered.

4. **Section 5.1 Upland Sources to Other Project Areas, pages 54-77:** The description of project areas throughout this section should be updated to describe that the project areas extend beyond areas identified for active remediation in ROD Figure 31a. Project areas include these active remediation areas (i.e., SMAs) and also include areas surrounding the SMAs (as shown on Figures 5-5a through 5-5i).

5. **Section 5.2.1 Sediment Trap Data Evaluation, Recontamination potential bullet, page 79**: The text in this bullet states "Detected results exceeded the site-wide RAL in 15% of samples collected downriver from the Project Area in the eastern half of the river." This text may refer to PCBs based on the previous sentence, but the text does not identify which contaminant this applies to. Revise to clarify which contaminant this applies to.

6. **Table 4-2a**: This table should be revised to highlight all of the analytes that exceed surface water CULs from ROD Table 17. Only two cells are highlighted, but many other analytes from the sample collected on 6/7/2019 exceed CULs.

7. **Tables 5-3a through 5-4h:** The data source(s) used in these surface and subsurface sediment summary tables should be referenced in the text or as a footnote in the tables.

8. **Figure 4-7a**: Monitoring wells located along the property line with the US Moorings site should be added to the figure for completeness (e.g., MW-40F).

9. **Figures 5-5a through 5-6i:** The data source(s) used in these surface and subsurface sediment concentration figures should be referenced in the text or as a footnote in the figures.

References

DEQ. 2016. *Portland Harbor Upland Source Control Summary Report.* November 21, 2014 – Updated March 25, 2016.

DEQ. 2010. *Guidance for Evaluating the Stormwater Pathway at Upland Sites*. Prepared January 2009 and updated October 2010.

DEQ and EPA. 2005. *Portland Harbor Joint Source Control Strategy.*

EPA. 2020a. *Remedial Design Guidelines and Considerations, Portland Harbor Superfund Site, Portland, Oregon.* Prepared by EPA Region 10. Revised February 28, 2020.

EPA. 2020b. Memorandum to Oregon Department of Environmental Quality. Dated July 09, 2020.

EPA. 2017. *Record of Decision, Portland Harbor Superfund Site, Portland, Oregon*. Prepared by EPA Region 10.

Helsel, D.R., 2004. *Nondetects and Data Analysis: Statistics for Censored Environmental Data*, 1st Edition. John Wiley & Sons, Inc. Hoboken, New Jersey.

Herrera Environmental Consultants, Inc. (Herrera). 2020. *2019-2019 (Year 2) Annual Report: Effectiveness Monitoring and Stormwater Source Control Evaluation, ODOT Facility in Portland Harbor Project Area*. Prepared for ODOT.