EPA Comments and Responses on Draft (dated June 24, 2020) and Final (dated November 10, 2020) Sufficiency Assessment B1 Navigation Channel Project Area

EPA Response dated December 22, 2020

This is U.S. Environmental Protection Agency's (EPA's) conditional approval of the Final Sufficiency Assessment (Final SA) for the B1 Navigation Channel Project Area. The Final SA was prepared by Anchor QEA, LLC on behalf of NW Natural and dated November 10, 2020. The next check-in for the SA is in the Basis of Design Report (BODR) where, pursuant to Section 3.3 of the Navigation Channel Statement of Work (SOW) attached to the Administrative Settlement Agreement and Order on Consent for Removal Action, CERCLA Docket No. 10-2009-0255 (ASOAC), NW Natural will "summarize the results of the sufficiency assessment and whether potential sources of recontamination have been adequately investigated and controlled or considered such that the RA can proceed." EPA requests this summary consist of a memorandum attached as an appendix to the BODR that will address EPA's responses provided below and include any updates to SA Tables 6-1, 6-2a and 6-2b. The SOW also states in Section 3.10 that the Pre-Final (95%) remedial design (RD) deliverable will include "an updated sufficiency assessment summary table per ¶ 3.1(c)(8) as a final check to ensure remedial construction can commence". EPA request an analogous SA memorandum and updated Tables 6-1, 6-2a and 6-2b be prepared to address this requirement.

EPA Comments on the Final SA

Unless otherwise noted, NW Natural's responses to EPA's comments on the Draft SA and the Final SA report are acceptable. However, clarification and supplemental information is provided below for the following comments: General Comments 1, 3, 4, 5, 6, 7, 8, and 9; Specific Comments 2, 3a, 3b, 3c, 4, 5a, 11, 12, 13, 14, 16, 18d, and 19.

EPA General Comment 1 (July 28, 2020)

Upland Source Control: Revise the upland source control portion of the SA to include upland sources that are likely to contribute contaminants of concern (COCs) to the Navigation Channel Project Area**.** The upland sources likely to result in contaminant migration directly to the Navigation Channel Project Area should be identified (if there are any) and the status of these source should be evaluated. NW Natural's proposal in Section 4 to defer detailed evaluations of potential uplands sources of contamination and incorporating the findings into RD could result in the identification of data gaps after completion of pre-design investigation (PDI) work. 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.

NW Natural Response (November 10, 2020)

Section 4 ("Deep Groundwater Discharge") has been added to the Final Sufficiency Assessment to describe indirect upland migration pathway from upland properties to the Project Area.

EPA Response (December 22, 2020)

EPA appreciates the addition of Section 4 and the associated discussion of deep groundwater sources that could potentially discharge into the Navigation Channel Project Area. However, the intent of EPA's comment was for NW Natural to identify specific upland sources that are likely to contribute to recontamination of the Navigation Channel Project Area. This comment is partially addressed by the reorganization of upland sources in Section 5.1 to "near-field" and "far-field" project areas and the assignment of relative magnitude of risk categories (i.e., Low, Medium, or High) in Section 6 and Table 6-2a. Despite these changes, EPA still believes that much of the information included in Section 5.1 is not relevant to the Navigation Channel Project Area because it is not likely (or has not been demonstrated by data included in the SA to be likely) that contaminant migration will occur from many of the upland sources to the Navigation Channel Project Area at concentrations and quantities that would pose serious risk to recontamination. NW Natural may elect to retain these upland source summaries in the Final SA, but EPA does not consider any of the information presented in Section 5.1 to be sufficient to support a delay in proceeding with remedial action (RA). EPA expects NW Natural to consider the status of potential sources when updates to the sufficiency assessment summary table are provided in the BODR and the pre-final (95%) RD submittals.

EPA General Comment 3 (July 28, 2020)

Contamination Conceptual Site Model: A discussion of contamination in the Navigation Channel Project Area must be included in the CSM. Sediment samples with contaminant concentrations above remedial action levels (RALs), principal threat waste (PTW) thresholds, and cleanup levels (CULs) from the Portland Harbor Record of Decision (ROD) (EPA 2017a) should be described and contaminated groundwater discharging to the project area should also be described. 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 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 Section 4.

NW Natural Response (November 10, 2020)

New Sections 3.2 ("Identification of Upland and In-Water Migration Pathways of Recontamination"), 3.3 ("Nature and Extent of Contamination Within the Project Area"), and 3.4 ("Recontamination Conceptual Site Model Summary") have been added to the Final Sufficiency Assessment.

EPA Response (December 22, 2020)

EPA appreciates the updates to Section 3, including the addition of Figures 3-6 through 3-9. However, a key aspect of the CSM for recontamination that is described in Section 3 but that appears to be overlooked throughout the remainder of the Final SA is that the contaminants that are driving the delineation of sediment management areas (SMAs) are polycyclic aromatic hydrocarbons (PAHs). For the remaining ROD Table 21 contaminants, Table 3-2 and Section 3.3.1 indicate that one surface sediment sample for PCBs was the only surface or subsurface sample that exceeded Navigation Channel RALs or PTW thresholds (although Figure 3-6 seems to indicate that there weren't any PCB exceedances). These data suggest that contamination from upland or in-river project areas has not migrated to the Navigation Channel Project Area at concentrations that exceeds RALs or PTW thresholds for any contaminant other than PAHs (and one PCB sample). This has important implications regarding the assessment of risk from upland and in-water sources that should be considered when evaluating the potential recontamination

from these sources. EPA expects NW Natural to consider this aspect of the CSM when updates on the status of potential sources are provided in the BODR and the pre-final (95%) RD submittals.

EPA General Comment 4 (July 28, 2020)

Section 4 In-Water Recontamination Potential Evaluation: The discussion in this section should focus on areas with potential to recontaminate the project area based on migration pathways identified in the CSM. It is not appropriate to "assume 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 must be substantiated by a complete migration pathway identified in the CSM, and preferably with site-specific data that provides evidence of potential recontamination. The SA should assess potential in-water sources of contamination that are most likely to delay remedy implementation. Evaluation of the project areas immediately adjacent, upstream, and downstream of the Navigation Channel Project Area provides the most representative information regarding potential recontamination.

NW Natural Response (November 10, 2020)

In accordance with EPA's comment, Section 5 ("In-Water Recontamination Potential Evaluation") has been reorganized to account for the proximity of other project areas (and associated adjacent upland properties) to the Project Area. Specifically, the other project areas within the Portland Harbor Superfund Site have been grouped by "near-field potential recontamination sources" and "far-field potential recontamination sources." The Project Area is unique within the Portland Harbor Superfund Site because it is located solely within the federally authorized navigation channel, and no upland properties are directly adjacent to the Project Area. It is important to note that, as discussed in Section 3 ("Recontamination Conceptual Site Model and Migration Pathway Identification"), the contaminant transport model for the navigation channel presented in the 2016 Feasibility Study (EPA FS) shows there is potential for contaminated sediments to migrate from anywhere within the Portland Harbor Superfund Site and deposit and potentially impact sediment quality in the Project Area. Specifically, sediment sources from both the east and west shoreline areas have the potential to migrate into the navigation channel and subsequently migrate upriver and downriver within the navigation channel based on the tidal conditions (tidal reverses have been documented throughout the entire Portland Harbor Superfund Site). Similarly, erosion of impacted sediment sources anywhere within the Portland Harbor Superfund Site navigation channel migrate up and down the navigation channel with the potential to deposit and impact sediment quality in the Project Area. Therefore, any upland property adjacent to the Portland Harbor Superfund Site that impacts sediments in other project areas has the potential to indirectly recontaminate the Project Area. Spatial distance alone does not define the potential for recontamination of these harborwide sources. Rather, multiple other lines of evidence also impact the potential for sediment recontamination (e.g., whether the sediment contamination is within an erosional area, the RAL exceedance factors and associated depths below mudline, and the grainsize and mudline elevation of the sediment contamination). We believe other factors (such as the magnitude of RAL or PTW-highly toxic threshold exceedances and the associated depth below mudline, the potential for sediment disturbance or erosion, the potential for sediment quality impacts from upland sources, the sediment transport dynamics, and the effectiveness of environmental controls during remedy implementation) also have a direct and possibly greater influence on the magnitude of potential for sediment recontamination of the Project Area.

EPA Response (December 22, 2020)

The intent of the SA is to identify and evaluate upland and in-water sources of contamination and determine whether they have been adequately investigated and sufficiently controlled or considered such that RA can proceed. Listing all in-water project areas with contamination and assigning each of these project areas a source control status of C(u) does not fulfill the objective of the SA. The source control status of C(u) is reserved for sources that are not sufficiently assessed or controlled to the extent that sediment cleanup should not proceed until additional controls have been implemented and assessed for effectiveness. While EPA agrees that many factors contribute to potential sediment recontamination, as identified in NW Natural's response, these factors are not adequately documented to demonstrate that many of these project areas pose a realistic risk to recontamination at the Navigation Channel Project Area. Additional factors not described in NW Natural's response include sediment erosion and depositional patterns within the Navigation Channel Project Area (see Specific Comment 2) and distribution of contaminants. As described in Sections 14.2.1 and 14.2.11 of the ROD, EPA will evaluate appropriate remedy sequencing and will consider factors such as potential impacts of upstream work on downstream areas and potential for resuspension of contaminants during construction. Additionally, NW Natural will submit a remedial action sequencing plan as part of the BODR (SOW Section 3.3(g)). EPA will review construction work plans at project areas throughout the Portland Harbor Superfund Site (PHSS) to verify that releases to the water column associated with dredging will be minimized through operational best management practices (BMPs) and engineering control measures during RA.

EPA General Comment 5 (July 28, 2020)

Sufficiency Assessment Summary Table: As described in the Remedial Design Guidelines and Considerations (EPA 2020), "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 5-1 are already being evaluated as part of the in-water design under EPA oversight. Table 5-1 should be revised to identify sources specific to the Navigation Channel Project areas and evaluate the status of those sources. Instead of listing every project area, EPA recommends organizing Table 5-1 based on migration pathways in upland and in-water sources. Specific upland and in-water sources with potentially complete migration pathways to the Navigation Channel Project Area based on the CSM should be evaluated and the status should be provided on Table 5-1.

NW Natural Response (November 10, 2020)

A new Table 6-1 has been added to summarize indirect upland pathway discussed in the newly added Section 4 ("Deep Groundwater Discharge"). The in-water pathways are now summarized in Tables 6-2a and 6-2b and have been arranged based on spatial proximity to the Project Area consistent with EPA General Comment 4. See the response to EPA General Comment 4 regarding contaminated sediments throughout the Portland Harbor Superfund Site and, by extension, the adjacent upland properties that contribute to sediment contamination outside of the Project Area, having the ability to recontaminate the Project Area sediments.

EPA Response (December 22, 2020)

During review of the Gasco Project Area SA, DEQ noted that the effectiveness demonstration for the deep lower alluvium water-bearing zone (WBZ) is ongoing and recommended a "B" source control

status. The status of deep groundwater source control should be reviewed when the updates on the status of potential sources are provided in the BODR and the pre-final (95%) RD submittals.

As described in the Final SA, the Navigation Channel Project Area is unique within the PHSS because it is not directly adjacent to any upland properties. Because of its positioning, contaminants from upland sites are less likely to discharge from upland sources to the Navigation Channel Project Area at concentrations that pose a threat of recontamination. This aspect of the Navigation Channel Project Area must be considered in future versions of Table 6-2a that will be provided in the BODR and pre-final (95%) RD submittals. Based on the information presented in the Final SA, there do not appear to be any stormwater, direct discharge, shallow groundwater, riverbank, or overwater sources that could directly impact the Navigation Channel Project Area and represent a threat to recontamination that warrants delay in remedy implementation.

As described in EPA's response to General Comment 4, a C(u) designation is not be appropriate for every project area in Table 6-2b.

EPA General Comment 6 (July 28, 2020)

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 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 4.4 and 5 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. During the RD process NW Natural may elect to include considerations or criteria for subsequent evaluations of sources that are currently uncontrolled.

NW Natural Response (November 10, 2020)

Section 4 ("Deep Groundwater Discharge") and Section 5 ("In-Water Recontamination Potential Evaluation") have been revised to address this EPA comment.

EPA Response (December 22, 2020)

As described in Sections 14.2.1 and 14.2.11 of the ROD, EPA will evaluate appropriate remedy sequencing and will consider factors such as potential impacts of upstream work on downstream areas and potential for resuspension of contaminants during construction. Additionally, NW Natural will submit a remedial action sequencing plan as part of the BODR (NW Natural SOW Section 3.3(g)). EPA will review construction work plans to verify that releases to the water column associated with dredging will be minimized through operational BMPs and engineering control measures during RA.

EPA General Comment 7 (July 28, 2020)

Newfields Data: In footnote 1 on page 7, NW Natural notes that the SA does not include the 2014-2015 Newfields data for reasons stated in the Gasco Sediments Site Sufficiency Assessment. As stated in EPA's comment on the PDI work plan for the B1 Navigation Channel, 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 (DQOs) but use of the data should be considered for making RD decisions in this project area. EPA expects NW Natural to review the data in relation to RALs and PTW thresholds to determine if there are any impacts to sediment management area (SMA) delineation.

NW Natural Response (November 10, 2020)
Consistent with Section 3.2 of the Navigation Channel Revised Final Pre-Design Investigation Work Plan (PDIWP; Anchor QEA 2020) and Field Change Request No. 1 to EPA (dated September 25, 2020), an expanded rationale for excluding the NewFields data from any RD evaluation and, therefore, this Sufficiency Assessment has been added to Section 2.3. In summary, and as discussed with EPA in connection with the PDIWP, the design level EPA- approved PDI data collection is designed to generate a comprehensive, temporally consistent, high-density matrix of sediment quality data that will be used to support design and obviates any need to further consider the NewFields data.

EPA Response (December 22, 2020)
Because the Newfields dataset is approved for RD by EPA, the data should not be entirely disregarded at this phase of the RD. EPA acknowledges NW Natural's concern regarding the use of the Newfields data for RD; however, a qualitative discussion of the RAL and PTW threshold exceedances for this dataset would be helpful. The discussion could be supplemented or superseded with PDI data for the Newfields reoccupation samples after approval of the PDI Evaluation Report. If NW Natural chooses to exclude the Newfields data from the SA then all PDI data, including the reoccupied samples should be considered when updates on the status of potential sources are provided in the BODR and the pre-final (95%) RD submittals.

EPA General Comment 8 (July 28, 2020)
Sufficiency Assessment Summary: For "C" status sites, the Sufficiency Assessment Summary (Table 5-1) 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.

NW Natural Response (November 10, 2020)
Tables 6-1, 6-2a, and 6-2b (formerly 5-1) have been revised to differentiate between uncontrolled sources (designated C(u)) and sources where additional assessment is recommended (designated C(a)).

EPA Response (December 22, 2020)
Table 6-1 classifies the status of deep groundwater at several sites as "Unknown." Additional information should be gathered for these sites to assign an appropriate source control category (A, B, C(a), or C(u)) during future versions of the source control status table that will be provided in the BODR and the pre-final (95%) RD submittals.

EPA General Comment 9 (July 28, 2020)
Recontamination Potential Chemicals: References to recontamination potential chemicals (RPCs) should be removed from the SA. The SA appears to use the term "RPCs" to describe all chemicals that

were screened to evaluate recontamination potential (i.e., all ROD Table 17 COCs) and the report should clarify that all ROD Table 17 COCs were screened.

NW Natural Response (November 10, 2020)

The term "RPC" has been deleted from the Final Sufficiency Assessment and replaced throughout with "ROD Table 21 COCs." For recontamination potential evaluation purposes, only the COCs identified in ROD Table 21 have been compared against their associated RALs and PTW-highly toxic thresholds.

EPA Response (December 22, 2020)

The use of the term "ROD Table 21 COCs" appears accurate throughout the text. However, as described in Section 2.2, achievement of CULs from ROD Table 17 are a long-term requirement of the remedy to achieve remedial action objectives (RAOs). Therefore, assessment of recontamination must consider contaminants other than just ROD Table 21 COCs. The Final SA includes many contaminants other than ROD Table 21 COCs in the text, screening tables, and appendix figures, so changes are not required.

EPA Specific Comment 2 (July 28, 2020)

Section 3.1.6 Riverbed Elevation Changes, pages 11-13: Additional discussion should be provided on the erosion and depositional patterns of the Navigation Channel Project Area. Much of this section focuses on other project areas, and the summary table of erosional and depositional areas (Table 3-1) does not include the Navigation Channel Project Area. Based on inspection of Figures 3-5a through 3-5h and Map 3.1-6 provided in Appendix A, it appears that most of the Navigation Channel Project area is neutral or erosional. This pattern of limited sediment accumulation in the project area has a substantial impact on the potential for recontamination via sediment deposition from upstream sources and should be discussed in the SA.

NW Natural Response (November 10, 2020)

Section 3.1.7 has been revised to specifically discuss erosion and depositional patterns over time for the Project Area. Table 3-1 has been revised to include net erosional, neutral, and net depositional acreages for the Project Area.

EPA Response (December 22, 2020)

The changes to Section 3.1.7 are helpful for characterizing riverbed elevation changes over time and supporting the discussion of sediment erosion and deposition within the Navigation Channel Project Area. However, the conclusions of this assessment do not seem to be incorporated into the recontamination CSM. Specifically, the text in Section 3.1.7 describes that there is a mixture of erosional, neutral, and depositional areas within the Navigation Channel Project Area and Table 3-1 indicates that only 28.4% of the Navigation Channel Project Area was classified as depositional based on riverbed elevation changes from 2002 to 2018. Similarly, the PHSS remedial investigation states that the reach between river miles (RMs) 5 and 7 are dominated by areas of small-scale net erosion (Section 6.2.1.3.2) and the PHSS feasibility study shows that much of the reach between RMs 5 and 6 had a negative score for the multiple lines of evidence for MNR (Appendix D Figure D8-7). These data and analyses suggest that widespread sediment deposition is not likely to occur in much of the project area, which lessens the potential for sediment recontamination in those areas. This aspect of the CSM must be considered when assessing recontamination potential in the sufficiency assessment summary to be provided with the BODR and the updated sufficiency assessment summary table in the pre-final (95%) RD submittal.

EPA Specific Comment 3a (July 28, 2020)

Section 4.1, Upland Sources to Other Project Areas, pages 15-39: The conclusions derived from the information presented in this section should be provided in the SA. The information provided in these sections is a summary of upland pathway status presented in the Portland Harbor Upland Source Control Summary Report (DEQ 2016) and no supporting data or updates to source control status since 2016 are provided. The relevance of this information to the Navigation Channel Project Area is not described and there is no description of a complete migration pathway from these upland sources to the Navigation Channel Project Area. Additionally, these upland facilities are not included in the recontamination evaluation summary presented in Table 5-1. If the updated CSM does not identify a complete transport pathway (see General Comments 2 and 3), then this information is not needed and should be removed from the SA (see General Comment 4).

NW Natural Response (November 10, 2020)

The Oregon Department of Environmental Quality's 2016 Portland Harbor Upland Source Control Summary Report is the most recent, publicly available source control status document for the majority of the upland sites. In addition, the Willamette Cove Sufficiency Assessment (GSI 2020; dated June 29, 2020) was used to expand on more current source control information for the Willamette Cove Project Area. Per Section 3.4 ("Recontamination Conceptual Site Model Summary") of the Navigation Channel Final Sufficiency Assessment, the sources of potential sediment recontamination to the Project Area are associated with the following: 1) the indirect upland pathway of deep groundwater; 2) the indirect upland pathways for stormwater, direct discharge, shallow groundwater, and riverbank erosion derived from upland properties adjacent to other project areas; 3) the direct in-water pathway of suspended sediment in surface water from near-field and far-field recontamination potential sources; 4) the direct in-water pathway of depositional sediment proximal to the Project Area; 5) the direct in-water pathway of surface and subsurface sediment present in other project areas (with near-field and far-field recontamination potential sources) with the potential to erode, resuspend, and subsequently migrate and deposit into the Project Area, and 6) the direct in-water pathway derived from remediation dredging in other project areas with the potential to erode, resuspend, and subsequently migrate and deposit into the Project Area.

EPA Response (December 22, 2020)

Because there are no upland facilities directly adjacent to the Navigation Channel Project Area, contaminants from upland sites are less likely to discharge to the Navigation Channel Project Area at concentrations that pose a threat of recontamination. Documented or suspected contamination in the Navigation Channel Project Area that originated from upland sources has not been demonstrated in the SA, and a complete migration pathway has not been explicitly identified from upland sources to the Navigation Channel Project Area. As described in EPA's response to General Comment 1, NW Natural may elect to retain these upland source summaries in the Final SA, but EPA does not consider the information presented in Section 5.1 to be sufficient to support a delay in proceeding with RA.

EPA Specific Comment 3b (July 28, 2020)

Section 4.1, Upland Sources to Other Project Areas, pages 15-39: The evaluation of upland sources should focus on areas with an identified migration pathway to the Navigation Channel Project Area. The Navigation Channel Project Area is unique among the project areas throughout the Portland Harbor Superfund Site because it is not directly adjacent to upland facilities. Therefore, contaminant migration

pathways to the Navigation Channel Project Area from upland facilities may not be as direct as project areas along the shoreline. Generally, facilities directly upland from the Navigation Channel Project Area are more likely to have a complete migration pathway based on proximity to the project area, but this should be confirmed based on a site-specific CSM.

NW Natural Response (November 10, 2020)
See responses to EPA General Comments 1 and 4.

EPA Response (December 22, 2020)
See EPA response to General Comment 1 and Specific Comment 3a.

EPA Specific Comment 3c (July 28, 2020)

Section 4.1, Upland Sources to Other Project Areas, pages 15-39: A discussion of the groundwater that discharges to the Navigation Channel Project Area must be added to the SA. Appendix C of the Portland Harbor Remedial Investigation (RI) report identifies contaminated groundwater from the Gasco and Siltronic upland sites that discharges to the Navigation Channel Project Area (EPA 2016). The status of each of the groundwater contamination plumes and potential impact on achieving the ROD remedial action objectives at the Navigation Channel Project Area should be discussed in the SA. Discuss any sources, COCs, and/or pathways contributing to contamination in the groundwater that have not been effectively addressed and could impact the implementation of the remedial action. If there are data gaps in groundwater characterization they should be identified, and a plan should be established for how these data gaps will be addressed. Groundwater sources should be added to Table 5-1, as appropriate, and assigned a source control status.

NW Natural Response (November 10, 2020)
The only potential indirect upland migration pathway that discharges into the Project Area is via the deep groundwater pathway. Sources of potential deep groundwater discharge are documented in Section 4.1.

EPA Response (December 22, 2020)
The text in Section 4 indicates that there are still some uncertainties associated with the deep groundwater pathway (resulting in the "unknown" description in Table 6-1). This represents a data gap that should be identified in Section 4.3. Future summaries of the sufficiency assessment to be provided with the BODR and the pre-final (95%) RD submittal should discuss whether this data gap has been filled. If the data gap remains, the BODR and pre-final (95%) RD submittals should describe whether uncertainties in the deep groundwater pathway could affect remedy effectiveness.

EPA Specific Comment 4 (July 28, 2020)

Sections 4.1.2, B1 Boundary – Gasco Sediments Project Area and 4.1.3, B1 Boundary – US Moorings Project Area, pages 17-21: Sufficiency assessment reports are currently under EPA review for the Gasco Sediments Site and US Moorings project areas, which are the two project areas directly adjacent to the Navigation Channel Project Area. Owing to their locations, these two project areas are particularly relevant for evaluating source control and recontamination potential in the Navigation Channel Project Area. The information presented in the SA should be updated, as appropriate, based on the EPA comments on the Gasco Sediments Site and US Moorings sufficiency assessment reports.

NW Natural Response (November 10, 2020)

The Final Sufficiency Assessment has been updated with relevant and applicable information, based on EPA comments on the US Moorings Sufficiency Assessment. The U.S. Army Corps of Engineers is in the process of providing NW Natural with additional environmental data for the upland pathways, and this additional information will be included in the US Moorings Final Sufficiency Assessment. NW Natural has not received comments on the Gasco Sediments Site Sufficiency Assessment.

EPA Response (December 22, 2020)

EPA understands that continual refinement of source control status will occur during future summaries of the SA to be provided with the BODR and the pre-final (95%) RD submittals as additional information is gathered and updates are made to the US Moorings SA and Gasco Sediments Site SA.

EPA Specific Comment 5a (July 28, 2020)

Section 4.1.2.1 Gasco Sediments Site Project Area Description, page 17: The SA indicates that the hydraulic control and containment (HC&C) system "eliminates discharge" of groundwater in the alluvium water-bearing zone (WBZ) to the Willamette River. To clarify, the HC&C system is achieving design and performance objectives for the upper and lower portions of the WBZ by maintaining groundwater elevations below the elevation of the Willamette River along the NW Natural property and northern portion of the adjoining Siltronic property (i.e., maintaining hydraulic gradients from the river towards the uplands). Evaluation of the influence of the HC&C system on groundwater in the deep portion of the Alluvium WBZ is ongoing.

NW Natural Response (November 10, 2020)

It has been demonstrated in Section 5.3.4 of the DEQ-approved Gasco Groundwater Modeling Report (Anchor QEA 2017) that the HC&C system is currently capturing groundwater from the Deep Lower Alluvium WBZ. Specifically, see Figures 5-5 through 5-10b of the report showing particle tracking paths under pumping and non-pumping conditions. Section 4.1 of the Final Sufficiency Assessment has been revised to address this comment.

In addition, a new Section 3.1.2 ("Geology and Hydrogeology") has been added in Section 3 of the Final Sufficiency Assessment to provide specific project information on geological setting.

EPA Response (December 22, 2020)

EPA understands that the evaluation of the Deep Lower Alluvium WBZ is ongoing. Future summaries of the SA report to be provided with the BODR and the pre-final (95%) RD submittal should incorporate any updates to the assessment of the deep groundwater plume.

EPA Specific Comment 11 (July 28, 2020)

Section 4.2.2 Depositional Sediment Data Evaluation, pages 42-43: The text in this section should clearly state that the depositional sediment sampling (i.e., surface sediment sampling being discussed) was not conducted within the navigation channel, and therefore has limited applicability to the Navigation Channel Project Area. As described in Section 3 and shown on Figures 3-2, 3-5c, and 3-5g, the hydrodynamic conditions in the Navigation Channel Project Area and the adjacent Gasco Sediments Site Project Area are very different and the two project areas have different sediment deposition/erosion

patterns. The Gasco Sediments Site is adjacent to upland facilities, directly downstream of other nearshore project areas, and the pilot cap did not cover all areas of contaminated sediment. The transport processes that may have resulted in sediment accumulation at the Gasco Sediments Site are distinct from those in the Navigation Channel Project Area. These factors all suggest that the deposited sediment sampled on top of the Gasco Early Action pilot cap is unlikely to be representative of sediment that may accumulate within portions of the Navigation Channel Project Area. For these reasons, EPA does not consider these data to be a primary line of evidence when evaluating sediment recontamination potential at the Navigation Channel Project Area.

NW Natural Response (November 10, 2020)

The Final Sufficiency Assessment has been revised to provide the rationale for using depositional sediment data directly adjacent to the Project Area as a secondary line of evidence for suspended sediment in surface water that could be remobilized and deposit in the Project Area.

EPA Response (December 22, 2020)

Future versions of Table 6-2b should not include the "Depositional Sediment Proximal to Project Area" as a specific pathway. Although these data may be used as a secondary line of evidence to assess recontamination potential, this should not be considered a pathway that must be addressed before RA can proceed. Instead, EPA considers these data as a line of evidence for potential sediment resuspension from the Gasco Sediments Site that could recontaminate the Navigation Channel Project Area if the Gasco Sediments Site is not remediated before the Navigation Channel Project Area.

EPA Specific Comment 12 (July 28, 2020)

Section 4.3 Sediment Erosion and Remediation Dredging Impacts, pages 43-53: 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 Navigation Channel Project Area, the relevance of these summaries is unclear.

NW Natural Response (November 10, 2020)

A general assessment of the potential recontamination of the Project Area from the in-water migration pathway of sediment erosion from near- and far-field Plan B boundaries and from remediation dredging impacts has been added to Sections 5.4 and 5.7, and Table 6-2b.

EPA Response (December 22, 2020)

As described in EPA's response to General Comment 4, the source control status of C(u) is reserved for sources that are not sufficiently assessed or controlled to the extent that sediment cleanup should not proceed until additional controls have been implemented and assessed for effectiveness. EPA does not agree that all other in-water project areas should be assigned a C(u) status. Furthermore, there is insufficient evidence presented in the SA to justify the "High" or "Medium-High" magnitude of risk of potential recontamination from each of these project areas. Remedy implementation under EPA oversight will consider appropriate sequencing of remedial actions and operational BMPs such that recontamination potential from upstream sources is minimized during remedy construction. Future versions of Table 6-2b should be updated, as appropriate.

EPA Specific Comment 13 (July 28, 2020)

Section 4.4 Recontamination Potential Assessment, page 53: The assessment presented in this section does not accurately reflect the information presented in the SA. Although Section 4.3 presents frequencies of RAL and PTW exceedances, there is no discussion of whether these exceedances occur in erosive areas. Section 4.1 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 navigation channel. Revise the text as appropriate.

NW Natural Response (November 10, 2020)

Section 5.1 ("Upland Sources to Other Project Areas") has been revised to describe the upland sources within near- and far-field project areas that may have a sediment recontamination potential to the Project Area. This section has also been updated with more recent documentation obtained since the initial submittal of the Sufficiency Assessment. Section 5.7 ("In-Water Recontamination Potential Assessment") discusses the potential of erosion (due to propeller wash) of surface and subsurface contaminated sediment into the Project Area. See responses to EPA General Comments 1 and 4.

EPA Response (December 22, 2020)

See EPA response to General Comments 1 and 4 and Specific Comment 12.

EPA Specific Comment 14 (July 28, 2020)

Section 4.6 Data Gaps Identification, page 54: An evaluation of data gaps specific to the Navigation Channel Project Area must be provided in the SA. The SA concludes that data gaps for the Navigation Channel Project area will be informed by RD work at other project areas. As the only project area entirely within the navigation channel, the Navigation Channel Project Area is unique, and data likely exist that will not be informed by work at other project areas.

NW Natural Response (November 10, 2020)

Section 5.6 ("Data Gaps Identification") has been revised to include potential data gaps resulting from the current understanding of the in-water migration pathways impacting the Project Area.

EPA Response (December 22, 2020)

The sufficiency assessment summary to be provided in the BODR should discuss whether there are any remaining data gaps in the sufficiency assessment and whether those data gaps could impact RD. Remaining data gaps should be assessed and considered when developing the updated sufficiency assessment summary tables in the BODR and pre-final (95%) RD submittals.

EPA Specific Comment 16 (July 28, 2020)

Table 5-1 Recontamination Evaluation Summary: The source control status ratings (i.e., A, B, or C) presented in Table 5-1 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 Navigation Channel 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 Navigation Channel 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.

NW Natural Response (November 10, 2020)

As discussed in response to EPA General Comment 5, the in-water pathways have been arranged based on spatial proximity to the Project Area. See the response to EPA General Comment 4 regarding contaminated sediments throughout the Portland Harbor Superfund Site having the ability to recontaminate the Project Area sediments. A general magnitude ranking of low, medium, or high potential risk to contribute to recontamination of the Project Area has been added to the summary table (now Table 6-2b) for each of the other project areas.

EPA Response (December 22, 2020)

The intent of the SA summary table is to identify sources that must be addressed before cleanup can proceed or must otherwise be integrated into the in-water design. A status of C(u) or C(a) indicates that cleanup should not proceed until controls have been implemented and assessed for these potential sources. As described in EPA responses to General Comments 1, 4, and 5, and Specific Comment 12, there is insufficient evidence to suggest that upland sites discharging to other project areas warrant a C(u) or C(a) status and it is inappropriate to assign a C(u) status to every other project area. Future versions of Tables 6-1, 6-2a, and 6-2b should be updated based on the comments provided herein.

EPA Specific Comment 18d (July 28, 2020)

Figure 4-4a through 4-4i and Appendix C Figures C-2a through C-2z: 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.

NW Natural Response (November 10, 2020)

Non-detects were excluded for individual chemicals where the method for the detection limit is very low and not sufficiently accurate. This was specifically applied to individual dioxins/furans congeners; exceedances for individual dioxins/furans congeners may occur, but this would result in biasing overall results high. In addition, when calculating sums/totals for polycyclic aromatic hydrocarbons (PAHs), PCBs, DDx, non-detects are currently included in the calculation, consistent with the ROD data management procedures.

EPA Response (December 22, 2020)

EPA does not agree with the exclusion of non-detects based on the rationale provided. Specifically, if the method detection limit is very low and the analyte was not detected, this is useful data because it indicates the analyte concentration is lower than the detection limit (which is described as “very low”). Handling of non-detected results for statistical analysis should follow EPA’s *Data Quality Assessment: Statistical Methods for Practitioners, EPA QA/G-9S* Section 4.7 Values Below Detection Limits.

EPA Specific Comment 19 (July 28, 2020)

Figures 4-5a through 4-6i: The sampling locations within the Navigation Channel 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 Navigation Channel Project Area and state that they will be addressed during RD. Understanding the current distributions and trends in contaminant concentrations within the Navigation Channel 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.

NW Natural Response (November 10, 2020)

Consistent with the response to EPA General Comment 3, Sections 3.3 ("Nature and Extent of Contamination Within the Project Area") has been included to present current RAL and PTW-highly toxic threshold exceedances within the Project Area. The Sufficiency Assessment evaluates post-remedy conditions, which will necessarily contain or remove any potential sources of recontamination from within the Project Area. Therefore, Section 5 does not include a discussion of potential recontamination from surface/subsurface sediment data within the Project Area.

EPA Response (December 22, 2020)

For clarification, the intent of this comment was to provide visual comparison of contaminants that exceed RALs and PTW thresholds in the Navigation Channel Project Area and other project areas. This comparison would support the CSM because it would show which other sites have similar contaminants as the Navigation Channel Project Area. This could be used as a line of evidence in the recontamination potential assessment, because if a contaminant is not present in the Navigation Channel Project Area it suggests there has not been historic migration of that contaminant from other source areas.