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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
OREGON OPERATIONS OFFICE
811 S.W. 6th Avenue
Portland, Oregon 97204

February 11, 2004

Mr. Jim McKenna
Port of Portland & Co-Chairman, Lower Willamette Group
121 NW Everett
Portland, Oregon 97209

Mr. Robert Wyatt
Northwest Natural & Co-Chairman, Lower Willamette Group
220 Northwest Second Avenue
Portland, Oregon 97209

Re: Portland Harbor Superfund Site; Administrative Order on Consent for Remedial Investigation and Feasibility Study; Docket No. CERCLA-10-2001-0240
RI/FS Work Plan

Dear Messrs. Wyatt and McKenna:

We have completed our review of the Revised Draft Final Programmatic Work Plan (Work Plan), dated November 13, 2003. This document is a major improvement over previous drafts and has addressed a number of the issues raised in our July 25, 2003 comment letter. Additionally, because EPA has agreed to allow the Respondents to produce additional technical memoranda, there are only a few significant issues remaining. Attached to this letter are EPA's comments that need to be addressed prior to EPA approval of the Work Plan.

In order to expedite completion of the Work Plan approval process, EPA would like to use a different revision process that would help achieve final approval of the Work Plan no later than 30 days from receipt of these comments. Rather than submit all of the Respondents' proposed changes in a revised Work Plan within 30 days, Respondents shall provide all revisions to the specific sections/pages in the Work Plan in response to EPA comments prior to a scheduled meeting with EPA. This approach is in lieu of requiring resubmittal of another complete draft of this document that would need to go through the review/comment cycle. EPA will then meet with Respondents to discuss revisions.

We would like to meet with the Respondents to resolve EPA's comments no later than March 3, 2004. Therefore, EPA requests that the Respondents provide its revisions to the Work Plan at least 5 days prior to the meeting. We believe this revision schedule is reasonable, because EPA has provided specific language modifications for a number of comments. The meeting discussions then should generally be limited to comments and issues where EPA did not provide Respondents with specific language in the comments. We propose to use the meeting time to work through the Respondents' proposed changes and, hopefully, reach

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agreement on the needed modifications.

Please note that a key element that needs to be resolved before final approval of the Work Plan is the project schedule. EPA discussed some of our initial concerns with the Respondents' proposed project schedule at our February 5, 2004 meeting . We must continue to work together to develop an acceptable schedule for the RI/FS so the schedule can be incorporated in the Final Work Plan.

If you do not agree to use the process as outlined above, please inform us within 3 days of your receipt of this letter. In that event, Respondents must revise the draft Work Plan to respond to all comments and resubmit the complete Work Plan no later than 30 days from your receipt of these comments. If you have any questions, please call Chip Humphrey at (503) 326-2678 or Eric Blischke (503) 326-4006. All legal inquiries should be directed to Lori Cora at (206) 553-1115.

Sincerely,

Chip Humphrey
Eric Blischke
Remedial Project Managers

cc: John Crellin, ATSDR
Helen Hillman, NOAA
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Rick Eichstaedt, Nez Perce Tribe
Paul Ward and Tom Zeilman, Confederated Tribes of Yakama Nation
Valerie Lee, Environment International
Betsy Day, Integral Consulting

EPA REVIEW COMMENTS
PORTLAND HARBOR RI/FS REVISED DRAFT FINAL PROGRAMMATIC WORK PLAN

GENERAL COMMENTS:

Human Health Risk Assessment:

Fish Consumption Rates and Exposure Point Concentrations. EPA, in consultation with its partners, has developed a proposal for the evaluation of the fish consumption exposure pathway in the human health risk assessment. The attached spreadsheet and narrative (Summary of Fish Consumption Issues and Resolution for the Portland Harbor RI) describes fish consumption rates and how fish consumption exposure point concentrations will be determined. EPA directs the LWG to utilize the described approach in the human health risk assessment.

Ecological Risk Assessment:

DEQ and its partners still have a number of comments regarding the ecological risk assessment that must be addressed before EPA can approve the Work Plan. Some of the comments are straight forward and can be addressed through simple text changes (see Specific Comments on Appendix B). However, there are still a number of questions about how the ecological risk assessment will be performed. Although the current project schedule calls for submittal of an Ecological Exposure Characterization Approach Technical Memorandum (TM), it is unclear if this document, as currently envisioned, will be adequate to address agency comments on the ecological risk assessment approach. As a result, EPA directs the LWG to incorporate the following elements into a comprehensive ecological risk assessment TM:

- Assessment Endpoints: Further clarification is required regarding how various ecological receptors will be evaluated. The link between assessment endpoints and measures of effect and exposure must be clearly described in the technical memorandum. EPA will provide direction on measures of effect and exposure to the LWG prior to the upcoming EPA/DEQ Work Plan meeting.
- Habitat Viability and System Function: One of the criteria used to select assessment endpoints for the ecological risk assessment is "the concepts of habitat viability and function of the system". More clarification on the role of habitat and system function is required in the TM.
- Exposure Point Concentrations: Further discussion regarding the calculation of exposure point concentrations for various ecological receptors is required. This includes sediment concentrations for both mobile and immobile species and fish tissue concentrations. It is critical that localized effects on populations be considered in development of exposure point concentrations. Some specific issues related to the EPC that should be discussed and agreed upon by the LWG and the EPA and its partners prior to completion of the

Preliminary Risk Evaluation include 1) identification of the specific area selected to represent a receptor; 2) selection of the specific sediment samples used to represent a receptor (prior to receiving analytical chemistry results); and 3) selection of the specific method or methods (such as area weighted averages, 95 percent confidence intervals, or nonparametric methods) used to calculate the EPC for a specific receptor.

- Food Web Model: A TM on the selection and use of the food web model for the site needs to be developed and submitted.
- The development and use of the Preliminary Risk Evaluation (PRE): Further discussion of the preliminary risk evaluation should be included in this section. The objectives of the PRE should be presented as well as where the PRE fits into the overall risk assessment process. The ecological risk assessment technical memoranda shall be approved prior to submittal of the PRE.
- Evaluating the risk resulting from PCB exposure. The previous version of the Work Plan included an approach for evaluating PCB exposure. This statement was removed in response to agency comments rather than revised. The technical memorandum process should be used to develop an acceptable approach toward evaluating ecological exposure to PCBs
- Data Quality Objectives (DQOs): A revised set of data quality objectives for the ecological risk assessment should be submitted once the ecological risk assessment approach has been finalized through the technical memorandum process.
- Proposed benthic risk assessment approach: The Work Plan states that effects on the benthic community will be evaluated through a predictive relationship between sediment chemistry and toxicity. However, as stated in our previous comments on the Field Sampling Plan, at some locations the use of bioassays to determine directly whether an area is toxic to the benthic community may be required. The Work Plan should acknowledge that a direct toxicity approach will be utilized where the predictive approach fails. Also, a revised plan for interpretation and analysis of the bioassay data proposed for collection during Round 2B has not been submitted. Attachment A4 should be removed, and a plan for proceeding with the analysis and interpretative criteria of the bioassay testing should be developed further in a technical memorandum. In addition, in its July 2003 comment letter on the March 2003 RI Work Plan, EPA requested the complete list of organisms identified from each sample collected during the Round 1 sampling effort. This list should be submitted as part of the benthic analysis approach TM. Table 5-2, Figure 5-1 and Attachment B-4 should also be revised to reflect the agreed upon approach.
- Home Range and Foraging Areas: Data must be collected to justify site use factors (SUFs) less than 100%. If SUFs less than 100% are contemplated, empirical studies must be proposed and described in the Work Plan.

EPA recognizes that addressing the above issues through the development of a comprehensive ecological risk assessment TM will be time consuming. However, in the interest of overall project schedule, EPA is willing to approve the Work Plan and accompanying field sampling plan (FSP) as long as the LWG commits to resolving these issues in a timely and cooperative

manner.

Contribution of Sources:

Sources of contamination to Portland Harbor may contribute localized areas of risk exceeding acceptable levels. Sources include storm water discharges, groundwater discharges, atmospheric deposition and non-point source runoff. If it is determined that these sources contribute to unacceptable risk to the site, a combination of upland source control measures and in-water remediation measures will be required. The RI/FS must address the evaluation of the contribution of contaminant sources to localized or site wide risk. EPA and its partners recognize that it is not the responsibility of the LWG to gather the information necessary to design and implement source control measures. However, it is critical that the RI gather sufficient data for the human health and ecological risk assessments to evaluate the risks associated with the release, discharge or emission of these sources to Portland Harbor.

Interim Risk Evaluations:

The use of interim risk evaluations as described in the Work Plan may be used to focus the remedial investigation. However it is critical that aspects of the investigation such as the characterization of groundwater/pore water and data collection efforts to support the hydrodyhamic model are adequate to be able to understand whether (and under what conditions) receptors may be exposed contaminated subsurface sediment above acceptable levels. Moreover, any interim risk evaluations must be based on conservative exposure assumptions to ensure that the baseline risk assessment is comprehensive.

Future Data Needs:

Although the Draft Round 2 Field Sampling Plan describes a comprehensive sampling approach, additional data collection may be required to address data needs identified in subsequent TMs, data gaps identified during sampling rounds 2A and 2B or newly obtained information regarding suspected hazardous substance releases. Although it is presumed that these data gaps will be addressed during sampling Round 3, the exact mechanism for collecting this data will be determined at the time the data need is identified.

Data Use:

QA 1 and QA 2 Data Validation. The LWG has stated in many documents that data undergoing a QA 1 validation is acceptable for use as long has the results of the data validation process determined that the data was category 1 data. EPA is concerned that some data sets may have problems that are not identified through a QA 1 validation process. As a result, EPA has determined that only data that has undergone a QA 2 validation process or that has otherwise been approved for use by EPA may be used to support the human health and ecological risk assessments. QA 1 data may be used to estimate the nature and extent of contamination and

delineate sediment management areas (SMAs). If critical data sets necessary to support the risk assessment process are identified by the LWG, those data sets must undergo QA 2 validation or otherwise be approved for use in the risk assessment by EPA.

Schedule:

There are numerous schedule references that are either out of date or inaccurate. EPA and the LWG are in the process of developing an acceptable project schedule. EPA does not intend to approve the Work Plan until an acceptable overall project schedule is finalized. Key elements that need to be addressed in the schedule include reasonable time for agency review and comment, submittal of interim deliverables for the purpose of determining data sufficiency, and the incorporation of additional technical memoranda. EPA must have clear date-certain deadlines in the schedule for: (1) sampling events, (2) data analysis and validation, (3) when EPA will receive validated data (60 days from sampling); and (4) when all samples must be analyzed and validated thus starting the 120 day clock on the characterization summary.

Site Boundary:

EPA does not agree with many elements of the site boundary discussion presented in Section 6.3.1. This is a critical issue to both EPA and the LWG that will take additional time and discussion to resolve. As a result, EPA directs the LWG to remove Section 6.3.1 from the Work Plan and commit to resolving this issue with EPA and its partners in the near future.

Groundwater:

EPA and its partners provided comments on the groundwater report on January 30, 2004. Much of the language presented in Section 7.2.3 is similar or identical to language in the groundwater report. Any changes to the groundwater report that affect language in the Work Plan must be reflected in the Work Plan.

Preliminary Remediation Goals:

The Work Plan does not contain sufficient detail regarding the development of preliminary remediation goals (PRGs). EPA directs the LWG to commit to the development of a TM that will describe how PRGs will be developed.

Conceptual Site Model:

EPA and its partners provided comments on the conceptual site model (CSM) on January 30, 2004. The Work Plan has many references to the conceptual site model that need to be revised to reflect the current understanding regarding the timing and content of the CSM. In addition, the CSM should be considered a vehicle for resolving a number of issues identified above such as the consideration of contaminant sources to the site and the resolution of groundwater issues.

SPECIFIC COMMENTS

Section 1

Section 1.3.2, p 8. The discussion of the conceptual site model should describe the Conceptual Site Model development process as agreed upon.

Section 1.3.2, p 10. Insert the following sentence in the penultimate paragraph on page 10: Areas of localized risk and site-wide risk will be considered in the FS.

Section 1.3.3, p 11. Reword the following sentence: "As appropriate, validated results from previous rounds of investigation will be documented and provided to EPA for review to guide in scoping subsequent rounds of the investigation" to: "Validated results with corresponding sampling location information from previous rounds of investigation will be documented and provided to EPA for review as soon as possible to guide in scoping subsequent rounds of the investigation."

Section 1.3.3, p 11. The RI/FS data generation and reporting should be revised consistent with our ongoing discussions regarding project schedule.

Section 1.4, p 12. The second and third sentences of this section should be revised to read: "LWG will coordinate cultural resource work with appropriate tribes to ensure a full and comprehensive cultural resource analysis is done when characterizing Site use. The cultural resource analysis and cultural use analysis will be initiated in 2004 and will be considered in future work. "

Section 1.5 - Community Relations. Delete sentence that states "EPA has not yet prepared a specific in-water Community Relations/Public Participation Plan as required by the AOC." The plan for the Portland Harbor Superfund Site relates to both interested community members for upland work and the sediment/river issues.

Section 1.6, p 13. Please revise the CSM text to read: A revised CSM will be submitted prior to the development of the Round 2, Phase 2 sediment coring FSP.

Section 2

Section 2.1.5, p 25, Section 5.0, Section 5.1.2 p 81, Section 5.1.3 p 83 and 84 and other locations. The term "porewater" should not be used indiscriminately unless it is related to a method specific water sample (and which should be defined as such in the glossary). This term appears throughout the document with a multitude of meanings and that is not acceptable. The concept of transition zone is related to ground water discharges to the river, which is a key conceptual model component for this entire site and project. It refers to a continuum of mixing between the ground water discharges and the surface water, occurring within the sediment

matrix, and that is an important concept that is lost using a term such as "porewater". Note that this needs to be changed globally in the draft Work Plan.

Section 2.6, p 40. There are references to hydrodynamic modeling here and throughout the draft Work Plan, but there is no single section or subsection which documents the draft modeling plan or discusses the modeling as a main topic. Many of the references are in the Natural Attenuation section, but there should be a section prior to that which discusses the draft plan that was submitted to EPA and how the results will be incorporated into the RI/FS.

Section 3

Section 3.4 Spills. EPA requested that spills earlier than 1995 be added as the information could help identify areas for sediment sampling or possible sediment contamination. It appears from the text that some information from 1982 has been added to Appendix E. This section's information appears to be limited; however, to spills for which there are reporting requirements under a regulatory program. The LWG or individual members likely have historic information about spills from overwater activities and product transfer and handling practices occurred. The information in Appendix E should include known significant historic spills and handling practices that resulted in contaminants being put into the river, as this information may be relevant for the CSM and future sampling.

Section 3.8.1, p. 49. Table E-5 (not E-4) in Appendix E of the Work Plan identifies shoreline facilities upstream of the ISA that are listed in DEQ's ECSI data base.

Section 4

Section 4.1, p 51. The Work Plan should state that Category 1 data include data that have been validated according to QA 1 and QA 2 validation procedures. Only data that are QA 2, or otherwise approved by EPA, may be used to support the human health and ecological risk assessments. Data that are QA 1 may be used to support other aspects of the RI/FS such as the development of sediment management areas (SMAs). If Category 1, QA 1 data sets are determined to be critical to the human health or ecological risk assessments, this data must be validated according to QA 2 validation procedures. In either case, all Category 1 data to be used for any purpose during the RI/FS must be evaluated to determine its suitability for use. Factors to be considered include, but are not limited to:

- The use of appropriate detection limits;
- Sample compositing techniques;
- Analytical methods;
- Age of data;
- Sample depth; and
- Whether the sample is located in an area of scour or deposition.

Section 4.2, p 57. The Work Plan states that chemical "concentrations may or may not be representative of current conditions or representative of sources that originated in the ISA." The Work Plan should state that historic data will be evaluated based on a weight of evidence approach (i.e., do historic data make sense given our understanding of sources, pathways and the results of contemporary sediment sampling). This evaluation should be performed as part of a data sufficiency analysis following completion of the Round 2 sampling event and prior to commencement of the Round 3 sampling event.

Section 4.2.2, p 61. A paragraph should be included which describes how subsurface data was presented on Maps 4-21 through 4-38. For example, if a location had several samples (from different depths in the same core), how were these presented? In addition, the text should indicate the depth range for surface sediment data presented in Maps 4-3 through Maps 4-20.

Section 4.5, p 75. The text should state that a limited commercial crayfish fishery exists within the Lower Willamette River. In addition, the fifth sentence of the last paragraph should be revised as follows: "A news story by the Oregonian and limited interviews conducted by ATSDR suggest that groups likely to be catching and eating fish from the LWR include immigrants from Eastern Europe (continue with text in draft)..."

Section 4.6, p 75. Change the text of the following sentences. "For example, the historic database contains some samples with high undetected concentrations of PCBs. From an analytical perspective, these data are Category 1 and acceptable for use. From a risk assessment perspective, these data are likely not useful because the concentrations were undetected and therefore the risk associated with them cannot be defined." to: For example, the historic database contains some samples with undetected concentrations of PCBs at high detection limits. From an analytical perspective, these data are Category 1 and acceptable for use. From a sampling design perspective, these data are not useful because of the uncertainty associated with concentrations below the high detection limits and additional sampling and analysis may be necessary. From a risk assessment perspective, these data are also likely not useful because of the uncertainty associated with concentrations below the high detection limits and therefore the risk associated with these concentrations cannot be defined.

Section 4.6, p 75. Usability of Historical Data. The issue is discussed only in terms of category 1 and 2 data. This needs to be revised to address the further complications of QA1 vs. QA2 data (where QA2 has a more detailed quality assurance review).

Section 4.5, p 75. Commercial fishing for crayfish occurs in the ISA. This should be acknowledged in the 7th paragraph in this section.

Section 5

Section 5.0, p79. Revise the text to note that an revised CSM will be submitted in accordance with the approved project schedule.

Section 5.1.3, p 85. The fourth through sixth sentences in the first full paragraph should read: Halogenated and aromatic VOCs, low molecular weight (three or fewer aromatic rings) PAHs and certain species off metals generally exhibit a low affinity for sediments..... However, these more mobiles species may partition to aquifer materials and sediments under certain conditions (e.g., from anaerobic zones to more oxygenated zones). Other chemicals such as pesticides, high molecular weight (four or more aromatic rings) PAHs, and some metals, tend to adsorb or bind to soils or sediments....

Section 6

Section 6.0 - Overview of Portland Harbor RI/FS Process, 3rd paragraph. Second sentence should be amended as follows:

"It is anticipated that four rounds of data collection efforts conducted by the LWG will be used in conjunction with the Category 1 historic information to provide the site-specific data needs to complete the RI, baseline risk assessment, and FS reports: . . . "

Add following sentence to end of this paragraph: "However,
additional sampling rounds may be required to address data gaps identified as a result of technical memorandum development, review of Round 1 data or review of new data or information."

Section 6.1, p 99. Delete the five instances of "(or background)" in the numbered list of preliminary RAOs.

Section 6.2, p 100. The Work Plan should acknowledge that in addition to localized areas of risk as delineated by preliminary SMAs, contaminated sediments may present area or site-wide risks that will need to be addressed in the FS. One of the potential outcomes of the RI will be that unacceptable risk will be restricted to generally well-defined sources and areas of relatively high contaminant concentrations (and associated risk), and defined as SMAs. Another potential outcome will be that in addition to these relatively well-defined, areally limited SMAs; unacceptable risk will result from undefined sources and lower levels of contamination over large portions of Portland Harbor.

Section 6.2, p 100. Although EPA and its partners agree that interim risk evaluation can help focus the RI, this step can not be performed until the site is adequately characterized. The sentence in the first paragraph beginning with "Additional data" should be revised to read: "Additional data collection will be focused on data needed to characterize sources, contaminants, pathways and/or receptors and to reduce uncertainties associated with preliminary estimates of risk."

Section 6.2, p 100. The first sentence of the first full paragraph should be revised to read: "Once the site has been adequately characterized relative to the nature and distribution of chemical

constituents, the media, pathways, and chemicals driving unacceptable risk will be identified in the baseline risk assessment."

Section 6.2 - Objectives of the RI/FS, last paragraph on page 100. The language appears to limit the scope of the RI/FS to risk reduction from exposure to chemicals in sediment. This should include other media associated with the in-water portion of the Site (ie, groundwater and/or surface water).

Section 6.2, p 101. The last sentence of page 101 states that wildlife PRGs will be based in probable risk levels. PRGs should be based on threshold effect levels.

Section 6.2 - Objectives of the RI/FS, four paragraph and enumerated items 1 through 7, pages 102 - 104. The lead-in sentence should be revised to: "The RI/FS will develop the information to support the following elements for EPA's consideration in developing the proposed plan and ROD." EPA will consider these objectives (except the allocation/cash out item) as we develop the proposed plan, and suggest that these issues continue to be discussed and may be raised to EPA in the future in a letter. The reference to Allocation/Cash Out (Item 6) must be deleted. Additional references in this section to what the ROD will contain (ie, "the ROD should") are inappropriate and should be deleted.

Section 6.3.1, pp 105 - 107. This section should be deleted. Further discussion regarding the development of site boundaries is required before EPA can approve this section.

Section 6.4 - Major Phases of Work - First paragraph, delete following from the first sentence . . . "With the LWG's ROD goals in mind,". The LWG's ROD goals should be deleted per previous comment.

Section 7

Section 7.0, p 120. The fourth paragraph states the RI/FS will be completed third quarter of 2006; this should be changed to be consistent with the approved project schedule.

Section 7.2.2, p 128. This section should be revised to accurately reflect the current surface water sampling approach as described in EPA comments submitted on December 22, 2003.

Section 7.2.3, p 129. After the last sentence of the first paragraph of Problem Description, insert the sentence: "In addition, it is important to consider the total loadings of persistent, bioaccumulative toxins to the river." In addition, after the first sentence of the third paragraph, insert the sentence: "The groundwater component of the RI/FS should consider the risk presented from the cumulative effects of PBTs entering the river and subsequent bioaccumulation in fish."

Section 7.2.3, p 137. Delete language referring to method for screening and insert language from Appendix C comments: "After this review, the LWG, in consultation with EPA and its partners,

will determine which seeps will need further evaluation for human health risk assessment and the methods that will be used for this evaluation. This evaluation may include assessment of existing groundwater data or of new data collected by the LWG or other parties."

Section 7.3.4, p 141. Delete the last two sentences on item 4 that refer to the use of upstream fish tissue data.

Section 8

Section 8.0. The Work Plan description of the FS process relies heavily on the development of sediment management areas. Section 8 of the Work Plan should include a section that describes how site wide risks will be evaluated. For example, the FS should allow for the consideration of total loadings of PBTs on the system from contaminated groundwater, outfalls, over water activities, etc. In addition, the FS should consider potential remedial action alternatives/management approaches to address site-wide risks, not just risk presented by individual SMAs as the RI/FS should be building toward site-wide approaches as well as addressing hot spots and SMAs. Care should be taken in conducting field work to consider, where possible, collection of data that would allow identification of meaningful alternatives to reduce contaminants in fish.

Section 8.1 - FS Process and Major Steps, "Early Actions" subsection on page 149. EPA does not agree with the definition for early actions. Each potential early action will have its own scope, objectives, and goals, thus, it is not possible to "define" early actions, nor is it relevant to the Work Plan.

Section 8.2 - Remedial Action Objectives. The Work Plan should note that action is required if human health risks exceed at the minimum 10 -4 or state that 10-4 to 10 -6 is EPA's risk range.

Section 8.4 - Facility Siting Studies. This section and the Appendix should acknowledge that the facility siting process invokes some of the substantive requirements of certain ARARs, such as for consideration of in-water disposal, Section 404(b)(1) criteria should be considered during the selection and screening of the alternatives evaluation. For example, an in-water disposal option likely will not pass the 404(b)(1) alternatives analysis if the only upland disposal site is a commercial landfill. Information and consideration of one or more on-site upland disposal sites in addition to a landfill is likely required to fulfill 404 requirements.

Due to the significant ARAR issues (EO 11988, City of Portland Ordinance, Ch. 24.50.060(D) & (F)(8)) associated with any amount of filling/capping in the Willamette River, which is a flood-prone river, there should be some early regulatory (FEMA, City of Portland, USAGE) and public outreach on the issue of significant filling and/or capping to see if they are even viable alternatives to pursue.

Likewise, significant mitigation for aquatic impacts and flood level mitigation would be required

for significant capping and/or a CDF, which will need to have some early assessment of where, what, how, and how much it would cost to run through the nine criteria analysis. An analysis of the impacts on the floodplain, or base flood level would need to be conducted on all alternatives.

Section 8.6.3, p 156. It is unclear what is meant by "high" risk versus relatively "low" risk areas. Any decision on defining such areas must be made by EPA.

Tables

Table 7-11, DQO Process for Human Health:

General Comment: Change language in this table to include direct contact with in-water sediments as a pathway in the risk assessment to be assessed quantitatively.

Under (1), add groundwater to list of media to be assessed.

Under (2), add groundwater to list of media. Remove the word "ISA" as beach sediment outside of the ISA is being assessed.

Under (3),

Add "and Round 2" afer the word "Round 1" in the second point since EPA has requested additional beach sediment sampling in Round 2 adjacent to Oregon Steel and Sauvie Island.

In the fifth point, Add "Resident" to the beginning of the sentence; after "Round 1" add "and fish samples collected in the summer of 2003 by Oregon Department of Human Services (ODHS), Agency for Toxic Substances and Disease Registry (ATSDR), Oregon Department of Fish and Wildlife (ODFW), City of Portland, and USEPA, Region 10 (USEPA)."

After the sentence staring with "A Seep Reconnaissance Survey..." delete the second sentence and replace with " Existing groundwater data or groundwater data collected from seeps as a part of the RI may be used to estimate potential exposures and risks to groundwater."

Replace the sentence beginning with "Toxicity databases..." with language that ensures compliance with EPA Directive OSWER Directive 9285.7-53, Human Health Toxicity Values in Superfund Risk Assessments (December 5, 2003).

Under (4), :

Under target populations, remove the word "composite" and "individual". For example, sturgeon collected in 2003 were individual samples, not composites. Also, since the FSP for surface water has not been completed so it isn't known if they will be "individual" samples.

Under spatial boundaries, remove the words "ISA" for sediment and surface water and replace with the word "site". Also remove the word "quiescent". Remove "collected within the ISA" for tissue since salmon and lamprey were not collected within the ISA.

Under (5), change language to be consistent with the Risk Assessment Appendix C (i.e., the 95th percentile UCL on the average is not being used for exposure point concentrations.)

Appendix A

Figure 1, Flowchart and Appendix A. Depending on the disposal site alternatives that are run through the FS, the chart and the process should plan on early public participation and comment. Disposal site selection is likely to be a significant public concern and efforts should be taken to involve and educate the community early. Additionally, the floodplain implications likely will require some consultation with relevant regulatory agencies.

Section 2.4, p 4. The natural attenuation evaluation rely heavily on the hydrodynamic modeling approach. This section should be revised to describe how the proposed sediment data collection efforts and hydrodynamic modeling effort will be used to support the natural attenuation modeling effort.

Section 5.5, p 16. The relationship between sub-areas as described in this section and SMAs as described elsewhere in the Work Plan is unclear. Please clarify.

Attachment A1, Section 2.5, p 6. Delete "background" where it occurs in the numbered list of preliminary RAOs.

Appendix A1 - ARARs chart. Add City of Portland Ordinance, Ch. 24.50.060(D) & (F)(8) to the box with Federal ARAR 40 CFR Part 6, App. A and EOs 11988 and 11990, as the City of Portland ordinance implements, in part, substantive requirements of those EOs.

Attachment A4, Section 2.4, p 9. It is unclear whether the Boudreau Model is the most appropriate methodology for evaluating natural attenuation processes. Given that a detailed hydrodynamic model will be performed for the site, EPA requires more information regarding the use of these two modeling approaches to evaluate natural attenuation, Attachment A4 should be revised to reflect the current sampling approach and the reliance on the hydrodynamic model to evaluate natural attenuation as a GRA. In addition, Attachment A4 should state that the natural attenuation evaluation will rely on the following lines of evidence:

- Document that sources of contamination have been controlled
- Time series data for sediment and data that demonstrate a clear and meaningful trend of decreasing contaminant concentration, mass, or toxicity over time;

- Core data demonstrating a predictable rate of sedimentation or contaminant transformation
- Historical information concerning frequency and intensity of natural and man-made disruptive events;
- Reliable future predictions (through modeling or other methods) of contaminant levels in surface water, sediment, and biota that demonstrate how human and ecological risks will be reduced to acceptable levels in an acceptable time frame;
- Reliable future predictions concerning natural and man-made disruptive events, their frequency, intensity and impact on contaminant migration;
- Data from field studies (e.g., core data) that demonstrate the depth of the sediment mixing zone or zone that is currently bioavailable or likely to become so in the future;
- Data from field studies (conducted in or with actual contaminated site media and representative of site-wide exposure) that directly demonstrate the occurrence of a particular attenuating process at the site and its ability to degrade the contaminants of concern or reduce the risk of exposure to the contaminants;
- Development of conceptual and predictive models to assess current and future human and ecological exposures; and
- Knowledge of future plans for use and development of the watershed.

Appendix **B**

Section 2.1.1, p 10, first sentence of first full paragraph. The Work Plan states that fish will be evaluated at the population level). However, the Work Plan also suggests that fish tissue concentrations will be combined within each feeding guild to estimate effects (e.g., Appendix **B**, page 80, third sentence of last full paragraph). Fish concentrations must be combined within feeding guilds to estimate population level effects. The Work Plan states that in cases where there is inadequate data to perform an population level assessment, a community level assessment will be performed. This is unacceptable. It is expected that sufficient toxicity studies are available to allow evaluation at the population level.

Section 2.1.1, p 13. The second to last paragraph states that threatened and endangered bird species will be assessed at the individual level. In other sections of the Work Plan, it is stated that "special concern species" will be evaluated at the level of the individual. The Work Plan should state clearly that the following species will be evaluated at the level of the individual: federally listed threatened, endangered, candidate, and proposed species, state listed species and species listed under the federal migratory bird treaty act.

Section 2.1.3.2, p 15. The Work Plan states: "Measures of ecological effects on an individual level will be performed by comparison to a NOAEL and on a population level by comparison to a LOAEL." For each level, a comparison to both a NOAEL and LOAEL should be made.

Section 2.3.4, p 44. A sentence should be added stating that mink have been observed near Ross Island.

Section 2.4.2, p 46. This section should list bull trout as another endangered species present in the area.

Section 2.4.3, p 47. The Work Plan should state that bald eagles are year-round residents in the area and that additional bald eagles may overwinter in the area. The statement regarding home ranges extending beyond the ISA should be deleted. Many birds breed in the area and have small ranges during the breeding season and thus can be exposed to contaminants during a crucial life stage. In particular, bald eagles will primarily forage within one mile of the nest site. Thus, from a risk perspective, many birds spend their most crucial and sensitive life stage within a short distance from their nest regardless of the extent of their full home range. This factor must be taken into account when assigning site use factors. As stated earlier, site use factors less than 100% must not be utilized without the appropriate documentation and studies.

Section 2.5.3.4, p 55. Surface sediment samples collected during Round 2A should be evaluated for the presence of lamprey ammocoetes. If lamprey ammocoetes are identified they should be collected and held for possible analysis.

Section 5.1, p 74. Exposure point concentrations should be developed for plants as the maximum concentration in appropriate habitat areas. Also, exposure point concentrations for immobile receptors should be the maximum concentration.

Section 5.3., p 77. The Work Plan states that tissue residue concentrations will be compared to toxicity values to estimate the risk to the benthic community from bioaccumulative chemicals. Because clam tissues were obtained in sufficient mass from only a few locations, the Work Plan should include an approach for analyzing bivalve tissue for contaminants if acceptable tissue/ sediment correlations are not achieved with crayfish and/or sculpin.

Section 5.3, p 82. The Work Plan should state that the correlation between lipid content and contaminant concentrations will be performed and evaluated in conjunction with EPA and its partners.

Section 5.3, p 84. Some chemicals (ie, DDE, PCBs, dioxins and furans) cause mortality or other impacts to the developing embryo or eggs at lower levels than would impact adult birds through dietary exposure. Therefore, the Work Plan should state that some bird species will require assessment of eggs or developing embryos through the use of NOAEL and LOAEL values in eggs.

Table 3-4A. The units for PAHs are listed as ug/l and should be listed as ug/kg.

Table 5-3, Step 3: Revise the table to indicate that fish tissue collected for the ecological risk evaluation also include carp.

Attachment B5 - Ecotoxicological profiles: Substantial toxicological information is lacking in these profiles, and more information related to the chemicals of concern in the ISA should be added. Only certain areas of ecotoxicology are addressed for a receptor group; other methods or issues should be added if they directly pertain to the site. The profiles could be augmented with information from the "Handbook of Ecotoxicology, Second Edition" (David J. Hoffman, Bamett A. Rattner, G. Allen Burton, Jr., John Cairns, Jr., editors). The following are examples of data that should be added or text that should be adjusted.

- Section 2.2: No mention is made of behavioral impacts of metals to fish, such as copper affecting migrating behavior of salmonids.
- Section 2.3: No mention is made of lead toxicity to birds.
- Section 3.3: Extensive field data has associated DDE to reduced productivity in wild breeding birds, aquatic birds and raptors. Laboratory and/or field data have also demonstrated the potential for DDE to induce eggshell thinning and egg dessication, which is excluded from the last sentence.
- Sections 5.3 and 6.0: No mention is made of egg-injection studies (as opposed to dietary studies). Legitimate, scientifically-controlled egg injection studies have been conducted on cormorants and other bird species. The effects observed from egg injection should be cited here, as these studies will be key in deriving risk factors for the assessment.
- Section 6.3, Birds: There have been numerous studies on the effects of PCDDs and PCDFs on wild birds, in contrast to what is stated here. Aside from egg injection studies, a number of field studies have been conducted by John Elliott and others in Canada on bald eagles and great blue herons, in the Great Lakes on cormorants and bald eagles, and in the Columbia River on osprey, bald eagles, and cormorants. References for these studies can be found in the final reports produced by our office (see web page "http://oregonfwo.fws.gov/EnvContam/EnvContam_Field/EC_Field_Studies.html" for reference sections within reports on bald eagles and cormorants). Numerous studies have been conducted on PCDD and PCDF effects on wild birds since the publication of the White and Seginak (1994).
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Attachment B-6 - The TRV development should include field studies and sensitive life stages. In addition, Section 4.0 on page 86 should be renumber Section 5.0.

Attachment B-7, p 88, Food web models: The LWG should evaluate correlations in contaminant concentrations between sculpin and sediment, between crayfish and sediment, and between bivalves and sediment (collection of additional bivalves and co-located sediment may be needed). A regression approach should be used to determine a biota-sediment accumulation factor (BSAF) for each matrix provided an adequate correlation exists. The limitations or assumptions of this empirically-derived BSAF can then be discussed with the EPA and their partners to determine its suitability to the site. Meanwhile, the LWG should begin collecting site-specific data to populate parameters used in the proposed food web models. Many of these models will require the same parameters, so these data can be collected prior to deciding on which specific food web model to use. A Technical Memo should be produced describing the

parameters needed for the food web models, and what site specific data will be used to fill the model.

Figures 2-8 through 2-11. The Work Plan should include a presentation of upland habitat to better understand in-water habitat use of the river by ecological receptors. For example, the North Doane Lake area provides lake habitat for many waterfowl, including the Merganser, one of our receptors of concern. Breeding areas and nests should be depicted generally on maps.

Figure 2-11. This figure should be updated with new information from the government team review of amphibian habitat.

Figure 2-12. Invertebrate infauna direct contact/uptake from pore water is listed as complete and uncertain. This pathway must be evaluated in the ecological risk assessment.

Attachment B2 (formerly C1) Section 4.2 and subsection 4.2.4, page 42. Text needs to address previous comment on amphibian survey limitations and conclusions, either by making requested changes or by indicating the information will be coming in a TM.

Attachments B2 (formerly C1), Aquatic Plant and Amphibian/Reptile Reconnaissance Survey; B3 (formerly C2), Lamprey Survey; B4 (formerly C3), Benthic Approach; B6 (formerly C5), Fish TRV Selection; B7 (formeriy C6), Aquatic Food Web Model; B8 (formeriy C9), Fish Stomach Content Screening; and B9 (formerly C8), Bird & Mammal TRV Selection. No changes appear to have been made to these sections to indicate that LWG is responding to agency or partner comments. Text needs to address previous comments, either by making requested changes or by indicating the information will be coming in TMs.

Appendix C

General Comments:

There are four major changes to Appendix C of the Work Plan. The first is language that adds multiple species diets to the risk assessment. Multiple species diets will be done for the recreational and non-tribal high fish consumers using only resident fish as well as for Native Americans using resident fish as well as salmon, sturgeon, and lamprey. The second major change is the addition of direct contact to in-water sediments as a pathway to be assessed in the risk assessment. The third is inclusion of children in the transient scenario, and the fourth is a revised method to calculate the Exposure Point Concentrations.

The main body of the Work Plan (e.g. section 7.4 and others) must be consistent with the language changes and other changes described for Appendix C, including, but not limited to, the addition of the tribal scenario (with salmon, sturgeon, and lamprey), the use of the ODHS data, additional beach and surface water sampling that will be done, and addition of exposure to in-water sediments as a pathway to be included in the risk assessment.

Specific Comments:

Section 1, p 1. Last sentence, 2nd paragraph, add back the word "data" before the word "needed".

Section 1.2, p 2. When discussing the risk assessments in this section and throughout the RI, remove language referring to the use of Category 1 historic data for the risk assessment. Reword the language to make it clear that only data that has undergone a QA2 data quality review will be used for the risk assessment (e.g., "Historic data that has undergone a QA2 level of review...").

Add the word "resident" before "fish/crayfish".

Section 1.2, p 3 paragraph 2. After "remedial investigation" add "and other available biota data of acceptable quality". In next sentence, after "bioconcentration factors", add "or the need to collect additional fish tissue data".

Section 1.2, p 3. Delete the sentence, "For chemicals resulting in unacceptable risk.....receptors at the site". This would not be done as a part of the risk assessment but rather as a part of the development of remediation goals in the FS. It's also not clear what media are being referred to (fish, sediment?).

Section 2.1, p 4. Delete reference to "Category 1" historic data and replace with QA2 level data. In first sentence of second paragraph, add the words "for risk assessment" after DQOs. Delete the last sentence beginning with "the historic data DQOs...."and/or make it consistent with comments on body of RI Work Plan.

Section 2.2, p 4. In the second sentence, add the word "resident" before the word "fish"; after "Round 1" add a period and delete "and". Next sentence should read, " Surface water samples and additional beach sediment samples will be collected during Round 2 to support the HHRA." Remove the words "summer of 2003" and replace with "winter of 2004". Replace "late summer/fall of 2003" with "spring of 2004".

Add a second paragraph to this section that states, "Sturgeon, spring Chinook, and lamprey were collected in the summer of 2003 through a cooperative effort of the Oregon Department of Human Services (ODHS), Agency for Toxic Substances and Disease Registry (ATSDR), Oregon Department of Fish and Wildlife (ODFW), the City of Portland and USEPA, Region 10 (USEPA). (This sampling effort will be referred to as the "ODHS sampling" in the rest of this Appendix). Although these data were not collected as apart of the RI, they will be evaluated by the LWG and used in the HHRA.

Section 2.3.1, p 5. The RI risk assessment should contain an evaluation of direct human contact with in-water sediments in addition to beach sediments. Therefore, the following changes should be made to this section: Add two new headings to this section. The first "Beach Sediments"

should be added right after "2.3.1 Sediments". Add the second heading "In-Water Sediments" after Section 2.3.1.2. In this section add the following language, "As now written, this Work Plan only includes assessment of risks from exposures to beach sediments, not in water sediments. Exposure to in-water sediments may occur as a result of boat fishing/crabbing or diving. This exposure pathway will be evaluated in the risk assessment. The methods and exposure parameters that will be used will be determined following discussions between the EPA, its partners, and the LWG.".

Section 2.3.1.1, p 5. Add the words "the most current" before "EPA Region 9"

Section 2.3.1.1, p 6. After "for chemicals that do not have Region 9 PRGs," add "EPA, Region 10, will contact USEPA's Superfund Technical Support to determine if recent EPA Provisional Peer Reviewed Toxicity Values (PPRTVs) have been developed for a detected chemicals. If such a PPRTV has been developed, the LWG in consultation with EPA, may determine that a PRG will be developed for that chemical using the PPTRV. If no PPTRV is available, Region 9 PRGs for surrogate....(continue with the rest of the paragraph).

Section 2.3.2, p 7. After "As a result," add "for the baseline risk assessment" since additional COPCs for surface water may be identified by comparison to Ambient Water Quality Criteria for human health.

Section 2.3.2.1 - After "As a health protective initial approach", add "for the baseline risk assessment".

Section 2.3.2.1, p 8. In first paragraph after "for chemicals that do not have", add the same language as that added for Section 2.3.1.1.

After Section 2.3.2.2, add a Section 2.3.2.3. that says "Contaminants in surface water may be a source of contaminants in biota tissue. For the risk assessment, exposure to contaminants in surface water via biota tissue will be assessed as a part of the risk assessment for fish and shellfish. However, as a part of the RI for Portland Harbor, surface water data collected in all areas of the site will be screened against EPA's Ambient Water Quality Criteria for fish consumption and Oregon Water Quality Standards."

Section 3.1, p10. Change "Non-tribal consumption fisher" to "Non-tribal high consumption fisher" to better describe this group. Change throughout the Appendix and RI Work Plan.

Section 3.1.1, pp 10 and 11. After "These areas are classified as human use areas", add "and were sampled during Round 1 of the RI." Delete "Additional use areas outside of the ISA may be identified during the RI/FS."

At end of section, add "Additional potential use areas outside of the ISA were identified during 2003 and will be sampled as a part of Round 2 of the RI; these areas will be included in the

human health risk assessment. Additional use areas may be identified during the RI/FS. For example, as a part of Round 2, beach samples are being collected in areas where shorebird exposure may occur. If information suggests that these beaches would be accessible to humans, either now or in the future, these shorebird beach results will be screened against Region 9 PRGs for residents and workers using the same methodologies as those used for human use areas; those beaches failing the screening will be further evaluated in the risk assessment."

Section 3.2, p12. For the sentence beginning with "If a groundwater seep....", delete all language after "discharge of the seep." Delete all language after next sentence beginning with "Locations..." Insert "After this review, the LWG, in consultation with EPA and its partners, will determine which seeps will need further evaluation for human health risk assessment and the methods that will be used for this evaluation. This evaluation may include assessment of existing groundwater data or of new data collected by the LWG or other parties."

Section 3.3.1.1, p 14. Add language about divers to the effect that we need to get additional data to decide if this is an exposure route of concern.

Section 3.3.2, p 15. After the words "This receptor only includes adults transients " delete the words," as children have not been observed as transients within the site". Based upon information from Dave Stone at the ODHS, it appears that children are transients within the site and their risk will need to be assessed. The exposure factors to be used for children will be determined after discussions between EPA, its partners, and the LWG.

Section 3.3.4, p 18. Under Native American Consumption Fisher, remove the statement "and are recommended for evaluation of Native American subsistence fishing populations." The tribes have made it very clear that they do not agree that the data in the CRITFC survey are representative of a subsistence diet and EPA agrees.

Section 3.3.4.3, p 20. Rearrange the section on Consumption of Fish and Shellfish to discuss resident fish and shellfish first then anadromous species. Change language in this section to the following:

3.3.4.3 Consumption of Fish and Shellfish

Certain chemicals may accumulate in fish and shellfish tissue. Potential current and future receptors that consume fish or shellfish caught within the site may be exposed to COPCs that accumulate in the fish or shellfish. Therefore, this pathway is considered complete and significant for fishers who consume fish and shellfish caught within the site.

The following discusses the rationale for selecting the fish species that will be the focus of the risk assessment.

Resident Fish and Shellfish

Page 20, Third sentence, delete "target species" and replace with "Selected resident species (i.e. target species)"; after "HHRA" at the end of the second sentence add "and sampled in Round 1".

Page 21, Under Limited Home Range, in the last sentence add the word "resident" before "species". Under Predators and Bottom-feeders, add the word "resident" before "species". In the next two paragraphs that begins with "The above criteria..." add the word "resident" before "fish species" (in five places).

Salmonids and Lamprey

Salmonids are an important species for both sport and tribal fishers in Portland Harbor. Salmonids are anadromous and spend parts of their lifetimes both in the Pacific Ocean and in freshwater systems. A continuing, multi-year study by the Oregon Department of Fish and Wildlife (ODFW) for the City of Portland (ODFW, 2002 & 2003) shows that salmonids spend varying amounts of time within Portland Harbor.

Lamprey are harvested by Native American Tribes primarily at Willamette Falls. Juvenile lamprey spend from 1 – 7 years in freshwater rivers and tributaries before transforming into adults. The preferred habitat of juvenile lamprey is muddy bottoms, backwater, and low gradient areas. Its main food sources are microscopic plants and animals obtained by filtering mud and water. This makes juvenile lamprey particularly susceptible to contaminants present in sediments. After transforming to the adult form, lamprey move into the ocean where they live as predators/parasites on larger fish before returning to fresh water for as long as a year before spawning.

Salmonids and lamprey were not sampled as a part of the RI/FS Round 1 investigation. However, spring Chinook salmon were collected in July, 2003, as a part of a cooperative effort by ODHS, ATSDR, ODFW, and USEPA, Region 10. These salmon were collected from the Clackamas River Hatchery. Lamprey were also collected as a part of this effort at the Willamette Falls in May of 2003 (Quality Assurance Project Plan for Salmon, Sturgeon, and Lamprey Tissue Investigation, Portland Harbor Site, May 2003).

Sturgeon

White sturgeon are found in the lower Willamette including in Portland Harbor. They are highly valued as sport fish (Rien 2001); several thousand sturgeon have been harvested from the lower Willamette River annually. White sturgeon are also found in the Columbia River and along the Pacific Coast. White sturgeon are the largest freshwater fish in North America and have long life spans. Some individual fish have been found that are over 100 years old. Sturgeon appear to move based upon availability of food and suitable habitat and often congregate in areas with available food supplies for long periods.

Sturgeon feed on a variety of benthic organisms and have been shown to feed on organisms buried up to 20 mm below the sediment surface. The fish do this by digging into the sediment with their jaws and expelling the sediment across their gills. They continue this process until they extract and ingest the prey specimen. The sturgeon's feeding techniques, especially the extraction of buried prey, will result in exposure to contamination in sediments where sturgeon feed. Sturgeon was not sampled as a part of the RI/FS Round 1 investigation. However, juvenile sturgeon were collected within the Portland Harbor site in July, 2003, as a part of the cooperative effort by ODHS, ATSDR, ODFW, the City of Portland, and USEPA, Region 10.

The potential risk resulting from salmonids, lamprey, and sturgeon will be included in the risk assessment by including these species in a multiple species diet along with resident fish. This multiple species diet will be based upon tribal consumption information in the CRITFC Fish Consumption Report. The risk assessment will include a discussion of the uncertainties in determining what percentage of the chemical body burden in sturgeon, salmon, and lamprey results from exposure to COPCs from the site.

Section 3.4, p 22. The method proposed in the Workplan to calculate EPCs is not consistent with EPA guidance. For tissue and sediment samples, the guidance provided in EPA's Superfund Soil Screening Guidance (EPA/540/R-96/018) for calculating EPCs for composite samples should be used (it is not certain how water samples will be collected yet). Because compositing is a physical average, the Soil Screening Guidance recommends using the maximum concentration of each contaminant in the composites used to estimate the EPC. This maximum composite method is a conservative estimate of the average for composites (similar to the 95 percent UCL on the arithmetic mean). The language in the first 3 paragraphs of this section should be replaced with language consistent with using the maximum value of each composite as should other language in the Workplan that discusses the EPC.

Section 3.4.1 – Delete the word "quiescent" as surface water from recreational use areas that are not quiescent will be sampled in Round 2.

Section 3.4.2.2 to 3.4.2.4, pp 23 and 24 - After the words "if so", add "following EPA approval,".

Section 3.4.3, p 24. Divide into two sections *Resident Species* and *Lamprey, Salmonids and Sturgeon*. The first two paragraphs would be for resident species only. In the first sentence of the first paragraph, add the word "resident" before the words "fish and shellfish" samples". Also add a sentence that states that a multiple species diet will be done for resident species assuming that 1/4 of each ingestion rate used is carp, crappie, bass, and bullhead (e.g., for and ingestion rate of 142.4 g/day, 35.6 g/day is from each of the 4 species).

Under *Lamprey, Salmonids and Sturgeon*, add "Data from uncooked fish samples collected as a part of the ODHS study and any subsequent investigations will be used to estimate the EPCs for

tissue for use in a multiple species diet that is based upon the proportion of fish consumed in the CRITFC Fish Consumption study. For sturgeon (fillet without skin), site wide EPCs will be calculated. For lamprey (whole body) and Chinook salmon (whole body and fillets), the EPCs will be estimated using the composite samples collected at the Clackamas Hatchery, and at Willamette Falls, respectively. Site-wide EPCs calculated for resident species will be included in the multiple species diet. "

Section 3.4.4, p 24. Add the words "as described below" after "where it is reasonably likely that a COPC is present".

Section 3.4.5.1, p 26. In the last paragraph that starts with "Therefore, as an", delete the second and third sentence. Add "If after reviewing the risk characterization results (assuming 10% inorganic arsenic as a fraction of total), the risk is unacceptable, the LWG, EPA and its partners will consider the need for arsenic speciation analysis of the fish tissue. Irregardless of the risk characterization results, EPA may select a subset of the archived tissue data collected by the LWG and have it analyzed for speciated arsenic at the EPA, Region10 laboratory."

Section 3.4.5.2, p 27. During the development of the FSP for biota, EPA made it very clear that if the LWG chose to not analyze fillet samples for PCB congeners and chlorinated dioxins and furans, the data from corresponding whole body samples would be used to estimate risk for fillet samples for both PCB congeners and for dioxin/furans. It is not clear from this section that this will be done (e.g., what is meant by "where congener data are available"?) It is our assumption that whole body data on dioxin-like PCB congeners will be used for fillet tissue in calculating EPCs and risk from (1) total PCBs and from (2) dioxin-like PCB congeners. Also, the whole body data on dioxin/furans will be used to calculate the risks in fillet tissue from dioxins/furans. The uncertainty resulting from the use of whole body data for fillet tissue will need to be addressed in the risk assessment.

Section 3.5.1.4, p 30. Modify this section to read:

"The HHRA will use different fish ingestion rates for the 3 fisher scenarios selected: recreational fisher; high consumption non-tribal fisher; and Native American.

For the recreational fisher and high consumption non-tribal fisher scenarios, the risk assessment for the target resident fish species (bass, black crappie, bullhead, and large-scale sucker) will be done using the ingestion rate for these two scenarios with concentration data on each individual resident species (by body type). EPCs will be calculated for fishing zones (carp, crappie and bullhead) and mile reach (bass) as well as for the entire site. A multiple species diet will also be done for these two fisher groups by using the fish ingestion rate for that scenario with the concentration data of all resident species (by body type) for the site (i.e., a multiple species diet assuming that each of the 4 fish target species represent 1/4 of a person's diet). Crayfish will be assessed separately by using EPCs calculated for each sampling site and the entire site.

For the tribal scenario, a multiple species approach will be done using the fish consumption data from the CRITFC Fish Consumption study with concentration data from the target resident species as well as from sturgeon, salmon and lamprey caught as a part of the ODHS sampling effort.

The fish ingestion rates included in the HHRA will be from technically defensible studies or EPA guidance that are appropriate for Portland Harbor. The actual rates will be determined through discussion with EPA and its partners through approval of the fish ingestion technical memorandum no later than 1 March 2004. Once approved, the fish ingestion rates will become part of the Work Plan and will be used in the HHRA unless additional information becomes available prior to the HHRA. In the case that additional information does become available, it will be discussed with EPA and its partners as to if and how it will be used in the risk assessment.

Section 4.1, p 31. Modify the language in this section to (1) make it consistent with the recentiy released EPA Directive OSWER Directive 9285.7-53, Human Health Toxicity Values in Superfund Risk Assessments (December 5, 2003); and (2) in the last paragraph, incorporate language from comment on page 6, section 2.3.1.1, so that it is clear that PPRTVs and other available toxicity values (e.g., ATSDR, State of California) are considered in addition to using structurally similar compounds as surrogates.

Section 4.4, p 37. Please make it clear that the most recently published WHO TEFs will be used in the risk assessment unless EPA develops and/or adopts new values.

Table 4 - Add the word "resident" after "Selected" in the tide.

In Tables 12 and 13, with the statement "Required by EPA" please include the rationale for the value as was done in the tables when using Best Professional Judgement. For example, for Table 12. Please clarify that the exposure frequencies are based upon 3 days/week (156 days/year) and I day/week (52 days/year).

Tables 15 through 20 - It might be better to delete the larger box in each of these tables (i.e. that showing the exposure route, parameter code, etc.) and/or the equations. These don't really reflect what will be done for the risk assessment. For example, intakes for each individual resident fish species and crayfish will be calculated separately for the recreational and non-tribal high consumer. Also, a multi-species diet will be done.