Table 2: General categories of LWG objections to the EPA June 22, 2012 revisions[1]:

| Issue Number | Basis for LWG objection | April 23, 2004 Programmatic Work Plan | EPA Comment on 2009 Draft BHHRA | LWG/EPA Comment Resolution | May 2, 2011 Draft Final BHHRA (redline) | EPA June 22, 2012 Revised BHHRA |
|---|---|---|---|---|---|---|
| 1a | **The LWG objects to EPA's revisions that delete factual information regarding clam consumption because these revisions are inconsistent with prior agreements between EPA and the LWG.** | This scenario was not included in the Programmatic Work Plan. The scenario was added to the BHHRA per EPA's Identification of Round 3 Data Gaps (December 2, 2005). | July 16, 2010, **comment G2** (note): "The fact that collection of *Corbicula* is illegal is relevant but not particularly important for the pathway in general. Indications are that *Corbicula* are being collected and consumed to some extent (e.g., from the Linnton Community Center's discussion with transients). It is reasonable to assume that bivalve consumption is a current and potential future exposure pathway and that future biomass would increase. Therefore, the low clam mass that may limit current bivalve consumption does not apply to future exposure." | LWG September 15, 2010 *General Responses to Directed Comments on BHHRA*: "As discussed at the August 20th and September 9th meetings, the clam consumption scenario can be factually discussed in the revised BHHRA. Language regarding the evaluation of shellfish consumption at the direction of EPA and that the harvest and possession of Asian clams is illegal can remain in the revised BHHRA. Information from the Linnton study will be cited as such. Language implying opinion or judgment about the clam consumption scenario will not be included in the revised BHHRA."<br><br>EPA September 22, 2010 *EPA General Responses to EPA Directed BHHRA and BERA Comments*: "EPA has reviewed the September 15, 2010 letter and attachments and agrees, with clarifications, that EPA's directed comments on the BERA and BHHRA should be revised in accordance with the general framework, and that the proposed resolution described in LWG's general responses matches our understanding of the meeting outcome." Includes three unrelated clarifications. | Text modified consistent with the comment resolution and related specific comments listed below. | EPA deleted or modified text that was specifically agreed-upon in the 2010 comment resolution process. |
| 1b | | | EPA's comments on the 2009 Draft BHHRA did not include comments on §3.3.6. | | Text in §3.3.6. "Like fish, shellfish may bioaccumulate certain chemicals in their tissue. Populations that consume shellfish may be exposed to COPCs that accumulate in the shellfish tissue. In the Programmatic Work Plan, crayfish was identified as the species to use to evaluate shellfish consumption. Additionally, as required by EPA, consumption of clams is also evaluated in this BHHRA. Harvest and possession of Asian clams, which is the clam species that was found in the LWR during sampling events, is illegal in the State of Oregon because Asian clams are on the prohibited species list of the ODFW rules regarding the importation, possession, confinement, transportation and sale of nonnative wildlife (OAR 635–056–0050)." | "Certain contaminants can bioaccumulate in shellfish, and populations may be exposed to COPCs through consumption of shellfish that are collected within the Study Area." |
| 1c | | | July 16, 2010, **comment S51** §3.3.6.1, p. 40 (revise): "The language in this section should be deleted and replaced with the following text:<br>*"Although the extent of shellfish consumption in the lower Willamette River is not known, information regarding the consumption of shellfish in the lower Willamette River is available. The Oregon Office of Environmental Public Health, Department of Health Services (DHS) had* | LWG November 18, 2010 *General Responses to EPA's Non-Directive Comment Key Issues on the BHHRA*: "This issue was addressed in the responses to EPA's Directive Comments."<br><br>EPA December 8, 2010 *EPA General Responses to EPA Non-Directed RI, BHHRA and BERA Comments*: "EPA | Revised text in §3.3.6.1. "In theory, shellfish consumption could occur throughout the Study Area wherever shellfish are found. However, it is not known to what extent shellfish consumption occurs~~, as there is no documentation of ongoing shellfish consumption by humans occurring in the Study Area~~.<br><br>The Linnton Community Center project (Wagner 2004) reported that some transients | "Certain contaminants can bioaccumulate in shellfish, and populations may be exposed to COPCs through consumption of shellfish that are collected within the Study Area. The actual extent shellfish harvesting and consumption is presently occurring is not known. The Linnton Community Center project (Wagner 2004) reported that some transients reported eating clams and |

Table 2: General categories of LWG objections to the EPA June 22, 2012 revisions[1]:

| Issue Number | Basis for LWG objection | April 23, 2004 Programmatic Work Plan | EPA Comment on 2009 Draft BHHRA | LWG/EPA Comment Resolution | May 2, 2011 Draft Final BHHRA (redline) | EPA June 22, 2012 Revised BHHRA |
|---|---|---|---|---|---|---|
| | | | *previously received information from ODFW indicating that an average of 4300 lbs of crayfish were commercially harvested from the portion of the Willamette River within Multnomah County each of the 5 years from 1997-2001. Most of this catch was sold to the Pacific Seafood Company of Oregon. DHS also has information from local commercial crayfish harvesters indicating that Europe is a major portion of their market. Furthermore, as part of the McCormick and Baxter assessment in 1991, Ken Kauffman at DHS talked with the wife of a licensed commercial crayfish harvester who served (at that time) as the secretary-treasurer of the Oregon Crayfish Association. She indicated that the area around McCormick and Baxter was a very productive Cray fishery and that she and her husband had harvested there prior to the advisory on many occasions.*<br><br>*"In addition to this historical commercial crayfish harvesting information in the Lower Willamette, DHS also occasionally receives calls from citizens interested in harvesting crayfish from local waters who are interested in fish advisory information. Between 2001 and 2007, DHS fielded 8 calls from citizens who reported catching and eating crayfish from Portland-area waters, although only one was specifically from the Study Are). It is not known what percent of individuals who catch and eat crayfish contact DHS to ask for fish advisory information. DHS estimates that for each person who contacts them regarding the safety of consuming crayfish from the Lower Willamette, there are many more that catch and consume the animals without contacting DHS*<br><br>*"Although the collection of Corbicula is illegal, this is not particularly important for the pathway in general. There are indications that Corbicula are being collected and consumed (e.g., from the Linnton Community Center's discussion with transients). It is reasonable to assume that bivalve consumption is a current and possible future exposure pathway and that future biomass would increase.""* | has reviewed the LWG responses, as summarized in the tables, and has determined that the vast majority of issues associated with addressing EPA's comments have been resolved. However, there were three comments for which the LWG did not agree to make the specified changes." Includes three unrelated comments and additional unrelated clarifications. | reported eating clams and crayfish; however, many of the individuals indicated that they were in the area temporarily, move from location to location frequently, or have variable diets based on what is easily available. The Superfund Health Investigation and Education (SHINE) program in the Oregon Department of Human Services (DHS) stated that is unknown whether or not crayfish are harvested commercially within Portland Harbor (ATSDR 2006). ~~In addition,~~ ODFW has records for crayfish collection in the Columbia and Willamette Rivers, but these records do not indicate whether the collection actually occurs within the Study Area. Based on ODFW's data for 2005 to 2007, no commercial crayfish landings were reported for the Willamette River in Multnomah County. DHS had previously received information from ODFW indicating that an average of 4300 pounds of crayfish were harvested commercially from the portion of the Willamette River within Multnomah County each of the five years from 1997-2001. In addition to this historical commercial crayfish harvesting, DHS occasionally receives calls from citizens who are interested in harvesting crayfish from local waters who are interested in fish advisory information. According to a member of the Oregon Bass and Panfish club, crayfish traps are placed in the Portland Harbor Superfund Site boundaries and collected for bait and possibly consumption (ATSDR 2006). Even if collection does occur within the Study Area, it is not known whether those crayfish are consumed by humans or used as bait." | crayfish, although many of the individuals indicated that they were in the area temporarily, move from location to location frequently, or have variable diets based on what is easily available. The Superfund Health Investigation and Education (SHINE) program in the Oregon Department of Human Services (DHS) stated that is unknown whether or not crayfish are harvested commercially within Portland Harbor (ATSDR 2006). ODFW has records for crayfish collection in the Columbia and Willamette Rivers, but these records do not indicate whether the collection actually occurs within the Study Area. Based on ODFW's data for 2005 to 2007, no commercial crayfish landings were reported for the Willamette River in Multnomah County. DHS had previously received information from ODFW indicating that an average of 4,300 pounds of crayfish were harvested commercially from the portion of the Willamette River within Multnomah County each of the five years from 1997-2001. In addition, DHS occasionally receives calls from citizens who are interested in harvesting crayfish from local waters and are interested in fish advisory information. According to a member of the Oregon Bass and Panfish club, traps are placed in the Portland Harbor Superfund Site boundaries and crayfish collected for bait and possibly for consumption (ATSDR 2006). Although consumption of shellfish was considered a potentially complete pathway for dockside workers, in-water workers, recreational beach users, divers, and recreational fishers, it was quantitatively evaluated only for subsistence fishers, as they were considered the most likely population to regularly harvest and consume shellfish." |
| 1d | | | July 16, 2010, **comment S96** §5.2.6, pp. 91-92 (b) (directed change): "When consumption of shellfish is discussed in the Uncertainty Section, the following phrase should be deleted:<br>"*despite the fact that there is no documented ongoing consumption of shellfish in the Study Area and the harvest* | See comment resolution in 1a above. | Deleted text from §5.2.6, p. 121. "~~despite the fact that there is no documented ongoing consumption of shellfish in the Study Area and the harvest or possession of Asian clams, the species assessed in the BHHRA, is illegal.~~" | |

Table 2: General categories of LWG objections to the EPA June 22, 2012 revisions[1]:

| Issue Number | Basis for LWG objection | April 23, 2004 Programmatic Work Plan | EPA Comment on 2009 Draft BHHRA | LWG/EPA Comment Resolution | May 2, 2011 Draft Final BHHRA (redline) | EPA June 22, 2012 Revised BHHRA |
|---|---|---|---|---|---|---|
| | | | *or possession of Asian clams, the species assessed in the BHHRA, is illegal.*"" | | | |
| 1e | | | July 16, 2010, **comment S126** §7.2.3.1, pp. 115-116 (directed change): The following sentence in the first paragraph should be deleted:<br>"~~*However, there is no documentation of ongoing shellfish consumption by humans occurring in the Study Area, and the harvest or possession of Asian clams, which is the species assessed in this BHHRA, is illegal*~~." | See comment resolution in 1a above. | Revised text in §7.2.3.1 (now §6.2.3.2): "This BHHRA evaluated risks from shellfish consumption based on crayfish and clam tissue data. However, ~~there is no documentation of ongoing shellfish consumption by humans occurring in the Study Area, and~~ the harvest or possession of Asian clams, which is the species assessed in this BHHRA, is illegal." | All text deleted. |
| 1f | | | July 16, 2010, **comment S147** §7.2.5.3, p. 122 (directed change): "Revise the text in the second paragraph following the bulleted list as indicated:<br>"*However, it is not known to what extent shellfish consumption occurs*~~*, as there is no documentation of ongoing shellfish consumption by humans occurring in the Study Area*~~.*""* | See comment resolution in 1a above. | Revised text in §7.2.5.3 (now §6.2.5.3): "The information suggesting that shellfish consumption may occur at the Study Area comes from a community project sponsored by the Linnton Community Center, as discussed in Section 3.3.6. However, it is not known to what extent shellfish consumption occurs~~, as there is no documentation of ongoing shellfish consumption by humans occurring in the Study Area~~." | "Information regarding consumption of shellfish from the Study Area relies in part from information obtained from a community project sponsored by the Linnton Community Center, as discussed in Section 3.3.6. However, it is not known to what extent shellfish consumption actually occurs." |
| 1g | | | July 16, 2010, **comment S182** §8.1.1.2, p. 139 (revise): "Revise the first sentence as follows:<br>"~~*It is not known to what extent*~~ *Current and potential future shellfish consumption rates for the site are not known.* ~~*actually occurs, and there is no documentation of ongoing shellfish consumption by humans occurring in the Study Area.*~~"" | See comment resolution in 1c above. | Revised text in §8.1.1.2 (now §7.1.1.2): "~~It is not known to what extent shellfish consumption actually occurs, and there is no documentation of ongoing shellfish consumption by humans occurring in the Study Area.~~ Current and potential future shellfish consumption rates for the site are not known." | Section deleted. |
| 2a | **The LWG objects to EPA's revisions describing the drinking water scenario, including deleting the term "hypothetical", because these revisions are inconsistent with prior agreements between EPA and the LWG.** | This scenario was not included in the Programmatic Work Plan. The scenario was added to the BHHRA per EPA's Identification of Round 3 Data Gaps (December 2, 2005). | July 16, 2010, **comment G6** (directed change): "Much of the language in the draft BHHRA that discusses the Willamette River as a potential future drinking water source is inappropriate. Under OAR 340-041-0340, Table 340A, domestic water supply is a designated beneficial use of the Willamette River, with adequate pretreatment. CERCLA sets out a mandate for remedies that are protective for both private and public users of surface water or groundwater. The Willamette River is potable and capable of serving as a potential drinking water source; thus, the expectation is that this resource will be protected and remediated to achieve such use (40 CFR 300.430(a)(1)(ii)(F)). This expectation is reflected in the current remedial action objectives and ARARs for the PH site and must be reflected in the HHRA for the site. Throughout the draft HHRA, where reference is made to the risk characterization done for potential future domestic use of surface water, much of the language will need to be deleted and/or modified to be consistent with the fact that surface water is potable and capable of serving as a potential drinking water source and that the expectation is that the resource | LWG September 15, 2010 *General Responses to Directed Comments on BHHRA*: "As discussed at the August 20th and September 9th meetings, the term "hypothetical" can be used when describing the use of the Lower Willamette River (LWR) as a domestic water source, as long as factual information is provided to support that characterization. Language regarding the designated beneficial use of the LWR and the need to protect the resource will be included in the revised BHHRA. Language regarding the need to remediate the resource will not be included. The following language is an example of how the scenario will be described in the revised BHHRA:<br><br>"*Even though no current or future uses of the LWR within Portland Harbor as a domestic water source have been identified, as discussed above under OAR 340-041-0340 Table 340A, domestic water supply is a designated beneficial use of the Willamette River, with adequate pretreatment. Because the Willamette River is capable of serving as a potential drinking water* | Text modified consistent with the comment resolution and related specific comments listed below. | EPA deleted or modified text that was specifically agreed-upon in the 2010 comment resolution process. |

Table 2: General categories of LWG objections to the EPA June 22, 2012 revisions[1]:

| Issue Number | Basis for LWG objection | April 23, 2004 Programmatic Work Plan | EPA Comment on 2009 Draft BHHRA | LWG/EPA Comment Resolution | May 2, 2011 Draft Final BHHRA (redline) | EPA June 22, 2012 Revised BHHRA |
|---|---|---|---|---|---|---|
| | | | will be protected and remediated to achieve such use. EPA has provided comments on this inappropriate language which occurs throughout the draft BHHRA." | *source, the expectation is that this resource will be protected to achieve such use with adequate pretreatment.""*<br><br>EPA September 22, 2010 *EPA General Responses to EPA Directed BHHRA and BERA Comments*: "EPA has reviewed the September 15, 2010 letter and attachments and agrees, with clarifications, that EPA's directed comments on the BERA and BHHRA should be revised in accordance with the general framework, and that the proposed resolution described in LWG's general responses matches our understanding of the meeting outcome." Includes three unrelated clarifications. | | |
| 2b | | | July 16, 2010, **comment S36** §2.3.4, p. 26 (directed change): "Replace "Hypothetical" with "Potential" in the title for this section.<br><br>1st paragraph- Add the following sentence: *"Even though no current or future uses of the LWR within Portland Harbor as a domestic water source have been identified, as discussed above under OAR 340-041-0340 Table 340A, domestic water supply is a designated beneficial use of the Willamette River, with adequate pretreatment. Because the Willamette River is potable and capable of serving as a potential drinking water source, the expectation is that this resource will be protected and remediated to achieve such use (40 CFR 00.430(a)(1)(ii)(F)) under CERCLA.""* | See comment resolution in 2a above. | Revised text in §2.4.4. "Even though no current or future uses of the LWR within Portland Harbor as a domestic water source have been identified, under OAR 340-041-0340 Table 340A, domestic water supply is a designated beneficial use of the Willamette River, with adequate pretreatment. Because the Willamette River is capable of serving as a potential drinking water source, the expectation is that this resource will be protected to achieve such use with adequate pretreatment. Although surface water within the Study Area is not currently used as a domestic water source, nor are there future plans for domestic water use within the Study Area, surface water data were quantitatively evaluated in the BHHRA as a hypothetical future domestic water source at the direction of EPA (see Section 2.4.5 below). The same criteria and screening values used for data to assess direct contact with surface water and the groundwater seep were used to select COPCs for surface water as a hypothetical future domestic water source. As with the surface water and groundwater seep screening, the noncarcinogen RSLs were divided by 10 to account for potential multiplicative effects, and the modified RSLs were used as the screening values." | Section deleted. |
| 2c | | | July 16, 2010, **comment S41** §2.4.5, pp. 29-30 (directed change): "Delete "Hypothetical" from the title and from the first and second sentences on page 30, The word "hypothetical" should be deleted throughout the BHHRA when referring to SW for domestic use. Note that "future" implies by itself something that is "hypothetical," "potential," "possible," etc.<br>1st Paragraph - As stated in General Comment 5, under OAR 340-041-0340, Table 340A, domestic water supply is a designated beneficial use of the Willamette | See comment resolution in 2a above. | Revised text in §2.4.5."There is no known current or anticipated future use of surface water within the Study Area for a drinking water supply. Even though no current or future uses of the LWR within Portland Harbor as a domestic water source have been identified, under OAR 340-041-0340 Table 340A, domestic water supply is a designated beneficial use of the Willamette River, with adequate pretreatment. Because the Willamette River is capable of serving as a potential drinking water source, the expectation is that this resource will be | Section deleted. |

Table 2: General categories of LWG objections to the EPA June 22, 2012 revisions[1]:

| Issue Number | Basis for LWG objection | April 23, 2004 Programmatic Work Plan | EPA Comment on 2009 Draft BHHRA | LWG/EPA Comment Resolution | May 2, 2011 Draft Final BHHRA (redline) | EPA June 22, 2012 Revised BHHRA |
|---|---|---|---|---|---|---|
| | | | River, with adequate pretreatment, and the surface water is potable and capable of serving as a potential drinking water source. Therefore, the first paragraph in this section should be deleted. Uncertainties associated with future use of surface water can be included in the Uncertainty section. Section 2.4.5 should also include a brief discussion of the sources of surface water contaminants.<br><br>Although EPA agreed that "integrated data" could be used to select COPCs and develop EPCs for surface water as a drinking water source, it was assumed that surface water data from throughout the Portland Harbor site that could be integrated (i.e., by combining near bottom and near surface samples in a given location) would be used and that these data would be integrated as appropriate. Instead only surface water data from the river transects, Willamette Cove, Cathedral Park and the Shipyard were used. Water could be withdrawn from the river at any point for use as drinking water. Therefore, the COPC screening for this pathway should be revised using all appropriate data sets, including data from Round 3. See additional comments on Section 3.4.3.4." | | protected to achieve such use with adequate pretreatment. Potential sources of contaminants to surface water are discussed in the RI. ~~Even in the unlikely event that surface water in the Study Area were to be used for a domestic water supply, which includes drinking and bathing, such use would be subject to requirements for adequate pretreatment in accordance with the Safe Drinking Water Act, and Oregon rules. However, for this BHHRA, EPA required assessment of domestic uses of untreated surface water from the Study Area.~~ Because future use of the LWR as a domestic water supply would require adequate pretreatment, the evaluation of untreated surface water as a drinking water source is designated a hypothetical scenario. The inclusion of the assessment of domestic use of untreated surface water from the Study Area was done at the direction of EPA." | |
| 2d | | | July 16, 2010, **comment S43** §3.1, p. 31 (directed change): "The difference between a "potentially exposed" and "hypothetically exposed" population is not clear. In the first sentence here and throughout the risk assessment, delete the term "hypothetical" when discussing potential exposure pathways." | See comment resolution in 2a above. | No change to text. | "Potentially exposed populations were identified based on consideration of current and potential future uses of the Study Area." |
| 2e | | | July 16, 2010, **comment S44** §3.2, p. 33 (directed change): "In the bulleted list continued from page 32, replace "Hypothetical domestic water use" with "residents" or a similar term. "Domestic water use" is an exposure pathway, not a current or potentially exposed concentration. In addition, The CSM in Figure 3-1 should delete "Hypothetical" for residential ingestion of surface water. As previously indicated, future is a sufficient caveat." | See comment resolution in 2a above. | Revised text in §2.4.5."~~Hypothetical d~~Domestic water user" | |
| 2f | | | July 16, 2010, **comment S48** §3.3.3.4, p. 38 (directed change):" Delete "Hypothetical" in the title for this section.<br><br>The text in this section should be modified to be consistent with the comments in General Comment 5 and on Section 2.4.5, as follows:<br>*"As mentioned in Section 2.4.5, no known current ~~or anticipated future~~ use of surface water within the Study Area for a domestic* | See comment resolution in 2a above. | Title change: "~~Hypothetical Future~~ Domestic Water User"<br><br>Revised text in §3.3.3.4. "As mentioned in Section 2.4.5, there is no known ~~or anticipated future~~ current use of surface water within the Study Area for a domestic water supply. ~~Due to a requirement by EPA~~ However, because domestic water use is a designated beneficial use of the Willamette River following adequate pretreatment, ~~river water,~~ the ~~hypothetical~~ use | Section deleted. |

Table 2: General categories of LWG objections to the EPA June 22, 2012 revisions[1]:

| Issue Number | Basis for LWG objection | April 23, 2004 Programmatic Work Plan | EPA Comment on 2009 Draft BHHRA | LWG/EPA Comment Resolution | May 2, 2011 Draft Final BHHRA (redline) | EPA June 22, 2012 Revised BHHRA |
|---|---|---|---|---|---|---|
| | | | *water supply is known or planned. However, ~~Due to a requirement by EPA, the hypothetical~~ because domestic water use is a designated beneficial use of the Willamette River, ~~a use of untreated~~ river water as a domestic water source was assessed as a ~~hypothetical~~ future pathway for both adult and child residents, resulting in exposures through ingestion and dermal contact. In this scenario, exposure to surface water could ~~hypothetically~~ potentially occur throughout the Study Area.""* | | of untreated river water as a domestic water source was assessed as a hypothetical future pathway for both adult and child residents, at the direction of EPA.~~, resulting in exposures through ingestion and dermal contact.~~ In this scenario, exposure to untreated surface water could hypothetically occur from ingestion and dermal contact throughout the Study Area. At the direction of the EPA, volatilization of chemicals from untreated surface water to indoor air through household uses was identified as a potentially complete exposure pathway for hypothetical future domestic water use." | |
| 2g | | | July 16, 2010, **comment S56** §3.4.3.4, p. 48 (directed change): "Delete "Hypothetical" in the title for this section." | See comment resolution in 2a above. | Title change: "~~Hypothetical Future~~ Domestic Water User" | |
| 2h | | | July 16, 2010, **comment S68** §3.5.1.8, p. 59 (directed change): "Title - Replace "Hypothetical" with "Potential" in the title for this section.<br>Change the word "hypothetical" to "potential" when referring to domestic water in this section and throughout the HHRA.<br>Inhalation of contaminants from surface water should be included as a part of the scenario, unless it can be shown that this is not an issue for the surface water contaminants that are selected for evaluation in Section 6." | See comment resolution in 2a above. | Title change: "~~Hypothetical~~ Domestic Water Users"<br><br>Revised text in §3.5.1.8. "~~Although s~~ Surface water within the Study Area is not currently used as a domestic water source and there are no known plans to use it as a domestic water source in the future. However, the designated beneficial uses of the Willamette River include domestic water supply, assuming adequate pretreatment of the water prior to consumption. EPA specified that the BHHRA evaluate use of untreated river water as a domestic water supply. This scenario is considered hypothetical because pretreatment of surface water for domestic use would be required under current state laws." | Paragraph deleted. |
| 2i | | | July 16, 2010, **comment S85** §5.2.3.4, p. 83 (directed change): "Replace "Hypothetical" with "Potential" in the title for this section and elsewhere within Section 5.2.3. As previously discussed, additional surface water sampling data should be used for the screening for selection of COPCs, using both MCLs and EPA RSLs." | See comment resolution in 2a above. | Title change: "~~Hypothetical~~ Domestic Water User"<br><br>Revised text in §5.2.3.4. "There is no known or anticipated future use of surface water within the Study Area for a domestic water supply. Because the designated beneficial use of the Willamette River is as a domestic water supply with adequate pretreatment~~However~~, ~~at~~ EPA~~'s direction, untreated~~ directed that surface water ~~was~~ be evaluated as a ~~hypothetical~~ future domestic water source for both adult and child residents. For purposes of this BHHRA, untreated surface water was used to assess risks from future domestic water uses, so the risks are considered hypothetical." | Paragraph deleted. |
| 2j | | | July 16, 2010, **comment S128** §7.2.3.3, p. 116 (directed change): "Replace "*Hypothetical*" with "*Potential Future*" in the title for this section. As described in General Comment 6, under OAR 340-041-0340, Table 340A, domestic water supply is a designated beneficial use of the Willamette River, with adequate | See comment resolution in 2a above. | Title change: "~~Hypothetical~~ Domestic Water Users"<br><br>Revised text in §7.2.3.3 (now §6.2.3.4). "The domestic water user risks are based on the hypothetical use of untreated surface water drawn from the Study Area as a domestic water source. Surface water in the | "The evaluation of surface water as a domestic water source is based on the assumption that surface water is drawn from the Study Area. Within the Study Area, the LWR is not currently used as a domestic water source. According to the City of Portland, the primary domestic water source for |

Table 2: General categories of LWG objections to the EPA June 22, 2012 revisions[1]:

| Issue Number | Basis for LWG objection | April 23, 2004 Programmatic Work Plan | EPA Comment on 2009 Draft BHHRA | LWG/EPA Comment Resolution | May 2, 2011 Draft Final BHHRA (redline) | EPA June 22, 2012 Revised BHHRA |
|---|---|---|---|---|---|---|
| | | | pretreatment. CERCLA sets out a mandate for remedies that are protective for both private and public users of surface or groundwater. Surface water is potable and capable of serving as a potential drinking water source; thus, the expectation is that the resources will be protected and remediated to achieve such use (40 CFR 300.430(a)(1)(ii)(F)) in the absence of pretreatment. Therefore, the text in this section should be revised as indicated:"<br><br>*Surface water in the LWR within the Study Area is not currently used as a domestic water source~~, nor are there plans to use surface water within the Study Area as a domestic water source in the future~~. According to the City of Portland, the primary domestic water source for Portland is the Bull Run watershed, which is supplemented by a groundwater supply from the Columbia South Shore Well Field (City of Portland 2008). ~~In addition, the Willamette River was determined not to be a viable water source for future water demands through 2030 (City of Portland 2008~~). Under OAR 340-041-0340, Table 340A, domestic water supply is a designated beneficial use of the Willamette River, with adequate pretreatment. CERCLA sets out a mandate for remedies that are protective for both private and public users of surface or groundwater. Willamette River surface water is potable and capable of serving as a potential drinking water source; thus, the expectation is that the resources will be protected and remediated to achieve such use (40 CFR 300.430(a)(1)(ii)(F)) in the absence of pretreatment. The fact that surface water is not currently being used or that no one currently plans to use this resource is not justification for not attaining or using criteria to protect the river.*<br><br>*~~Even if the Willamette River were to be used as a domestic water source, which is not likely, that would only occur after adequate pretreatment to meet Safe Drinking Water Act standards and Oregon rules. Under OAR 340-041-0340 Table 340A, domestic water supply is a designated beneficial use of the Willamette River, but only with adequate pretreatment and natural quality that meets drinking water standards.~~ Therefore, the evaluation of ~~untreated~~ surface water as a potential future domestic water source~~, even under hypothetical future conditions,~~ is a ~~conservative~~ health protective approach and consistent with* | | LWR within the Study Area is not currently used as a domestic water source~~, nor are there plans to use surface water within the Study Area as a domestic water source in the future~~. According to the City of Portland, the primary domestic water source for Portland is the Bull Run watershed, which is supplemented by a groundwater supply from the Columbia South Shore Well Field (City of Portland 2008). In addition, the Willamette River was determined not to be a viable water source for future water demands through 2030 (City of Portland 2008). ~~Given that current knowledge of the City of Portland planning for water supply does not indicate that the reach of the Willamette River including the Study Area will be used for domestic purposes in the future.~~<br><br>~~Even if the Willamette River were to be used as a domestic water source, which is not likely, that would only occur after adequate pretreatment to meet Safe Drinking Water Act standards and Oregon rules.~~ Under OAR 340-041-0340 Table 340A, domestic water supply is a designated beneficial use of the Willamette River, but only with adequate pretreatment and natural quality that meets drinking water standards. The use of the Willamette River as a domestic water source would only occur after adequate pretreatment to meet Safe Drinking Water Act standards and Oregon rules. As a result, the term hypothetical was used to describe the scenario, which was based on the use of untreated surface water.<br><br>Therefore, the evaluation of untreated surface water as a domestic water source, even under hypothetical future conditions, is a conservative approach and is not based on current knowledge of future planned uses of the Willamette River within the Study Area as a domestic water source or based on Oregon rules that require adequate pretreatment. ~~an indication of current or reasonably anticipated future risks at the Study Area.~~" | Portland is the Bull Run watershed, which is supplemented by a groundwater supply from the Columbia South Shore Well Field (City of Portland 2008). In addition, the Willamette River was determined not to be a viable water source for future water demands through 2030 (City of Portland 2008). Therefore, the evaluation of surface water as a domestic water source is a conservative approach and is not based on current knowledge of future planned uses of the Willamette River within the Study Area as a domestic water." |

Table 2: General categories of LWG objections to the EPA June 22, 2012 revisions[1]:

| Issue Number | Basis for LWG objection | April 23, 2004 Programmatic Work Plan | EPA Comment on 2009 Draft BHHRA | LWG/EPA Comment Resolution | May 2, 2011 Draft Final BHHRA (redline) | EPA June 22, 2012 Revised BHHRA |
|---|---|---|---|---|---|---|
| | | | *EPA regulations and guidance.~~approach and is not an indication of current or reasonably anticipated future risks at the Study Area.~~""* | | | |
| 2k | | | July 16, 2010, **comment S132** §7.2.5, pp. 117-118 (directed change): "Modify the 3rd sentence in the 2nd paragraph as follows: "*In the case of the scenarios assessing the use of untreated surface water as a domestic water source, both the RME and CT scenarios represent ~~hypothetical~~ potential future exposures.""* | See comment resolution in 2a above. | Revised text in §7.2.5 (now §6.2.5). "In the case of the scenarios assessing the use of untreated surface water as a domestic water source, both the RME and CT scenarios represent hypothetical exposures." | Sentence deleted. |
| 2l | | | July 16, 2010, **comment S136** §7.2.5.2, pp. 119-120 (directed change): "The following changes should be made in the 3rd paragraph in this section: *In addition to the direct contact scenarios mentioned above, risks were assessed from exposure to surface water as a ~~hypothetical~~ potential future domestic water source. This scenario assumes untreated surface water is used as a domestic water source ~~is drunk and bathed in~~ 350 days a year for 30 years (adult resident) or 6 years (child) ~~resident), using tap water ingestion rates. As with the transient scenario, this scenario is equally unlikely for residents in the area.~~ The LWR within the Study Area is not currently used as a domestic water source, but could be used as such in the future ~~nor are there any future plans to use the LWR within the Study Area as a domestic water source.~~""* | See comment resolution in 2a above. | Revised text in §7.2.5.2 (now §6.2.5.2). "In addition to the direct contact scenarios mentioned above, risks were assessed from exposure to surface water as a hypothetical future domestic water source. This scenario assumes untreated surface water is used as a domestic water source ~~drunk and bathed in~~ 350 days a year for 30 years (adult resident) or six years (child resident)~~, using tap water ingestion rates. As with the transient scenario, this scenario is equally unlikely for residents in the area~~. The LWR within the Study Area is not currently used as a domestic water source, ~~nor are there any future plans to use the LWR within the Study Area as a domestic water source~~ but could be used as such in the future." | Paragraph deleted. |
| 2m | | | July 16, 2010, **comment S173** §8.0, p. 137 (directed change): "Revise the last bullet as follows: "*~~Hypothetical~~ Potential future resident – ~~Hypothetical direct~~ Future exposure to untreated surface water used as a domestic water source.""* | See comment resolution in 2a above. | Revised text in §8.0 (now §7.0). "~~Hypothetical future resident~~ Domestic Water User – Hypothetical direct exposure to untreated surface water used as a domestic water source" | "Domestic Water Use – Direct exposure to surface water used as a domestic water source" |
| 3a | **The LWG objects to EPA's revisions deleting references to evaluations being done at the direction of EPA because these revisions are inconsistent with prior agreements between EPA and the LWG.** | This issue was not raised by EPA during development and finalization of in the Programmatic Work Plan. | July 16, 2010, **comment S28** §1.0, p. 12 (revise): "The document suggests that this report is somehow different from other risk assessments because EPA directed the use of conservative assumptions. In fact, risk assessments performed under guidance from other federal agencies, states, and even other countries, assess risks and inform risk management decisions based on assumptions that report risks in the upper range of those possible. The risk assessment for PH is thus typical in this regard. Accordingly, with the exception of the first sentence, the text in the third paragraph should be deleted." | LWG September 15, 2010 *General Responses to Directed Comments on BHHRA: "*As discussed at the August 20th and September 9th meetings, language stating that evaluations were done at the direction of EPA can remain in the revised BHHRA. Language implying opinion or judgment about the prudence of that direction will be removed."<br><br>EPA September 22, 2010 *EPA General Responses to EPA Directed BHHRA and BERA Comments*: "EPA has reviewed the September 15, 2010 letter and attachments and agrees, with clarifications, that EPA's directed comments on the BERA and BHHRA should be revised in accordance with the general framework, and that the | Revised text in §1.0. "The LWG has worked with the United States Environmental Protection Agency (EPA) to develop the methods and assumptions used in this BHHRA. At the direction of EPA, this BHHRA incorporates ~~conservative~~ assumptions to provide a health protective assessment of risks associated with contaminants present at the Site, which is consistent with EPA guidance on risk assessment (1989). For many of the exposure scenarios evaluated in this BHHRA, upper-bound literature values are used to quantify exposure due to the lack of site-specific exposure information. In some cases, the maximum detected concentrations are used to quantify long-term exposures~~. While the use of maximum detected concentrations provides a health protective approach, it~~ which may not be representative of ~~conditions~~ ongoing exposures in the Study | "The LWG has worked with the United States Environmental Protection Agency (EPA) to develop the methods and assumptions used in this BHHRA. Consistent with EPA guidance (1989), this BHHRA incorporates assumptions to provide a health protective assessment of risks associated with contaminants present at the Site. The risk assessment for Portland Harbor is a baseline risk assessment in that it evaluates human health risks and hazards associated with contamination in the absence of remedial actions or institutional controls." |

Table 2: General categories of LWG objections to the EPA June 22, 2012 revisions[1]:

| Issue Number | Basis for LWG objection | April 23, 2004 Programmatic Work Plan | EPA Comment on 2009 Draft BHHRA | LWG/EPA Comment Resolution | May 2, 2011 Draft Final BHHRA (redline) | EPA June 22, 2012 Revised BHHRA |
|---|---|---|---|---|---|---|
| | | | | proposed resolution described in LWG's general responses matches our understanding of the meeting outcome." Includes three unrelated clarifications. | Area. Therefore, the results of the BHHRA have a margin of conservatism built into the risk conclusions consistent with EPA guidance (1989). ~~The conservative assumptions about exposure and toxicity also affect the preliminary remediation goals (PRGs) and early activities in the Feasibility Study (FS).~~" | |
| 3b | | | July 16, 2010, **comment S30** §1.2, p. 14 (directed change): "Modify the last paragraph in Section 1.2 as shown:<br>*"The approach of this BHHRA is based on EPA (1989, 1991b, 2001a, 2004, 2005a) and Region 10 EPA (2000a) guidance.~~, except where further health protective assumptions were used at the request or direction of EPA.~~"*<br>The risk assessment for PH follows EPA guidance and is not atypical or overly health protective for risk assessments done for a Superfund RI/FS." | See comment resolution in 3a above. | Revised text in §1.2. "The approach of this BHHRA is based on EPA (1989, 1991b, 2001a, 2004, 2005a) and ~~Region 10~~ EPA Region 10 (2000a) guidance~~, except where further health protective assumptions were used at the request or direction of EPA~~ and direction from EPA. The approach is also consistent with DEQ guidance for HHRAs (DEQ 2000a, 2010)." | "The BHHRA is based on EPA (1989, 1991b, 2001a, 2004, 2005a) and EPA Region 10 (2000a) guidance, and is also consistent with DEQ guidance (DEQ 2000a, 2010)." |
| 3c | | | July 16, 2010, **comment S45** §3.2.2 (revise): "Infant ingestion of mother's milk and ingestion and dermal contact with household uses of surface water should be added as potential exposure pathways to the bulleted list." | LWG November 18, 2010 *General Responses to EPA's Non-Directive Comment Key Issues on the BHHRA*: "This issue was addressed in the responses to EPA's Directive Comments."<br><br>EPA December 8, 2010 *EPA General Responses to EPA Non-Directed RI, BHHRA and BERA Comments*: "EPA has reviewed the LWG responses, as summarized in the tables, and has determined that the vast majority of issues associated with addressing EPA's comments have been resolved. However, there were three comments for which the LWG did not agree to make the specified changes." Includes three unrelated comments and additional unrelated clarifications. | Revised text in §3.2.2. "The conceptual site model (CSM) for human exposures based on the current understanding of the Study Area and requirements from EPA is presented in Figure 3-1. The CSM graphically depicts possible sources of COPCs based on current information, possible COPC-affected media, mechanisms of COPC transfer between media, and the processes through which human receptors may be exposed to chemicals. Additional information on potential sources of COPCs is provided in Section 5 of the RI Report. Potentially complete exposure pathways were identified in the Programmatic Work Plan or based on subsequent requirements from EPA. In-water workers exposure to river sediment, transients exposure to shoreline seeps, divers exposure to surface water and in-water sediment, infant exposure via consumption of human milk for all receptors with bioaccumulative COPCs, and hypothetical future exposures of ~~residents~~ domestic water users to surface water were included as potentially complete pathways per requirements from EPA. Pathways that are potentially or hypothetically complete and may result in significant exposure, or for which significance is unknown, were evaluated quantitatively in this BHHRA, per direction from EPA. Pathways included at the direction of EPA include clam consumption, exposure to surface water and in-water sediment by a commercial diver, and hypothetical exposure to untreated surface water ~~as domestic water source~~ by a ~~hypothetical future resident~~ domestic water user." | "The conceptual site model (CSM) describes potential contaminant sources, transport mechanisms, potentially exposed populations, exposures pathways and routes of exposure. As discussed in Sections 4, 5, and 6 of the RI Report, contaminated media within the Study Area are sediment, water, and biota. Current and historical industrial activities and processes within the Study Area have led to chemical releases from either point or nonpoint sources, including discharges to the river from direct releases or via outfalls and groundwater within the Study Area. In addition, releases that occur upstream of the Study Area and atmospheric deposition from global, regional, and local emissions may also represent potential contaminant sources to the Study Area. Chemicals in sediment and water may be accumulated by organisms living in the water column or by benthic organisms in sediments. Fish and shellfish within the Study Area feeding on these organisms can accumulate chemicals in their tissues through dietary and direct exposure to sediment and water. Additional information on potential contaminant sources is provided in Section 4 of the RI Report, and a more detailed CSM is presented in Section 10. A graphical representation of the exposure CSM is presented on Figure 3-1." |
| 3d | | | July 16, 2010, **comment S125** §7.2.3, p. | See comment resolution in 3a above. | Revised text in §7.2.3 (now §6.2.3). "Some of | "Some of the uncertainties associated |

Table 2: General categories of LWG objections to the EPA June 22, 2012 revisions[1]:

| Issue Number | Basis for LWG objection | April 23, 2004 Programmatic Work Plan | EPA Comment on 2009 Draft BHHRA | LWG/EPA Comment Resolution | May 2, 2011 Draft Final BHHRA (redline) | EPA June 22, 2012 Revised BHHRA |
|---|---|---|---|---|---|---|
| | | | 115 (directed change): "Delete the following sentences:<br>"~~*As required by EPA Region 10, this BHHRA included exposure scenarios that are not well documented, so it is unknown to what extent exposures currently occur, if at all, within the Study Area. In addition, this BHHRA evaluated risks associated with a hypothetical future scenario, which is not anticipated to reasonably occur in the future based on current information for the Study Area. The uncertainties associated with these potential and hypothetical exposure scenarios are discussed in the following subsections.*~~"<br>Consistent with EPA Superfund guidance, EPA and its partners chose only those scenarios that are reasonably anticipated to occur and are consistent with current statutory or regulatory requirements (e.g., designated beneficial use of the river as a source for drinking water)." | | the exposure scenarios evaluated in this BHHRA have limited documentation regarding the actual extent of exposure to receptors in the Portland Harbor. These scenarios were included in this BHHRA at the direction of EPA Region 10. The uncertainties associated with these scenarios are discussed in the following subsections. ~~As required by EPA Region 10, this BHHRA included exposure scenarios that are not well documented, so it is unknown to what extent exposures currently occur, if at all, within the Study Area. In addition, this BHHRA evaluated risks associated with a hypothetical future scenario, which is not anticipated to reasonably occur in the future based on current information for the Study Area. The uncertainties associated with these potential and hypothetical exposure scenarios are discussed in the following subsections.~~" | with the exposure scenarios evaluated in the BHHRA are discussed in the following subsections." |
| 3e | | | July 16, 2010, **comment S172** §8.0, p. 137 (revise): "Revise the first sentence in the second paragraph as follows:<br>*"Populations evaluated in the risk characterization portion of the BHHRA were identified based on human activities that are known to occur now and/or which could occur in the future within the Study Area, …""* | See comment resolution in 3c above. | Revised text in §8.0 (now §7.0). "The populations evaluated in the risk characterization portion of the BHHRA were identified based on human activities that are known to occur now and/or which could occur in the future within the Study Area, as described in the Programmatic Work Plan, or were directed by EPA for evaluation in this BHHRA." | "The populations evaluated in the BHHRA were identified based on human activities currently known to occur within the Study Area or could occur in the future, as described in the Programmatic Work Plan." |
| 3f | | | EPA's comments on the 2009 Draft BHHRA did not include comments on the cited text in §1.2. | | Text in §1.2. "Exposure scenarios that were not included in the Programmatic Work Plan were evaluated in this BHHRA based on direction from EPA. Specific agreements with and direction from EPA related to the approach for this BHHRA are documented in Attachment F1." | "Specific documents related to the approach for this BHHRA are presented in Attachment F1." |
| 3g | | | EPA's comments on the 2009 Draft BHHRA did not include comments on the cited text in §3.1. | | Text in §3.1. "The above populations were identified based on human activities that are known to occur within the Study Area, as described in the Programmatic Work Plan, or were required by EPA for evaluation in this BHHRA." | "The above populations were identified based on human activities know to occur within the Study Area, with the exception the use of surface water as a domestic water source." |
| 3h | | | EPA's comments on the 2009 Draft BHHRA did not include comments on the cited text in §3.3.2.2. | | Text in §3.3.2.2. "The diver exposure scenarios were directed by EPA in a memorandum regarding the *Proposed Commercial Diver Exposure Scenario for the Portland Harbor Risk Assessment* (EPA 2008c)." | Sentence deleted. |
| 3i | | | EPA's comments on the 2009 Draft BHHRA did not include comments on the cited text in §5.2.3.3.2. | | Text in §5.2.3.3.2. "The commercial diver in a dry suit was not evaluated for CT exposure, as directed by EPA." | "a CT evaluation was not done for a commercial diver in a dry suit." |
| 4a | **The LWG objects to EPA's revisions that modify the Study Area boundaries because these revisions are inconsistent with prior agreements between EPA and** | This issue was not raised by EPA during development and finalization of in the Programmatic Work Plan. | No comments. | April 15, 2009 table, *Outstanding Portland Harbor RI/FS Issues, Status as of 4/15/2009*:<br>#22 (Study Area Boundary): "On 6/11/08 EPA and LWG agreed that the site-wide risk scenarios would be | Text in §1.3. "The approximate 10-mile portion of Portland Harbor from RM 1.9 to 11.8 is referred to as the Study Area (Map 1-1)."<br><br>Text in §5.2.2. "In addition to calculating risks from in-water sediment exposure within the | "The approximate 11-mile portion of Portland Harbor from RM 0.8 to 12.2 is referred to as the Study Area (Map 1-1)." |

Table 2: General categories of LWG objections to the EPA June 22, 2012 revisions[1]:

| Issue Number | Basis for LWG objection | April 23, 2004 Programmatic Work Plan | EPA Comment on 2009 Draft BHHRA | LWG/EPA Comment Resolution | May 2, 2011 Draft Final BHHRA (redline) | EPA June 22, 2012 Revised BHHRA |
|---|---|---|---|---|---|---|
| | **the LWG.** | | | developed for the Study Area from RM 2 to RM 11.8 and that separate EPCs and baseline risk evaluations would be prepared for the areas between RM 1 and RM2, upper Multnomah Channel, and RM 11.8 to RM 12.2." | Study Area (which includes exposure areas from RM 1.9 to RM 11.8, including Swan Island Lagoon), risks from in-water sediment exposure were calculated for three river segments outside of the Study Area: the downstream reach (RM 1.0-1.9), the downtown river segment (RM 11.8 – 12.2), and Multnomah Channel." | Text deleted. |
| 5a | **The LWG objects to EPA's revisions that were not the subject of prior comments.** | | July 16, 2010 Cover Letter:<br><br>"EPA has attempted to provide clear direction on the specific revisions that are needed to resolve the comments."<br><br>"EPA's comments are focused on areas of the report that were deficient, and changes are needed to make the report acceptable to EPA." | | The Executive Summary was revised in accordance with EPA's July 16, 2010 comments, which included 25 specific comments, of which 3 were directed changes, on the Executive Summary. | Executive Summary section deleted |
| 5b | | | | | The Conclusions section was revised in accordance with EPA's July 16, 2010 comments, which included 2 specific comments, of which one was a directed change, on the Conclusions. | Conclusions section deleted |
| 5c | | | | | | The above are two specific examples; throughout the 200-page document, there are extensive additional directed changes to the text, table, and figures that were not part of the July 16, 2010 comments. |