

Response to Comments

Prepared by: Windward Environmental

Date: March 23, 2015

This document provides a response to comments relating to Windward's October 6, 2015 draft report titled *Development of Human Health Water Quality Criteria for the State of Idaho*. The tables in this document include the following:

- ◆ Table 1 addresses comments from the Draft Peer Review Report titled *Peer Review of Development of Human Health Water Quality Criteria for the State of Idaho* (dated December 1, 2015)
- ◆ Table 2 addresses comments from two Westat memorandums:
 - ◆ *Review of Idaho Fish Survey* (dated October 19, 2015)
 - ◆ *To-do list for improving the estimates of Idaho fish consumption* (dated October 26, 2015)

Green shaded rows in these tables indicate that revisions were made to Windward's October 6, 2015 draft report to address the comment.

Table 1. Response to comments provided in the Peer Review Report of Windward’s October 6, 2015 draft report titled *Development of Human Health Water Quality Criteria for the State of Idaho*

Description of Comment / Suggestion	Response
General Impressions and Big Picture Comments	
<p>Reviewers had various comments relating to suggestions for the inclusion of additional background information regarding the following topics:</p> <ul style="list-style-type: none"> • Scope/purpose of the report • Intended audience • Information about Monte Carlo and probabilistic methods (and discussion of advantages) • Discussion comparing probabilistic and deterministic methods • Add information regarding WQC development for carcinogens and non-carcinogens. 	<p>Although this report was not intended to be a stand-alone document, additional background information would have been helpful to provide context for this report. The following clarifications would have improved the report:</p> <ul style="list-style-type: none"> • Report was prepared to respond to EPA’s disapproval of Idaho’s previous human health WQC, and thus included a limited subset of chemicals • Intended audience was a subset of individuals interested in the technical details of the use of probabilistic methods for WQC development. • A brief overview of Monte Carlo / probabilistic methods would have been added, along with references to where the reader can find more background information. This would include a discussion of advantages and a comparison with deterministic methods. <p><i>Revisions: This comment was addressed in the revised version of the report (dated March 22).</i></p>
<p>No explanation is provided for why some metals (e.g., lead, copper, and chromium) are not included in the reports.</p>	<p>Additional background information would have clarified this issue; this report was prepared to respond to EPA’s disapproval of Idaho’s previous human health WQC, and thus included a limited subset of chemicals. This was not an attempt to revise human health WQC for all chemicals. More details on the scope of Idaho’s rulemaking can be found on DEQ’s web site here: http://www.deq.idaho.gov/laws-rules-etc/deq-rulemakings/docket-no-58-0102-1201/</p> <p><i>Future revisions: If the report is revised, this information would be added for improved clarity.</i></p>
<p>No justification is provided for the use of different levels of protection for different populations / use of mean value for Nez Perce; suggest using the 95th percentile for both populations.</p>	<p>Decision to use 95th percentile for the general population and mean value for the Nez Perce tribal population was a policy decision made by Idaho DEQ based on EPA guidance that WQC should protect the majority of the general population and should adequately protect high-end consumers.</p> <p><i>Future revisions: If the report is revised, this information would be added for improved clarity.</i></p>
<p>Use of the mean value for evaluating the Nez Perce population is problematic in that it also adjusts the drinking water intake rate. The 90th percentile drinking water intake rate should be used for all populations.</p>	<p>Decision to use mean WQC value for Nez Perce was a policy decision made by Idaho DEQ. The reviewer provides a good point that the impact of this decision should be evaluated further. However, it is unclear if the reviewer understands that the same distributions (i.e., for body weight, fish consumption rate, and body weight-normalized drinking water intake rate) were used to develop WQC for both the general population and Nez Perce tribal population.</p> <p><i>Future revisions: If the report is revised, the impact of this decision on the resulting WQC would be further evaluated, and discussed in the report. Text in Section 3.3.2 would be clarified to indicate that equivalent inputs are being discussed, not actual model inputs.</i></p>
<p>Is the inclusion of non-Idaho fish in the data used to develop the FCR appropriate for WQC development?</p>	<p>The consideration of this comment is beyond the scope of this report; FCRs were derived by Idaho DEQ and are discussed in Idaho DEQ’s technical report. However, it should be noted that this policy decision resulted in a higher FCR, and thus more health-protective WQC.</p> <p><i>Future revisions: None needed.</i></p>

Description of Comment / Suggestion	Response
<p>Reviewer confusion regarding the two types of WQC developed for each chemical (fish only, and fish + water), and which types were evaluated for which populations.</p>	<p>Following typical EPA guidance for the development of WQC, two types of criteria were developed: fish-only WQC (which assume that no local water is consumed) and fish+water WQC (which assume that both local fish and local water are consumed). WQC based on both the general population and the tribal population were developed for each of these criteria types (i.e., both populations were evaluated based only on the consumption of fish, and on the consumption of both fish and water). <i>Future revisions: If the report is revised, text would be clarified as needed to better explain the two types of WQC and/or highlight references to EPA guidance on this topic.</i></p>
<p>The probabilistic evaluation was not fully utilized to assist in clearly describing variability and resulting risk differences. The evaluation should have included a full analysis of the upper percentiles of FCR for the Nez Perce Tribe and WQC using all deterministic parameter values, including use of at least the 90th percentile DI for all populations (2.4 L/d).</p>	<p>The scope of this report included the development of WQC using probabilistic methods, but did not include a more complex evaluation of variability. Reviewer comments regarding the addition of more background information would have helped to clarify this. In addition, reviewer comments noted later in this document regarding additional evaluations to provide context for the probabilistically-calculated WQC would help to address this concern. <i>Future revisions: If the report is revised, the changes noted above would be incorporated.</i></p>
<p>Specific Comments</p>	
<p>Section 2.1: The general population is defined relative to fish consumption. What about drinking water intake?</p>	<p>It is not clear what the reviewer is asking in this comment. The general population includes all survey respondents; drinking water is included for all populations. <i>Future revisions: None needed.</i></p>
<p>Section 2.1: The term “angler-only population” is unclear. What specifically does this mean?</p>	<p>The “angler only” population is a subset of the general population that includes only those individuals who indicated that they were licensed Idaho anglers in the survey. These individuals are typically known to consume fish at a rate higher than that for the general population. The same assumptions regarding water consumption for the general population were applied to the “angler-only” population. <i>Future revisions: If the report is revised, this term would be clarified, and a reference to the fish consumption survey report will be added.</i> <i>Revisions: This comment was addressed in the revised version of the report (dated March 22).</i></p>
<p>Table 2-2: Comment regarding missing WQC acronym in Table 2-2, and need to provide units conversion</p>	<p>The WQC acronym was inadvertently omitted, and a note regarding the units conversion can be added to the table. <i>Revisions: This comment was addressed in the revised version of the report (dated March 22).</i></p>
<p>Section 2.2.1: Presumably, the iterative runs involved changing only the input water concentrations. However, this is not stated.</p>	<p>Comment is correct; only iterative runs involved changing water concentrations. <i>Revisions: This comment was addressed in the revised version of the report (dated March 22).</i></p>
<p>Section 2.2.2: The text “plus or minus one digit” could be changed to “plus or minus one significant figure.”</p>	<p><i>Revisions: This comment was addressed in the revised version of the report (dated March 22).</i></p>
<p>Section 2.2.2: Comment regarding the two metrics used to evaluate whether the model runs were stable, and whether @RISK’s convergence function could be used instead.</p>	<p><i>Future revisions: If the report is revised, we would consider whether using the convergence function in @RISK would be a more straightforward way to performing this evaluation, and whether it would provide results that are more easily understood.</i></p>

Description of Comment / Suggestion	Response
<p>Section 2.3.1: Evaluate whether the average body weight for the general population is the same as the average body weight for the population consuming fish, or if a different distribution should be used.</p>	<p>Body weights used in the calculation of FCRs were based on the survey data provided by Idaho DEQ. However, based on the comparison to national data and the relatively low sensitivity of the model to changes in body weight, this issue is not expected to have a large influence on WQC.</p> <p><i>Future revisions: If the report is revised, an evaluation of population-specific body weights would be considered.</i></p>
<p>Section 2.3.2 and 2.3.3: Suggest considering normalizing drinking water intake rate and FCR by body weight for individual survey results to ensure realistic values</p>	<p>As discussed in Section 2.3.2, a body-weight normalized drinking water intake rate was used in the development of the WQC. The FCR was not normalized by body weight based on the results of the evaluation presented in Section 2.3.3.1, which indicated that there is no relationship between FCR and body weight in the survey data.</p> <p><i>Future revisions: None needed; although we would review the report to ensure that the above is clear in the report.</i></p>
<p>Section 2.3.3: The development of fish consumption rates based on unpublished data is not acceptable; these must be published.</p>	<p>Survey data are presented in a report prepared by the Northwest Research Group (NWRG). A citation to this report (NWRG 2015) is included in the report, and the citation provides this link to the report: http://www.deq.idaho.gov/media/60176884/58-0102-1201-nwrq-fish-consumption-survey-final-report.pdf</p> <p><i>Future revisions: None needed.</i></p>
<p>Section 2.3.3 (Table 2-6): The explanations in the footnotes are not sufficient to justify the choice of values. In addition, using or relying on a report that is not yet published is a major challenge to this effort because the data are not available for supporting some of the values.</p>	<p>As noted previously, this report was not intended to be a stand-alone document, thus includes only limited information regarding the FCR development by Idaho DEQ. This information is documented in Idaho DEQ's technical report.</p> <p><i>Future revisions: The addition of more background information regarding the scope of the report would have helped to clarify why only limited information was included here. If the report is revised, we will evaluate whether some additional information could be added to clarify where the rationale for the selected FCR values is presented.</i></p>
<p>Section 2.3.3: Report should include more information on survey data used to develop FCR, and Idaho DEQ should have considered all EPA guidance in FCR development.</p>	<p>This report was not intended to be a stand-alone document. Thus, the report includes only a brief summary of the FCR data and includes references to the survey data report. The development of the FCR for use in the PRA was beyond the scope of this report. Applicable EPA guidance was considered by Idaho DEQ and Windward in the entire Idaho-specific FCR development process (survey development, survey execution, and data analysis), and for the development of WQC.</p> <p><i>Future revisions: None needed.</i></p>
<p>Section 2.3.3: More information is needed regarding the fish consumption patterns of the tribes to determine appropriateness of using this population to represent high-level consumers.</p>	<p>This report was not intended to be a stand-alone document. Thus, the report includes only a brief summary of the FCR data and includes references to the survey data report. As discussed in Section 2.1 of the Windward report, Idaho-specific FCR were available for three higher-risk groups or populations: 1) Idaho anglers, 2) Nez Perce tribal members, and 3) Shoshone-Bannock tribal members. Of these three the highest FCR were in the Nez Perce Tribe, and thus the Nez Perce population was selected to represent high-level consumers.</p> <p><i>Future revisions: None needed.</i></p>

Description of Comment / Suggestion	Response
<p>Section 2.3.3: More information should be included in the report regarding the Idaho angler-only and Shoshone-Bannock FCRs to evaluate protectiveness of WQC for these groups. In addition, these populations should be evaluated using the 95th percentile FCR.</p>	<p>Information regarding the consumption rates for these two populations is discussed in Section 2.3.3 of the report; Table 2-6 clearly shows that the Nez Perce tribe is the higher-level consuming population with the highest FCR. In addition, the protectiveness of the proposed WQC for the angler-only and Shoshone-Bannock populations were evaluated in Section 3.2 (for the average individual, 90th percentile, and 95th percentile). In addition, because this report was not intended to be a stand-alone document, references to the survey data are included.</p> <p><i>Future revisions: None needed.</i></p>
<p>Section 2.3.4: Text needs to provide some at least brief comment on why the RSC for the selected chemicals was adjusted upward by EPA, in part to provide context for why the RSC for other chemicals remain unadjusted.</p>	<p>As noted previously, this report was not intended to be a stand-alone document, thus it was beyond the scope of this work to provide rationale for EPA's adjustments to the RSC values. Please see EPA's 2015 recommended human health criteria for more information: http://www.epa.gov/wqc/human-health-water-quality-criteria</p> <p><i>Future revisions: If the report is revised, we could consider whether any notes regarding EPA's rationale for adjusting the RSC values could be added to Appendix A (Table A1).</i></p>
<p>Section 2.3.5: The use of BAFs (and the development of the Idaho-specific weighting factors for these BAFs) needs to be better explained.</p>	<p>As noted above, the Windward report was not intended to be a stand-alone document, but rather referenced other reports for details regarding parameter development. In this case, Section 2.3.5 and Table A2 of Appendix A provide an overview of the methodology, and a citation for Idaho DEQ's technical report is provided, and is available online here: http://www.deq.idaho.gov/media/60177673/58-0102-1201-human-health-criteria-support-document-1215.pdf.</p> <p><i>Future revisions: Background information regarding the scope of the report would help clarify why more information was not provided in the report.</i></p>
<p>Section 2.3.5: Reviewer confusion regarding how the BAF is dependent on the FCR.</p>	<p>The value of the BAF is not dependent on the magnitude of the FCR, but rather the proportion of the Idaho-specific FCRs comprised of fish from Trophic Levels 2, 3, and 4 were used to weight the trophic level BAFs provided by EPA. A reference to Idaho DEQ's technical report where this is presented is included in Section 2.3.5.</p> <p><i>Future revisions: If the report is revised, this Idaho-specific BAF weighting would be more clearly described to prevent this confusion.</i></p>
<p>Section 2.3.6 and Appendix A: Report should cite original source of toxicity values in addition to EPA AWQC report</p>	<p>This is a reasonable suggestion for adding additional useful information to the report.</p> <p><i>Future revisions: If the report is revised, this would be added to Appendix A (Table A3).</i></p>
<p>Table 3-1: What is meant by "Selected WQC?"</p>	<p>The "Selected WQC" is the lowest WQC calculated based on either the general population or the Nez Perce Tribal population.</p> <p><i>Revisions: This comment was addressed in the revised version of the report (dated March 22) by adding an explanation of this term in a footnote to Table 3-1.</i></p>
<p>Section 3.2: Evaluation presented in this section (deterministic calculations of protectiveness of WQC) should include the Nez Perce population evaluated at the 95th percentile (FCR = 56.6 g/day).</p>	<p>This is a good suggestion for providing additional information regarding the protectiveness of the probabilistically-calculated WQC. The expectation is that the increase in risk would be approximately proportional to the increase in the FCR.</p> <p><i>Future revisions: If the report is revised, this would be added to Section 3.2.</i></p>

Description of Comment / Suggestion	Response
Appendix A (Table A2): More clearly present the trophic levels used with FCRs for each population in the report Section 2.3.5 and not just Appendix A	<i>Future revisions: If the report is revised, a table of the Idaho-specific BAF-weighting factors could be added to Section 2.3.5.</i>
Appendix B: Deterministic calculations of WQC for general population and Nez Perce should be added to Appendix B for informational purposes and improved transparency.	We agree that the addition of WQC values calculated deterministically would be helpful for providing additional context for the probabilistically-calculated WQC values. <i>Future revisions: If the report is revised, this evaluation would be added to Appendix B.</i>
Comments regarding additional areas of exploration	
Consideration of developmental toxicants (i.e., evaluate these chemicals for children and women of child-bearing age)	Water quality criteria were developed based on EPA's current guidance; these topics are not yet included in this guidance and thus were not considered in this evaluation.
Consideration of direct exposure to surface water during recreation (e.g., incidental ingestion)	<i>Future revisions: None</i>

Table 2. Response to comments provided in the Westat memorandums (dated Oct. 19 and 25, 2015)

Description of Comment / Suggestion	Response
<p>Suggestion for use of ratios of upper percentiles from general population FCR to determine upper percentiles for FCR for the Nez Perce tribal population (October 19 memorandum; Section 4.1).</p> <p>“Revise the adjustment for estimating the top 5% of the Nez Perce distribution...” (October 25 memorandum)</p>	<p>The suggested methodology for filling in the missing data for the upper percentiles of the Nez Perce tribal population FCR is logical. Windward calculated WQC based on a revised distribution using this suggested distribution development method as part of additional analyses conducted for this report. Although these changes did have a major impact on the resulting WQC, this suggestion is easier to justify and should be incorporated.</p> <p><i>Future revisions: If the report is revised, WQC will be updated to use a revised distribution based on these methodology.</i></p>
<p>“Assumption that drinking water intake rate per body weight appears to be a reasonable assumption.” (October 19 memorandum; Section 4.2.1)</p>	<p><i>Future revisions: none needed.</i></p>
<p>“We expect fish consumption to increase with increasing body weight.” Suggestion for evaluating correlation on log-transformed basis (October 19 memorandum; Section 4.2.2)</p> <p>“Consider a correlation between log-transformed body weight and log-transformed usual fish consumption.” (October 25 memorandum)</p>	<p>Section 2.3.3.1 of Windward’s draft report evaluated this topic, but did not discuss a log-log correlation evaluation. This evaluation was conducted in response to this suggestion, and as with the non-transformed data, no correlation was found. Thus, no correlation factor is needed.</p> <div data-bbox="869 691 1934 1073" data-label="Figure"> </div> <p><i>Revisions: This comment was addressed in the revised version of the report (dated March 22) by adding the above figure to Section 2.3.3.1.</i></p>
<p>Translation of Group 2 fish to equivalent Idaho Fish / calculated weighted fraction of chinook across all respondents (October 19 and 25 memorandums)</p>	<p>This comment, although related to the FCR, is applicable to Idaho DEQ’s technical support document (available online here: http://www.deq.idaho.gov/media/60177673/58-0102-1201-human-health-criteria-support-document-1215.pdf) and thus is not addressed here.</p> <p><i>Future revisions: none needed.</i></p>

Note that the majority of the comments in these memorandums did not relate directly to Windward’s PRA report, and thus are not included in this table.