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CORPORATE HEADQUARTERS

June 19, 2014

SENT VIA EMAIL TO: paula.wilson@deq.idaho.gov

Ms. Paula Wilson
Idaho Department of Environmental Quality
1410 North Hilton
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Dear Ms. Wilson:

Attached are comments prepared by Arcadis on the May 21, 2014 negotiated rulemaking on the water quality/fish consumption rulemaking and Discussion Paper #4. We would appreciate DEQ's consideration of these comments. Please let us know if you have any questions.

Sincerely,

Alan L. Prouty
Vice President, Sustainability & Regulatory Affairs

Enclosure

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Comments on the Idaho Fish Consumption Rate and Human Water Quality Criteria-Discussion Paper #4 Market (All) or Local Fish Presented at the May 21, 2014 Negotiated Rulemaking Meeting

June 18, 2014

Comments on the IDEQ May 21, 2014 Negotiated Rulemaking Presentation Materials

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Acronyms and Abbreviations

IDEQ	Idaho Department of Environmental Quality
NCI	National Cancer Institute
RfD	reference dose
POD/UF	point of departure/uncertainty factor
RSC	relative source contribution
USEPA	United States Environmental Protection Agency
WQC	water quality criteria

1. Introduction

ARCADIS staff participated by webinar in the May 21, 2014, Negotiated Rulemaking Meeting hosted by the Idaho Department of Environmental Quality (IDEQ) concerning the fish consumption rates to be used to derive Idaho water quality criteria (WQC) for the protection of human health. Since that time, ARCADIS has reviewed both the slide presentations given during the May 21 Negotiated Rulemaking Meeting and Discussion Paper #4 on Market (All) or Local Fish presented at the Meeting. Based on our review, we first offer several general comments on the material presented in Discussion Paper #4 for consideration by IDEQ. The general comments are followed by several specific comments.

2. Comments

2.1 Inclusion of Marine Fish

Inclusion of all market fish in the statewide WQC, which presumably also include marine fish, would be precedent setting. As the discussion paper states on page 3, the United States Environmental Protection Agency (USEPA) has not included marine fish in its national criteria historically nor do USEPA's proposed revisions to national criteria include marine fish; only fresh and estuarine fish are included (USEPA 2014). We believe that marine fish should be excluded from the fish consumption rates used to derive Idaho-specific WQC for the same reasons that USEPA excludes such fish from national WQC. Namely, exposures and risks associated with such fish are not affected by freshwater WQC.

2.2 Philosophical Basis for Development of Criteria

The discussion paper raises the philosophical issue of whether WQC are designed to protect people from all chemicals in all fish in their diet or only from chemicals in fish from Idaho waters. Water quality criteria are not derived to protect people from all potential water-related exposures, regardless of the nature and location of the water causing the exposure. Rather, surface water criteria are derived to protect people from surface water-related exposures that can be affected by regulations promulgated by either the state or USEPA. This is consistent with USEPA's exclusion of marine fish from the national criteria. As noted above, USEPA is not able to regulate concentrations of chemicals in fish caught from open ocean waters. Similarly, ambient air quality guidelines are not derived to protect people from all possible air exposures, such as those that a person may experience when they have purchased a new appliance for their home that may be releasing volatile chemicals into indoor air. Control of exposure to indoor air releases occurs by limiting the amount of a chemical that may be released by new appliances not by adjusting ambient air quality guidelines. Such guidelines could be set to zero and still not reduce indoor air exposures from new appliances. Similarly, if concentrations of chemicals in fish from non-Idaho sources need to be controlled, that can be accomplished by regulating the amount of chemicals in such non-Idaho fish separately from Idaho WQC. The state-specific WQC will have no effect on the concentrations of chemicals in non-Idaho fish.

2.3 Carcinogenic vs. Noncarcinogenic Criteria

The discussion paper is not entirely clear on the distinction between criteria developed to protect the public from cancer causing chemicals versus non-cancer-causing chemicals.

Protection from cancer-causing chemicals is based on placing a limit on the incremental risk associated with a particular exposure over and above background. By including market fish in the fish consumption rate, IDEQ is including background fish exposures and trying to protect against those. Even if background risks are relatively large, the goal of cancer-based criteria has always been to limit the incremental risk associated with a specific behavior or situation (in this case, exposures from Idaho waters), not the background risk, because the specific criteria under consideration cannot affect the background risk. Some other regulation may be necessary to affect that risk. (For example, as IDEQ notes in the discussion paper, if the risk from a frequently eaten fish of marine origin is "too high," that risk can be reduced by limiting the concentration of the chemical in imports of that species. Including that fish in the fish consumption rate used to derive the state-specific WQC will reduce the state-specific criterion, but it will not reduce the risk to people eating that particular species of fish. In such an instance, Idaho could set the state-specific WQC to zero, and the risk from eating that marine species may well still be "too high.")

Development of criteria to protect the public from exposures to non-cancer-causing compounds is somewhat different. For noncarcinogens, USEPA does take into account background exposures. That is the goal of the relative source contribution (RSC). If data indicate that background exposures (i.e., exposures not affected by surface water criteria) are potentially large, then the RSC is set such that a relatively small proportion of a person's total exposure can come from regulated surface waters. If the data indicate that background exposures are relatively small, then the RSC is set such that a relatively large proportion of a person's total exposure can come from regulated surface waters.

So, the proper way to account for background exposures to noncarcinogens is through the use of the RSC, not by including such potential exposures in one of the other parameters used to derive WQC as the discussion paper appears to be suggesting by including market-based fish in the fish consumption rate. For carcinogens, the focus should be on assuring that the incremental risk from the exposure being regulated meets the allowable risk level. If one or more background sources pose a risk that is considered unacceptable, such risks should be addressed by regulations specific to those sources, not by changing the assumptions or allowable risk level used to derive WQC.

2.4 Relative Source Contributions

The discussion paper states that the RSC is used to "…account for nonwater sources of exposure to noncarcinogens" (page 5) and implies that only non-water-related sources can be included in the derivation of the RSC. While the discussion of the RSC in USEPA (2000) has specific sections discussing non-water exposure pathways (e.g., inhalation and dermal exposures), the RSC is not limited to nonwater-related

exposures. The RSC is intended to "ensure that the level of a chemical allowed by a criterion or multiple criteria, *when combined with other identified sources of exposure common to the population of concern* (emphasis added), will not result in exposures that exceed the [reference dose (RfD)] or the [point of departure/uncertainty factor (POD/UF)]" (USEPA 2000, page 4-4). If the Department identifies that marine fish are a source of exposure for a particular chemical to Idahoans, then the RSC can incorporate that potential exposure when developing state-wide WQC for that chemical. When estimating RSCs, Florida specifically included exposures associated with consumption of marine fish when the data indicated such exposures warranted inclusion (FDEP 2014, Appendix D, page 6).

Attempting to account for possible exposures to chemicals from marine fish by including marine fish in the consumption rate used to derive WQC has the potential to lead to criteria that are over-protective for some chemicals and under-protective of others. The contribution of marine fish to overall exposure will vary by chemical because concentrations of chemicals, and therefore risks, are likely to vary between species of marine fish. If marine fish are included in state-wide WQC to account for exposures from such fish, then for chemicals that are not present in marine fish, WQC will be over-protective because such criteria assume marine fish contribute to exposure when, in reality, they do not. On the other hand, for chemicals that are present in marine fish at concentrations higher than WQC allow to be present in Idaho fish, WQC will be under-protective because such criteria assume marine fish have the same concentration as allowed by Idaho WQC when, in reality, they have a greater concentration. To assure that state-wide WQC are appropriately protective, the contribution of marine fish to overall exposure, if such exposure is assumed to exist, should be accounted for using the RSC on a chemical-by-chemical basis, not through the inclusion of marine fish in the overall fish consumption rate.

The discussion paper speculates about the need to use lower RSCs than USEPA's default of 0.2 because marine fish may represent relatively large sources of exposure for some chemicals (page 6). Such speculation is premature given that information regarding the concentration of chemicals in marine fish has not been summarized and compared to allowable daily doses based either on the RfD or the POD/UF. When Florida derived RSCs for several chemicals (FDEP 2014, Appendix D), for none did they estimate an RSC of less than 0.2 even though the contribution of marine fish was explicitly considered. In fact, they identified several chemicals for which the RSC should be greater than USEPA's default ceiling of 0.8. It is also worth noting that USEPA recently approved WQC promulgated by the Spokane Tribe with RSCs equal to 1.0 (USEPA 2013). Similarly, the state of Washington has publically stated in many forums that their "soon-to-be" updated WQC will use an RSC of 1.0, and the federal government (Occupational Safety & Health Administration) uses an RSC of 1.0 in regulating exposures to non-carcinogens in the workplace. Thus, speculation about RSCs decreasing to less than USEPA's lower default of 0.2 should be eliminated from the discussion paper and replaced by discussion of the recent FDEP findings, which indicate that even when marine fish are included, RSCs appear to remain greater than the default lower limit of 0.2, often substantially so, even exceeding the default of ceiling of 0.8 (FDEP 2014, Table 3-3).

2.5 Implications for Fish Consumption Survey

The statement in the conclusion of the discussion paper (page 6) that the Idaho survey may not have sufficient responses to apply the National Cancer Institute (NCI) methodology to consumption of only Idaho fish is concerning given the critical nature of understanding the consumption rate of fish caught and consumed from waters of Idaho. Ideally, the survey should be expanded to assure that sufficient responses are gathered to apply the NCI methodology to Idaho fish. If that is not possible, IDEQ will need to develop an alternative approach by which Idaho-specific fish consumption rates can be derived from the broader overall fish consumption rate information collected as part of the survey. Perhaps that can be done by looking at the proportion of fish that are classified as "market" that are caught in marine waters versus in fresh and estuarine waters. Hopefully supermarkets in Idaho would be willing to share information about the amounts of the different kinds of fish they sell. This information should allow discrimination between marine and freshwater fish and potentially between freshwater fish raised or caught in Idaho waters versus freshwater fish from outside of Idaho.

3. Specific Comments

Page 3, third paragraph states "While this may seem like the most practical route (we can only regulate what goes on in Idaho, not out in the ocean), it also means that we are not accurately estimating the overall risk to the population if there is any consumption of fish from other sources."

Specific Comment: The only risk that WQC can affect is the risk from consumption of fish caught in Idaho. Risk from fish caught elsewhere, or other exposure from other media such inhalation or soil exposures, can only be addressed through regulations than can affect those other exposures. Examples include air regulations that limit air exposures or food regulations that set tolerance limits for chemicals in foods, including foods such as marine fish. State WQC cannot affect (i.e., reduce) these other exposures. Thus, the health protection goal of WQC is not overall risk, but rather limiting risk from consumption of fish caught in Idaho.

Page 3, third paragraph states: "The overall risk to Idaho citizens would be underestimated."

Specific Comment: The sentence implies the overall risk of Idaho citizens will be underestimated if consumption from other sources is not included. Setting aside that the WQC cannot affect the concentrations and exposures from other sources of fish (as discussed above), it is not the case the overall risk will be underestimated. The statement assumes other sources of fish contain chemicals. They may not. If they do not, then consumption of fish from these other sources has no effect on overall risk. The sentence should be clarified to indicate that overall risk is not necessarily underestimated.

Page 3, third paragraph states: "If the fish consumption rate is based on all fish consumed, regardless of source, we are protecting the population at a known and acceptable risk level while knowing that there may be a significant portion of the exposure from outside sources that we do not regulate or monitor.

Specific Comment: Basing the fish consumption rate on all fish does not necessarily mean the population is protected "at a known and acceptable risk level." If fish from other sources have chemical concentrations higher than those associated with state-wide WQC, then people eating such fish will have risks that exceed the acceptable risk level. Further, unless the concentration of the chemical in the other sources of fish is known, the level of risk of such consumers is also unknown. This sentence should be removed from the discussion paper because one cannot know, and the sentence should not imply, that citizens are protected at an acceptable risk level exactly because, as the sentence states as the end, Idaho does "not regulate or monitor" those outside sources and, thus, cannot know the exposures and risks associated with those sources.

Page 3, fourth paragraph, presents an example of John and Paul who differ in the source of fish they consume.

Specific Comment: This example is not particularly helpful because it has made several simplifying assumptions that are unlikely to be true, particularly once data about the full range of fish consumption rates are available from Idaho state-specific fish consumption rate survey. The survey will almost certainly find a range of fish consumption rates among Idaho citizens and that many citizens consume fish caught from Idaho waters as well as fish from other sources. These realities greatly blur what appears to be a dramatic difference in consumption rates between the two hypothetical individuals in the example and fail to acknowledge and use the rich and robust fish consumption rate data set that will be the result of the state-wide Idaho fish consumption rate survey. The example should either be modified and expanded to make full use of the fish consumption rate information likely to be available from the state-wide survey or be removed from the discussion paper so as not to mislead readers about fish consumption rates among Idaho citizens.

Page 3, fifth paragraph, refers to a criterion changing by "1.6 times."

Specific Comment: The basis for this change is unclear. Relevant background information should be provided or the example should be eliminated from the discussion paper.

Page 4, first full paragraph, states: "Returning to protection, if the fish consumption rate is based on all fish consumed, John and Paul are protected at the same risk level."

Specific Comment: For the reasons already discussed above, this statement is not accurate. John and Paul's level of protection depends upon the relative concentration of chemicals in marine versus Idaho fish. The marine fish concentration is unknown and, therefore, their respective levels of protection are unknown.

The sentence needs to be corrected, or as suggested in the specific comment above, the hypothetical example should be eliminated from the discussion paper.

Page 4, first full paragraph, states: "If the fish consumption rate is specific only to Idaho fish, the two are no longer protected at the same rate. Paul's associated risk with eating Idaho fish is greater than John's."

Specific Comment: For the reasons discussed above, this example greatly simplifies and makes extreme differences in fish consumption between citizens of Idaho. If the example is to be retained in the discussion paper, it should be expanded to incorporate a more realistic representation of the differences in fish consumption among Idaho citizens.

Page 5, last paragraph states: "Relative source contribution (RSC) is a term that appears in the calculation of criteria for noncancer effects. This term is used to account for nonwater sources of exposure to noncarcinogens. The RSC is chemical specific and adjusts the criteria calculation to account for exposure to the chemical from other sources such as food (other than fish and shellfish) and inhalation."

Specific Comment: As discussed above in the general comments, the RSC can be used to account for any important source of exposure other than those regulated by state-wide WQC. As recognized by Florida, those other sources can include marine fish. Consider rewording the above sentences to: "This term is used to account for background sources of exposure to noncarcinogens not affected by the criterion in question. The RSC is chemical specific and adjusts the criteria calculation to account for exposure to the chemical from other sources such as food and inhalation."

Page 5, last paragraph states: "Criteria for carcinogens do not use an RSC because they are set at an incremental lifetime risk (1 in 10^6) posed by the chemical's presence in water (Louch et al. 2012)."

Specific Comment: Criteria can be set to incremental risk levels other than $1x10^{-6}$. Consider rewording the above sentence to: "Criteria for carcinogens do not use an RSC because they are set at an incremental lifetime risk (for example, 1 in 10^6) posed by the chemical's presence in water (Louch et al. 2012)."

4. Conclusions

We believe the fish consumption rates used to derive state-wide WQC for Idaho should be based on fish caught from Idaho waters. Inclusion of market (marine) fish in the fish consumption rate used to derive WQC will not affect the potential risks Idaho citizens may have from such fish. If Idaho believes potential exposures from non-Idaho market fish potentially pose an unacceptable risk, then such exposures should be addressed through regulation separate from the state-wide WQC.

We also believe the presentation of the different approaches used by USEPA to estimate potential noncancer and cancer risks could be clarified. The key differences between regulation of cancer risk (based

on regulating the incremental risk associated with a particular source) and noncancer risk (using and RSC to apportion a fraction of total allowable daily exposure to the source being regulated) could be made more transparent. Additionally, the discussion of RSC should be modified to make clear that all other sources of exposure can be included in the derivation of an RSC, including fish from non-Idaho waters, if such fish are known to represent an important source of exposure.

Lastly, the discussion paper alludes to the possibility that the current design and implementation of the state-wide fish consumption survey will not lead to sufficient responses to employ the NCI method to derive a distribution of long-term consumptions rates for fish consumed from Idaho waters. If the Department believes that to be the case, then we strongly recommend the Department take action to modify the implementation of the survey or identify other information that can be used in conjunction with the results of the survey to assure that such a distribution can be developed once the survey is completed.

5. References

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