UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OFFICE OF
WATER AND WATERSHEDS

May 29, 2015

Don Essig
Idaho Department of Environmental Quality
1410 N. Hilton
Boise, Idaho 83706

RE: EPA comments on Idaho's Proposed Policy Decisions Related to Human Health Criteria for Toxics

Dear Don:

The EPA appreciates the opportunity to provide comments to the Idaho Department of Environmental Quality (DEQ) on the policy recommendations that DEQ will use to inform revisions to Idaho's human health ambient water quality criteria. In particular, the EPA appreciated DEQ's presentation at the April 21, 2015 negotiated rulemaking meeting, where you discussed these proposed policy decisions as well as several options DEQ is still contemplating. The EPA supports DEQ's ongoing efforts and recognizes the challenging work that DEQ has undertaken thus far in consideration of revisions to Idaho's human health criteria.

The enclosed detailed comments reflect many of the issues the EPA identified in our previous letters on each of the policy discussion papers developed by DEQ over the past year. Given that DEQ has further considered these important policy decisions and is now providing a recommended position, or in some cases consideration of several options, the EPA is providing more specific comments for your consideration. Please note that, in some instances, the EPA is providing more general comments at this time and is requesting additional information to better understand DEQ's proposal before providing more detailed comments.

In general, the EPA is encouraged that several of DEQ's proposed policy decisions reflect recommendations consistent with EPA's 2000 Human Health Methodology and more recent EPA policy documents. At the same time, the EPA is concerned about some of DEQ's proposed policy decisions and we have described those concerns and provide suggestions for addressing them in the enclosed comments. In addition, it is important to note some overarching themes that the EPA will consider when evaluating protective human health criteria:

- Tribal Reserved Rights: In addition to complying with the CWA and EPA's regulations, when setting criteria to adequately protect Idaho's designated uses, it is necessary to consider tribal reserved rights, including tribal treaty-reserved fishing rights (executive orders and federal statutes could also apply).

- Best available science: The EPA commends DEQ for its collaborative work to develop state-specific fish consumption survey data and tribal fish consumption survey data for

Idaho. The EPA is encouraged that Idaho is considering the tribal survey data along with the state-wide survey data, and appreciates Idaho's efforts to coordinate and collaborate with EPA and the tribes. Along with using local and regional FCR data, DEQ should use the best available science to select all the input parameters needed to derive its human health criteria. In many instances, the EPA's 2014 draft 304(a) recommended criteria represents the best available science. If the EPA's criteria recommendations become final before Idaho adopts a final human health criteria rule, the EPA recommends that the state use that information instead of the 2014 draft criteria information.

- Protection of Downstream Waters: It is important for Idaho to demonstrate how its revised human health water quality criteria will provide for the attainment and maintenance of the water quality of downstream waters, consistent with EPA's regulations at 40 CFR 131.10(b).

The EPA appreciates DEQ's efforts to revise Idaho's human health criteria for toxic pollutants and looks forward to continued conversations regarding these important decisions. In addition, EPA remains committed to supporting DEQ's work and is available to provide technical assistance as you develop a proposed rule. If you have any questions or would like to discuss these comments further, please contact me at (206) 553-1834 or Lon Kissinger at (206) 553-2115.

Sincerely,

Lisa Macchio
Water Quality Standards Coordinator

Enclosure

EPA's Comments on Idaho Department of Environmental Quality's (DEQ) Policy Recommendations Related to Revisions to Idaho's Human Health Criteria for Toxics
May 29, 2015

Derivation of FCR using consumers only

EPA supports DEQ's proposed policy decision to base its fish consumption rate (FCR) on consumers only and to exclude non-consumers in the derivation of a FCR for Idaho. This is consistent with EPA's recommendation to use consumer only data when available. In particular, EPA supports DEQ deriving FCRs from 24-hour recall survey results using a statistical modeling approach developed by the National Cancer Institute, the NCI method, to develop defensible consumer only FCRs for Idaho. This is consistent with EPA's approach to develop the FCR used to compute national human health ambient water quality criteria. If such modeling approaches are not used to derive FCRs from short term dietary recall data, biased FCRs would result.

Evaluate range of exposure/risk in both general and higher consuming subpopulations

EPA supports DEQ's proposed policy decision to evaluate the range of exposure/risk in both the general population and higher consuming populations. Human health criteria are designed to minimize the risk of adverse cancer and non-cancer effects occurring from lifetime exposure to pollutants through the ingestion of drinking water and consumption of fish/shellfish. When choosing exposure factor values to include in the derivation of a criterion for a given pollutant, EPA recommends considering values that are relevant to populations that are most susceptible to that pollutant. For example, highly exposed populations should be considered when setting criteria. To that end, EPA's methodology notes a preference for the use of local data to calculate human health criteria (e.g., locally derived FCRs, drinking water intake rates and body weights, and waterbody-specific bioaccumulation rates), over national default values, to better represent local conditions.[1]

Deterministic or Probabilistic

EPA needs additional detailed information to evaluate whether DEQ's proposal to employ probabilistic risk assessment (PRA) to develop human health criteria is scientifically defensible and protective. EPA recommends that DEQ present a draft proposal at the next rulemaking meeting that clearly defines desired outcomes for the PRA approach and how they will be met. For example, the EPA generally recommends that variables describing toxicity should not be distributed, as insufficient data generally exist to develop distributions for toxicity variables, and toxicity metrics are developed by consensus at the national level. Therefore, it is important for DEQ to clearly explain why it is choosing the PRA approach and how it will address the

[1] USEPA. 2000. Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA-822-B-00-004. http://www.epa.gov/waterscience/criteria/humanhealth/method/complete.pdf.

following types of issues, as these would be considerations in EPA's assessment of a PRA approach. EPA is available to provide more detailed comments once DEQ provides additional information on its proposal.

(1) The purpose and scope of the analysis should be clearly articulated. This should include derivation of human health criteria that are protective of higher fish consuming populations. The risk management decisions related to interpretation of output exposure or risk distributions should be specified (e.g., human health criteria shall be derived such that the 95th percentile of the risk distribution will equal 1 in 1,000,000).

(2) The methods used for the analysis (including all models and/or software used, all data upon which the assessment is based, and all assumptions that have a significant impact upon the results, for example correlation of variables) should be well documented, easily located, and reproducible. This documentation should include a discussion of the degree to which the data used are representative of the population under study, and possible sources of bias and uncertainty in both the input and output distributions. In particular, variability (the range of values a variable might assume) should be distinguished from uncertainty (lack of knowledge about a variable).

(3) DEQ also should calculate human health criteria using deterministic (e.g., point estimate) methods. Providing these values will allow comparisons between the probabilistic and deterministic approaches for developing human health criteria. When comparisons are made, it is important to explain the similarities and differences in the underlying data, assumptions, and models as well as the strengths and weaknesses of differing assumptions.

Exclusion of market fish

EPA is concerned with DEQ's proposed policy decision to exclude market fish from the FCR that it will use to derive revised human health criteria. As EPA stated in our June 2014 comment letter on this topic, a FCR that reflects the amount of fish Idahoans consume should not just include fish consumed from local waters. Therefore, EPA recommends that DEQ include market fish in the FCR used to derive human health criteria. This approach is consistent with a national water quality program principle that every state does its share to protect people who consume fish and shellfish that originate from multiple jurisdictions. In addition, the goal of water quality criteria for human health is to protect people from exposure to pollutants through fish and water over a lifetime, and the goal of a state's designated use should be that the waters are safe to fish in the context of the total consumption pattern of its residents.

Exclusion of anadromous fish

EPA is concerned with DEQ's proposed policy decision to exclude anadromous fish from the FCR, and recommends that DEQ include anadromous fish in the FCR used to derive HHC.

While EPA's 304(a) recommended criteria account for exposures to non-carcinogens and nonlinear carcinogens in anadromous fish using the RSC, EPA supports and recommends that states include anadromous fish in the FCR when there are available, scientifically sound regional and/or local data that suggest high consumption of anadromous fish. For example, because of the uncertainties in the sources of salmon contaminant body burdens (discussed in more detail below), the large amounts of salmon consumed by Native Americans, and the fact that market basket preferences of individuals may vary,[2] Oregon and Washington chose to include salmon in the FCR used to derive human health criteria. EPA approved Oregon's human health criteria in 2011. Similarly, EPA supported Washington's decision to derive human health criteria using a FCR that included anadromous fish consumption.[3] In light of this and the fact that Washington and Oregon are downstream from Idaho, implementation of human health water quality criteria throughout the Pacific Northwest would be facilitated by uniformly including salmon in the FCR for Idaho.

EPA also is concerned with DEQ's proposed policy decision to account for anadromous fish exposures using the RSC instead of the FCR because adjusting the RSC to reflect exposures to contaminants in anadromous fish is difficult to accomplish in a data driven way.

Because of uncertainty regarding where and how marine species acquire the bulk of their contaminant body burden, EPA also recommends that DEQ consider scientific studies in addition to the Hope 2012 study. For example, EPA believes that further characterization of salmon ocean habitat is warranted and some adult salmon may feed in, and acquire contaminants from, near coastal waters that are under the jurisdiction of the CWA. Also, the Hope paper's conclusions are limited by its focus on PCBs and not other toxics. Central to the modeling, is the assumption that contaminant uptake occurs largely through diet. While this is true for PCBs, depending on a chemical's lipophilicity, direct uptake from water may be a significant contributor to an organism's contaminant body burden (Qiao et al. 2001). In the case of adult salmon, direct uptake of chemicals from water is a possibility during their return migration through inland waters. The Hope paper also does not discuss different patterns of contaminant uptake associated with the complex life histories of other salmonids. In addition, the Hope paper

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[2]For example, a study on fish consumption habits of Asian Pacific Islanders demonstrated FCRs similar to Puget Sound Tribes but indicated that certain ethnic groups preferred to consume non-anadromous species.
Sechena R, Nakano C, Shiquan L, Polissar N, Lorenzana R, Truong S, Fenske R. 1999. Asian and Pacific Islander Seafood Consumption Study (EPA 910/R-99-003)
http://www.epa.gov/r10earth/pdf/asian_pacific_islander_seafood_consumption_1999.pdf

[3] Washington proposed draft HHC in January 2015 for public comment. The comment period closed on March 23, 2015, and Washington has not yet adopted final HHC and submitted them to EPA for CWA action. Therefore, EPA has not yet reviewed or acted upon Washington's HHC.

references EPA's policy of excluding salmon from the FCR used to assess site-specific health risks at Superfund sites in Puget Sound. However, it is important to note that EPA's Superfund policy generally applies to risk assessments for bioaccumulative pollutants in discrete geographic areas where cleanup is to occur, which does not raise the same scope of considerations or potential impacts as the development of state-wide water quality criteria. In summary, EPA recommends that DEQ consider that returning adult salmon may acquire contaminants directly from fresh water (Qiao et al. 2001).[4] DEQ may wish to consult with established experts (such as Weitkamp)[5] who have documented that certain adult salmon species from Idaho waters may reside in coastal waters of the U.S. (i.e., fall run chinook and coho salmon).

Risk Level

EPA supports DEQ's proposed policy decision to retain its 10^{-6} risk level to protect the populations in Idaho. However, EPA is concerned with DEQ's decision to protect high consuming populations, including tribes, at a 10^{-6} cancer risk level using the mean consumption rate of consumer only data. Instead, EPA recommends that DEQ consider the approach used by Oregon to protect high consuming populations at a 10^{-6} cancer risk level using the 95th percentile of consumer only data. This approach is more consistent with EPA's general recommendation that states and authorized tribes select a FCR that reflects consumption that is not suppressed when sufficient data are available.[6] Deriving criteria using an unsuppressed FCR furthers the restoration goals of the CWA, and ensures protection of human health as pollutant levels decrease, fish habitats are restored, and fish availability increases. Further, in cases where tribal treaty or other reserved fishing rights apply, selecting a FCR that reflects unsuppressed fish consumption may be necessary in order to satisfy such rights. Government-to-government consultation with affected tribes is important in deciding which fish consumption data should be used.

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[4]Qiao P, Gobas FAPC, Farrell AP. Relative Contributions of Aqueous and Dietary Uptake of Hydrophobic Chemicals to the Body Burden in Juvenile Rainbow Trout http://www.researchgate.net/profile/Frank_Gobas2/publication/12373146_Relative_contributions_of_aqueous_and_dietary_uptake_of_hydrophobic_chemicals_to_the_body_burden_in_juvenile_rainbow_trout/links/0fcfd5112a3b20b012000000.pdf

[5] http://www.nwfsc.noaa.gov/contact/display_staffprofile.cfm?staffid=189

[6] EPA. January 2013. *Human Health Ambient Water Quality Criteria and Fish Consumption Rates: Frequently Asked Questions*. http://water.epa.gov/scitech/swguidance/standards/criteria/health/methodology/upload/hhfaqs.pdf.

Relative Source Contribution (RSC)

EPA recommends that DEQ provide additional detailed information regarding its proposal to adjust the RSC based on changes in FCR, bioaccumulation, and water-plus-organism vs. organism only human health criteria. As previously noted, EPA is concerned because adjusting the RSC is difficult to accomplish in a data driven way. It is true that the relative dose fractions contributed by fish and water exposures relative to all other routes of exposure would be affected by consideration of the above factors. However, exposures not associated with fish and water ingestion are also chemical-specific and have not been presented in such a way as to support data driven modification of the RSC. To support this approach, DEQ would need to provide chemical-specific alternate route exposure to modify the RSC in a data driven way that is scientifically sound. DEQ also should consider the recommended adjusted RSCs that will be described in EPA's final updated 304(a) human health water quality criteria recommendations.

Bioaccumulation Factors (BAFs)

The EPA supports DEQ's proposed policy decision to use BAFs. This approach is consistent with the EPA's 2000 Human Health Methodology, which recommends use of BAFs when available, and reflects the latest scientific information on bioaccumulation. Unlike bioconcentration factors that only account for uptake from the water column, BAF's account for other exposure pathways. As DEQ is aware, the EPA is in the process of updating its national 304(a) recommended water quality criteria for the protection of human health and the proposed criteria updates include the use of BAFs specific to different trophic levels. During DEQ's presentation on April 21, 2015, DEQ recommended consideration of trophic level BAFs; more specifically, a trophic weighted BAF value based on information from DEQ's fish consumption survey. There are a number of issues DEQ may need to consider when weighting trophic level BAFs. For example, the data from a general population survey should be sufficiently robust to determine fish consumption by trophic level, and also representative of higher consumers, who may be consuming greater amounts of higher trophic level fish. For example, Columbia River Intertribal Fish Commission (CRITFC) survey respondents consume a much higher fraction of trophic level 4 fish than the general U.S. population (CRITFC 1994).[7] EPA is encouraged by DEQ's recommendation to derive criteria using BAFs and looks forward to reviewing additional details in order to evaluate DEQ's selected approach.

Body Weight and Drinking Water Intake Assumptions

EPA supports DEQ's proposed policy decision to apply a three step preference to estimate body weight assumptions consistent with EPA's guidance [i.e., 1) data from Idaho's fish consumption surveys, 2) data from the Idaho Department of Health and Welfare BRF State Survey, 3) EPA's 2011 Exposure Factors Handbook/NHANES]. If the approach to use local or regional data is not

[7]Columbia River Intertribal Fish Commission. 1994. A Fish Consumption Survey Of The Umatilla, Nez Perce, Yakama, and Warm Springs Tribes of the Columbia River Basin. Technical Report 94-3 https://www.deq.idaho.gov/media/895853-fish-consumption-survey-1994.pdf

sufficiently reliable, EPA encourages DEQ to consider the new information used to update EPA's national criteria recommendations including EPA's 2011 Exposure Factors Handbook. For example, EPA derived its 2014 draft 304(a) recommendations using an updated body weight assumption of 80 kg, the national mean based on a survey of the U.S. population and described in EPA's 2011 Exposure Factors Handbook.

EPA supports DEQ's proposed policy decision to use a drinking water intake assumption of 2.4 L/day. EPA derived its 2014 draft 304(a) recommendations using a drinking water intake rate of 3 L/day. This rate represented a consumer-only estimate of combined direct and indirect water ingestion for all sources of water at the 90th percentile for adults ages 21 and older. In response to public comments that focused on the most current national drinking water data, EPA intends to finalize the updated 304(a) criteria using a drinking water intake rate of 2.4 L/day, which represents the per capita estimate of combined direct and indirect community water ingestion at the 90th percentile for adults ages 21 and older.