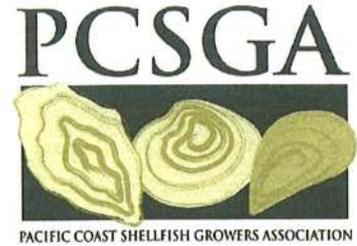


January 17, 2012

[fishconsumption@ecy.wa.gov](mailto:fishconsumption@ecy.wa.gov)

Toxics Cleanup Program  
Washington State Department of Ecology  
Olympia, WA



sustainably farmed  
oysters, clams, mussels, scallops

Re: Comments on *"Fish Consumption Rates Technical Support Document: A Review of Data and Information About Fish Consumption in Washington"* dated September 2011

Dear Sir or Madam:

Attached please find comments regarding the September 2011 Washington State Department of Ecology (Ecology) report titled *"Fish Consumption Rates Technical Support Document: A Review of Data and Information About Fish Consumption in Washington."* These comments were prepared by ENVIRON on behalf of the Pacific Coast Shellfish Growers Association (PCSGA).

Founded in 1930, PCSGA is based in Olympia, Washington, and represents over 100 shellfish growers in Washington, Alaska, Oregon, California, and Hawaii. Members of PCSGA grow a variety of shellfish including oysters, clams, mussels, and scallops.

Shellfish growers are dedicated to protecting the marine environment. Our communities and our livelihoods are dependent upon the high water quality that has enabled us to farm clean, healthy shellfish here for over 150 years and has helped make Washington the largest producer of farmed shellfish in the nation.

PCSGA commends Ecology for its decision to revise fish consumption rates for Washington residents. Accurate fish consumption rates help protect Washington's shellfish resources. Shellfish and fish caught in the State's waters play a vital role in our environment, culture, and economy, and are important parts of a healthy diet.

We ask that you review and respond to these and all other comments received during this comment period. PCSGA looks forward to further discussions with Ecology regarding the Fish Consumption Rates Technical Support Document, and to continued engagement in this important process.

Respectfully,



Margaret Pilaro Barrette  
Executive Director

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January 16, 2012

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Toxics Cleanup Program  
Washington State Department of Ecology  
Olympia, WA

Re: Comments on *"Fish Consumption Rates Technical Support Document: A Review of Data and Information About Fish Consumption in Washington"* dated September 2011

Dear Sir or Madam:

This letter provides comments on the draft Washington State Department of Ecology (Ecology) report titled *"Fish Consumption Rates Technical Support Document: A Review of Data and Information About Fish Consumption in Washington"* dated September 2011 (hereafter referred to as the "fish consumption TSD"). These comments were prepared by ENVIRON on behalf of the Pacific Coast Shellfish Growers Association.

We would like to commend Ecology for its timely and comprehensive review of available information and approaches for estimating fish consumption rates for Washington residents. We are blessed with large and diverse sources of marine, estuarine and freshwater fish and shellfish, and fish and shellfish caught in the State's waters play an important role in healthy diets. Protection of this resource is important to all of us.

In the fish consumption TSD, Ecology provides a useful and informative review of fish consumption survey data available for the Pacific Northwest, building on and adapting the analysis done for the Oregon Department of Environmental Quality (2008). We agree that this information helps to characterize fish consumption habits and rates for different State population groups with regard to how much fish is consumed, what kinds of fish are consumed and where the fish is obtained. This information is also likely to be useful in development of site-specific fish consumption rates. However, we question Ecology's conclusion that these data may be used to derive a state-wide default fish consumption rate applicable to a variety of regulatory requirements.

Ecology's notion that one default fish consumption rate can be derived to support a range of regulatory actions does not appear to be scientifically supportable. This is not due to scientific flaws in the fish survey data, but to the narrow focus of many regulations. Each regulation has different goals that are likely to require separate assessments of fish consumption. While a common goal of most regulations is to reduce chemical concentrations in fish, water quality criteria are focused on chemicals in water, while sediment quality standards are focused on contaminated sediments.

Chemicals in fish and shellfish are the result of exposures via diet, water and sediment, with the relative contribution from the various pathways being a function of the kind of fish, individual chemical and type of water body. For example, polycyclic aromatic hydrocarbons (PAHs) may be metabolized in fish, but not in shellfish, resulting in different rates of accumulation in fish vs. shellfish. Biomagnification of mercury results in higher concentrations in higher trophic level fish. Concentrations of arsenic are higher in marine species than in freshwater species,

although most of the arsenic is present in nontoxic, organic forms. These examples illustrate the point that simplistically derived water quality criteria and sediment standards may not yield the expected reductions in chemicals in fish.

Strategies to reduce chemical concentrations might be better focused on relevant fish and shellfish species groups and habitat for each chemical. We recognize that existing regulatory frameworks may not support such an approach, but identification of multiple, carefully defined fish consumption estimates would provide greater flexibility in responding to limits of existing regulations. Some critical issues related to fish consumption definitions are described in the remainder of these comments.

**Origin of fish:** Distinctions are frequently made between fish caught by anglers vs. fish purchased in stores, between locally sourced fish vs. fish from other areas, and between resident fish and anadromous fish such as salmon. Most regulations are applied to specific water bodies or sites. Logically, applicable fish consumption rates would be limited to fish harvested from the water body or site being regulated. Most regulated chemicals will be present in a variety of food items in addition to fish. Chemicals in fish from other areas are no different conceptually from chemicals in other food items. Thus, consumption of fish from other areas should not be included in the local fish consumption rates, just as consumption of other kinds of foods should not be included. The framework provided by U.S. Environmental Protection Agency (USEPA) Region 10 is a good resource for site-specific approaches (USEPA 2007b).

**High consumers:** Fish consumption rates should be derived for representative high consumers broken out by fish species groups harvested from the applicable area or water body, such as those derived by The Suquamish Tribe (2000) or Sechena et al. (1999). Available surveys for Washington have demonstrated substantial variation among high consumer groups in terms of fish species groups consumed and locations from which they are harvested. Little information is currently available for high consumer groups in eastern Washington. At a minimum, separate fish consumption rates are needed for freshwater vs. marine and estuarine water bodies, and for resident shellfish vs. finfish.

**Long-term average consumption rates:** Fish consumption rates for high consumers should be derived from surveys that provide distributions of long-term average rates for each individual rather than from short term dietary surveys such as those presented in USEPA (2002). Upper percentile values from short term surveys can markedly overestimate upper percentiles of long term average rates within populations.

**Consumers vs. nonconsumers:** Use of long term average consumption rates also mitigates concerns regarding use of data for “consumers only” vs. data for “consumers and non-consumers” combined. Short term surveys will include many “nonconsumers” who may consume fish at other times, but didn’t during the short period of the survey. Surveys that calculate long term averages will include few “nonconsumers” because most people consume some fish or shellfish.

**Resident fish vs. anadromous fish:** Fish for which chemical concentrations are not affected by the water body or area being regulated should not be included in the fish consumption rate. Salmon and other anadromous fish that do not spend much of their adult life in freshwaters of the state should not be included in fish consumption rates for freshwater bodies. Similarly,

salmon that spend most of their life outside waters of the state should not be included in fish consumption rates for marine and estuarine water bodies.

**Suppression vs. increased fish consumption:** Ecology raises concerns about consumption rates possibly being suppressed for a variety of reasons (page 96). Some of these reasons are associated with irreversible changes due to development, fluctuation in fish populations and changing cultural preferences. Such changes should not be “corrected” in estimated fish consumption rates. Suppression due to concerns about chemical contamination is unlikely in most marine and estuarine water bodies of the State because most of them are not highly contaminated. Actions taken over the past 40 years have led to substantial improvements in water quality throughout the state. Remedial actions at many contaminated sites have also yielded cleaner sediments in urban areas. In contrast to concerns about suppression, Ecology should describe changing dietary preferences leading to increased fish consumption rates in the general population over the past decade or two.

**Chemical uptake into fish:** As described above, chemical uptake into fish is a variable function of combined exposures to chemicals in diet, sediment and water. Because Ecology intends to apply fish consumption rates in the context of regulations of chemicals in water and sediment, we recommend that Ecology add a section to the fish consumption TSD describing how the bioaccumulation of chemicals in fish varies by the concentration of the contaminant in water, the type of organism, and the trophic level of the fish species. Historically, water quality criteria have been derived using overly simplistic assumptions that chemical concentrations in surface water can be related to fish concentrations by applying a bioconcentration factor (BCF) with fish consumption rates. As described in USEPA (2007a), bioaccumulation should be represented by a regression equation or some other algorithm rather than a simple constant. Ideally this discussion would come early in the document to provide perspective for the regulatory discussion. Ecology’s discussion of exposure parameters (page 96) should also include some mention of how chemical concentrations in fish are predicted. An understanding of factors controlling chemical uptake into fish is crucial to identification of fish consumption rates that are relevant for the various regulatory contexts in which Ecology will apply them.

In summary, Ecology’s fish consumption TSD provides much useful information to inform the development of fish consumption rates, and acknowledges the multiple regulatory contexts and possible need for multiple fish consumption rates, rather than a single default value. Nevertheless, Ecology proceeds to recommend a range of values from which a single default fish consumption rate would be selected. We do not believe that a single default fish consumption rate can adequately support the varied regulatory needs of the State. Rather, we recommend that Ecology develop a series of rates for, at a minimum, resident marine and estuarine fish, marine and estuarine shellfish, and resident freshwater fish for various high consumer groups.

Sincerely,



Rosalind A. Schoof, PhD, DABT, Fellow ATS  
Principal

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