
Site-Specific Fish Consumption Rates to Support MTCA Cleanup Decisions in the Port Angeles Area

DEPARTMENT OF
ECOLOGY

Prepared for

MTCA Science Advisory Board
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Agenda

- Quick Overview
 - MTCA rule requirements
 - Proposed site-specific fish consumption rates
 - Questions for the Board
- Description of the EPA Decision-Making Framework – Lon Kissinger, EPA Region X
- Proposed fish consumption rates developed by the Lower Elwha Klallam Tribe – Larry Dunn (LEKT) and Bill Beckley (Ridolfi)
- Questions for the Science Advisory Board

Background

- February 1991 MTCA Cleanup Standards adopted
- Default fish consumption rate
 - Flexibility to develop site-specific rates
- February 2000 Deferral agreement between EPA, Lower Elwha Klallam Tribe (LEKT) and Ecology
- May 2006 Ecology and Rayonier LLC began negotiations for new agreed order to address upland areas & marine sediments (includes site-specific risk assessment)
- May 2007 LEKT asked Ecology to have the SAB review fish consumption report
- October 2007 Final report and recommendations to Ecology

MTCA Rule

- The MTCA rule establishes a process for setting surface water cleanup levels for carcinogens
 - Cleanup levels for individual hazardous substances must be at least as stringent as surface water quality standards;
 - Risk-based cleanup levels for individual hazardous substances are established at a level corresponding to an incremental cancer risk of one-in-one million (10^{-6}) using the MTCA risk equations;
 - MTCA risk equations are based on the reasonable maximum exposure
 - Total site risk (including consideration of multiple hazardous substances & multiple exposure pathways) shall not exceed one-in-one hundred thousand (10^{-5}).
- The MTCA and SMS rule establish narrative standards that are used to establish site-specific cleanup standards based on protecting human health.
 - General MTCA risk policies are applicable to sediments.

MTCA Rule Equation – Surface Water

$$\text{CUL } (\mu\text{g/L}) = \frac{\text{RISK} \times \text{ABW} \times \text{AT} \times \text{UCF}}{\text{CPF} \times \text{BCF} \times \text{FCR} \times \text{FDF} \times \text{ED}}$$

RISK = Acceptable cancer risk level

ABW = Average body weight (70 kg)

AT = Averaging time (75 years)

UCF = Unit conversion factor

CPF = Carcinogenic Potency Factor

BCF = Bioconcentration factor (liters/kilogram)

FCR = Fish consumption rate (54 g/day)

FDF = Fish diet fraction (0.5) (unitless)

ED = Exposure duration (30 years)



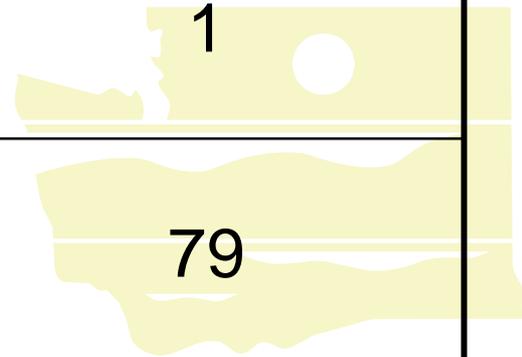
Fish Consumption Rates

- MTCA default is 54 g/day X 0.5 diet fraction (effectively 27 g/day)
- Studies show tribes and other ethnic groups eat a lot more fish than recreational fishers
- MTCA provides flexibility to develop site-specific fish consumption rates when necessary to protect human health.
- Modification of some exposure parameters, including fish consumption rates, requires consultation with EPA, DOH and the SAB.



Proposed Site-Specific Parameters

	MTCA Default Parameters	Proposed Site-Specific Parameters
Fish Consumption Rate (g/day)	54	583
Fish Diet Fraction (unitless)	0.5	1
Average Body Weight (kg)	70	79



Practical Implications

- Fish consumption rates are at the upper end of the range of consumption rates used to establish cleanup requirements in Washington.
- Risk-based cleanup standards based on LEKT fish consumption rates will be lower than background concentrations and/or analytical limits.
- Additional studies may be needed to characterize background concentrations for the Port Angeles cleanup.



Regulatory Dilemma

What exposure parameters should be used to characterize health risks in areas on or adjacent to the former Rayonier mill site in Port Angeles?

Policy Issues

- Reasonable maximum exposure
 - Use of 90th or 95th percentile to characterize exposure
 - Current vs past vs future exposures
- Tribal treaty rights

Scientific Issues

- Use of 583 g/day to characterize RME
- Use of fish diet fraction of one to characterize RME
 - Diet fraction vs source contribution
- Use of ave. body weight of 79 kg to characterize RME

Questions for the Science Advisory Board

- The LEKT recommends that Ecology use a fish consumption rate of 583 g/day when establishing cleanup requirements for the former Rayonier mill site and Port Angeles Harbor. Does SAB agree that this rate is consistent with current scientific information?
 - Extrapolation from Suquamish Tribal Study
 - Does 583 g/day represent a reasonable estimate for high end exposures?
- The LEKT recommends that Ecology use a fish diet fraction of one (1) when establishing cleanup requirements for the former Rayonier mill site and Port Angeles Harbor. Does the SAB agree that this value is consistent with current scientific information?
- The LEKT recommends that Ecology use an average body weight of 79 kg when establishing cleanup requirements for the former Rayonier mill site and Port Angeles Harbor. Does the SAB agree that this value is consistent with current scientific information?

Quality of Information Analysis

- Theory and technique with widespread acceptance in relevant scientific community
- Standard testing methods or widely accepted scientific methods
- Review of relevant information (support and non-support) and rationale for proposed modifications
- Valid assumptions that err on side of protecting human health and the environment
- Highly-exposed populations
- Quality assurance/quality control, limitations of information, etc.



Information Materials

- Lower Elwha Klallam Tribe Fish Consumption and the EPA Region 10 guidelines
- Local Sea Food and Lower Elwha Klallam Tribal Health
- Framework for Selecting and Using Tribal Fish and Shellfish Consumption Rates for Risk-Based Decision Making at CERCLA and RCRA Cleanup Sites in Puget Sound and the Strait of Georgia
- Quality of Information Analysis

Preparation for Board Review

- Are the questions listed above written in way that can be objectively evaluated based on current scientific information and knowledge?
- Are there other scientific questions that you believe the Department should be considering when evaluating this issue?
- Do the discussion materials provide you with a sufficient amount of information to review the questions identified above? If not, what additional information would you find useful?



Next Steps

- Follow-up Questions and Discussions
- Prepare and Distribute Additional Materials
- Board Meeting to Complete Review and Provide Recommendations

