



Human Health Water Quality Criteria
Risk Policy, Fish Consumption Rates and
Environmental Justice



Northwest Toxics Conference
Environmental Law Education Center

James Tupper

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Overview

- Risk policy for water quality human health criteria
- Fish consumption rates used in deriving criteria
- Implementation challenges for the state and regulated community
- Impact on toxics reduction

Current Water Quality Human Health Criteria

- Washington covered under the National Toxic Rule – 40 CFR 131.36
 - WAC 173-201A-240(5)
 - WAC 173-201A-240(6) “Risk-based criteria for carcinogenic substances shall be selected such that the upper-bound excess cancer risk is less than or equal to one in one million.”
- History of NTR
 - Adopted by EPA in 1992
 - Washington one of 14 states not in compliance with section 304 of the CWA – failed to promulgate human health criteria
 - Ecology concluded that it did not have the resources to develop human health criteria
 - Washington required to adopt policy on acceptable risk level
 - Washington covered under NTR and is not required to develop independent human health criteria – 40 CFR 131.36(14)

Fish Consumption Rate – 6.5 g/day

- It is indefensible
- It is a lie
- It is not protective
- Exposes high consuming populations to too much risk

“But Washington assumes that people only eat **6.5 grams per day**, the so-called ‘fish consumption rate.’ Anyone who eats more is out of luck.”

Huffingtonpost April, 2012

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Is it defensible?

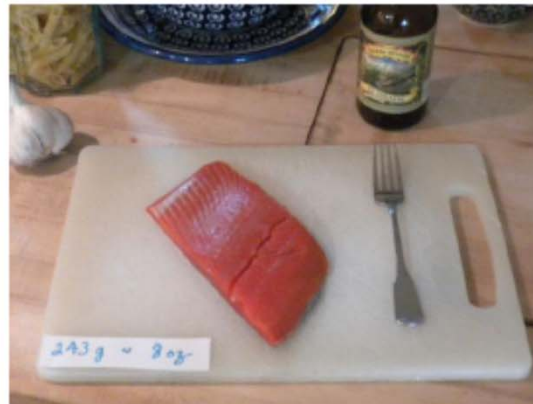
Dioxin/Organochlorine Center v. Clarke, 57 F.3d 1517 (9th Cir. 1995)

- Challenge to dioxin water quality criteria for Columbia River TMDL
- At issue was use of 6.5 g/day FCR where actual consumption rates ranged to 150 g/day
- 6.5 g/day affirmed under conservative assumptions associated with the standard
- 10^{-6} risk policy not intended to apply to all consumers

Is it a lie?

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Ecology, Fish Consumption Rate Technical Support Document, at 3 (January 2013)



Fish portion sizes (6.5, 54, 175, and 243 grams)

Amount of Salmon in NTR Fish Consumption Rate



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Ecology, Fish Consumption Rate Technical Support Document (January 2013)

Table 23. Tulalip Tribal Adult Fish Consumption Rates by Species Group and Source

Population Tribal	Species Group	Harvest Source of Fish	Descriptive Statistics (g/day)				
			50 th Percentile	Mean	75 th Percentile	90 th Percentile	95 th Percentile
Tulalip	All Fish	All Sources	44.5	82.2	94.2	193	268
	Finfish	All Sources	22.3	44.1	49.1	110	204
	Shellfish	All Sources	15.4	42.6	40.1	113	141
	Non-anadromous	All Sources	20.1	45.9	52.4	118	151
	Anadromous	All Sources	16.8	38.1	43.3	92.1	191
	All	Puget Sound	29.9	59.5	75.0	139	237
	Finfish	Puget Sound	13.0	31.9	33.1	78.4	146
	Shellfish	Puget Sound	14.2	36.9	40.1	111	148
	Non-anadromous	Puget Sound	14.8	35.5	38.8	109	145
	Anadromous	Puget Sound	11.8	30.4	32.4	66.0	148

See Polissar et al., 2012, Table E-1.

Is it Protective?

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NTR Criteria Intended to Protect High Fish Consumers

- NTR based on extended EPA review of acceptable level of increased risk
- Assumes that risk levels of 10^{-6} and 10^{-5} for general population will protect high consumers at a risk level of 10^{-4}
- Within this range increased exposure risk is assumed to be essentially zero.

National Risk Policy for HHWQC

- National Toxics Rule, 57 Fed. Reg. 60848 (December 22, 1992)
- California Toxics Rule, 65 Fed. Reg. 31681 (May 18, 2000)
- EPA, Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (October 2000)
- *Dioxin/Organochlorine Center v. Clarke*, 57 F.3d 1517, 1524 (9th Cir. 1995)

EPA acknowledges that at any given risk level for the general population, those segments of the population that are more highly exposed face a higher relative risk. For example, if fish are contaminated at a level permitted by criteria derived on the basis of a risk level of 10^{-6} , individuals consuming up to 10 times the assumed fish consumption rate would still be protected at a 10^{-5} risk level. Similarly, individuals consuming 100 times the general population rate would be protected at a 10^{-4} risk level. EPA, therefore, believes that derivation of criteria at the 10^{-6} risk level is a reasonable risk management decision

CTR, 65 Fed. Reg. 31699, 31681 (May 18, 2000)

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EPA believes that both 10^{-6} and 10^{-5} may be acceptable for the general population and that highly exposed populations should not exceed a 10^{-4} risk level. States or Tribes that have adopted standards based on criteria at the 10^{-5} risk level can continue to do so, if the highly exposed groups would at least be protected at the 10^{-4} risk level....In cases where fish consumption among highly exposed population groups is of a magnitude that a 10^{-4} risk level would be exceeded, a more protective risk level should be chosen. Such determinations should be made by the State or Tribal authorities and are subject to EPA's review and approval or disapproval under Section 303(c) of the CWA.

EPA, Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health, at 2-6 (October 2000)

Dioxin/Organochlorine Center v. Clarke, 57 F.3d 1517, 1524 (9th Cir. 1995)

- The EPA argues that the one-in-one million risk level mandated by the state water quality standards for the general population does not necessarily reflect state legislative intent to provide the highest level of protection for *all* subpopulations could be reasonably construed to allow for lower yet adequate protection of specific subpopulations.

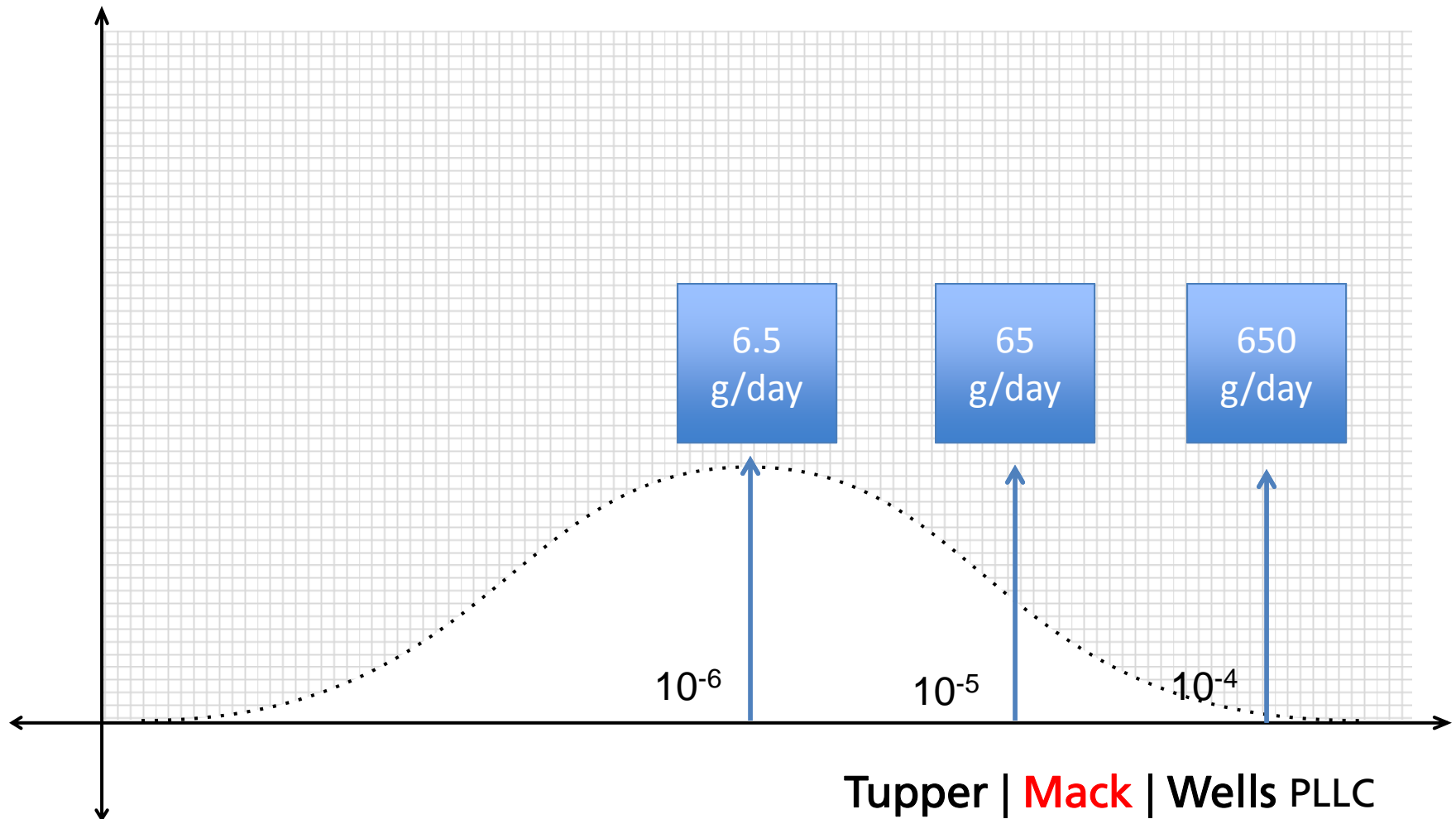
EPA, TSD for Oregon HHWQC, at 27 (Oct. 17, 2011)

- “EPA has identified a risk level range of 1×10^{-6} (1:1,000,000) to 1×10^{-5} (1:100,000) to be an appropriate risk management goal for the **general** population. The nationally recommended 304(a) criteria are intended to protect the **general** population at a cancer risk of 1×10^{-6} .”
- “EPA’s 2000 Methodology states that criteria based on a 10^{-5} risk level are acceptable for the general population as long as States and authorized Tribes ensure that the risk to more highly exposed subgroups (sport fishers or subsistence fishers) does not exceed the 10^{-4} risk level. “

Zero tolerance and no residue

- EPAS, 57 Fed. Reg. 60848-1
- FDA, 33 Fed. Reg. 19226,19227 (July 19, 1977)
- FDA, 42 Fed. Reg. 10412 (Feb. 22, 1977)(10^{-6} is essentially a “zero risk”)
- EPA, 45 Fed. Reg. 79318, 79347 (Nov. 28, 1980)(Concentrations at 10^{-6} to 10^{-4} “do not represent a significant risk to the public”)

Risk Policy for Human Health Criteria in Washington



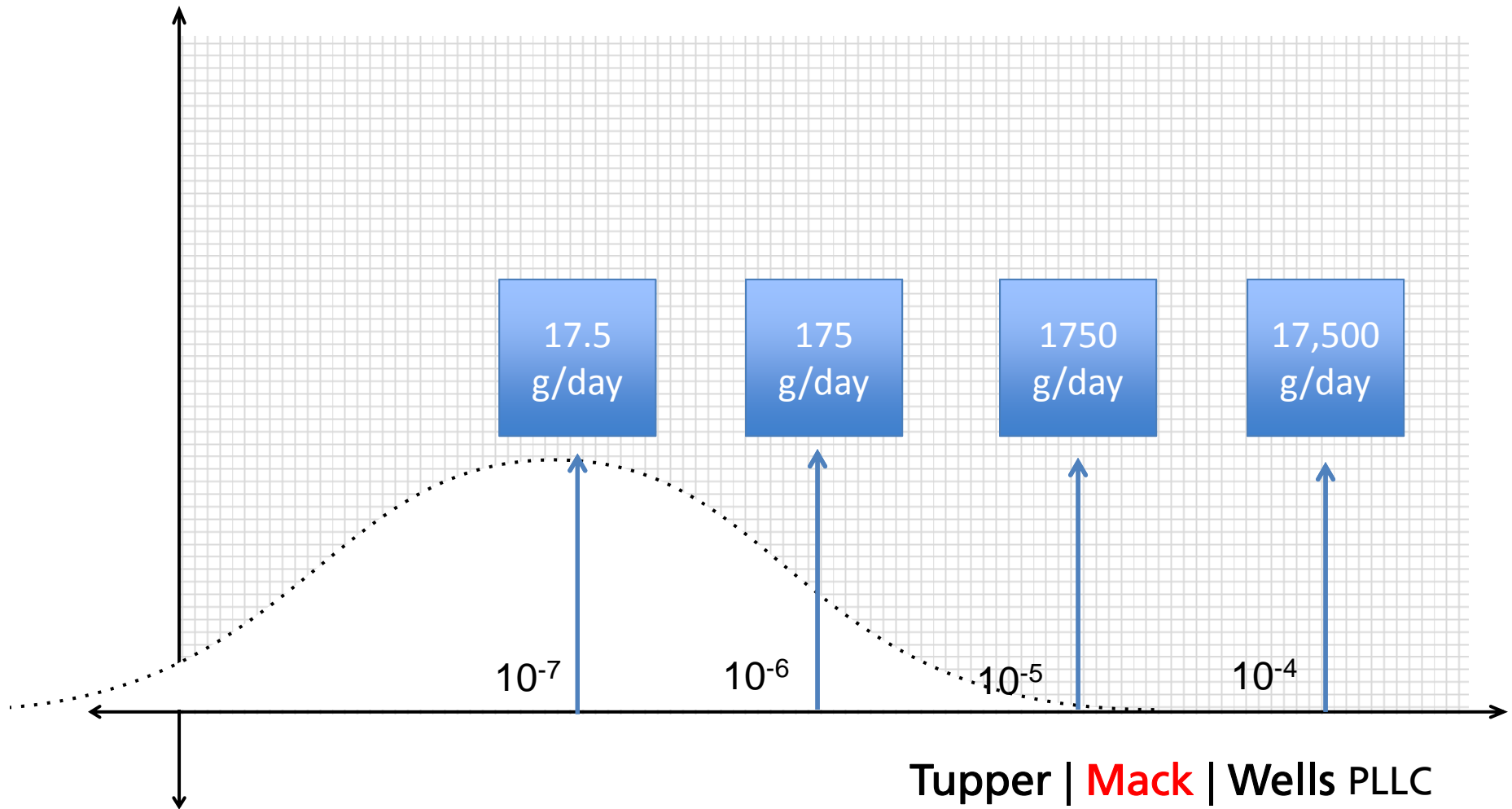
Ecology, Fish Consumption Rate Technical Support Document (January 2013)

Table 33. Summary of Fish Consumption Rates from Studies Meeting the Measures of Technical Defensibility, All Finfish and Shellfish (g/day)

Population	Source of Fish	Number of Adults Surveyed	Mean	Percentiles			
				50th	75th	90th	95th
General population (consumers only)	All sources: EPA method	2,853	56	38	79	128	168
	All sources: NCI method	6,465	19	13	25	43	57
Columbia River Tribes	All sources	464	63	41	65	130	194
	Columbia River	–	56	36	57	114	171
Tulalip Tribes	All sources	73	82	45	94	193	268
	Puget Sound	71	60	30	75	139	237
Squaxin Island Tribe	All sources	117	84	45	94	206	280
	Puget Sound	–	56	30	63	139	189
Suquamish Tribe	All sources	92	214	132	284	489	797
	Puget Sound	91	165	58	221	397	767

See also Polissar et al., 2012

Risk Policy for Human Health Criteria in Washington at 175 g/day FCR



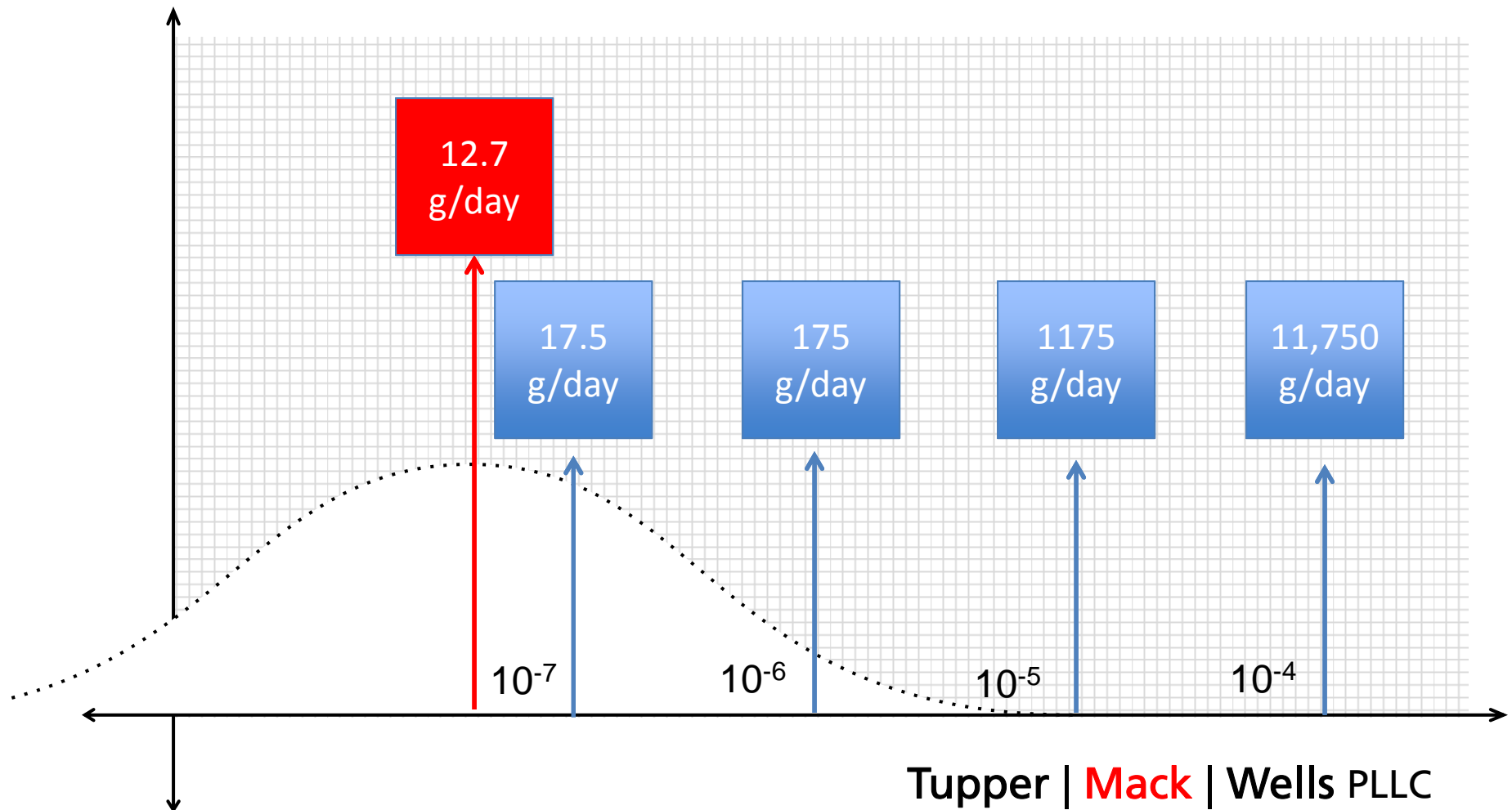
Ecology, Fish Consumption Rate Technical Support Document (January 2013)

Table 19. General Population: Adult Respondents, Consumers Only, Based on NHANES 2003–2006, Using NCI Statistical Survey Methodology

Population	Species Group	Descriptive Statistics (g/day)				
		50 th Percentile	Mean	75 th Percentile	90 th Percentile	95 th Percentile
National Estimates from NHANES 2003–2006 (consumers only)	All Fish	12.7	18.8	24.8	43.3	56.6
	Finfish	9.0	14.0	18.1	31.8	43.3
	Shellfish	2.4	5.4	6.0	13.2	20.5

See Polissar et al., 2012. Estimates based on NCI statistical methodology (Tooze et al., 2006) that models two days of fish consumption from 24-hour episodic dietary recall and fish dietary information from the food frequency questionnaire.

Risk Policy for Human Health Criteria in Washington at 175 g/day FCR Compared to average consumption rate for fish consumers



Risk Policy Issues TBD by Ecology

- Does the state set criteria at 10^{-6} based on:
 - The current policy focused on the average consumption rate for consumers and non-consumers?
 - The average of consumers in general population?
 - The 90th percentile of consumers in general population?
 - The average or 90th percentile of Tribal FCRs?
 - How will salmon be included?

Other Factors to Consider

“Risk management is the process of selecting the most appropriate guidance or regulatory actions by integrating the results of risk assessment with engineering data and with social, economic, and political concerns to reach a decision. In this (EPA 2000) methodology, the choice of a default fish consumption rate which is protective of 90 percent of the general population is a risk management decision. The choice of an acceptable cancer risk by a State or Tribe is a risk management decision.”

EPA, HHWQC Methodology, at 2-4 (October 2000)

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FRESHWATER

DRAFT Comparison: Washington National Toxic Rule (NTR) criteria versus Oregon Human Health Criteria

Grouped by: ➡

More protective criteria
could result in new permit limit
where detected

More protective criteria
non-detect in effluent sample

New criteria

Equal or less protective
than current NTR criteria

NA = Not Applicable
NC = Not Calculated
Red values = more protective
Blue values = less protective

NTR Chem #	Chemical Name	CAS #	NTR Criterion Water and Organisms (µg/L) based on 6.5 Grams/Day	Oregon Criterion Water and Organisms (µg/L) based on 175 grams/day Includes updated RSCs, RfDs, Cancer Slope Factors, and other modifications specific to Hg & As	Is Oregon's revised criterion is more protective?	Percent decrease between WA & OR Criteria	Priority Pollutant Scan Data Detection From preliminary data as presented in Policy Forum #3. (Ecology staff are in the process of reviewing all available effluent datasets to determine if any other chemicals have been detected in discharge.)	EPA method number	Detection Level (DL) (µg/L)	Quantitation Level (QL) (µg/L)
	Non-Carcinogens									
	Carcinogens									
77	1,4-Dichlorobenzene	106467	397	16	Yes	96%	Detected	624	4.4	17.6
1	Antimony	7440360	14	5.1	Yes	63%	Detected	200.8	0.3	1
68	Bis(2-Ethylhexyl) Phthalate	117817	1.8	0.20	Yes	89%	Detected and Quantified	625	0.1	0.5
14	Cyanide	57125	698	130	Yes	81%	Detected	335.4	5	10
79	Diethyl Phthalate	84662	22,631	3,800	Yes	83%	Detected	625	1.9	7.6
36	Methylene Chloride	75092	4.7	4.3	Yes	8%	Detected	624	5	10
9	Nickel	7440020	607	140	Yes	77%	Detected and Quantified	200.8	0.1	0.5
38	Tetrachloroethylene	127184	0.80	0.24	Yes	70%	Detected and Quantified	624	1	2
39	Toluene	108883	6,765	720	Yes	89%	Detected and Quantified	624	1	2
119	Total Polychlorinated Biphenyls (PCBs)	multiple CAS #	0.00017	0.0000064	Yes	96%	Detected w/ non- 40 CFR 136 methods	1668C	~ 30pg/L	~50 pg/L
37	1,1,2,2-Tetrachloroethane	79345	0.17	0.12	Yes	30%	--	608	0.25	0.5
42	1,1,2-Trichloroethane	79005	0.61	0.44	Yes	27%	--	624	1.9	2
29	1,2-Dichloroethane	107062	0.38	0.35	Yes	9%	--	624	1	2
85	1,2-Diphenylhydrazine	122667	0.040	0.014	Yes	65%	--	1625B	5	20
76	1,3-Dichlorobenzene	541731	397	80	Yes	80%	--	624	1.9	7.6
32	1,3-Dichloropropene	542756	10	0.30	Yes	97%	--	624	1	2
16	2, 3, 7, 8-TCDD Dioxin	1746016	0.000000013	0.0000000051	Yes	96%	--	1613B	1.3E-06	0.000005

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Criteria Below Detection Limits

- “As EPA explained, a permit condition set at a level below the general analytical detection limit would make it difficult to or impossible to measure compliance.”
- “Thus, EPA established the most stringent wasteload allocations for the Pulp Mills that it could monitor using existing analytical detection capabilities.”

EPA Brief, at 39, *DOC v. Clarke*

Tupper | **Mack** | Wells PLLC

Questions?

Tupper | **Mack** | Wells PLLC



Tupper | **Mack** | Wells PLLC

Natural Resources, Land Use & Environmental Law

James Tupper
Tupper@tmw-law.com
(206) 493-2317 Direct
(206) 818-1871 Cell

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