

Example Calculation of Tissue Equivalent Concentrations (TEC) for PCBs in the Water Quality Assessment

TEC calculation PCB

For chemicals that have non-carcinogenic effects (TEC_N):

TEC_N = (Reference dose) x (Body weight) ÷ Fish consumption rate

$$(0.02\mu\text{g}/\text{kg}\text{-day} \times 80\text{kg} \times 1000\text{g}/\text{kg}) \div 175\text{g}/\text{day} = \mathbf{9.1\mu\text{g}/\text{kg}}$$

For chemicals that have a carcinogenic effect level (TEC_C):

TEC_C = (Risk level) x (Body weight) ÷ (Cancer slope factor) x (Fish consumption rate)

$$(.000001 \times 80\text{kg} \times 1000\text{g}/\text{kg}) \div ((2\text{mg}/\text{kg}\text{-day})^{-1} \times 175\text{g}/\text{day}) = 0.00023\text{mg}/\text{kg} = \mathbf{0.23\mu\text{g}/\text{kg}}$$

Example Spokane Tissue PCB Dataset

Median values of PCB (ppb) for Spokane River sites (2012 Ecology data only)

Site	LSS	N	MWF	N	RBT	N	NPM	N
1-Stateline	40.6	7						
2-Plante Ferry	97.0	7			29.8	3		
3-Mission Park	89.8	7	124	5	93.6	3		
4-Ninemile	30.0	7	154	7	42.2	3		
5-Upper Spokane Lake	182	7	91.0	7				
7-Little Falls Pool	33.0	7						
8-Spokane Arm					ND	5	24	3

Category 5 determination- fictitious example

Example Category Determinations for Fish Tissue

PCBs: Cat 5 carcinogenic threshold = **2.3ppb**

Example 1:

Species	Median [] ppb	# comp. samples
Cutthroat Trout	ND	1
Mountain Whitefish	3.2	2
Northern Pikeminnow	6.7	1
Rainbow Trout	1.2	1

Category determination: Category 5- 303(d) list

PCBs: Cat 5 carcinogenic threshold = **2.3ppb**

Example 2:

Species	Median [] ppb	# comp. samples
Mountain Whitefish	0.20	1
Northern Pikeminnow	2.8	1
Rainbow Trout	Non-detect	1

PCBs: carcinogenic threshold = **0.23ppb**

Example 3:

Species	Median [] ppb	# comp. samples
Cutthroat Trout	ND	2
Mountain Whitefish	0.10	3
Northern Pikeminnow	0.20	2
Rainbow Trout	0.05	3

Distribution of FFCMP fish t-PCB results



