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**Appendix I**

Results of Sensitivity Modeling  
Analyses Relating to Fish

## APPENDIX I

### Results of Sensitivity Modeling Analyses Relating to Fish

In EPA's September 9, 2008 comments on the March 2008 Corrective Measures Study (CMS) Report, the Agency expressed concerns regarding a few of the assumptions used by GE in the processing of fish PCB concentrations predicted by EPA's bioaccumulation model to calculate certain model output metrics. As such, EPA directed GE to evaluate the sensitivity of these assumptions on the calculated metrics involved. A brief summary of these comments is provided below:

- *EPA General Comment #17:* The analysis of percent reductions in PCB concentrations predicted for fish fillets presented in the CMS Report used initial concentrations in fish at the end of the model validation simulation. EPA stated that the percent reductions would be considerably different if initial conditions in fish were calculated by "spinning up" the first year of the model projection simulation (i.e., by using current boundary conditions to reflect the initial condition rather than historical boundary conditions). EPA directed GE to acknowledge this issue and provide a discussion of its effect on the assessment of the sediment alternatives.
- *EPA Specific Comment #38:* EPA noted that, in the original CMS Report, the "blended fish" calculations used for human health risk comparisons relied exclusively on concentrations in largemouth bass. EPA stated that, with the use of only this species, changes in fillet concentrations show more sensitivity to changes in water column PCB concentrations than would have been the case if species that derive more exposure from sediment sources (e.g., brown bullhead) were included in the calculations. As such, EPA directed GE to include a discussion of how the assessment of human risk evaluations was affected by the use of only largemouth bass.
- *EPA Specific Comment #60:* In this comment, EPA stated that it disagreed with GE's assignment of feeding preferences for osprey, and that the parameterization in the CMS was incorrectly based on the assumption that all modeled fish species would be consumed equally by osprey (Revised CMS Table 3-12). EPA noted that the differences between the CMS Report and EPA methods result in CMS-simulated fish tissue concentrations that are approximately 16% less than those calculated by EPA. These differences derive mainly from the following assumptions in the CMS: (1) a greater assumed proportion of forage fish in osprey diet; and (2) inclusion of younger age classes (on average) of white sucker and sunfish in osprey diet.

The Revised CMS Report applies the same basic assumptions as the original CMS Report. However, in response to EPA's comments, GE has evaluated the impact of each of the alternate methods described by EPA on the results of the modeling-based analyses presented in the Revised CMS Report. This appendix presents the results of these sensitivity analyses.

### **I.1 SENSITIVITY OF CALCULATED PERCENT REDUCTIONS IN FISH TO FISH INITIAL CONDITIONS**

In General Comment #17 on the March 2008 CMS Report, EPA indicated its view that GE's use of initial concentrations in fish at the end of the model validation period resulted in an over-estimation of the reduction in PCB concentrations in fish fillets. EPA stated that the calculated percent reductions in fish would be considerably different if initial conditions in fish were calculated by "spinning up" the first year of the simulation (i.e., using current boundary conditions to reflect the initial condition rather than historical boundary conditions).

During a technical meeting on January 31, 2007, GE and EPA agreed that Year 1 of the model projection would begin immediately following the model validation period, and that simulated remediation in the Rest of River would also begin in Year 1 (to eliminate any unknowns regarding timing of Rest of River remediation efforts). It would be inconsistent with this approach to "reset" the initial conditions in the Food Chain Model (FCM), thereby assuming that fish in the Rest of River have instantly achieved equilibrium with the current boundary condition.

Nonetheless, to evaluate this issue, initial conditions in the fish were calculated by "spinning up" the first year of the projection simulation using current water column and sediment conditions (see Section 3.2.2.4 in the Revised CMS Report for a definition of "current" conditions), as described by EPA in this comment. "Spinning-up" is the process whereby initial conditions in the fish are determined by running the FCM with constant water column and sediment concentrations for a period of time that is sufficient for the fish to reach equilibrium with those exposures (approximately 10 years or more). The table below compares, by subreach, the original end-of-validation PCB concentrations in fish (fillets) with the initial concentrations in fish calculated using EPA's 10-year "spinning up" method.

**Table I-1. Comparison of Spun-up Initial Conditions to Fish PCB Concentrations at End of Validation Period.**

	Reach 5A	Reach 5B	Reach 5C	Reach 5D	Woods Pond
End-of-Validation Fish PCBs (mg/kg)	18	17	14	22	15
Spun-up Initial Conditions (mg/kg)	12	13	10	17	12

Given the long projection simulation period used for the CMS (52 years or more), resetting the initial condition in the fish has no impact on predicted fish concentrations at the end of the simulation. This is because, at the end of the simulation period, fish will have gone through several growth cycles in the model, causing fish concentrations to reach a new equilibrium with post-remediation sediment and water column PCB levels; and these levels are substantially different from the initial condition. However, resetting the initial condition does affect the calculated percent reduction in fish over the projection period (as noted by EPA, because the initial PCB concentrations in the fish are lower). A comparison of the percent reductions in Reach 5/6 and Reach 7/8 fish tissue resulting from the above-described EPA method for all sediment alternatives to the percent reductions included in the Revised CMS Report is presented in Tables I-2 and I-3 below, respectively.

**Table I-2. Comparison of Calculated Percent Reductions in Fish PCB Concentrations (PSA).**

	Percent Reduction in Fish PCB Concentrations During the Model Projection Period in the PSA									
	Reach 5A		Reach 5B		Reach 5C		Reach 5D		Reach 6	
	CMS	EPA	CMS	EPA	CMS	EPA	CMS	EPA	CMS	EPA
SED 1/2	60	41	47	28	48	29	57	45	44	27
SED 3	99	98	83	77	87	83	72	63	95	94
SED 4	99	98	98	97	97	96	98	98	99	98
SED 5	99	98	99	98	99	98	98	98	99	98
SED 6	99	98	99	98	99	98	98	98	99	99
SED 7	98	98	99	98	99	98	98	98	99	98
SED 8	99	99	99	99	99	99	99	98	99	99
SED 9	98	97	98	98	99	98	98	98	99	99
SED 10	77	66	62	49	59	44	51	37	76	68

**Table I-3. Comparison of Calculated Percent Reductions in Fish PCB Concentrations (Reaches 7/8).**

	Percent Reduction in Fish PCB Concentrations During the Model Projection Period in Reaches 7/8																	
	Reach 7A		Reach 7B		Reach 7C		Reach 7D		Reach 7E		Reach 7F		Reach 7G		Reach 7H		Reach 8	
	CMS	EPA	CMS	EPA	CMS	EPA	CMS	EPA	CMS	EPA	CMS	EPA	CMS	EPA	CMS	EPA	CMS	EPA
SED 1/2	52	28	48	27	50	29	51	28	54	36	63	44	45	41	60	44	43	41
SED 3	91	86	81	73	86	80	88	82	89	84	91	86	80	78	90	86	75	74
SED 4	96	94	85	79	91	87	93	89	93	91	94	91	83	82	93	91	79	78
SED 5	97	95	86	80	92	88	93	90	94	91	94	92	84	83	94	91	95	94
SED 6	97	96	96	95	98	98	94	91	96	95	95	92	94	93	94	92	97	96
SED 7	97	95	98	97	98	98	93	90	96	95	95	92	95	94	94	92	97	97
SED 8	97	96	99	99	99	99	94	92	98	97	96	93	98	97	95	93	97	97
SED 9	97	95	98	97	98	98	93	90	98	97	95	92	97	96	95	92	96	96
SED 10	68	53	62	47	67	51	69	57	75	62	75	62	59	56	73	62	57	55

As shown in these tables, percent reductions calculated using the alternate method described by EPA generally do not change significantly over those presented in the Revised CMS Report, except for SED 1/2 and SED 10. For SED 4 through SED 9 in Reaches 5 and 6, percent reductions generally decrease by 1% or less; in Reaches 7 and 8, percent reductions generally decrease by 5% or less. Under SED 3, percent reductions under the EPA method are lower than those presented in the Revised CMS Report by as little as 1% in some reaches and up to 5 to 10% in other reaches. Under SED 1/2 and SED 10, the predicted reductions in fish concentrations under EPA's method are generally between 10% and 25% lower than under the method used in the Revised CMS Report.<sup>1</sup>

<sup>1</sup> It should be noted, as discussed in Section 6.2.5.2 of the Revised CMS Report, that the most recent adult fish sampling data (primarily fillets) from Reach 5B/5C and Reach 6 (Woods Pond), which were collected in 2008, show even lower PCB concentrations in those fish than the initial concentrations used in EPA's model or the spun-up initial concentrations. This suggests that the upstream remediation and natural recovery processes reflected in SED 1/2 may achieve lower fish PCB concentrations than would be predicted by EPA's model for those alternatives using either the CMS method or the EPA method of calculating initial concentrations. This would be evaluated and confirmed through future long-term fish sampling.

## I.2 MODEL SENSITIVITY TO USE OF LARGEMOUTH BASS ALONE IN “BLENDED” FISH CALCULATIONS

In Specific Comment #38 on the March 2008 CMS Report, EPA noted that, in the CMS, the “blended fish” calculations used for human health risk comparisons relied exclusively on concentrations in largemouth bass. EPA indicated that changes in fillet concentrations would show less sensitivity to changes in water column PCB concentrations if species that derive more exposure from sediment sources (e.g., brown bullhead) were included in the calculations. GE was directed to include a discussion of the sensitivity of the model to the use of solely largemouth bass.

To assess the sensitivity of using only largemouth bass (as opposed to a combination of fish species) to evaluate attainment of the IMPGs for human consumption of fish, the method used by EPA in the HHRA to calculate a “blended” fish concentration was adapted for use with the species simulated by EPA’s FCM. The methodology used for calculating “blended” fish concentrations using the FCM output was provided by EPA to GE in an email dated November 12, 2008 (included as Appendix H to the Revised CMS Report). These blended fish results were then compared to the largemouth bass results used in the Revised CMS Report.

### I.2.1. Blended Fish Calculation Method

Application of EPA’s blended fish calculation method consisted of averaging model outputs across different species and size classes, as shown by the equation below, which was developed by EPA (Appendix H) for Reaches 5/6 and Reaches 7/8:

$$\text{Blended Fish, R5/6 and R7/8} = [LMB_{(\text{fillet, Age } 9+)}] * 0.75 + [BB_{(\text{fillet, age } 5+)}] * 0.25$$

Blended fish assumptions for Connecticut were not provided by EPA in the November 12, 2008 email (Appendix H). In the HHRA, the calculation of fish concentrations in the Connecticut reaches used smallmouth bass data. In the CMS, the Connecticut 1-D Analysis was used to estimate fish concentrations in the Connecticut impoundments using the largemouth bass equations from EPA’s FCM (see Appendix J of the Revised CMS Report). Similar to largemouth bass, smallmouth bass also have a length limit of 12 inches; therefore, only age classes corresponding to lengths greater than 12 inches were used in the calculation. Thus, the blended fish concentrations for Connecticut would be unchanged from what was used in the Revised CMS Report – that is:

$$\text{Blended Fish, CT} = \text{Average} (LMB_{(\text{fillet, } \geq 30.4 \text{ cm})})$$

### ***1.2.2 Results from Blended Fish Calculation***

Application of EPA's blended fish averaging methods to FCM outputs results in PCB concentrations that are on average 5% higher than those documented in the Revised CMS Report, which were based on largemouth bass alone. The reasons for this average increase are due to both the exclusion of smaller sized largemouth bass (which have lower concentrations than the larger fish) and the inclusion of brown bullhead (which have higher concentrations as a bottom feeder) in the calculation.

To evaluate the impacts of the revised blended fish calculation method on the evaluations of the sediment alternatives, the extent of human fish consumption IMPG attainment resulting from the use of this blended fish PCB concentration was compared to that resulting from the sole use of largemouth bass, as used in the Revised CMS Report. These results are summarized in Tables I-4 through I-12 for each of the sediment alternatives. These tables show that the slight average increase in PCB concentrations resulting from use of the revised blended fish calculation method has a negligible effect on attainment of the human consumption IMPGs and, overall, generally results in slightly less IMPG attainment. Specifically, for each sediment alternative, use of the blended fish method would result in a few additional instances of non-attainment of those IMPGs, mostly for the deterministic CTE IMPGs. However, there are a few cases where an additional IMPG or IMPGs would be attained as result of the revised blended fish calculation method. Specifically, that method would result in attainment of the following additional IMPGs: (a) under SED 6 and SED 9, the deterministic RME IMPG based on an assumed  $10^{-4}$  cancer risk and the deterministic CTE non-cancer IMPG for children in Reach 7C; (b) under SED 7, those same IMPGs in Reaches 7C and 8; and (c) under SED 8, the probabilistic RME non-cancer IMPG for adults in Reach 6.

### **1.3 MODEL SENSITIVITY TO OSPREY FEEDING PREFERENCES**

In Specific Comment #60 on the March 2008 CMS Report, EPA noted that it disagreed with GE's assignment of feeding preferences for osprey (the species selected by EPA to represent piscivorous birds), and it asserted that the parameterization in the CMS was incorrectly based on the assumption that all modeled fish species would be consumed equally by osprey (Revised CMS Report Table 3-12). Based on information developed in the Ecological Risk Assessment (ERA), EPA contended that an alternate parameterization (namely, the prey preference matrix used for eagles) is a better representation of the osprey diet:

$$\text{Blended}_{\text{raptor}} = (0.6 \times \text{Age 4 Sucker}) + (0.15 \times \text{Age 5 Sunfish}) + (0.25 \times \text{Age 5 Bass})$$

In addition, EPA stated that, based on the size range of fish consumed by osprey, it is more appropriate to assume a diet consisting of age 4+ white sucker, age 5+ sunfish, and age 5+ bass as surrogate age classes most representative of this range. The CMS used the average of multiple age classes, including ages 1+ to 5+ for white sucker, 2+ to 5+ for sunfish, and 1+ to 9+ for largemouth bass.

As a result of these differences, EPA noted that the concentrations calculated based on the method used in the CMS are 16% lower than those calculated by EPA using this alternative parameterization. These differences derive mainly from: (1) greater assumed proportion of forage fish in osprey diet in the CMS; and (2) inclusion of younger age classes (on average) of white sucker and sunfish in osprey diet in the CMS. As discussed below, GE does not agree with EPA's arguments, and has not changed its assumptions on osprey feeding preferences in the modeling presented in the Revised CMS Report. However, as also discussed below, GE has assessed the sensitivity of achievement of the IMPGs for piscivorous birds (represented by osprey) to EPA's assumed feeding preferences for osprey.

The assumption that all modeled fish species would be consumed equally by osprey was based on GE's interpretation of the ERA. For example, while the ERA notes that fish represent the predominant prey of osprey (assumed to be 100% in the ERA), it makes no mention of the composition of diet by fish species (EPA, 2004, Vol. 6, pp. H-25 – H-26); and the cited table on osprey diet (Table H.2-11) does not provide a clear basis for making that determination, particularly since none of the studies listed in that table was conducted on a large Northeastern river comparable to the Housatonic River. Furthermore, the ERA's discussion of the assumed PCB concentrations in fish consumed by osprey focuses on the effect of the assumed length of fish, rather than the species or how they might be weighted (Vol. 6, p. H-26). Similarly, the summary table on PCB concentrations in such fish provides no indication of weighting by species. In contrast, for bald eagles, the ERA explicitly defines the weighting applied for different guilds of fish (Vol. 6, Table K.2-2). All of these elements of the ERA indicate that EPA did not weight fish by species when calculating the dietary concentration of osprey. GE followed that approach in the CMS Report and the Revised CMS Report.

In any event, contrary to EPA's suggestion that the bald eagle's weighting scheme be applied to osprey, prey preferences of bald eagles and osprey likely differ, as would be expected based on Gause's Law of Competitive Exclusion (i.e., species competing for the same resources cannot stably exist). In contrast with the bald eagle's preference of sucker>bass>sunfish, Van Daele and Van Daele (1982) reported that osprey target bullheads and salmonids disproportionately when compared to netted samples and that yellow perch and suckers were underrepresented in the diet. Edwards and Collopy (1988) reported that adult ospreys took bass in proportion to their abundance but took sunfish and



shad disproportionately relative to their abundance. Although these two studies do not provide an adequate basis for quantitatively defining weights, they suggest that preferences among osprey follow a trend of bullhead/sunfish>bass>sucker (i.e., almost opposite to the preferences of bald eagles). With respect to the age ranges used in the Revised CMS, the assignment of model age classes that correspond to the preferred size range (130 to 400 millimeters [mm]) for osprey used in the ERA (i.e., the age classes shown in Table 3-11 of the Revised CMS Report) was based on analysis of site data and EPA’s model inputs, as follows:

- As the EPA FCM does not include length as a parameter, it was necessary to correlate the preferred length range to weight, a parameter used in the model. Log-log plots of length and weight data from the EPA and GE datasets were generated for each of the modeled species, and regressions from the data were used to convert the length range to a weight range.
- The resulting weight ranges were then compared to the weights input in the EPA FCM for each fish age class to establish the age classes that fall within the preferred osprey size range.

The attached Figure I-1 contains an example for Cyprinids. Based on the length/weight relationship shown in this figure, the 130 to 400 mm size range corresponds to a weight range of 20 to 600 grams. This weight range was then compared against the age-weight inputs in EPA’s FCM for Cyprinids (summarized in Table I-13 below; also shown in Table 2 of Appendix C2 of EPA’s Final Model Documentation Report [EPA, 2006]):

**Table I-13. Cyprinid Age versus Weight.**

Cyprinid Age Class	1	2	3	4	5	6
Range (grams)	0.2 – 3.0	3.0 – 5.0	5.0 – 8.0	8.0 – 12	12 – 20	20 – 25

From the EPA FCM inputs, the only age class for cyprinids having weights within the range of 20 to 600 grams is age 6, the last modeled age class. Thus, this is the age class listed for cyprinids in Table 3-11 of the Revised CMS Report. The same approach was employed for all of the species listed in Table 3-11 of the Revised CMS Report. GE believes that this approach for determining the age classes for osprey prey is appropriate. In fact, use of the ERA’s size range extending up to 400 mm was already conservative, given that that range is greater than ranges reported in several studies (e.g., Cramp and Simmons, 1980; Van Daele and Van Daele, 1982; Prevost, 1982).

While GE does not agree with EPA’s alternate parameterization of osprey feeding preferences, the significance of the method proposed by EPA was evaluated by: (a)

increasing the PCB concentrations predicted by the model for fish consumed by osprey for all alternatives, using the CMS approach regarding this species' prey, by the 16% cited by EPA; and then (b) comparing those increased concentrations again to the IMPG for piscivorous birds based on osprey (3.2 mg/kg in fish prey). Table I-14 below illustrates the impact of this alternate approach on the number of averaging areas achieving this IMPG for each of the sediment alternatives.

**Table I-14. Number of Averaging Areas Meeting IMPG for Piscivorous Birds.**

<b>Alternative</b>	<b>Number of Averaging Areas Meeting IMPG using CMS Approach</b>	<b>Number of Averaging Areas Meeting IMPG After Applying 16% Increase to Model-Predicted Concentration</b>	<b>Comments</b>
SED 1/2	0 of 14	0 of 14	No changes in IMPG attainment
SED 3	6 of 14	6 of 14	No changes in IMPG attainment
SED 4	11 of 14	10 of 14	Change from attaining IMPG to non-attainment in Reach 7G
SED 5	13 of 14	11 of 14	Change from attaining IMPG to non-attainment in Reach 7C and 7G
SED 6	14 of 14	14 of 14	No changes in IMPG attainment
SED 7	14 of 14	14 of 14	No changes in IMPG attainment
SED 8	14 of 14	14 of 14	No changes in IMPG attainment
SED 9	14 of 14	14 of 14	No changes in IMPG attainment
SED 10	0 of 14	0 of 14	No changes in IMPG attainment

As shown in the above table, the method proposed by EPA would not have a large impact on attainment of the IMPG for piscivorous birds or on the comparison among alternatives in terms of achieving that IMPG.

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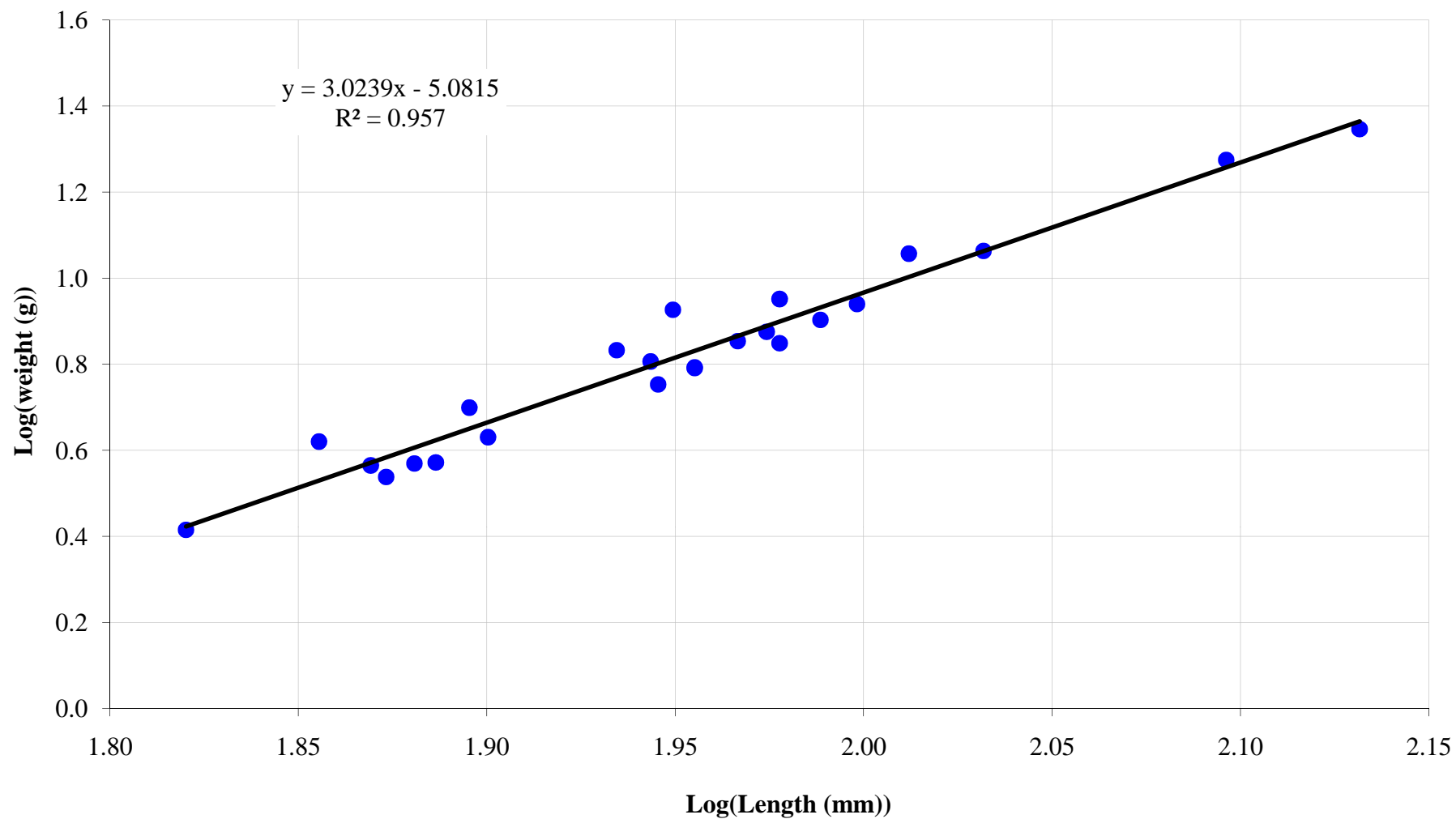
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**Figure I-1. Length-weight relationship in cyprinids from Reaches 5 and 6.**

**Table I-4. IMPGs for human consumption of fish tissue compared to projected fillet-based fish PCBs calculated using EPA's "blended" fish method (top panel) and the sole use of largemouth bass (bottom panel) (SED1 / SED 2).**

Tissue Type	Assessment Type	Exposure Assumptions	Risk Level	IMPG (mg/kg)	Average Fish Tissue (Fillet) PCB Concentration (mg/kg) <sup>1</sup>																						
					Reach 5A	Reach 5B	Reach 5C	Reach 5D	Reach 6	Reach 7A	Reach 7B	Reach 7C	Reach 7D	Reach 7E	Reach 7F	Reach 7G	Reach 7H	Reach 8	BBD	LL	LZ	LH					
					7.9	9.5	8.0	9.8	8.6	6.0	6.0	6.1	5.3	3.9	3.1	3.4	2.6	3.6	0.2	0.1	0.08	0.08					
Blended Fish Fillets	Deterministic	RME	10 <sup>-6</sup> Cancer Risk	0.0019																							
			10 <sup>-5</sup> Cancer Risk	0.019																							
			10 <sup>-4</sup> Cancer Risk	0.19																							
			Non-Cancer -- Child	0.026																							
		Non-Cancer -- Adult	0.062																								
		CTE	10 <sup>-6</sup> Cancer Risk	0.049																							
			10 <sup>-5</sup> Cancer Risk	0.49																							
			10 <sup>-4</sup> Cancer Risk	4.9																							
	Non-Cancer -- Child		0.19																								
	Probabilistic	RME (5th percentile)	Non-Cancer -- Adult	0.43																							
			10 <sup>-6</sup> Cancer Risk	0.0064																							
			10 <sup>-5</sup> Cancer Risk	0.064																							
			10 <sup>-4</sup> Cancer Risk	0.64																							
		CTE (50th percentile)	Non-Cancer -- Child	0.059																							
			Non-Cancer -- Adult	0.12																							
			10 <sup>-6</sup> Cancer Risk	0.057																							
10 <sup>-5</sup> Cancer Risk			0.57																								
		10 <sup>-4</sup> Cancer Risk	5.7																								
		Non-Cancer -- Child	0.71																								
		Non-Cancer -- Adult	1.5																								

Tissue Type	Assessment Type	Exposure Assumptions	Risk Level	IMPG (mg/kg)	Average Fish Tissue (Fillet) PCB Concentration (mg/kg) <sup>1</sup>																						
					Reach 5A	Reach 5B	Reach 5C	Reach 5D	Reach 6	Reach 7A	Reach 7B	Reach 7C	Reach 7D	Reach 7E	Reach 7F	Reach 7G	Reach 7H	Reach 8	BBD	LL	LZ	LH					
					7.3	9.3	7.4	9.5	8.6	6.4	5.7	6.3	5.5	4.1	3.2	3.5	2.8	3.6	0.2	0.1	0.08	0.08					
Bass Fillets	Deterministic	RME	10 <sup>-6</sup> Cancer Risk	0.0019																							
			10 <sup>-5</sup> Cancer Risk	0.019																							
			10 <sup>-4</sup> Cancer Risk	0.19																							
			Non-Cancer -- Child	0.026																							
		Non-Cancer -- Adult	0.062																								
		CTE	10 <sup>-6</sup> Cancer Risk	0.049																							
			10 <sup>-5</sup> Cancer Risk	0.49																							
			10 <sup>-4</sup> Cancer Risk	4.9																							
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			10 <sup>-6</sup> Cancer Risk	0.057																							
10 <sup>-5</sup> Cancer Risk			0.57																								
		10 <sup>-4</sup> Cancer Risk	5.7																								
		Non-Cancer -- Child	0.71																								
		Non-Cancer -- Adult	1.5																								

**Notes**

<sup>1</sup> Model endpoint concentrations after 52-year projection (autumn average); whole body concentrations divided by a factor of 5.0 to convert to fillet basis. Results for CT impoundments are highly uncertain as they were estimated from the CT 1-D Analysis.

BBD: Bulls Bridge Dam Impoundment  
 LL: Lake Lillinah  
 LZ: Lake Zoar  
 LH: Lake Housatonic

**Key**

- = model prediction is lower than the IMPG
- = model prediction is lower than the cancer IMPG, but is not lower than the corresponding non-cancer IMPGs
- = model prediction exceeds the IMPG

CTE = central tendency exposure  
 RME = reasonable maximum exposure

**Table I-5. IMPGs for human consumption of fish tissue compared to projected fillet-based fish PCBs calculated using EPA's "blended" fish method (top panel) and the sole use of largemouth bass (bottom panel) (SED 3).**

Tissue Type	Assessment Type	Exposure Assumptions	Risk Level	IMPG (mg/kg)	Average Fish Tissue (Fillet) PCB Concentration (mg/kg) <sup>1</sup>																				
					Reach 5A	Reach 5B	Reach 5C	Reach 5D	Reach 6	Reach 7A	Reach 7B	Reach 7C	Reach 7D	Reach 7E	Reach 7F	Reach 7G	Reach 7H	Reach 8	BBD	LL	LZ	LH			
					0.24	3.5	2.1	6.4	0.73	1.2	2.5	1.9	1.4	1.0	0.84	1.4	0.72	1.7	0.04	0.03	0.02	0.02			
Blended Fish Fillets	Deterministic	RME	10 <sup>-6</sup> Cancer Risk	0.0019																					
			10 <sup>-5</sup> Cancer Risk	0.019																					
			10 <sup>-4</sup> Cancer Risk	0.19																					
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		Non-Cancer -- Adult	0.062																						
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			10 <sup>-5</sup> Cancer Risk	0.49																					
			10 <sup>-4</sup> Cancer Risk	4.9																					
	Non-Cancer -- Child		0.19																						
	Probabilistic	RME (5th percentile)	Non-Cancer -- Adult	0.43																					
			10 <sup>-6</sup> Cancer Risk	0.0064																					
			10 <sup>-5</sup> Cancer Risk	0.064																					
			10 <sup>-4</sup> Cancer Risk	0.64																					
		CTE (50th percentile)	Non-Cancer -- Child	0.059																					
			Non-Cancer -- Adult	0.12																					
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10 <sup>-5</sup> Cancer Risk			0.57																						
	10 <sup>-4</sup> Cancer Risk	5.7																							
	Non-Cancer -- Child	0.71																							
	Non-Cancer -- Adult	1.5																							

Tissue Type	Assessment Type	Exposure Assumptions	Risk Level	IMPG (mg/kg)	Average Fish Tissue (Fillet) PCB Concentration (mg/kg) <sup>1</sup>																				
					Reach 5A	Reach 5B	Reach 5C	Reach 5D	Reach 6	Reach 7A	Reach 7B	Reach 7C	Reach 7D	Reach 7E	Reach 7F	Reach 7G	Reach 7H	Reach 8	BBD	LL	LZ	LH			
					0.25	3.0	1.8	6.3	0.71	1.3	2.1	1.8	1.4	1.0	0.82	1.3	0.72	1.6	0.04	0.03	0.02	0.02			
Bass Fillets	Deterministic	RME	10 <sup>-6</sup> Cancer Risk	0.0019																					
			10 <sup>-5</sup> Cancer Risk	0.019																					
			10 <sup>-4</sup> Cancer Risk	0.19																					
			Non-Cancer -- Child	0.026																					
		Non-Cancer -- Adult	0.062																						
		CTE	10 <sup>-6</sup> Cancer Risk	0.049																					
			10 <sup>-5</sup> Cancer Risk	0.49																					
			10 <sup>-4</sup> Cancer Risk	4.9																					
	Non-Cancer -- Child		0.19																						
	Probabilistic	RME (5th percentile)	Non-Cancer -- Adult	0.43																					
			10 <sup>-6</sup> Cancer Risk	0.0064																					
			10 <sup>-5</sup> Cancer Risk	0.064																					
			10 <sup>-4</sup> Cancer Risk	0.64																					
		CTE (50th percentile)	Non-Cancer -- Child	0.059																					
			Non-Cancer -- Adult	0.12																					
			10 <sup>-6</sup> Cancer Risk	0.057																					
10 <sup>-5</sup> Cancer Risk			0.57																						
	10 <sup>-4</sup> Cancer Risk	5.7																							
	Non-Cancer -- Child	0.71																							
	Non-Cancer -- Adult	1.5																							

**Notes**

<sup>1</sup> Model endpoint concentrations after 52-year projection (autumn average); whole body concentrations divided by a factor of 5.0 to convert to fillet basis. Results for CT impoundments are highly uncertain as they were estimated from the CT 1-D Analysis.  
 BBD: Bulls Bridge Dam Impoundment  
 LL: Lake Lillionah  
 LZ: Lake Zoar  
 LH: Lake Housatonic

**Key**

- = model prediction is lower than the IMPG
- = model prediction is lower than the cancer IMPG, but is not lower than the corresponding non-cancer IMPGs
- = model prediction exceeds the IMPG

CTE = central tendency exposure  
 RME = reasonable maximum exposure

**Table I-6. IMPGs for human consumption of fish tissue compared to projected fillet-based fish PCBs calculated using EPA's "blended" fish method (top panel) and the sole use of largemouth bass (bottom panel) (SED 4).**

Tissue Type	Assessment Type	Exposure Assumptions	Risk Level	IMPG (mg/kg)	Average Fish Tissue (Fillet) PCB Concentration (mg/kg) <sup>1</sup>																				
					Reach 5A	Reach 5B	Reach 5C	Reach 5D	Reach 6	Reach 7A	Reach 7B	Reach 7C	Reach 7D	Reach 7E	Reach 7F	Reach 7G	Reach 7H	Reach 8	BBD	LL	LZ	LH			
					0.25	0.41	0.47	0.38	0.22	0.52	2.1	1.2	0.94	0.66	0.56	1.2	0.48	1.5	0.02	0.01	0.01	0.01			
Blended Fish Fillets	Deterministic	RME	10 <sup>-6</sup> Cancer Risk	0.0019																					
			10 <sup>-5</sup> Cancer Risk	0.019																					
			10 <sup>-4</sup> Cancer Risk	0.19																					
			Non-Cancer -- Child	0.026																					
		Non-Cancer -- Adult	0.062																						
		CTE	10 <sup>-6</sup> Cancer Risk	0.049																					
			10 <sup>-5</sup> Cancer Risk	0.49																					
			10 <sup>-4</sup> Cancer Risk	4.9																					
	Non-Cancer -- Child		0.19																						
	Probabilistic	(5th percentile)	Non-Cancer -- Adult	0.43																					
			RME	10 <sup>-6</sup> Cancer Risk	0.0064																				
				10 <sup>-5</sup> Cancer Risk	0.064																				
				10 <sup>-4</sup> Cancer Risk	0.64																				
		Non-Cancer -- Child		0.059																					
		(50th percentile)	Non-Cancer -- Adult	0.12																					
			CTE	10 <sup>-6</sup> Cancer Risk	0.057																				
10 <sup>-5</sup> Cancer Risk				0.57																					
10 <sup>-4</sup> Cancer Risk	5.7																								
Non-Cancer -- Child	0.71																								
Non-Cancer -- Adult	1.5																								

Tissue Type	Assessment Type	Exposure Assumptions	Risk Level	IMPG (mg/kg)	Average Fish Tissue (Fillet) PCB Concentration (mg/kg) <sup>1</sup>																				
					Reach 5A	Reach 5B	Reach 5C	Reach 5D	Reach 6	Reach 7A	Reach 7B	Reach 7C	Reach 7D	Reach 7E	Reach 7F	Reach 7G	Reach 7H	Reach 8	BBD	LL	LZ	LH			
					0.26	0.39	0.42	0.40	0.23	0.50	1.6	1.1	0.84	0.62	0.52	1.1	0.46	1.3	0.02	0.01	0.01	0.01			
Bass Fillets	Deterministic	RME	10 <sup>-6</sup> Cancer Risk	0.0019																					
			10 <sup>-5</sup> Cancer Risk	0.019																					
			10 <sup>-4</sup> Cancer Risk	0.19																					
			Non-Cancer -- Child	0.026																					
		Non-Cancer -- Adult	0.062																						
		CTE	10 <sup>-6</sup> Cancer Risk	0.049																					
			10 <sup>-5</sup> Cancer Risk	0.49																					
			10 <sup>-4</sup> Cancer Risk	4.9																					
	Non-Cancer -- Child		0.19																						
	Probabilistic	(5th percentile)	Non-Cancer -- Adult	0.43																					
			RME	10 <sup>-6</sup> Cancer Risk	0.0064																				
				10 <sup>-5</sup> Cancer Risk	0.064																				
				10 <sup>-4</sup> Cancer Risk	0.64																				
		Non-Cancer -- Child		0.059																					
		(50th percentile)	Non-Cancer -- Adult	0.12																					
			CTE	10 <sup>-6</sup> Cancer Risk	0.057																				
10 <sup>-5</sup> Cancer Risk				0.57																					
10 <sup>-4</sup> Cancer Risk	5.7																								
Non-Cancer -- Child	0.71																								
Non-Cancer -- Adult	1.5																								

**Notes**

<sup>1</sup> Model endpoint concentrations after 52-year projection (autumn average); whole body concentrations divided by a factor of 5.0 to convert to fillet basis. Results for CT impoundments are highly uncertain as they were estimated from the CT 1-D Analysis.

BBD: Bulls Bridge Dam Impoundment

LL: Lake Lillionah

LZ: Lake Zoar

LH: Lake Housatonic

**Key**

- = model prediction is lower than the IMPG
- = model prediction is lower than the cancer IMPG, but is not lower than the corresponding non-cancer IMPGs
- = model prediction exceeds the IMPG

CTE = central tendency exposure  
RME = reasonable maximum exposure

**Table I-7. IMPGs for human consumption of fish tissue compared to projected fillet-based fish PCBs calculated using EPA's "blended" fish method (top panel) and the sole use of largemouth bass (bottom panel) (SED 5).**

Tissue Type	Assessment Type	Exposure Assumptions	Risk Level	IMPG (mg/kg)	Average Fish Tissue (Fillet) PCB Concentration (mg/kg) <sup>1</sup>																	
					Reach 5A	Reach 5B	Reach 5C	Reach 5D	Reach 6	Reach 7A	Reach 7B	Reach 7C	Reach 7D	Reach 7E	Reach 7F	Reach 7G	Reach 7H	Reach 8	BBD	LL	LZ	LH
					0.25	0.22	0.17	0.35	0.18	0.45	2.0	1.2	0.89	0.61	0.52	1.1	0.45	0.35	0.01	0.009	0.006	0.006
Blended Fish Fillets	Deterministic	RME	10 <sup>-6</sup> Cancer Risk	0.0019																		
			10 <sup>-5</sup> Cancer Risk	0.019																		
			10 <sup>-4</sup> Cancer Risk	0.19																		
			Non-Cancer -- Child	0.026																		
		Non-Cancer -- Adult	0.062																			
		CTE	10 <sup>-6</sup> Cancer Risk	0.049																		
			10 <sup>-5</sup> Cancer Risk	0.49																		
			10 <sup>-4</sup> Cancer Risk	4.9																		
	Non-Cancer -- Child		0.19																			
	Probabilistic	(5th percentile)	Non-Cancer -- Adult	0.43																		
			10 <sup>-6</sup> Cancer Risk	0.0064																		
			10 <sup>-5</sup> Cancer Risk	0.064																		
			10 <sup>-4</sup> Cancer Risk	0.64																		
		(50th percentile)	Non-Cancer -- Child	0.059																		
			Non-Cancer -- Adult	0.12																		
			10 <sup>-6</sup> Cancer Risk	0.057																		
10 <sup>-5</sup> Cancer Risk			0.57																			
	10 <sup>-4</sup> Cancer Risk	5.7																				
	Non-Cancer -- Child	0.71																				
	Non-Cancer -- Adult	1.5																				

Tissue Type	Assessment Type	Exposure Assumptions	Risk Level	IMPG (mg/kg)	Average Fish Tissue (Fillet) PCB Concentration (mg/kg) <sup>1</sup>																	
					Reach 5A	Reach 5B	Reach 5C	Reach 5D	Reach 6	Reach 7A	Reach 7B	Reach 7C	Reach 7D	Reach 7E	Reach 7F	Reach 7G	Reach 7H	Reach 8	BBD	LL	LZ	LH
					0.26	0.23	0.17	0.36	0.18	0.42	1.6	1.0	0.79	0.57	0.49	1.0	0.43	0.34	0.01	0.009	0.006	0.006
Bass Fillets	Deterministic	RME	10 <sup>-6</sup> Cancer Risk	0.0019																		
			10 <sup>-5</sup> Cancer Risk	0.019																		
			10 <sup>-4</sup> Cancer Risk	0.19																		
			Non-Cancer -- Child	0.026																		
		Non-Cancer -- Adult	0.062																			
		CTE	10 <sup>-6</sup> Cancer Risk	0.049																		
			10 <sup>-5</sup> Cancer Risk	0.49																		
			10 <sup>-4</sup> Cancer Risk	4.9																		
	Non-Cancer -- Child		0.19																			
	Probabilistic	(5th percentile)	Non-Cancer -- Adult	0.43																		
			10 <sup>-6</sup> Cancer Risk	0.0064																		
			10 <sup>-5</sup> Cancer Risk	0.064																		
			10 <sup>-4</sup> Cancer Risk	0.64																		
		(50th percentile)	Non-Cancer -- Child	0.059																		
			Non-Cancer -- Adult	0.12																		
			10 <sup>-6</sup> Cancer Risk	0.057																		
10 <sup>-5</sup> Cancer Risk			0.57																			
	10 <sup>-4</sup> Cancer Risk	5.7																				
	Non-Cancer -- Child	0.71																				
	Non-Cancer -- Adult	1.5																				

**Notes**

<sup>1</sup> Model endpoint concentrations after 52-year projection (autumn average); whole body concentrations divided by a factor of 5.0 to convert to fillet basis. Results for CT impoundments are highly uncertain as they were estimated from the CT 1-D Analysis.

BBD: Bulls Bridge Dam Impoundment

LL: Lake Lillionah

LZ: Lake Zoar

LH: Lake Housatonic

**Key**

- = model prediction is lower than the IMPG
- = model prediction is lower than the cancer IMPG, but is not lower than the corresponding non-cancer IMPGs
- = model prediction exceeds the IMPG

CTE = central tendency exposure

RME = reasonable maximum exposure



**Table I-8. IMPGs for human consumption of fish tissue compared to projected fillet-based fish PCBs calculated using EPA's "blended" fish method (top panel) and the sole use of largemouth bass (bottom panel) (SED 6).**

Tissue Type	Assessment Type	Exposure Assumptions	Risk Level	IMPG (mg/kg)	Average Fish Tissue (Fillet) PCB Concentration (mg/kg) <sup>1</sup>																	
					Reach 5A	Reach 5B	Reach 5C	Reach 5D	Reach 6	Reach 7A	Reach 7B	Reach 7C	Reach 7D	Reach 7E	Reach 7F	Reach 7G	Reach 7H	Reach 8	BBD	LL	LZ	LH
					0.25	0.21	0.16	0.34	0.17	0.42	0.50	0.19	0.80	0.35	0.49	0.43	0.41	0.22	0.009	0.006	0.005	0.004
Blended Fish Fillets	Deterministic	RME	10 <sup>-6</sup> Cancer Risk	0.0019																		
			10 <sup>-5</sup> Cancer Risk	0.019																		
			10 <sup>-4</sup> Cancer Risk	0.19																		
		Non-Cancer -- Child	0.026																			
		Non-Cancer -- Adult	0.062																			
		10 <sup>-6</sup> Cancer Risk	0.049																			
	CTE	10 <sup>-5</sup> Cancer Risk	0.49																			
		10 <sup>-4</sup> Cancer Risk	4.9																			
		Non-Cancer -- Child	0.19																			
		Non-Cancer -- Adult	0.43																			
		Probabilistic	RME (5th percentile)	10 <sup>-6</sup> Cancer Risk	0.0064																	
				10 <sup>-5</sup> Cancer Risk	0.064																	
	10 <sup>-4</sup> Cancer Risk			0.64																		
	Non-Cancer -- Child		0.059																			
	Non-Cancer -- Adult		0.12																			
	CTE (50th percentile)		10 <sup>-6</sup> Cancer Risk	0.057																		
		10 <sup>-5</sup> Cancer Risk	0.57																			
		10 <sup>-4</sup> Cancer Risk	5.7																			
Non-Cancer -- Child	0.71																					
Non-Cancer -- Adult	1.5																					

Tissue Type	Assessment Type	Exposure Assumptions	Risk Level	IMPG (mg/kg)	Average Fish Tissue (Fillet) PCB Concentration (mg/kg) <sup>1</sup>																	
					Reach 5A	Reach 5B	Reach 5C	Reach 5D	Reach 6	Reach 7A	Reach 7B	Reach 7C	Reach 7D	Reach 7E	Reach 7F	Reach 7G	Reach 7H	Reach 8	BBD	LL	LZ	LH
					0.26	0.22	0.16	0.35	0.17	0.40	0.41	0.20	0.70	0.34	0.45	0.40	0.39	0.22	0.009	0.006	0.005	0.004
Bass Fillets	Deterministic	RME	10 <sup>-6</sup> Cancer Risk	0.0019																		
			10 <sup>-5</sup> Cancer Risk	0.019																		
			10 <sup>-4</sup> Cancer Risk	0.19																		
		Non-Cancer -- Child	0.026																			
		Non-Cancer -- Adult	0.062																			
		10 <sup>-6</sup> Cancer Risk	0.049																			
	CTE	10 <sup>-5</sup> Cancer Risk	0.49																			
		10 <sup>-4</sup> Cancer Risk	4.9																			
		Non-Cancer -- Child	0.19																			
		Non-Cancer -- Adult	0.43																			
		Probabilistic	RME (5th percentile)	10 <sup>-6</sup> Cancer Risk	0.0064																	
				10 <sup>-5</sup> Cancer Risk	0.064																	
	10 <sup>-4</sup> Cancer Risk			0.64																		
	Non-Cancer -- Child		0.059																			
	Non-Cancer -- Adult		0.12																			
	CTE (50th percentile)		10 <sup>-6</sup> Cancer Risk	0.057																		
		10 <sup>-5</sup> Cancer Risk	0.57																			
		10 <sup>-4</sup> Cancer Risk	5.7																			
Non-Cancer -- Child	0.71																					
Non-Cancer -- Adult	1.5																					

**Notes**

<sup>1</sup> Model endpoint concentrations after 52-year projection (autumn average); whole body concentrations divided by a factor of 5.0 to convert to fillet basis. Results for CT impoundments are highly uncertain as they were estimated from the CT 1-D Analysis.  
 BBD: Bulls Bridge Dam Impoundment  
 LL: Lake Lillinonah  
 LZ: Lake Zoar  
 LH: Lake Housatonic

**Key**

- = model prediction is lower than the IMPG
- = model prediction is lower than the cancer IMPG, but is not lower than the corresponding non-cancer IMPGs
- = model prediction exceeds the IMPG

CTE = central tendency exposure  
 RME = reasonable maximum exposure

**Table I-9. IMPGs for human consumption of fish tissue compared to projected fillet-based fish PCBs calculated using EPA's "blended" fish method (top panel) and the sole use of largemouth bass (bottom panel) (SED 7).**

Tissue Type	Assessment Type	Exposure Assumptions	Risk Level	IMPG (mg/kg)	Average Fish Tissue (Fillet) PCB Concentration (mg/kg) <sup>1</sup>																	
					Reach 5A	Reach 5B	Reach 5C	Reach 5D	Reach 6	Reach 7A	Reach 7B	Reach 7C	Reach 7D	Reach 7E	Reach 7F	Reach 7G	Reach 7H	Reach 8	BBD	LL	LZ	LH
					0.27	0.23	0.18	0.36	0.19	0.44	0.25	0.19	0.85	0.33	0.49	0.36	0.42	0.19	0.009	0.006	0.005	0.004
Blended Fish Fillets	Deterministic	RME	10 <sup>-6</sup> Cancer Risk	0.0019																		
			10 <sup>-5</sup> Cancer Risk	0.019																		
			10 <sup>-4</sup> Cancer Risk	0.19																		
		Non-Cancer -- Child	0.026																			
		Non-Cancer -- Adult	0.062																			
		10 <sup>-6</sup> Cancer Risk	0.049																			
	CTE	10 <sup>-5</sup> Cancer Risk	0.49																			
		10 <sup>-4</sup> Cancer Risk	4.9																			
		Non-Cancer -- Child	0.19																			
		Non-Cancer -- Adult	0.43																			
		Probabilistic (5th percentile)	10 <sup>-6</sup> Cancer Risk	0.0064																		
			10 <sup>-5</sup> Cancer Risk	0.064																		
	10 <sup>-4</sup> Cancer Risk		0.64																			
	Non-Cancer -- Child		0.059																			
	Non-Cancer -- Adult		0.12																			
	CTE (50th percentile)		10 <sup>-6</sup> Cancer Risk	0.057																		
		10 <sup>-5</sup> Cancer Risk	0.57																			
		10 <sup>-4</sup> Cancer Risk	5.7																			
Non-Cancer -- Child		0.71																				
Non-Cancer -- Adult		1.5																				

Tissue Type	Assessment Type	Exposure Assumptions	Risk Level	IMPG (mg/kg)	Average Fish Tissue (Fillet) PCB Concentration (mg/kg) <sup>1</sup>																	
					Reach 5A	Reach 5B	Reach 5C	Reach 5D	Reach 6	Reach 7A	Reach 7B	Reach 7C	Reach 7D	Reach 7E	Reach 7F	Reach 7G	Reach 7H	Reach 8	BBD	LL	LZ	LH
					0.29	0.25	0.18	0.39	0.19	0.42	0.23	0.20	0.75	0.33	0.46	0.35	0.40	0.20	0.009	0.006	0.005	0.004
Bass Fillets	Deterministic	RME	10 <sup>-6</sup> Cancer Risk	0.0019																		
			10 <sup>-5</sup> Cancer Risk	0.019																		
			10 <sup>-4</sup> Cancer Risk	0.19																		
		Non-Cancer -- Child	0.026																			
		Non-Cancer -- Adult	0.062																			
		10 <sup>-6</sup> Cancer Risk	0.049																			
	CTE	10 <sup>-5</sup> Cancer Risk	0.49																			
		10 <sup>-4</sup> Cancer Risk	4.9																			
		Non-Cancer -- Child	0.19																			
		Non-Cancer -- Adult	0.43																			
		Probabilistic (5th percentile)	10 <sup>-6</sup> Cancer Risk	0.0064																		
			10 <sup>-5</sup> Cancer Risk	0.064																		
	10 <sup>-4</sup> Cancer Risk		0.64																			
	Non-Cancer -- Child		0.059																			
	Non-Cancer -- Adult		0.12																			
	CTE (50th percentile)		10 <sup>-6</sup> Cancer Risk	0.057																		
		10 <sup>-5</sup> Cancer Risk	0.57																			
		10 <sup>-4</sup> Cancer Risk	5.7																			
Non-Cancer -- Child		0.71																				
Non-Cancer -- Adult		1.5																				

**Notes**

<sup>1</sup> Model endpoint concentrations after 55-year projection (autumn average); whole body concentrations divided by a factor of 5.0 to convert to fillet basis. Results for CT impoundments are highly uncertain as they were estimated from the CT 1-D Analysis.  
 BBD: Bulls Bridge Dam Impoundment  
 LL: Lake Lillinonah  
 LZ: Lake Zoar  
 LH: Lake Housatonic

**Key**

- = model prediction is lower than the IMPG
  - = model prediction is lower than the cancer IMPG, but is not lower than the corresponding non-cancer IMPGs
  - = model prediction exceeds the IMPG
- CTE = central tendency exposure  
 RME = reasonable maximum exposure

**Table I-10. IMPGs for human consumption of fish tissue compared to projected fillet-based fish PCBs calculated using EPA's "blended" fish method (top panel) and the sole use of largemouth bass (bottom panel) (SED 8).**

Tissue Type	Assessment Type	Exposure Assumptions	Risk Level	IMPG (mg/kg)	Average Fish Tissue (Fillet) PCB Concentration (mg/kg) <sup>1</sup>																	
					Reach 5A	Reach 5B	Reach 5C	Reach 5D	Reach 6	Reach 7A	Reach 7B	Reach 7C	Reach 7D	Reach 7E	Reach 7F	Reach 7G	Reach 7H	Reach 8	BBD	LL	LZ	LH
					0.16	0.14	0.11	0.26	0.12	0.37	0.10	0.11	0.73	0.16	0.41	0.14	0.37	0.16	0.007	0.005	0.004	0.004
Blended Fish Fillets	Deterministic	RME	10 <sup>-6</sup> Cancer Risk	0.0019																		
			10 <sup>-5</sup> Cancer Risk	0.019																		
			10 <sup>-4</sup> Cancer Risk	0.19																		
		Non-Cancer -- Child	0.026																			
		Non-Cancer -- Adult	0.062																			
		CTE	10 <sup>-6</sup> Cancer Risk	0.049																		
	10 <sup>-5</sup> Cancer Risk		0.49																			
	10 <sup>-4</sup> Cancer Risk		4.9																			
	Non-Cancer -- Child		0.19																			
	Non-Cancer -- Adult		0.43																			
	Probabilistic		RME (5th percentile)	10 <sup>-6</sup> Cancer Risk	0.0064																	
		10 <sup>-5</sup> Cancer Risk		0.064																		
		10 <sup>-4</sup> Cancer Risk		0.64																		
		Non-Cancer -- Child		0.059																		
		CTE (50th percentile)	Non-Cancer -- Adult	0.12																		
			10 <sup>-6</sup> Cancer Risk	0.057																		
			10 <sup>-5</sup> Cancer Risk	0.57																		
			10 <sup>-4</sup> Cancer Risk	5.7																		
Non-Cancer -- Child			0.71																			
Non-Cancer -- Adult			1.5																			

Tissue Type	Assessment Type	Exposure Assumptions	Risk Level	IMPG (mg/kg)	Average Fish Tissue (Fillet) PCB Concentration (mg/kg) <sup>1</sup>																	
					Reach 5A	Reach 5B	Reach 5C	Reach 5D	Reach 6	Reach 7A	Reach 7B	Reach 7C	Reach 7D	Reach 7E	Reach 7F	Reach 7G	Reach 7H	Reach 8	BBD	LL	LZ	LH
					0.17	0.15	0.11	0.29	0.13	0.34	0.10	0.12	0.63	0.18	0.38	0.15	0.35	0.17	0.006	0.005	0.004	0.003
Bass Fillets	Deterministic	RME	10 <sup>-6</sup> Cancer Risk	0.0019																		
			10 <sup>-5</sup> Cancer Risk	0.019																		
			10 <sup>-4</sup> Cancer Risk	0.19																		
		Non-Cancer -- Child	0.026																			
		Non-Cancer -- Adult	0.062																			
		CTE	10 <sup>-6</sup> Cancer Risk	0.049																		
	10 <sup>-5</sup> Cancer Risk		0.49																			
	10 <sup>-4</sup> Cancer Risk		4.9																			
	Non-Cancer -- Child		0.19																			
	Non-Cancer -- Adult		0.43																			
	Probabilistic		RME (5th percentile)	10 <sup>-6</sup> Cancer Risk	0.0064																	
		10 <sup>-5</sup> Cancer Risk		0.064																		
		10 <sup>-4</sup> Cancer Risk		0.64																		
		Non-Cancer -- Child		0.059																		
		CTE (50th percentile)	Non-Cancer -- Adult	0.12																		
			10 <sup>-6</sup> Cancer Risk	0.057																		
			10 <sup>-5</sup> Cancer Risk	0.57																		
			10 <sup>-4</sup> Cancer Risk	5.7																		
Non-Cancer -- Child			0.71																			
Non-Cancer -- Adult			1.5																			

**Notes**

<sup>1</sup> Model endpoint concentrations after 81-year projection (autumn average); whole body concentrations divided by a factor of 5.0 to convert to fillet basis. Results for CT impoundments are highly uncertain as they were estimated from the CT 1-D Analysis.  
 BBD: Bulls Bridge Dam Impoundment  
 LL: Lake Lillinonah  
 LZ: Lake Zoar  
 LH: Lake Housatonic

**Key**

- = model prediction is lower than the IMPG
  - = model prediction is lower than the cancer IMPG, but is not lower than the corresponding non-cancer IMPGs
  - = model prediction exceeds the IMPG
- CTE = central tendency exposure  
 RME = reasonable maximum exposure

**Table I-11. IMPGs for human consumption of fish tissue compared to projected fillet-based fish PCBs calculated using EPA's "blended" fish method (top panel) and the sole use of largemouth bass (bottom panel) (SED 9).**

Tissue Type	Assessment Type	Exposure Assumptions	Risk Level	IMPG (mg/kg)	Average Fish Tissue (Fillet) PCB Concentration (mg/kg) <sup>1</sup>																		
					Reach 5A	Reach 5B	Reach 5C	Reach 5D	Reach 6	Reach 7A	Reach 7B	Reach 7C	Reach 7D	Reach 7E	Reach 7F	Reach 7G	Reach 7H	Reach 8	BBD	LL	LZ	LH	
					0.31	0.26	0.18	0.40	0.16	0.45	0.23	0.18	0.85	0.21	0.49	0.21	0.41	0.23	0.01	0.007	0.005	0.005	
Blended Fish Fillets	Deterministic	RME	10 <sup>-6</sup> Cancer Risk	0.0019																			
			10 <sup>-5</sup> Cancer Risk	0.019																			
			10 <sup>-4</sup> Cancer Risk	0.19																			
			Non-Cancer -- Child	0.026																			
		Non-Cancer -- Adult	0.062																				
		CTE	10 <sup>-6</sup> Cancer Risk	0.049																			
	10 <sup>-5</sup> Cancer Risk		0.49																				
	10 <sup>-4</sup> Cancer Risk		4.9																				
	Non-Cancer -- Child		0.19																				
	Non-Cancer -- Adult		0.43																				
	Non-Cancer -- Adult		0.0064																				
	Probabilistic	RME (5th percentile)	10 <sup>-6</sup> Cancer Risk	0.0064																			
			10 <sup>-5</sup> Cancer Risk	0.064																			
			10 <sup>-4</sup> Cancer Risk	0.64																			
			Non-Cancer -- Child	0.059																			
		Non-Cancer -- Adult	0.12																				
		CTE (50th percentile)	10 <sup>-6</sup> Cancer Risk	0.057																			
	10 <sup>-5</sup> Cancer Risk		0.57																				
10 <sup>-4</sup> Cancer Risk	5.7																						
Non-Cancer -- Child	0.71																						
Non-Cancer -- Adult	1.5																						

Tissue Type	Assessment Type	Exposure Assumptions	Risk Level	IMPG (mg/kg)	Average Fish Tissue (Fillet) PCB Concentration (mg/kg) <sup>1</sup>																		
					Reach 5A	Reach 5B	Reach 5C	Reach 5D	Reach 6	Reach 7A	Reach 7B	Reach 7C	Reach 7D	Reach 7E	Reach 7F	Reach 7G	Reach 7H	Reach 8	BBD	LL	LZ	LH	
					0.31	0.27	0.18	0.41	0.16	0.42	0.21	0.20	0.75	0.22	0.45	0.22	0.39	0.24	0.009	0.006	0.004	0.004	
Bass Fillets	Deterministic	RME	10 <sup>-6</sup> Cancer Risk	0.0019																			
			10 <sup>-5</sup> Cancer Risk	0.019																			
			10 <sup>-4</sup> Cancer Risk	0.19																			
			Non-Cancer -- Child	0.026																			
		Non-Cancer -- Adult	0.062																				
		CTE	10 <sup>-6</sup> Cancer Risk	0.049																			
	10 <sup>-5</sup> Cancer Risk		0.49																				
	10 <sup>-4</sup> Cancer Risk		4.9																				
	Non-Cancer -- Child		0.19																				
	Non-Cancer -- Adult		0.43																				
	Non-Cancer -- Adult		0.0064																				
	Probabilistic	RME (5th percentile)	10 <sup>-6</sup> Cancer Risk	0.064																			
			10 <sup>-5</sup> Cancer Risk	0.64																			
			10 <sup>-4</sup> Cancer Risk	6.4																			
			Non-Cancer -- Child	0.059																			
		Non-Cancer -- Adult	0.12																				
		CTE (50th percentile)	10 <sup>-6</sup> Cancer Risk	0.057																			
	10 <sup>-5</sup> Cancer Risk		0.57																				
10 <sup>-4</sup> Cancer Risk	5.7																						
Non-Cancer -- Child	0.71																						
Non-Cancer -- Adult	1.5																						

**Notes**

<sup>1</sup> Model endpoint concentrations after 52-year projection (autumn average); whole body concentrations divided by a factor of 5.0 to convert to fillet basis. Results for CT impoundments are highly uncertain as they were estimated from the CT 1-D Analysis.  
 BBD: Bulls Bridge Dam Impoundment  
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 RME = reasonable maximum exposure

**Table I-12. IMPGs for human consumption of fish tissue compared to projected fillet-based fish PCBs calculated using EPA's "blended" fish method (top panel) and the sole use of largemouth bass (bottom panel) (SED 10).**

Tissue Type	Assessment Type	Exposure Assumptions	Risk Level	IMPG (mg/kg)	Average Fish Tissue (Fillet) PCB Concentration (mg/kg) <sup>1</sup>																		
					Reach 5A	Reach 5B	Reach 5C	Reach 5D	Reach 6	Reach 7A	Reach 7B	Reach 7C	Reach 7D	Reach 7E	Reach 7F	Reach 7G	Reach 7H	Reach 8	BBD	LL	LZ	LH	
					4.5	6.9	6.5	11	3.7	4.0	4.5	4.3	3.7	2.7	2.1	2.6	1.8	2.8	0.1	0.08	0.06	0.05	
Blended Fish Fillets	Deterministic	RME	10 <sup>-6</sup> Cancer Risk	0.0019																			
			10 <sup>-5</sup> Cancer Risk	0.019																			
			10 <sup>-4</sup> Cancer Risk	0.19																			
			Non-Cancer -- Child	0.026																			
			Non-Cancer -- Adult	0.062																			
		CTE	10 <sup>-6</sup> Cancer Risk	0.049																			
			10 <sup>-5</sup> Cancer Risk	0.49																			
			10 <sup>-4</sup> Cancer Risk	4.9																			
			Non-Cancer -- Child	0.19																			
	Probabilistic	RME (5th percentile)	Non-Cancer -- Adult	0.43																			
			10 <sup>-6</sup> Cancer Risk	0.0064																			
			10 <sup>-5</sup> Cancer Risk	0.064																			
			10 <sup>-4</sup> Cancer Risk	0.64																			
			Non-Cancer -- Child	0.059																			
		CTE (50th percentile)	Non-Cancer -- Adult	0.12																			
			10 <sup>-6</sup> Cancer Risk	0.057																			
			10 <sup>-5</sup> Cancer Risk	0.57																			
			10 <sup>-4</sup> Cancer Risk	5.7																			
Non-Cancer -- Child	0.71																						
	Non-Cancer -- Adult	1.5																					

Tissue Type	Assessment Type	Exposure Assumptions	Risk Level	IMPG (mg/kg)	Average Fish Tissue (Fillet) PCB Concentration (mg/kg) <sup>1</sup>																		
					Reach 5A	Reach 5B	Reach 5C	Reach 5D	Reach 6	Reach 7A	Reach 7B	Reach 7C	Reach 7D	Reach 7E	Reach 7F	Reach 7G	Reach 7H	Reach 8	BBD	LL	LZ	LH	
					4.2	6.6	5.8	11	3.7	4.2	4.2	4.4	3.7	2.8	2.2	2.6	1.9	2.7	0.1	0.08	0.05	0.05	
Bass Fillets	Deterministic	RME	10 <sup>-6</sup> Cancer Risk	0.0019																			
			10 <sup>-5</sup> Cancer Risk	0.019																			
			10 <sup>-4</sup> Cancer Risk	0.19																			
			Non-Cancer -- Child	0.026																			
			Non-Cancer -- Adult	0.062																			
		CTE	10 <sup>-6</sup> Cancer Risk	0.049																			
			10 <sup>-5</sup> Cancer Risk	0.49																			
			10 <sup>-4</sup> Cancer Risk	4.9																			
			Non-Cancer -- Child	0.19																			
	Probabilistic	RME (5th percentile)	Non-Cancer -- Adult	0.43																			
			10 <sup>-6</sup> Cancer Risk	0.0064																			
			10 <sup>-5</sup> Cancer Risk	0.064																			
			10 <sup>-4</sup> Cancer Risk	0.64																			
			Non-Cancer -- Child	0.059																			
		CTE (50th percentile)	Non-Cancer -- Adult	0.12																			
			10 <sup>-6</sup> Cancer Risk	0.057																			
			10 <sup>-5</sup> Cancer Risk	0.57																			
			10 <sup>-4</sup> Cancer Risk	5.7																			
Non-Cancer -- Child	0.71																						
	Non-Cancer -- Adult	1.5																					

**Notes**

<sup>1</sup> Model endpoint concentrations after 52-year projection (autumn average); whole body concentrations divided by a factor of 5.0 to convert to fillet basis. Results for CT impoundments are highly uncertain as they were estimated from the CT 1-D Analysis.  
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