

PCB Allocation Scenarios for the Jackson River, Maury River, and Upper and Lower James River Watersheds

TMDL Endpoints

TMDL endpoints were calculated for three scenarios, based on different averages of selected fish species bioaccumulation factor (BAF) values (Table 1). The Scenario 1 mean uses species of commercial/recreational interest with sample size ≥ 8 . The Scenario 2 mean uses consumption advisory species regardless of sample size. The Scenario 3 mean uses consumption advisory species with sample size ≥ 8 . The TMDL endpoint defaults to the Virginia Department of Environmental Quality (DEQ) PCB water quality criterion (WQC) when the BAF value is greater than the WQC. The current PCB WQC is 640 pg/L. A proposed PCB WQC of 580 pg/L is under State review.

Table 1. TMDL Endpoints for each impaired segment based on average of selected fish species BAF values.

Impaired Segment	TMDL Endpoint (pg/L)		
	Scenario 1	Scenario 2	Scenario 3
Jackson River	640/580*		
Maury River	320	300	400
Upper James River (downstream endpoint at confluence with Bent Creek)	640/580*	91	120
Lower James River (downstream endpoint at I-95 bridge in Richmond)	140	61	52

* TMDL endpoint equal to WQC

Allocation Scenarios

PCB allocations were developed for the Jackson River, Maury River, Upper James River (downstream endpoint at confluence with Bent Creek) and Lower James River (downstream endpoint at I-95 bridge in Richmond) for each Scenario. Tables 2 – 7 show the allocation reductions needed for each scenario using the current and proposed water quality standards (WQS). Reductions needed to meet the current WQS require 0% exceedance of the current WQC (640 pg/L) and $\leq 10\%$ exceedance of the TMDL endpoint. Reductions needed to meet the proposed WQS are determined using DEQ's PCB TMDL decision process (DEQ, 2022).

Reference

DEQ. 2022. Applying Longterm Ave for PCB TMDLs 20220621.

Table 2. PCB allocation reductions required to meet the Scenario 1 TMDL endpoint for the current WQS. The current WQS requires 0% exceedance of the WQC (640 pg/L) and $\leq 10\%$ exceedance of the TMDL endpoint.

Impaired Segment	TMDL Endpoint (pg/L)	Required PCB Loading Reductions to Meet TMDL Endpoint, %						
		Upstream Sources	Permitted Sources ¹	CSOs	Surface Sources		Streambed Sediments	Spills
					MS4 Permitted Areas	Non-Regulated Areas		
Jackson River	640	-	51	-	-	86	0	100
Maury River	320	-	99.4	-	-	94	0	100
Upper James River	640	85	95	68	85	84	0	100
Lower James River	140	85	95	92	94	94	0	100

¹Only includes permitted point source dischargers.

Table 3. PCB allocation reductions required to meet the Scenario 1 TMDL endpoint for the proposed WQS using a WQC of 580 pg/L and DEQ's PCB TMDL decision procedure (DEQ, 2022).

Impaired Segment	TMDL Endpoint (pg/L)	Required PCB Loading Reductions to Meet TMDL Endpoint, %						
		Upstream Sources	Permitted Sources ¹	CSOs	Surface Sources		Streambed Sediments	Spills
					MS4 Permitted Areas	Non-Regulated Areas		
Jackson River	580	-	56	-	-	19	0	100
Maury River	320	-	99.4	-	-	0	0	100
Upper James River	580	12	95	68	10	10	0	100
Lower James River	140	12	95	92	0	0	0	100

¹Only includes permitted point source dischargers.

Table 4. PCB allocation reductions required to meet the Scenario 2 TMDL endpoint for the current WQS. The current WQS requires 0% exceedance of the WQC (640 pg/L) and $\leq 10\%$ exceedance of the TMDL endpoint.

Impaired Segment	TMDL Endpoint (pg/L)	Required PCB Loading Reductions to Meet TMDL Endpoint, %						
		Upstream Sources	Permitted Sources ¹	CSOs	Surface Sources		Streambed Sediments	Spills
					MS4 Permitted Areas	Non-Regulated Areas		
Jackson River	640	-	51	-	-	86	0	100
Maury River	300	-	99.5	-	-	94	0	100
Upper James River	91	85	99	68	95	95	0	100
Lower James River	61	95	98	92	96	96	0	100

¹Only includes permitted point source dischargers.

Table 5. PCB allocation reductions required to meet the Scenario 2 TMDL endpoint for the proposed WQS using a WQC of 580 pg/L and DEQ's PCB TMDL decision procedure (DEQ, 2022).

Impaired Segment	TMDL Endpoint (pg/L)	Required PCB Loading Reductions to Meet TMDL Endpoint, %						
		Upstream Sources	Permitted Sources ¹	CSOs	Surface Sources		Streambed Sediments	Spills
					MS4 Permitted Areas	Non-Regulated Areas		
Jackson River	580	-	56	-	-	19	0	100
Maury River	300	-	99.5	-	-	0	0	100
Upper James River	91	12	99	68	45	45	0	100
Lower James River	61	46	98	92	0	0	0	100

¹Only includes permitted point source dischargers.

Table 6. PCB allocation reductions required to meet the Scenario 3 TMDL endpoint for the current WQS. The current WQS requires 0% exceedance of the WQC (640 pg/L) and ≤ 10% exceedance of the TMDL endpoint.

Impaired Segment	TMDL Endpoint (pg/L)	Required PCB Loading Reductions to Meet TMDL Endpoint, %						
		Upstream Sources	Permitted Sources ¹	CSOs	Surface Sources		Streambed Sediments	Spills
					MS4 Permitted Areas	Non-Regulated Areas		
Jackson River	640	-	51	-	-	86	0	100
Maury River	400	-	99.3	-	-	94	0	100
Upper James River	120	85	99	68	90	90	0	100
Lower James River	52	90	98	92	98	98	0	100

¹Only includes permitted point source dischargers.

Table 7. PCB allocation reductions required to meet the Scenario 3 TMDL endpoint for the proposed WQS using a WQC of 580 pg/L and DEQ's PCB TMDL decision procedure (DEQ, 2022).

Impaired Segment	TMDL Endpoint (pg/L)	Required PCB Loading Reductions to Meet TMDL Endpoint, %						
		Upstream Sources	Permitted Sources ¹	CSOs	Surface Sources		Streambed Sediments	Spills
					MS4 Permitted Areas	Non-Regulated Areas		
Jackson River	580	-	56	-	-	19	0	100
Maury River	400	-	99.3	-	-	0	0	100
Upper James River	120	12	99	68	25	25	0	100
Lower James River	52	27	98	92	35	35	0	100

¹Only includes permitted point source dischargers.