

TMDL revision, June 2025

Willow River, Swan River, and Tamarack River *E. coli* TMDLs in Mississippi River–Grand Rapids Watershed TMDL (2019)

A review of the Mississippi River–Grand Rapids Watershed Total Maximum Daily Load (TMDL) Report¹ from September of 2019 discovered errors in three *Escherichia coli* (*E. coli*) TMDLs—Willow River (07010103-751), Swan River (07010103-753), and Tamarack River (07010103-758). The *E. coli* wasteload allocations (WLAs) were miscalculated for the Marble Wastewater Treatment Plant (WWTP), Remer WWTP, and Cromwell WWTP. The errors include transcription errors and the use of incorrect flows for WLA calculation. This TMDL revision corrects the WLAs for these WWTPs, in addition to updating WLAs for the Nashwauk WWTP and Keewatin WWTP (Table 1).

The approaches to calculating wastewater WLAs and load allocations (LAs) in the TMDL report (Section 4.2.3.5 and 4.2.2, respectively) were used to recalculate the TMDL tables presented here. Existing fecal coliform permit limits are consistent with *E. coli* WLA assumptions. The following TMDL table components did not change: loading capacity, WLAs for permitted stormwater, and margin of safety. The TMDL revisions do not change the implementation strategy in Section 8 of the approved TMDL.

The following information enhances the reasonable assurance in Section 6 of the approved TMDL: These three streams are prioritized for implementation efforts in the *Upper Mississippi Grand Rapids Watershed Comprehensive Watershed Management Plan: 2025–2035*². The goal of the “Streams & Rivers” section of the plan is to “improve and protect the riparian corridors of the streams. Improvement projects can include vegetative buffers, cedar revetments, tree planting, cattle fencing, gully stabilization, and projects to reconnect streams to the floodplain and allow for fish passage.” Now that the plan is approved, funding is available for these implementation efforts, which will help reduce pathogens to these streams.

A 319 implementation grant is also underway to target *E. coli* reductions in the Tamarack River Watershed: Tamarack River, Horseshoe, Island, and Minnewawa Lakes Restoration and Protection Phase 1 319. State funding from BWSR resulted in three raingardens and bioswales to capture and treat runoff from a local park and impervious parking lot before entering the Tamarack River.

An opportunity for public comment on the draft TMDL revision was provided via a public notice in the State Register from January 27, 2025 through February 26, 2025. There were no comment letters received as a result of the public comment period.

¹ MPCA 2019. Mississippi River–Grand Rapids Watershed Total Maximum Daily Load. Developed by Emmons & Olivier Resources, Inc. for the MPCA. Document #wq-iw8-58e. <https://www.pca.state.mn.us/sites/default/files/wq-iw8-58e.pdf>

² Houston Engineering. No date. Upper Mississippi Grand Rapids Watershed Comprehensive Watershed Management Plan: 2025–2035. https://drive.google.com/file/d/1WX3xJndqazmastZGFFv_Xp1CICQ18h32/view

Table 1. Revised *E. coli* WLAs for WWTPs

Permit name and number	Impaired water body (WID: 07010103-###)	Reason for WLA revision	WLA in 2019 TMDL (billion org/day)	Revised WLA (billion org/day)
Cromwell WWTP (MN0051101)	Tamarack R (758)	Miscalculated WLA	2.8 (Table 3-18, Table 4-13, 4-18)	3.0
Keewatin WWTP (MN0022012)	Swan R (753)	Permit in process of termination, facility no longer in operation, city connected to Nashwauk WWTP	0.9 (Table 3-18, Table 4-13) 1.5 (Table 4-17)	0
Marble WWTP (MN0020214)	Swan R (753)	Transcription error in TMDL table	1.5 (Table 3-18, Table 4-13) 0.5 (Table 4-17)	1.5
Nashwauk WWTP (MNG580184)	Swan R (753)	Permit expansion ^a , connected City of Keewatin. Converted from controlled to continuous discharge resulting in decrease of daily flow	14.8 (Table 3-18, Table 4-13 and 4-17)	3.3
Remer WWTP (MNG585210)	Willow R (751)	Miscalculated WLA. Permit number changed from MNG580210 to MNG585210	2.1 (Table 3-18, Table 4-13) 1.7 (Table 4-16)	6.1

- a. The permit authorizing the expansion was issued 6/3/2020, and final limits became effective in April 2024. Note that the December 2019 Nashwauk WWTP Statement of Basis incorrectly states that the WLA will be 5.261 b-org/day. The substantial reduction in the Nashwauk WWTP WLA is due to the conversion of the facility from controlled (i.e., pond system) to continuous discharge; the continuous discharge spreads the load over the entire year instead of being restricted to a limited discharge window. The daily flow used to calculate the WLA was reduced from 3.1 mgd to 0.695 mgd.

The following tables in the TMDL report are updated in this memo:

- Table 3-18. WWTF design flows and permitted bacteria loads
- Table 4-13. WWTP design flows and permitted bacteria loads
- Table 4-16. Willow River (07010103-751) *E. coli* TMDL and allocations
- Table 4-17. Swan River (07010103-753) *E. coli* TMDL and allocations
- Table 4-18. Tamarack River (07010103-758) *E. coli* TMDL and allocations

See below for the original and revised tables. Highlights in the original tables indicate text that was changed in the revised tables.

ORIGINAL Table 3-18. WWTF design flows and permitted bacteria loads

Stream Reach	Facility Name, Permit #	Facility Type	Design Flow Rate (mgd)	Permitted Bacteria Load	
				as Fecal Coliform: 200 org/ 100 ml [billion org/day]	as <i>E. coli</i> : 126 org. / 100 ml ¹ [billion org/day]
-753	Coleraine-Bovey-Taconite Joint WWTP MN0053341	Continuous Discharge	0.499	4.3	2.4
	Keewatin WWTP MN0022012		0.180	1.4	0.9
	Marble WWTP MN0020214		0.324	2.5	1.5
	Nashwauk WWTP MNG580184	Stabilization Pond ²	0.106	23.4	14.8
-751	Remer WWTP MNG580210	Stabilization Pond ²	0.353	3.3	2.1
-758	Cromwell WWTP MN0051101	Stabilization Pond ²	0.595	4.5	2.8

¹ WWTF permits are regulated for fecal coliform, not *E. coli*. The MPCA surface water quality standard for *E. coli* (126 org. / 100 ml) was used in place of the fecal coliform permitted limit of 200 org. / 100 ml, which was also the MPCA surface water quality standard prior to the March 2008 revisions to Minn. R. ch. 7050.

²The permit for stabilization ponds allows discharge only during the period March 1 - June 30 and September 1 - December 31.

UPDATED Table 3-18 is the same as UPDATED Table 4-13; see below.

ORIGINAL Table 4-13. WWTF design flows and permitted bacteria loads

Stream Reach	Facility Name, Permit #	Facility Type	Design Flow Rate (mgd)	Permitted Bacteria Load	
				as Fecal Coliform ¹ : 200 org/ 100 ml [billion org/day]	as <i>E. coli</i> : 126 org. / 100 ml ¹ [billion org/day]
-753	Coleraine-Bovey-Taconite Joint WWTP MN0053341	Continuous Discharge	0.499	4.3	2.4
	Keewatin WWTP MN0022012		0.180	1.4	0.9
	Marble WWTP MN0020214		0.324	2.5	1.5
	Nashwauk WWTP MNG580184	Stabilization Pond ²	0.353	23.4	14.8
-751	Remer WWTP MNG580210	Stabilization Pond ²	0.1063	3.3	2.1
-758	Cromwell WWTP MN0051101	Continuous Discharge	0.052	4.5	2.8

UPDATED Table 3-18 and 4-13. WWTF design flows and permitted bacteria loads

Stream Reach	Facility Name, Permit #	Facility Type	Design Flow Rate (mgd)	Permitted Bacteria Load	
				as Fecal Coliform ¹ : 200 org/ 100 ml [billion org/day]	as <i>E. coli</i> : 126 org. / 100 ml ¹ [billion org/day]
-753	Coleraine-Bovey-Taconite Joint WWTP MN0053341	Continuous Discharge	0.499	3.8	2.4
	Marble WWTP MN0020214	Continuous Discharge	0.324	2.5	1.5
	Nashwauk WWTP MN0053392	Continuous Discharge	0.695	5.3	3.3
-751	Remer WWTP MNG585210	Stabilization Pond ²	0.1063	9.7	6.1
-758	Cromwell WWTP MN0051101	Stabilization Pond ²	0.052	4.8	3.0

¹ WWTF permits are regulated for fecal coliform, not *E. coli*. The MPCA surface water quality standard for *E. coli* (126 org. / 100 ml) was used in place of the fecal coliform permitted limit of 200 org. / 100 ml, which was also the MPCA surface water quality standard prior to the March 2008 revisions to Minn. R. ch. 7050

²The permit for stabilization ponds allows discharge only during the period March 1 - Jun 30 and September 1 - December 31.

ORIGINAL Table 4-16. Willow River (07010103-751) *E. coli* TMDL and allocations

Willow River 007010103-751 Load Component		Flow Regime				
		Very High	High	Mid	Low	Very Low
		Billion organisms per day				
Existing Load ¹		245.0	101.5	23.7	8.4	NA
Wasteload Allocations	Remer WWTP (MNG580210)	1.7	1.7	1.7	1.7	1.7
	Total WLA	1.7	1.7	1.7	1.7	1.7
Load Allocations	Watershed Runoff	244.4	72.1	33.6	20.0	12.7
	Total LA	244.4	72.1	33.6	20.0	12.7
10% MOS		27.3	8.2	3.9	2.4	1.6
Total Loading Capacity ¹		273.4	82.0	39.2	24.1	16.0
Estimated Load Reduction		NA	19.5	NA	NA	NA
		NA	19%	NA	NA	NA

¹The TMDL for Willow River reach -751 was calculated using data from the HSPF model area weighted to WQ station S006-257. Existing loads were estimated using observed *E.coli* data from WQ station S006-257 (Appendix C).

UPDATED Table 4-16. Willow River (07010103-751) *E. coli* TMDL and allocations

Willow River 007010103-751 Load Component		Flow Regime				
		Very High	High	Mid	Low	Very Low
		Billion organisms per day				
Existing Load ¹		245.0	101.5	23.7	8.4	NA
Wasteload Allocations	Remer WWTP (MNG585210)	6.1	6.1	6.1	6.1	6.1
	Total WLA	6.1	6.1	6.1	6.1	6.1
Load Allocations	Watershed Runoff	240.0	67.7	29.2	15.6	8.3
	Total LA	240.0	67.7	29.2	15.6	8.3
10% MOS		27.3	8.2	3.9	2.4	1.6
Total Loading Capacity ¹		273.4	82.0	39.2	24.1	16.0
Estimated Load Reduction		NA	19.5	NA	NA	NA
		NA	19%	NA	NA	NA

¹The TMDL for Willow River reach -751 was calculated using data from the HSPF model area weighted to WQ station S006-257. Existing loads were estimated using observed *E.coli* data from WQ station S006-257 (Appendix C).

ORIGINAL Table 4-17. Swan River (07010103-753) *E. coli* TMDL and allocations

Swan River 07010103-753 Load Component		Flow Regime				
		Very High	High	Mid	Low	Very Low
		<i>E. coli</i> (billion organisms per day)				
Existing Load		NA	160.8	349.9	33.7	NA
Wasteload Allocations	Coleraine-Bovey WWTP (MN0053341)	2.4	2.4	2.4	2.4	2.4
	Keewatin WWTP (MN0022012)	1.5	1.5	1.5	1.5	1.5
	Marble WWTP (MN0020214)	0.5	0.5	0.5	0.5	0.5
	Nashwauk WWTP (MNG580184)	14.8	14.8	14.8	14.8	14.8
	Hibbing, MN MS4 (MS400270)	93.7	34.1	16.3	9.0	3.5
	Total WLA	112.9	53.3	35.5	28.2	22.7
Load Allocations	Watershed Runoff	658.4	239.9	114.3	62.8	24.1
	Total LA	658.4	239.9	114.3	62.8	24.1
10% MOS		85.7	32.6	16.6	10.1	5.2
Total Loading Capacity		857.0	325.8	166.4	101.1	52
Estimated Load Reduction		NA	NA	183.5	NA	NA
		NA	NA	52%	NA	NA

UPDATED Table 4-17. Swan River (07010103-753) *E. coli* TMDL and allocations

Swan River 07010103-753 Load Component		Flow Regime				
		Very High	High	Mid	Low	Very Low
		<i>E. coli</i> (billion organisms per day)				
Existing Load		NA	160.8	349.9	33.7	NA
Wasteload Allocations	Coleraine-Bovey WWTP (MN0053341)	2.4	2.4	2.4	2.4	2.4
	Marble WWTP (MN0020214)	1.5	1.5	1.5	1.5	1.5
	Nashwauk WWTP (MNG580184)	3.3	3.3	3.3	3.3	3.3
	Hibbing, MN MS4 (MS400270)	93.7	34.1	16.3	9.0	3.5
	Total WLA	100.9	41.3	23.5	16.2	10.7
Load Allocations	Watershed Runoff	670.4	251.9	126.3	74.8	36.1
	Total LA	670.4	251.9	126.3	74.8	36.1
10% MOS		85.7	32.6	16.6	10.1	5.2
Total Loading Capacity		857.0	325.8	166.4	101.1	52
Estimated Load Reduction		NA	NA	183.5	NA	NA
		NA	NA	52%	NA	NA

ORIGINAL Table 4-18. Tamarack River (07010103-758) *E. coli* TMDL and allocations

Tamarack River 07010103-758 Load Component		Flow Regime				
		Very High	High	Mid	Low	Very Low
		<i>E. coli</i> (billion organisms per day)				
Existing Load		189.1	122.3	NA	129.2	5.0
Wasteload Allocations	<i>Cromwell WWTP (MN0051101)</i>	2.8	2.8	2.8	2.8	2.8
	Total WLA	2.8	2.8	2.8	2.8	2.8
Load Allocations	<i>Watershed Runoff</i>	395.6	127.1	70.2	43.3	20.8
	Total LA	395.6	127.1	70.2	43.3	20.8
10% MOS		44.3	14.4	8.1	5.1	2.6
Total Loading Capacity		442.7	144.3	81.1	51.2	26.2
Estimated Load Reduction		NA	NA	NA	78	NA
		NA	NA	NA	60%	NA

UPDATED Table 4-18. Tamarack River (07010103-758) *E. coli* TMDL and allocations

Tamarack River 07010103-758 Load Component		Flow Regime				
		Very High	High	Mid	Low	Very Low
		<i>E. coli</i> (billion organisms per day)				
Existing Load		189.1	122.3	NA	129.2	5.0
Wasteload Allocations	<i>Cromwell WWTP (MN0051101)</i>	3.0	3.0	3.0	3.0	3.0
	Total WLA	3.0	3.0	3.0	3.0	3.0
Load Allocations	<i>Watershed Runoff</i>	395.4	126.9	70.0	43.1	20.6
	Total LA	395.4	126.9	70.0	43.1	20.6
10% MOS		44.3	14.4	8.1	5.1	2.6
Total Loading Capacity		442.7	144.3	81.1	51.2	26.2
Estimated Load Reduction		NA	NA	NA	78	NA
		NA	NA	NA	60%	NA