

Information Item:
Mississippi Basin Total Phosphorus
Permit Update

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Environment Committee: December 14, 2021



Mississippi Basin Total Phosphorus Permit

- Mississippi Basin Total Phosphorus Permit (MBTP) has been approved by EPA and MPCA for second term
 - NPDES Permit – National Pollution Discharge Elimination System
 - Innovative Permit – This permit limits five wastewater treatment plant (WWTP) combined total phosphorus (TP) loading in one permit rather than individually
 - Helps MCES implement difficult environmental solutions (71% TP reduction) strategically and cost effectively given an uncertain regulatory values and timeline



Total Phosphorus

Lake Pepin Total Maximum Daily Load (TMDL)

- The MPCA assessed Lake Pepin in **2002** and found nutrient levels too high to meet state water quality standards designed to ensure lakes and streams are fishable and swimmable. The assessment led to initiation of a TMDL study to define the maximum amount of phosphorus the lake can carry without violating water quality standards.
- Lake Pepin was listed as impaired for Aquatic Recreation in 2002 and 19 years later the TMDL was approved by EPA **May 2021**.



MPCA published site-specific eutrophication criteria for Lake Pepin to provide protection of aquatic recreational uses: 100 µg/L TP and 28 µg/L Chl-*a*.

Framework for TP Reductions (TMDL)

Wastewater 2nd Largest Source of TP

Large WWTPs required to have largest reductions – this table is post MBTP Permit

Mississippi River Basin Phosphorus Load Distribution

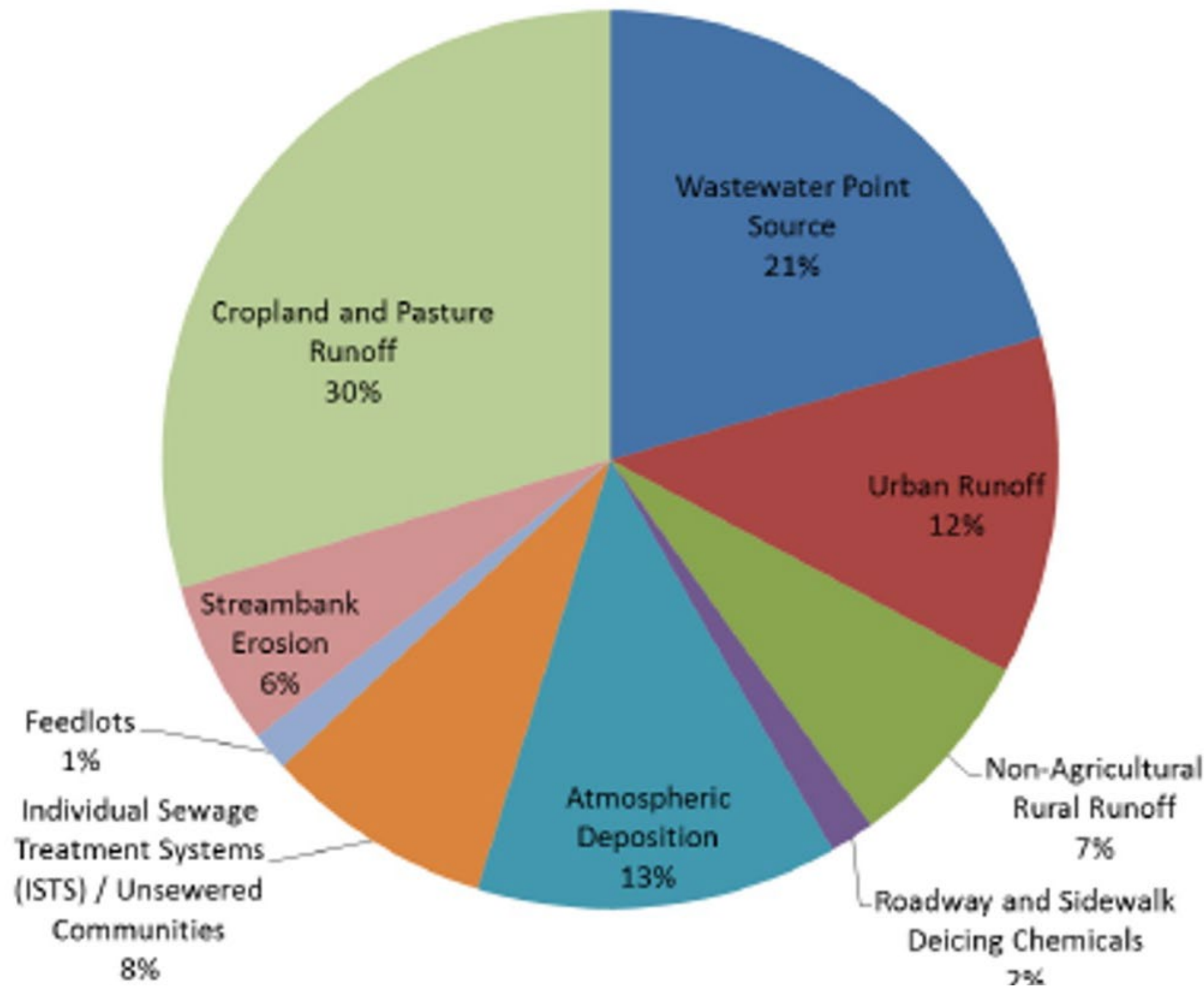


Table 19. Annual WLAs for municipal and industrial WWTPs in the Lake Pepin Watershed.

Facility Type and Flow (AWWDF or MDF ¹)	Annual WLA to meet Lake Pepin TMDL
Continuous > 20.0 mgd	AWWDF x 0.3 mg/L ²
Continuous 1.0 – 20.0 mgd	AWWDF x 0.8 mg/L ³
Continuous 0.2 – 1.0 mgd	AWWDF x 1.0 mg/L
Continuous <0.2 mgd	AWWDF x 3.50 mg/L or maintain current discharge
Stabilization ponds	AWWDF x 1.0 or 2.0 mg/L or maintain current discharge
WWTPs at conc. below RES	Maintain current discharge ⁴
Industrial Discharge with concentration > 1.0 mg/L and MDF > 1.0 mgd	MDF x 1.0 mg/L
Industrial Discharge with concentration > 1.0 mg/L and MDF < 1.0 mgd	MDF x 1.0 mg/L
Industrial Discharge with concentration < 1.0 mg/L	Current load x 1.15
Other Industrial	Limits specified on a site-specific basis

- 1) MDF = Maximum Design Flow --> common value used to evaluate industrial discharges
- 2) A facility specific concentration was established for the MCES Metro WWTP of 0.2779 mg/L
- 3) A facility specific concentration was established for the MCES Eagle's Point WWTP of 0.50 mg/L
- 4) Expansion of these WWTPs may be permitted assuming effluent concentration remains below RES

Table 20. Seasonal RES WLAs for municipal and industrial WWTPs in the Crow River Basin.

Summary of Mississippi Basin Total Phosphorus (MBTP) Permit

First Term of MBTP Permit, Effective 9/11/2015

- The TP limit established in this permit represents a 71% (393,000 kg/year) reduction of the previously permitted TP loading from the individual WWTPs included in this Permit.
- This was an innovative permit and was a result of an MCES/MPCA collaboration. MPCA successfully defended this permit in a lawsuit and was able to show a combined permit would be as effective as individual permits.
- No permit limit exceedances occurred during first term of MBTP permit.
- Permit allowed MCES to meet overall limits as a group before each plant could meet them separately.
 - A chemical TP removal system was installed at Hastings WWTP in 9/11/2018, and the last upgrade at Seneca improved TP removal. All 5 plants now meet TP limits individually also.

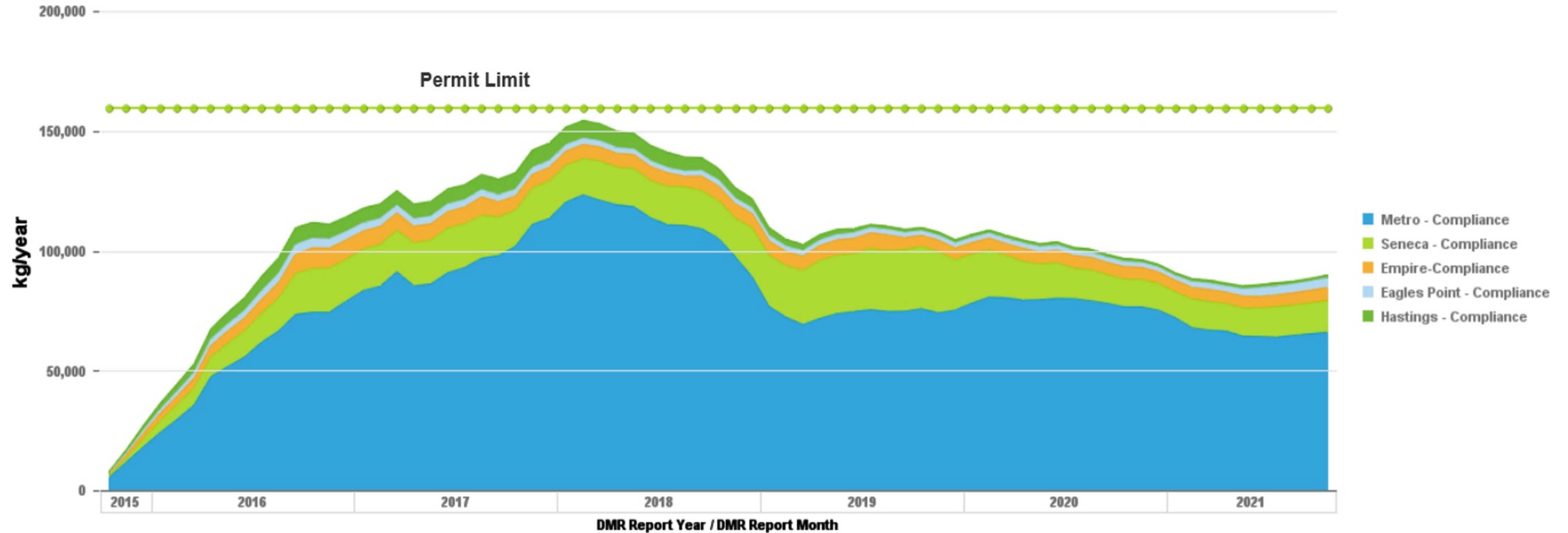
2nd Term of MBTP Permit

- We have an innovative model in place for successfully solving difficult environmental problem in collaboration with the MPCA.
- We have tested the model and EPA has allowed it to be a long-term vs temporary solution.
- We know the smaller plants are protected from permit violations if have an upset of Bio P process.
- We can be assured the new Hastings WWTP has certainty on allowable TP capacity.

How are we doing?

Plant Effluent Total Phosphorus Loading - 12 Month Rolling Sum

Umbrella Permit (MISS_BASIN) 12 Month Rolling Sum Compliance Trends



Umbrella Permit (MISS_BASIN) 12 Month Rolling Sum Historical Trends. (Total Sum and Hastings Not Reported on Permit)

Good for our waters

- MCES was able to plan for and execute phosphorus reductions before TMDL in place and before each WWTP could individually meet proposed requirements.
- MCES could prioritize the WWTPs with the most significant reductions opportunities in the Basin first.
- Given the success of this permit implementation, EPA has allowed the systems approach to remain in effect and provide future permit certainty.



Questions

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