COMMITTEE OF THE WHOLE
of the
NEENAH COMMON COUNCIL
Wednesday, January 21, 2026 at 5:00 PM
City Hall, 211 Walnut Street
Council Chambers

AGENDA

I. Call to Order

II. Roll Call.

III. Recommend Council forward a recommendation to the Neenah-Menasha Sewerage Commission to proceed with the proposed plant design presented at the January 21, 2026 Committee of the Whole meeting.

IV. Adjournment.

In accordance with the requirements of Title II of the Americans with Disabilities Act (ADA), the City of Neenah will not discriminate against qualified individuals with disabilities on the basis of disability in its services, programs, or activities. If you need assistance, or reasonable accommodation in participating in this meeting or event due to a disability as defined under the ADA, please call the Clerk's Office (920) 886-6100 or the **City's ADA Coordinator at (920) 886-6106 or e-mail clerk@neenahwi.gov** at least 48 hours prior to the scheduled meeting or event to request an accommodation.

Neenah
WISCONSIN
Water Utility

Neenah Water Utility
211 Walnut St. PO Box 426 Neenah, WI 54957-0426
Office: (920) 886-6182 Cell: (920) 858-6300
Email: amach@neenahwi.gov
Anthony L. Mach
Director of Neenah Water Utility

MEMORANDUM

DATE: January 16, 2026

TO: Waterworks Commission

FROM: Anthony L. Mach, President of Neenah-Menasha Sewerage Commission

RE: Recommendation to the Neenah-Menasha Sewerage Commission to Continue with Plant Upgrade Design Work for Phosphorus Removal Using Cloth-Disc Filters and Remove Optional UV Disinfection

Chad Olsen (McMahon), Paul Much (MCO), Corey Gordon (Menasha), and I met on January 15, 2026 with several DNR representatives to continue the discussion of purchasing water quality trading credits to offset the phosphorus discharge from the plant.

Despite the best efforts of all parties involved, there will not be enough credits available to offset the future wastewater plant phosphorous discharge. Compliance with the future limits will be impossible without a plant upgrade.

McMahon has suggested the Sewerage Commission explore integrating Ultraviolet (UV) Disinfection with the upgrade plans. While UV offers a more environmentally friendly approach to final effluent disinfection, the cost of installation is extremely high ($11.5M). UV is optional and the DNR has indicated there are no current or future plans to restrict the usage of Sodium Hypochlorite (Bleach) for disinfection.

The presentation details the reasoning behind why the EPA / DNR have instituted Total Maximum Daily Load (TMDL) limits on dischargers, future phosphorus discharge limits, approaches the Commission has explored to maintain compliance, final steps required, and estimated construction costs.

My recommendation is to proceed with plant upgrade design work, to include Cloth-Disc Filters for phosphorus removal, and to remove the UV Disinfection option from the design.

Staff are requesting a recommendation from the Neenah City Council to the Neenah-Menasha Sewerage Commission to continue with plant upgrade design work for Phosphorus removal using Cloth-Disc Filters and to remove the optional UV Disinfection system from the design.

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Anthony L. Mach
Director of Neenah Water Utility

MEMORANDUM

DATE: October 31, 2025

TO: Hon. Mayor Lang and Neenah Common Council

FROM: Anthony L. Mach

RE: Neenah-Menasha Sewerage Plant Update

As part of the discussions regarding the potential update of the Neenah-Menasha Sewer Plant, I wanted to take the time to share with you some of the history and current events which are shaping recent decision-making processes.

The plant is currently under a DNR and EPA mandate to reduce phosphorus discharge to a very low limit by April of 2027. These regulations apply to all dischargers, especially wastewater plants, in the US. The cost to remove phosphorus is expensive and generally consists of advanced chemical feed and filtration systems.

In discussing phosphorus treatment, it was suggested that the plant install optional ultraviolet (UV) disinfection in lieu of sodium hypochlorite (bleach) disinfection for the effluent. UV uses only light energy, rather than chemicals, to inactivate pathogens. This concept was seen as a possible way to cut overall operating costs, but there is no mandate to install UV treatment.

Staff from McMahon and MCO along with NMSC Commissioners have reviewed the recently submitted Facility Plan Amendment. This document provides two methodologies to address phosphorous: Filters or the purchase of Water Quality Trading Credits to offset the amount of phosphorus discharged. If filtration was required, Cloth Disk Filters were determined to be the most economical to own and operate.

The concept and discussion of Water Trading Credits is explained later in this memo.

The Opinion of Probable Costs from the Facility Plan Amendment are listed below:

- Cloth Disk Filters and UV treatment is $35M.
- Installation of a UV treatment system only is $11M.
- Installation of Cloth Disk Filters (only) is currently $24M (calculated).

According to calculations, Neenah would be responsible for approximately 54% of the total costs.

The charts with the Opinion of Probable Costs for these technologies are included as an attachment to this document.

Next, I want to define a few terms which are applicable to this memo:

Biological Oxygen Demand (BOD)

BOD refers to the total amount of oxygen that bacteria and other forms of microorganisms will consume while decomposing any organic matter that's present in the sewage. High BOD sewerage generally includes concentrated human waste, pulp materials, sugars, and dairy products. The plant has a BOD capacity of:

Average Daily = 24,573 lbs
Maximum Daily = 46,689 lbs
Maximum 7-Day = 36,860 lbs
Maximum 30-Day = 29,321 lbs

There have been a number of instances where this capacity has been exceeded, generally when local industries have spills or high-strength discharges.

Phosphorus Discharge

Phosphorus comes from both domestic and industrial sources within municipal wastewater, and non-point runoff from agricultural and urban areas. Domestic sources include human waste and detergents, while industrial sources are from processes like food processing and cleaning operations. Excessive phosphorus can be detrimental to surface water as it compromises water quality and can promote algal blooms.

Here is an excerpt from the NMSC Plant permit:

The discharge to the Menasha Channel of the Fox River which is within the Lower Fox River Basin TMDL area. The Lower Fox River Basin TMDL for total phosphorus and total suspended solids was approved by the USEPA in March 2012. If the department determines a WQBEL is necessary, limitations shall be consistent with a TMDL if a TMDL has been approved by the USEPA for the receiving waterbody consistent with s. NR 205.067(3)(a), Wis. Adm. Code. The department has determined that total phosphorus WQBELs are necessary. Therefore, the department must also calculate TMDL derived total phosphorus limits to be consistent with the Lower Fox River Basin TMDL. The approved total phosphorus WLA for the permittee is 6,275 lbs/year which results in calculated total phosphorus mass limits of 58 lbs/day as a monthly average and 19 lbs/day as a six-month average.

Based on the effluent total phosphorus data submitted on eDMRs from July 2017 to July 2024, the department has reasons to believe that permittee cannot currently meet the TMDL derived total phosphorus mass limits, so a compliance schedule is included.

Since the total phosphorus WLA is expressed as an annual load (lbs/yr), the permittee must also calculate and report the rolling 12-month sums of total monthly loads for total phosphorus. Rolling 12-month sums can be compared directly to the annual wasteload allocation.

The Neenah-Menasha Sewerage Commission had the foresight in 2019 to start the planning process of expanding the plant due to projected future capacity issues. At that time, they purchased two lots abutting Mathewson Street in Menasha in order to increase their total land holdings. The goal was to expand the current footprint into areas around the plant which would lessen the chance of encroaching on Shepard Park. The City of Menasha was not receptive to reconfiguring Shepard Park and asked for significant considerations if this was the only option.

Also in 2019, the City of Menasha took possession of 205 Mathewson Street and was willing to sell it to the Commission if the Commission would pay the city a PILOT. Note: PILOT payments for sewerage plants are highly unusual. The Commission rejected this offer and no further properties were acquired.

In 2021, staff from the Cities of Neenah and Menasha along with staff from McMahon, MCO, and our Sewerage Commissioners met in order to discuss the need for a plant upgrade to address future phosphorus removal needs. At that time, the group also discussed expanding the capacity of the plant to handle the significant increase in Biological Oxygen Demand (BOD) discharge from Sonoco / U.S. Paper Mills and occasional high BOD loadings from the other large industrial users. In addition, the group discussed the installation of ultraviolet (UV) treatment as an alternative to sodium hypochlorite (bleach) disinfection. In February of 2021, the Commission approved the Agreement for Professional Services from McMahon for the Tertiary Treatment for Phosphorus Removal & UV Disinfection Design Services.

The difficulty in making the decision whether to expand the plant cannot be understated. In essence, Sonoco was pushing the Commission to expand the plant due to their loadings, while the Commission understood the risk of all municipalities being exposed to the residual increases therein and potentially the full amount of debt if Sonoco decided to shut down. Sonoco would not post a bond for their portion of the plant upgrade, and the Commission would not accept exposure for the cost of the plant expansion. For approximately three years, Sonoco delayed the decision of whether to pretreat (decrease BODs) or otherwise continue discharging at current levels. They even threatened to shut down completely at times. Commissioners were stuck dealing with contract negotiations that were at times contentious.

Finally, in 2024 Sonoco made the decision at the corporate level to develop plans to pretreat their discharge. This allowed the Commission to finally plan for upgrading the plant for phosphorus removal without requiring expanded capacity. McMahon was requested to provide updated estimates for plant construction, and they did so in 2024 and 2025. In the interim period between 2021 and 2025, the estimates to upgrade the plant have increased significantly. This is due to inflationary increases in materials and labor along with tariffs.

In 2025, an alternative to expanding the plant was researched by MCO and McMahon staff. The State of Wisconsin supports a program where pollutant dischargers can purchase Water Quality Trading Credits. This is a market-based program which essentially incentivizes farmers or other entities to stop applying phosphorus-based fertilizers or install wetlands to reduce nutrient runoff. The credits represent a measurable reduction in pollutants like nitrogen or phosphorus. In short, this would allow the Commission to pay a certain amount for each credit (one pound of phosphorus = one credit). The plant would require the purchase of an estimated 8,900 credits each year.

The program seemed to possibly be a good alternative to upgrading the plant. This program has both pros and cons, however. The main pro is that the cost of credits could be less than the cost of making debt payments. The main cons are that this program only allows for credits to be purchased for 10 years and only limited amounts of credits are available. After 10 years, a new credit source is required or immediate state and federal violations would occur. In reality, the plant would need to start searching for credits after five or six years to allow for enough time to install an alternative phosphorus removal facility if an inadequate credit source was available. The risk is high with this methodology.

The newest credited development (Leach Farms) was explored to determine whether enough Trading Credits would be available. Also, this is an incredibly high number of credits to purchase compared to what is available. At the October 28, 2025 meeting, Chad Olsen from McMahon noted that the project was only going to be certified to provide approximately 75% of what we need for credits. Also, it was discovered that WisDOT was going to be bidding for these same credits. Since this is a competitive

process, the total cost of credits will most certainly increase. To find the addition 25%, quite a few smaller project credits (single-digit or small double-digits) would need to be purchased. It is unknown if these credits would even be available at the right time. Please see the Leach Farms attachment for more information on Leach Farms.

At the September 16, 2025 NMSC meeting, Bradley Viegut from Baird and Dawn Merlin from McMahon presented possible financing options and costs to the Commissioners and finance personnel from the municipalities. Our goal with the meeting was to determine the actual cost of borrowing (assuming the plant was fully upgraded with phosphorus removal and ultraviolet (UV) treatment). Two main funding methods were discussed: Revenue bonding and DNR Clean Water Funds. See the attached Baird borrowing sheet for more information.

Pros and cons for revenue bonding:

1. Doesn't affect each municipality's GO debt as this borrowing would be accomplished by the Neenah-Menasha Sewerage Commission (as an entity).
2. Debt repayments would be structured to "smooth-out" debt payments. There is an existing Clean Water loan outstanding with five more years of payments.
3. Cost of debt is substantially higher than alternative sources.
4. The interest rate stated in this presentation has dropped and a new presentation is needed.
5. Since this is privately placed debt, federal requirements (BABA, Davis-Bacon, etc.) would *not* apply.
6. Debt repayments are simple and easy to track as they are from one source (Commission).

Pros and cons for Clean Water Funding:

1. If issued as General Obligation (GO) debt, there would be a negative effect on Neenah's debt capacity as a percentage of legal limit.
2. Each municipality would need to borrow their respective share. This may be a burden for some municipalities.
3. Debt repayments would not be structured to "smooth-out" debt payments. Again, there is an existing Clean Water loan outstanding with five more years of payments.
4. Cost of debt is substantially lower than alternative sources.
5. There has been a very high utilization of this type of debt with a risk that funding would not be available.
6. Since this is government-funded debt, federal requirements (BABA, Davis-Bacon, etc.) *would* apply.
7. There is a possibility of principal forgiveness, but only for Menasha.

McMahon started developing a new Facility Plan Amendment to submit to the DNR earlier in 2025 and submitted this in October of this year. The Plan included phosphorus removal through filtration and UV disinfection. This Plan Amendment is a DNR requirement, and it was necessary to keep the process moving in the event both of these treatment processes are installed.

After the September 23, 2025 NMSC meeting, Gerry Kaiser, Vicky Rasmussen, Heath Kummerow, and I were given an extensive tour of the facility by MCO staff. We discussed the condition of all treatment units and walked the grounds where upgrades would be situated.

It is my belief that the municipalities which constitute the NMSC should be involved in the decision-making process, and I have engaged staff internally to keep them informed and collect input. However, I did state at the October 28, 2025 NMSC meeting that no decision has been made by the Commission as to whether the recommendation or decision to install treatment or pursue Trading Credits has been made. That being said, in light of the recent discoveries with the shortfalls of the Trading Program, it is my opinion that the Commission should pursue upgrading the plant and plan accordingly. This is also my recommendation to the Mayor, Common Council, and staff.

The total cost to upgrade the plant fully is projected to be $35M. If the plant was upgraded with both projects, the estimated cost allocation would be according to the CWF chart attached to this document.

I believe the best route is to upgrade the plant for phosphorus removal by using disc filters and removing UV treatment as an option. This will save an estimated $11M from the total project. I recommend that the existing sodium hypochlorite system be scrapped, and a new bulk storage system be installed to allow for tanker deliveries. Even if UV treatment were to be installed, the plant still needs sodium hypochlorite to combat filamentous bacteria growth within the plant.

More information will be provided as we receive it, including an updated borrowing presentation along with more information on how this project will be funded. There are a lot of moving parts here and the scenarios are complicated by the history of the plant, large industrial users, and the possibility that each municipality may want to borrow using different methods (if legal and feasible).

Table IX-1

CLOTH DISK FILTERS & UV DISINFECTION
OPINION OF PROBABLE COST
TERTIARY TREATMENT, UV DISINFECTION, & EFFLUENT FLOW MONITORING
FACILITY PLAN AMENDMENT
Neenah-Menasha Sewerage Commission | Winnebago County, Wisconsin

Site Work	
Miscellaneous Site Work	$50,000
New Parking	$75,000
48" Bypass Line	$1,230,000
Effluent Piping	$449,000
Effluent Flow Meter	$40,000
Storm Piping Modifications	$60,000
Subtotal	**$1,904,000**
Generator	
Base Slab	$33,000
Generator & Transfer Switch	$903,000
Install	$150,000
Subtotal	**$1,086,000**
Secondary Effluent Pump Station In Chlorine Contact Tank	
Granular Fill	$40,000
Temporary Structure/Heat	$150,000
Temporary Piping	$50,000
Temporary Pumping	$25,000
Concrete Foundation & Wet Well	$225,000
Pumps (4)	$700,000
Large Butterfly Valves (5)	$225,000
Pump Isolation Valves	$300,000
Mechanical Piping (Interior)	$250,000
Slide Gates	$35,000
Sampler	$10,000
Flow Meters (2)	$70,000
Mechanical Install	$402,000
Electrical & Controls	$450,000
Subtotal	**$2,932,000**
Cloth Media Filters	
CL2 Tank Internal Structure Demo	$175,000
CL2 Tank Mechanical Demo	$40,000
New Building (7,373 sq. ft.)	$5,600,000
Rapid/Coag/Floc Tank Concrete	$580,000
Filter Bay Concrete	$332,000
Other Concrete/Foundations	$357,000
Stairs	$60,000
Tank Coating	$325,000
Tank & Channel Grating	$100,000
Railing	$50,000
Gates	$234,000
Cloth Disk Media Filters	$2,175,000
Mixers	$110,000
Channel Mixers	$50,000
Polymer Feed Equipment	$200,000
Backwash Piping	$100,000
Alum Piping	$26,000
P & Turbidity Instrumentation	$50,000
Mechanical Install	$986,650
Electrical & Controls	$1,000,000
Subtotal	**$12,550,650**
UV Disinfection	
Excavation & Fill	$55,000
Concrete	$373,000
Channel Painting	$123,000
Aluminum Grating	$350,000
Railings	$17,000
Canopy	$400,000
UV Disinfection System	$3,690,000
Gates (4)	$180,000
Mechanical Install	$1,161,000
Electrical & Controls	$1,000,000
Subtotal	**$7,349,000**
Subtotal	**$25,821,650**
Engineering & Contingencies (30%)	$7,746,495
Contractor General Conditions (5%)	$1,291,083
Total Opinion of Probable Cost	**$34,859,228**

Table VII-5

UV DISINFECTION
OPINION OF PROBABLE CAPITAL COST
TERTIARY TREATMENT, UV DISINFECTION, & EFFLUENT FLOW MONITORING
FACILITY PLAN AMENDMENT
Neenah-Menasha Sewerage Commission | Winnebago County, Wisconsin

Site Work	
Miscellaneous Site Work	$25,000
New Parking	$75,000
Storm Piping Modifications	$35,000
Subtotal	**$135,000**

Generator	
Base Slab	$33,000
Generator & Transfer Switch	$903,000
Install	$150,000
Subtotal	**$1,086,000**

UV Disinfection	
Excavation & Fill	$55,000
Concrete	$373,000
Channel Painting	$123,000
Aluminum Grating	$350,000
Railings	$17,000
Canopy	$400,000
UV Disinfection System	$3,690,000
Gates (4)	$180,000
Mechanical Install	$1,161,000
Electrical & Controls	$1,000,000
Subtotal	**$7,349,000**

Subtotal	**$8,570,000**
Engineering & Contingencies (30%)	$2,571,000
Contractor General Conditions (5%)	$428,500
Total Opinion of Probable Cost	**$11,569,500**

UNIQUE CONSERVATION IMPROVEMENT PROJECT: LEACH FARMS

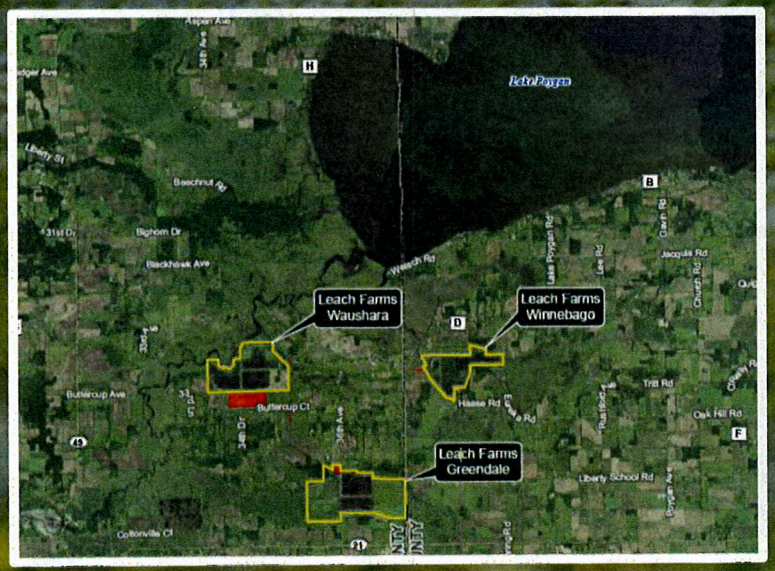
UPPER FOX WOLF WATERSHED, WISCONSIN

Introduction

The purpose of this summary is to provide a description of a multi-dimensional land use conversion project that will not only improve the quality of the water environment, but also could serve to provide a substantial stream of income resulting from such improvements. The project owner desires to solicit a buyer that is interested in complying with its conservation or corporate ESG mission to improve the environment while at the same time potentially realizing a substantial revenue stream from such improvements.

Project Location

This project is comprised of three individual farms located adjacent to the Willow and Pumpkinseed Creeks upstream from Lake Poygan in the Upper Wolf River watershed in Wisconsin. All three farms are located beneath the level of the adjacent creek and are converted wetlands surrounded by a dike. The fields are drained by an extensive subsurface drain tile system. In addition, the fields have been sloped to prevent the accumulation of excess rainwater. Tile discharges and runoff from the fields accumulates in ditches adjacent to the dikes. This accumulated runoff is discharged from a pumping system into the adjacent watershed allowing for accurate measurement of discharges.



Project History

The project area includes a former industrial-scale celery growing, processing and storage operation covering three farms totaling ~1,364 acres. At the time of operation, the project represented one of the largest celery growing operation in North America.

Although runoff from the project was not subject to regulation, the farm drainage discharges were tested on a voluntary basis in 2012. The discharges were found to be exceptionally high in phosphorus, total suspended solids and nitrogen. The high discharges are a result of the history of heavy fertilization required to produce high value celery crops.

Since the discharge testing, the project owner has sold the processing and storage facilities to a third party. However, the owner continues to own and farm the fields with the exception of 120 acres under lease annually to the buyer of the processing facilities. This lease expires in 2030.

Conversion Process and Credit Generation

The project owner engaged a qualified third party consultant, Strand Associates, to prepare a Water Quality Trading ("WQT") Plan that details the number of nutrient credits available in the event agricultural activities were discontinued and the fields converted to the prior existing natural environment. The Water Quality Trading Plan is finalized and approved by the Wisconsin Department of Natural Resources ("WDNR").

With the approved WQT plan, the fields can be converted back to a natural environment. The reductions in nutrients resulting from such conversion will be available in the form of nutrient credits to sell to permit holders in the watershed that are subject to limitations for these nutrients. These credits can be used by the purchaser as an alternative to installing very expensive control technology to mitigate their own nutrient discharges.

Wetland Conversion Project

One of the fields that is part of the project was originally a wooded wetland. The project owner retained Stantec, a global sustainable design and engineering firm, to design a plan to convert that farm into a wetland mitigation bank. The first phase of the proposed wetland mitigation bank has received final approval from the US Army Corps of Engineers ("USACE") and WDNR.

Developers that desire to fill wetlands to facilitate a proposed project must obtain a permit to authorize such filling. In the event the permit is issued, the developer must purchase credits from an authorized wetland mitigation bank as a condition to filling such wetlands.

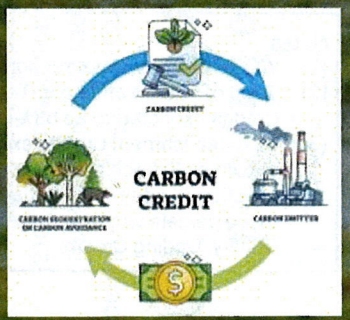
Mitigation banks are newly created wetlands that have been approved by the USACE and WDNR to accrue and sell credits to project developers located within the watershed who propose to fill wetlands for development. Leach Farms is currently the only source of its primary type of wetland mitigation credits (sedge meadow) in its watershed. The estimated value of the mitigation bank credits is nearly $100,000 each. Stantec estimates there are approximately 520 wetland credits available from this property.

Streambank Restoration Project

During the survey work for the wetland mitigation bank, the project owner discovered that the properties also include two possible sites for streambank restoration. Similar to the wetland program described above, any developer that obtains approval to disturb a streambank located in a watershed must obtain credits from a qualified restoration program as a condition of approval for such disturbance. In 2022 the project owner submitted a Prospectus and received Interagency Review Team approval for a streambank restoration project. Stantec estimates approximately 7,000 linear feet of streambank credits are available from sites at two of the farms.

Greenhouse Gas (GHG) Emission Offsets

At the request of the project owner, in 2022, Stantec prepared an estimate of the amount of carbon offsets that could be created once the conversion projects described in this summary are completed. Once the conversions are completed, the credits can be certified and sold to interested parties desiring to offset GHG emissions.



Neenah-Menasha Sewerage Commission

August 26, 2025

Bradley D. Viegut, Managing Director

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777 East Wisconsin Avenue
Milwaukee, WI 53202
Phone 414.765.3827

Neenah-Menasha Sewerage Commission

August 26, 2025

Summary of Scenarios

	Scenario 1	Scenario 2
Estimated Borrowing:	$37,960,000	$38,000,000
Project Fund Amount:	$35,000,000	$35,000,000
Borrowing Approach:	Issued in two phases - 2026 & 2027	Issued in single phase - 2026
Structure:	Matures May 1, 2029-2051	Matures May 1, 2029-2051
First Interest:	November 1, 2026	November 1, 2026
Callable:	May 1, 2035 & 2036	May 1, 2035
Estimated Interest Rate:	5.11%	5.14%

Neenah-Menasha Sewerage Commission

August 26, 2025

Preliminary Financing Plan – Scenario 1

LEVY YEAR	YEAR DUE	EXISTING DEBT SERVICE (Revenue & G.O.)	PROJECT FUND: $20,000,000 - PHASE I $21,740,000 SEWERAGE SYSTEM REVENUE BONDS Dated May 1, 2026 (First interest 11/1/26) PRINCIPAL (5/1)	INTEREST (5/1 & 11/1) TIC= 5.14%	TOTAL	PROJECT FUND: $15,000,000 - PHASE II $16,220,000 SEWERAGE SYSTEM REVENUE BONDS Dated May 1, 2027 (First interest 11/1/27) PRINCIPAL (5/1)	INTEREST (5/1 & 11/1) TIC= 5.08%	TOTAL	COMBINED DEBT SERVICE (Revenue & G.O.)	YEAR DUE
2025	2026	$1,443,337		$576,775	$576,775				$2,020,112	2026
2026	2027	$1,442,911		$1,153,550	$1,153,550		$429,931	$429,931	$3,026,393	2027
2027	2028	$1,442,475		$1,153,550	$1,153,550		$859,863	$859,863	$3,455,887	2028
2028	2029	$1,442,026	$25,000	$1,152,925	$1,177,925		$859,863	$859,863	$3,479,814	2029
2029	2030	$1,441,566	$25,000	$1,151,675	$1,176,675	$25,000	$859,238	$884,238	$3,502,478	2030
2030	2031	$1,441,094	$25,000	$1,150,425	$1,175,425	$25,000	$857,988	$882,988	$3,499,506	2031
2031	2032	$1,440,609	$25,000	$1,149,175	$1,174,175	$25,000	$856,738	$881,738	$3,496,521	2032
2032	2033		$680,000	$1,131,550	$1,811,550	$510,000	$843,363	$1,353,363	$3,164,913	2033
2033	2034		$715,000	$1,096,675	$1,811,675	$535,000	$817,238	$1,352,238	$3,163,913	2034
2034	2035		$750,000	$1,060,050	$1,810,050	$565,000	$789,738	$1,354,738	$3,164,788	2035
2035	2036		$790,000	$1,020,563	$1,810,563	$590,000	$760,863	$1,350,863	$3,161,425	2036
2036	2037		$835,000	$977,906	$1,812,906	$620,000	$729,838	$1,349,838	$3,162,744	2037
2037	2038		$880,000	$932,888	$1,812,888	$655,000	$696,369	$1,351,369	$3,164,256	2038
2038	2039		$925,000	$885,506	$1,810,506	$690,000	$661,063	$1,351,063	$3,161,569	2039
2039	2040		$975,000	$835,631	$1,810,631	$730,000	$623,788	$1,353,788	$3,164,419	2040
2040	2041		$1,030,000	$781,713	$1,811,713	$770,000	$584,413	$1,354,413	$3,166,125	2041
2041	2042		$1,090,000	$723,413	$1,813,413	$810,000	$541,925	$1,351,925	$3,165,338	2042
2042	2043		$1,150,000	$661,813	$1,811,813	$855,000	$496,138	$1,351,138	$3,162,950	2043
2043	2044		$1,215,000	$596,775	$1,811,775	$905,000	$447,738	$1,352,738	$3,164,513	2044
2044	2045		$1,285,000	$528,025	$1,813,025	$955,000	$396,588	$1,351,588	$3,164,613	2045
2045	2046		$1,355,000	$455,425	$1,810,425	$1,010,000	$342,550	$1,352,550	$3,162,975	2046
2046	2047		$1,430,000	$380,625	$1,810,625	$1,065,000	$285,488	$1,350,488	$3,161,113	2047
2047	2048		$1,505,000	$303,581	$1,808,581	$1,125,000	$226,669	$1,351,669	$3,160,250	2048
2048	2049		$1,590,000	$222,338	$1,812,338	$1,185,000	$166,031	$1,351,031	$3,163,369	2049
2049	2050		$1,675,000	$136,631	$1,811,631	$1,250,000	$102,113	$1,352,113	$3,163,744	2050
2050	2051		$1,765,000	$46,331	$1,811,331	$1,320,000	$34,650	$1,354,650	$3,165,981	2051
		$10,094,017	$21,740,000	$20,265,513	$42,005,513	$16,220,000	$14,270,175	$30,490,175	$82,589,705	

Note: This illustration represents a mathematical calculation of potential debt service, assuming hypothetical rates based on current market rates +0.25%. Estimates are for illustrative purposes only and are based on Baird's experience with comparable transactions. Actual interest cost will vary.

Neenah-Menasha Sewerage Commission

August 26, 2025

Preliminary Coverage Analysis – Scenario 1

LEVY YEAR	YEAR DUE	DEBT SERVICE COVERAGE *(Existing Revenue Only)*	DEBT SERVICE COVERAGE *(Existing G.O. Only)*	DEBT SERVICE COVERAGE *(New Issues - Revenue)*	COMBINED DEBT SERVICE COVERAGE *(Audit - 2023 Net Revenues)*	YEAR DUE
2025	2026	2.39	10.09	4.83	1.38	2026
2026	2027	2.39	10.08	1.76	0.92	2027
2027	2028	2.39	10.08	1.38	0.81	2028
2028	2029	2.39	10.08	1.37	0.80	2029
2029	2030	2.39	10.11	1.35	0.80	2030
2030	2031	2.39	10.10	1.35	0.80	2031
2031	2032	2.39	10.10	1.36	0.80	2032
2032	2033			0.88	0.88	2033
2033	2034			0.88	0.88	2034
2034	2035			0.88	0.88	2035
2035	2036			0.88	0.88	2036
2036	2037			0.88	0.88	2037
2037	2038			0.88	0.88	2038
2038	2039			0.88	0.88	2039
2039	2040			0.88	0.88	2040
2040	2041			0.88	0.88	2041
2041	2042			0.88	0.88	2042
2042	2043			0.88	0.88	2043
2043	2044			0.88	0.88	2044
2044	2045			0.88	0.88	2045
2045	2046			0.88	0.88	2046
2046	2047			0.88	0.88	2047
2047	2048			0.88	0.88	2048
2048	2049			0.88	0.88	2049
2049	2050			0.88	0.88	2050
2050	2051			0.88	0.88	2051

	Sewerage System
Gross Revenues:	$6,340,055
Less (Total Op. Exp. - Depreciation & Taxes):	($3,552,874)
2023 Net Revenues Available for Debt Service:	$2,787,181

(Assumes additional bonds test requires 1.10x max annual debt service)

Neenah-Menasha Sewerage Commission

August 26, 2025

Preliminary Financing Plan – Scenario 2

LEVY YEAR	YEAR DUE	EXISTING DEBT SERVICE (Revenue & G.O.)	PROJECT FUND: $35,000,000 $38,000,000 SEWERAGE SYSTEM REVENUE BONDS Dated May 1, 2026 (First interest 11/1/26) PRINCIPAL (5/1)	INTEREST (5/1 & 11/1) TIC= 5.14%	TOTAL	COMBINED DEBT SERVICE (Revenue & G.O.)	YEAR DUE
2025	2026	$1,443,337		$1,008,275	$1,008,275	$2,451,612	2026
2026	2027	$1,442,911		$2,016,550	$2,016,550	$3,459,461	2027
2027	2028	$1,442,475		$2,016,550	$2,016,550	$3,459,025	2028
2028	2029	$1,442,026	$25,000	$2,015,925	$2,040,925	$3,482,951	2029
2029	2030	$1,441,566	$25,000	$2,014,675	$2,039,675	$3,481,241	2030
2030	2031	$1,441,094	$25,000	$2,013,425	$2,038,425	$3,479,519	2031
2031	2032	$1,440,609	$25,000	$2,012,175	$2,037,175	$3,477,784	2032
2032	2033		$1,190,000	$1,981,800	$3,171,800	$3,171,800	2033
2033	2034		$1,250,000	$1,920,800	$3,170,800	$3,170,800	2034
2034	2035		$1,315,000	$1,856,675	$3,171,675	$3,171,675	2035
2035	2036		$1,385,000	$1,787,444	$3,172,444	$3,172,444	2036
2036	2037		$1,460,000	$1,712,763	$3,172,763	$3,172,763	2037
2037	2038		$1,540,000	$1,634,013	$3,174,013	$3,174,013	2038
2038	2039		$1,620,000	$1,551,063	$3,171,063	$3,171,063	2039
2039	2040		$1,710,000	$1,463,650	$3,173,650	$3,173,650	2040
2040	2041		$1,805,000	$1,369,125	$3,174,125	$3,174,125	2041
2041	2042		$1,905,000	$1,267,100	$3,172,100	$3,172,100	2042
2042	2043		$2,015,000	$1,159,300	$3,174,300	$3,174,300	2043
2043	2044		$2,125,000	$1,045,450	$3,170,450	$3,170,450	2044
2044	2045		$2,250,000	$925,138	$3,175,138	$3,175,138	2045
2045	2046		$2,375,000	$797,950	$3,172,950	$3,172,950	2046
2046	2047		$2,505,000	$666,881	$3,171,881	$3,171,881	2047
2047	2048		$2,640,000	$531,825	$3,171,825	$3,171,825	2048
2048	2049		$2,785,000	$389,419	$3,174,419	$3,174,419	2049
2049	2050		$2,935,000	$239,269	$3,174,269	$3,174,269	2050
2050	2051		$3,090,000	$81,113	$3,171,113	$3,171,113	2051
		$10,094,017	$38,000,000	$35,478,350	$73,478,350	$83,572,367	

Note: This illustration represents a mathematical calculation of potential debt service, assuming hypothetical rates based on current market rates +0.25%. Estimates are for illustrative purposes only and are based on Baird's experience with comparable transactions. Actual interest cost will vary.

Neenah-Menasha Sewerage Commission

August 26, 2025

Preliminary Coverage Analysis – Scenario 2

LEVY YEAR	YEAR DUE	DEBT SERVICE COVERAGE *(Existing Revenue Only)*	DEBT SERVICE COVERAGE *(Existing G.O. Only)*	DEBT SERVICE COVERAGE *(New Issue - Revenue)*	COMBINED DEBT SERVICE COVERAGE *(Audit - 2023 Net Revenues)*	YEAR DUE
2025	2026	2.39	10.09	2.76	1.14	2026
2026	2027	2.39	10.08	1.38	0.81	2027
2027	2028	2.39	10.08	1.38	0.81	2028
2028	2029	2.39	10.08	1.37	0.80	2029
2029	2030	2.39	10.11	1.37	0.80	2030
2030	2031	2.39	10.10	1.37	0.80	2031
2031	2032	2.39	10.10	1.37	0.80	2032
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2033	2034			0.88	0.88	2034
2034	2035			0.88	0.88	2035
2035	2036			0.88	0.88	2036
2036	2037			0.88	0.88	2037
2037	2038			0.88	0.88	2038
2038	2039			0.88	0.88	2039
2039	2040			0.88	0.88	2040
2040	2041			0.88	0.88	2041
2041	2042			0.88	0.88	2042
2042	2043			0.88	0.88	2043
2043	2044			0.88	0.88	2044
2044	2045			0.88	0.88	2045
2045	2046			0.88	0.88	2046
2046	2047			0.88	0.88	2047
2047	2048			0.88	0.88	2048
2048	2049			0.88	0.88	2049
2049	2050			0.88	0.88	2050
2050	2051			0.88	0.88	2051

	Sewerage System
Gross Revenues:	$6,340,055
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2023 Net Revenues Available for Debt Service:	$2,787,181

(Assumes additional bonds test requires 1.10x max annual debt service)

Neenah-Menasha Sewerage Commission

August 26, 2025

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NEENAH-MENASHA SEWERAGE COMMISSION GENERAL PF ESTIMATES

PRELIMINARY 9/11/2025

City of Neenah

Category	Points
Population	0
MHI	20
Family Poverty	20
Population Trend	0
County Unemployment Rate	0
LQI	0
TOTAL	40
General PF Percentage:	**0%**
Interest Rate, 20-year Loan, Tax-Exempt:	**2.585%**
Interest Rate, 20-year Loan, Taxable:	**3.077%**

City of Menasha

Category	Points
Population	0
MHI	40
Family Poverty	40
Population Trend	0
County Unemployment Rate	0
LQI	0
TOTAL	80
General PF Percentage:	**20%**
Interest Rate, 20-year Loan, Tax-Exempt:	**2.585%**
Interest Rate, 20-year Loan, Taxable:	**3.077%**

Village of Harrison

Category	Points
Population	0
MHI	0
Family Poverty	0
Population Trend	0
County Unemployment Rate	0
LQI	0
TOTAL	0
General PF Percentage:	**0%**
Interest Rate, 20-year Loan, Tax-Exempt:	**2.585%**
Interest Rate, 20-year Loan, Taxable:	**3.077%**

Fox Crossing Utilities (Based on Village Data)

Category	Points
Population	0
MHI	20
Family Poverty	20
Population Trend	0
County Unemployment Rate	0
LQI	0
TOTAL	40
General PF Percentage	**0%**
Interest Rate, 20-year Loan, Tax-Exempt:	**2.585%**
Interest Rate, 20-year Loan, Taxable:	**3.077%**

Town of Neenah Sanitary District No. 2 (Based on Town Data)

Category	Points
Population	30
MHI	0
Family Poverty	5
Population Trend	0
County Unemployment Rate	0
LQI	0
TOTAL	35
General PF Percentage	**0%**
Interest Rate, 20-year Loan, Tax-Exempt:	**2.585%**
Interest Rate, 20-year Loan, Taxable:	**3.077%**

GENERAL NOTES / ASSUMPTIONS

1. Parallel cost ratio not factored in for calculating interest rates. Assumed to be 100%.
2. Data dependent on fiscal year of loan
3. DOA can make an increase to market rates at any time. Market rates are assessed on a quarterly basis.
4. Maximum Principal Forgiveness per municipality is $2,100,000 (2025)

NMSC WWTF - Plant Influent Flows & Loadings
AverageFlows & Loadings (w/ Sonoco at Pretreatment Limits)

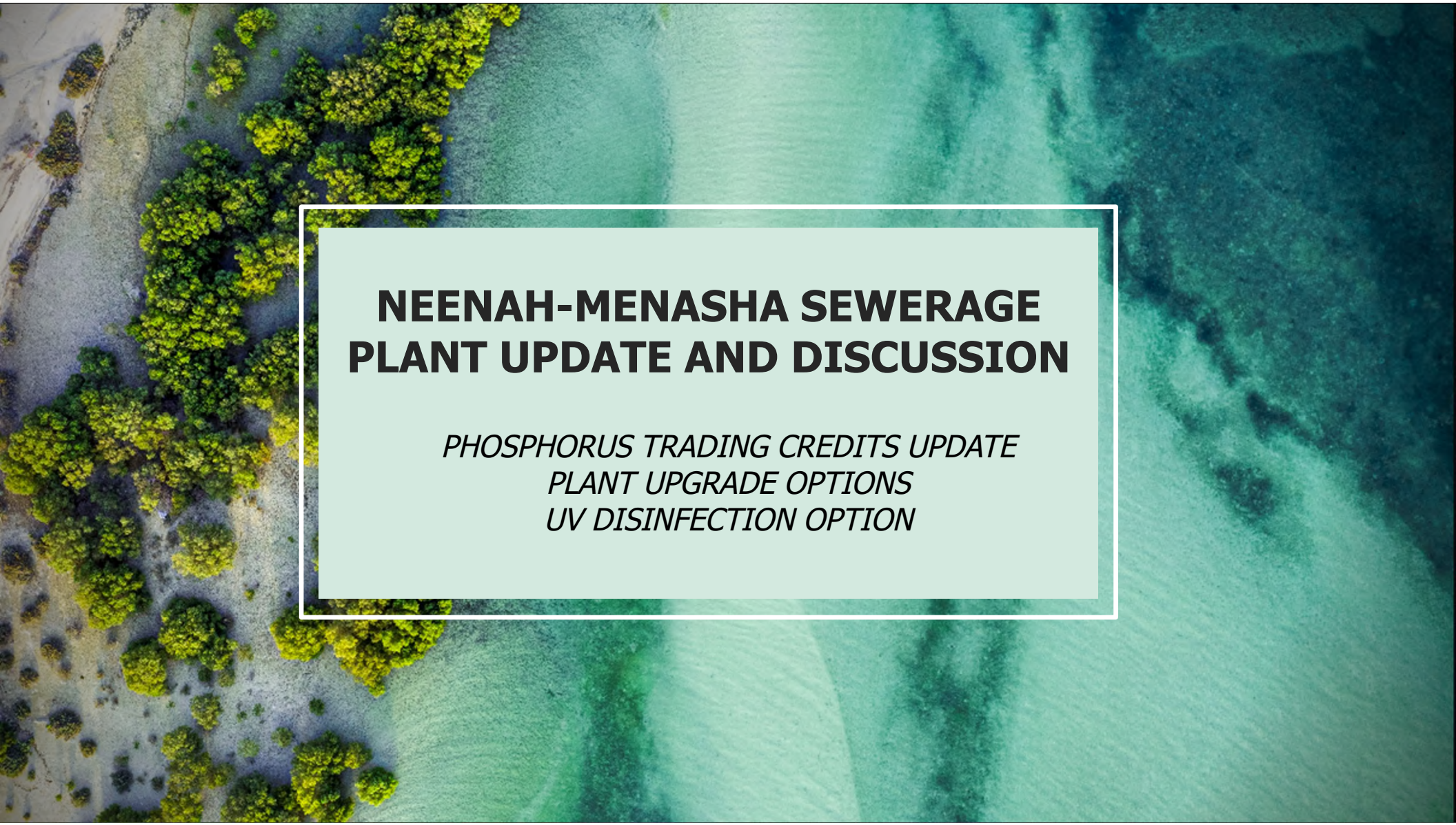
PRELIMINARY

Flow	$ 13,706,000
BOD	$ 2,366,000
TSS	$ 1,183,000
Total P	$ 17,745,000
Total	$ 35,000,000

	Flow			BOD			TSS			Total P			Total Allocation	
	MG/year	% of Total	Allocated	lbs./year	% of Total	Allocated	lbs./year	% of Total	Allocated	lbs./year	% of Total	Allocated	Value	%
City of Neenah	2,114	55%	$ 7,528,579	3,833,869	66%	$ 1,557,243	2,506,464	46%	$ 548,347	57,886	53%	$ 9,325,734	$18,959,903	54%
City of Menasha	933	24%	$ 3,321,332	790,390	14%	$ 321,041	1,514,672	28%	$ 331,369	23,155	21%	$ 3,730,424	$ 7,704,166	22%
Village of Fox Crossing	612	16%	$ 2,177,978	723,260	12%	$ 293,774	957,809	18%	$ 209,543	17,035	15%	$ 2,744,387	$ 5,425,682	16%
Village of Harrison	174	5%	$ 620,135	446,093	8%	$ 181,194	391,710	7%	$ 85,696	10,841	10%	$ 1,746,560	$ 2,633,585	8%
Town of Neenah	16	0.4%	$ 57,977	31,384	0.5%	$ 12,747	36,774	0.7%	$ 8,045	1,228	1.1%	$ 197,895	$ 276,665	1%
Plant Total	3,849	100%	##########	5,824,996	100%	$ 2,366,000	5,407,430	100%	$ 1,183,000	110,146	100%	$ 17,745,000	$35,000,000	100%

Notes:

1. Assumes Sonoco is meeting their Pretreatment Limits:
   a. Average BOD discharge of 5,000 lbs./day (a 51% reduction from current BOD loadings).
   b. Average TSS discharge of 1,300 lbs./day (a 45% reduction from current TSS loadings).
2. Flows and Loadings for remaining communities are based on 2023-2024 averages.



NEENAH-MENASHA SEWERAGE PLANT UPDATE AND DISCUSSION

PHOSPHORUS TRADING CREDITS UPDATE
PLANT UPGRADE OPTIONS
UV DISINFECTION OPTION

TOTAL MAXIMUM DAILY LOAD (TMDL)

WHAT IS THE TMDL AND WHY IS IT IMPORTANT?

- A Total Maximum Daily Load (TMDL) is the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards.
- A waterway that exceeds water quality standards is often no longer suitable for its designated uses, such as wildlife habitat, fishing, or other recreational activities.
- The TMDL for Phosphorus is the important topic here.

WHY DID THE EPA / DNR REQUIRE THE IMPLEMENTION OF A TMDL?

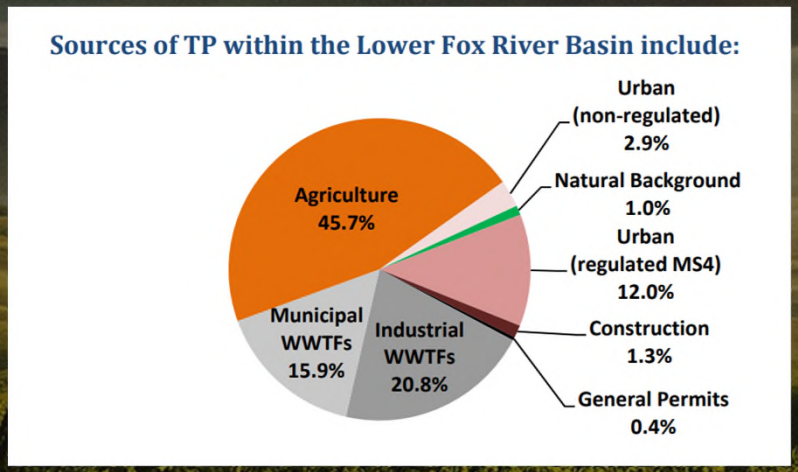
- Wisconsin is **required** by the Clean Water Act to develop TMDLs for all waters on our Impaired Waters List. The EPA oversees the federal TMDL program, while Wisconsin is currently granted authority to implement our own program.

- The ultimate goal of a TMDL is to improve water quality by reducing pollutants, such as phosphorus and sediment.

- To help achieve this, a TMDL answers the following questions:
  1. What is the current amount of pollution entering the waterway and how much is each source contributing?
  2. How much does pollution need to be reduced in order for each waterway to meet water quality standards?
  3. How will the needed pollutant load reductions be achieved for each waterway?

TOTAL MAXIMUM DAILY LOAD (TMDL)

TOTAL PHOSPHOROUS SOURCES IN THE LOWER FOX RIVER SYSTEM



The LFR Basin has 14 waters (including the Lower Fox River and Green Bay Area of Concern) on the federal "303(d)" or "Impaired Waters List" polluted by excessive phosphorus (TP) and total suspended solids (TSS) loadings.

HISTORICAL WASTEWATER PLANT PHOSPHORUS DISCHARGE

WASTEWATER TREATMENT FACILITY PERFORMANCE

Wastewater Treatment Facility flows, loads and performance from 2022 through 2024 are included in Tables IV-1, IV-2, and IV-3.

WWTF performance over that period, overall, has been excellent, with effluent biochemical oxygen demand (BOD) concentrations averaging less than 6 mg/L and total suspended solids (TSS) concentrations averaging less than 7 mg/L. Six-month average effluent Total P results, as compared to the future TMDL limit of 19 lbs./day, are shown below.

Time Period	Avg. Flow	Avg. Effluent Phosphorus		Achieve TMDL Mass Allocation?
	million gallons/day	pounds/day	mg/L	
May 22 - Oct 22	9.54	30	0.38	No
Nov 22- Apr 23	12.62	19	0.20	No
May 23 - Oct 23	8.41	25	0.39	No
Nov 23 - Apr 24	9.83	18	0.21	Yes
May 24 - Oct 24	12.24	31	0.33	No

Effluent P results show the Neenah-Menasha WWTF will not be able to consistently meet the future P limits with their current facilities.

UPCOMING TOTAL PHOSPHORUS LIMITS

Alternatives for complying with the upcoming Total P limits were evaluated based on the following design criteria.

- Annual Ave ..... 13 MGD
- Max Month ..... 20 MGD
- Max Day ..... 43 MGD
- Peak Hour ..... 65 MGD
- Max Secondary Effluent TSS ..... 30 mg/L
- Secondary Effluent Total P ..... 0.35 mg/L
- Tertiary Treatment Effluent Total P ..... 0.10 mg/L
- Final Effluent Total P Limit (six-month ave) ..... 19 lbs./day

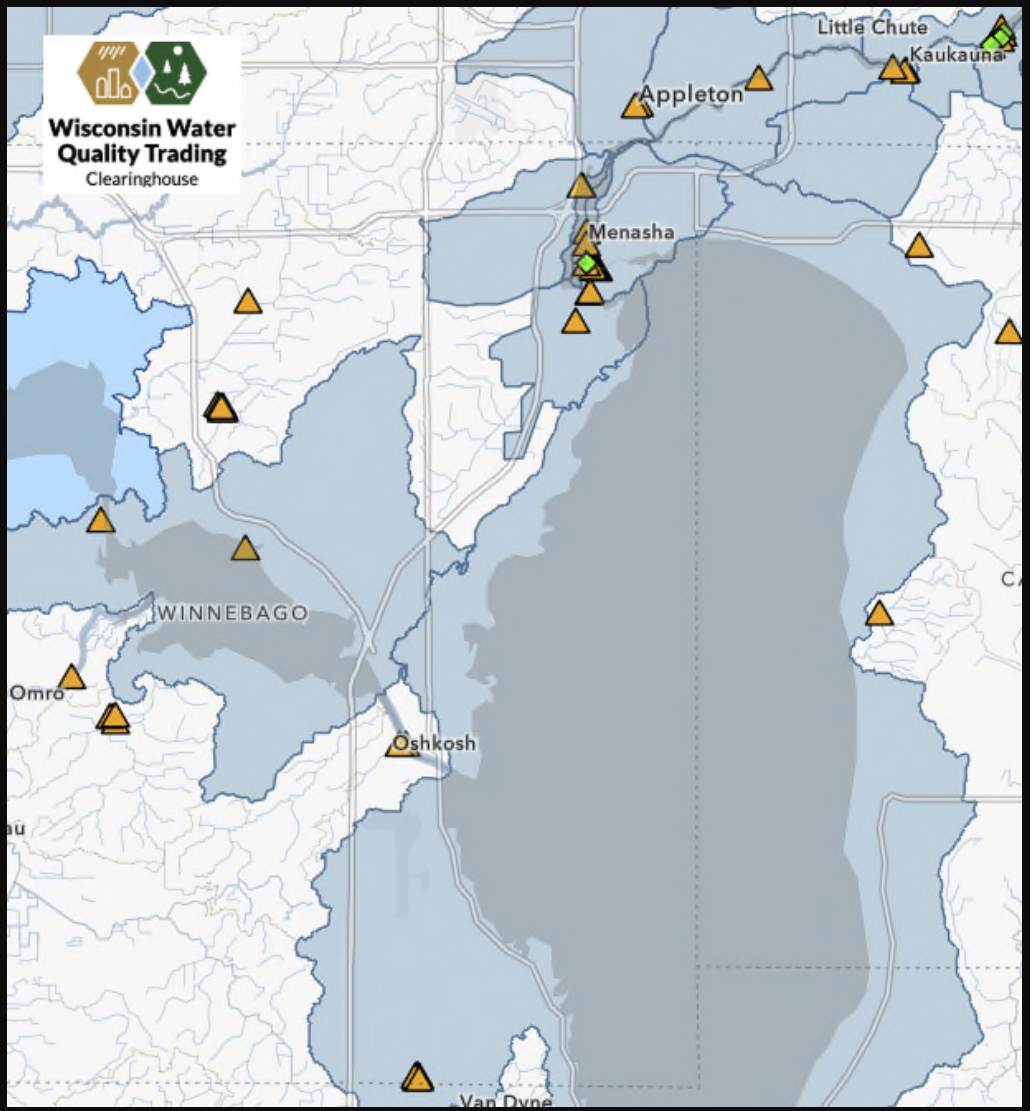
Step of the Adaptive Management Plan	Tasks in the Step	Supporting Administrative Code Reference
1. **Identify partners**	Identify potential partners and their role in adaptive management. Gather letters of support and create a memorandum of understanding (MOU) between partners, if desirable.	• s. NR 217.18(2)(d)3. Wis. Adm. Code
2. **Describe the watershed and set load reduction goals**	Describe the adaptive management action area including the counties in the watershed, available water quality data, number of reaches, hydraulic retention time and/or stream order data.	• s. NR 217.18(2)(d)2. Wis. Adm. Code
3. **Conduct a watershed inventory**	Gather current and historic land use data, and describe the physical features of the action area, typical agricultural practices in the watershed, and potential land uses in the future.	• s. NR 217.18(2)(d)1. Wis. Adm. Code
4. **Identify where reductions will occur**	Evaluate all data gathered in step 3 for decision-making purposes and identify critical areas within the action area to target management practices.	• s. NR 217.18(2)(d) Wis. Adm. Code
5. **Describe management measures**	Complete a facility plan to comply with interim limits, if necessary, and identify management measures that will be installed throughout adaptive management implementation to control nonpoint sources of excess phosphorus.	• s. NR 217.18(2)(d) Wis. Adm. Code
6. **Estimate load reductions expected by permit term**	Quantify the phosphorus reductions needed from point sources, and approximate the phosphorus reductions expected from nonpoint source management measures.	• s. NR 217.18(2)(d)2. Wis. Adm. Code
7. **Measuring success**	Develop a monitoring strategy that will identify who will collect data, who will analyze these data, when and where samples will be collected, and the quality assurance protocols that will be followed.	• s. NR 217.18(3)(a) Wis. Adm. Code
8. **Financial security**	Estimate the cost and outline the sources of funding to implement the adaptive management plan, either individually by the permittee or in conjunction with other permittees as partnering on the adaptive management effort.	• s. NR 217.18(2)(d)4. Wis. Adm. Code
9. **Implementation schedule with milestones**	Prioritize implementation measures and develop a schedule by setting compliance dates for adaptive management interim limits and water quality milestones.	• s. NR 217.18(3)(b) Wis. Adm. Code

COMPLIANCE WITH THE TOTAL PHOSPHORUS LIMITS

Adaptive management

Adaptive Management includes performing tasks in the watershed to reduce the Total P in the receiving stream to so that P criteria in the stream is met after the point of discharge.

This is the method the Commission was exploring in 2012. However, it was found that adaptive management in the watershed was too difficult and expensive to be feasible.

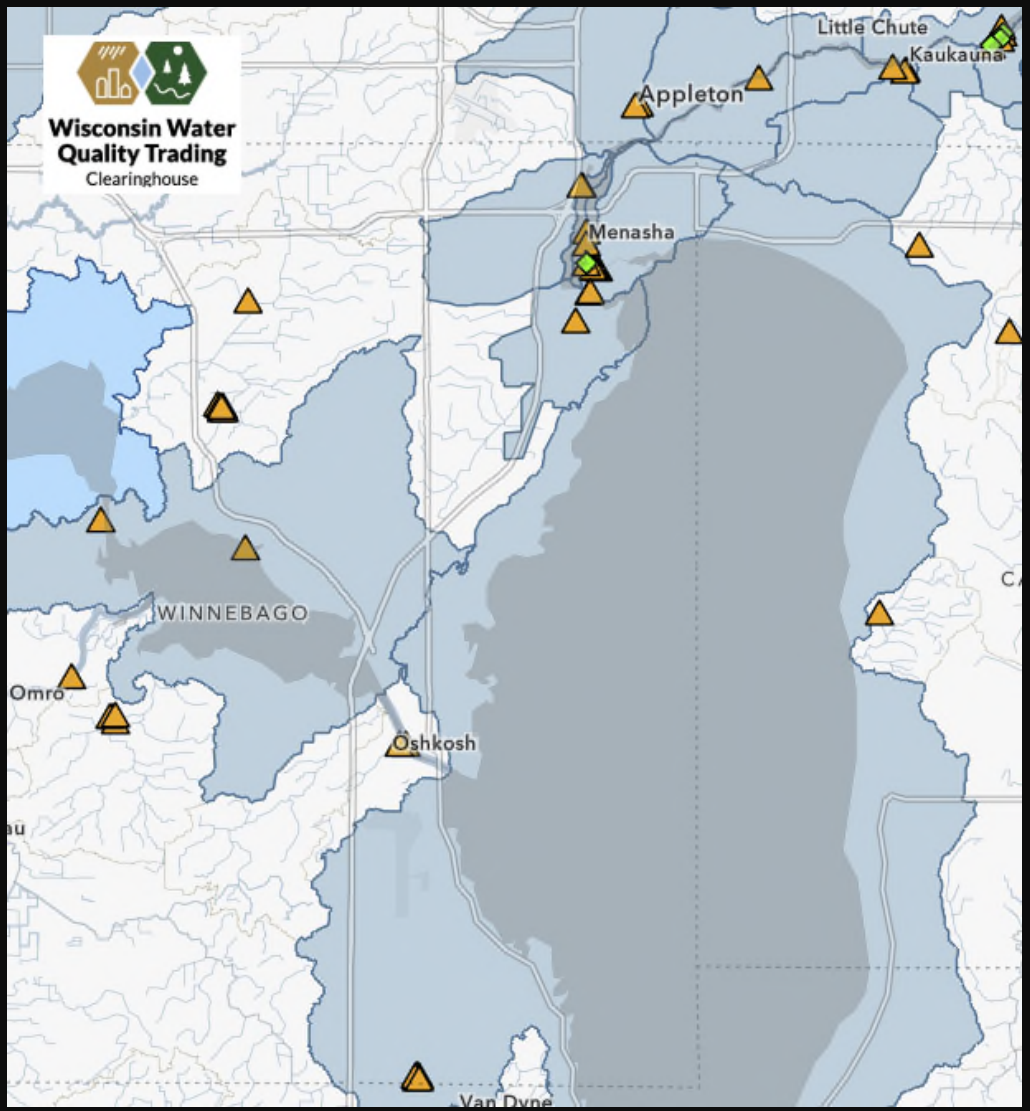


COMPLIANCE WITH THE TOTAL PHOSPHORUS LIMITS

Water Quality Trading

Water Quality Trading provides point source discharges (such as wastewater plants) with the flexibility to acquire pollutant reductions (credits) from other sources in the watershed (such as farmers) to offset their load so that they will comply with their permit requirements. Recent rule changes allowed for ten-year credit validity.

The Commission was made aware of the possibility of obtaining enough WQ Trading Credits in September 2025.



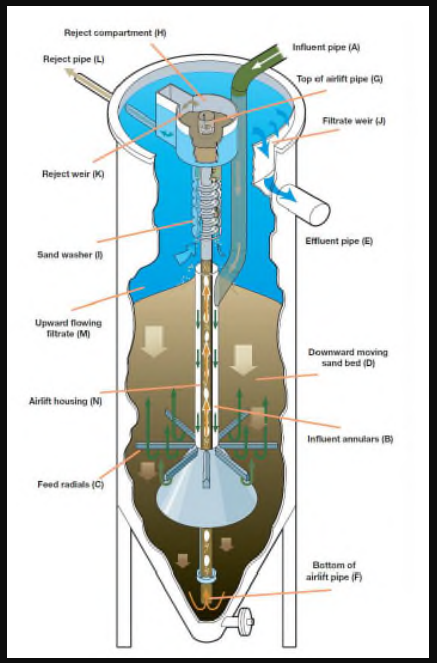
COMPLIANCE WITH THE TOTAL PHOSPHORUS LIMITS

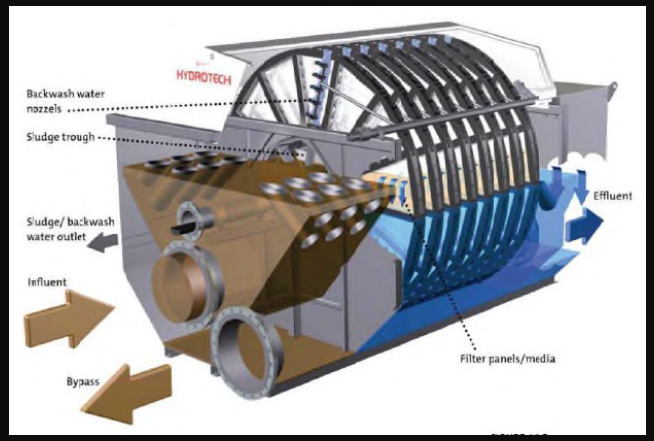
Water Quality Trading

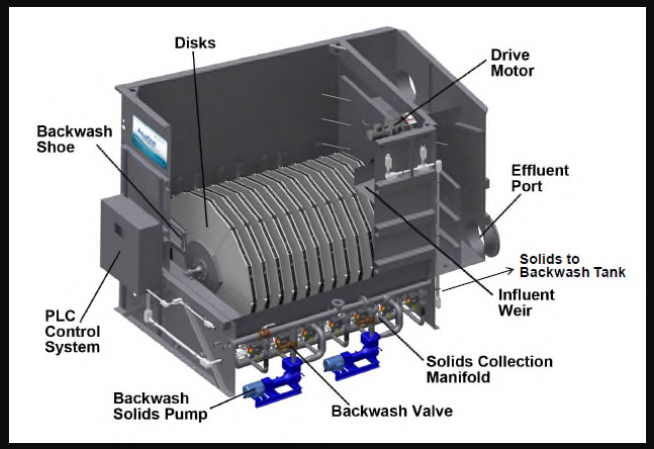
The project, proposed by Leach Farms, had the potential to offer enough credits to offset the wastewater plant's phosphorus discharge completely, thus negating the requirement to update the plant for a maximum of ten years.

Significant cost savings could have been realized, but we still would have needed to find more credits around year seven to ensure compliance.

The projected number of credits was not realized.







COMPLIANCE WITH THE TOTAL PHOSPHORUS LIMITS

Tertiary Filtration

Tertiary Filtration includes additional treatment within the treatment plant that chemically treats and filters out excess phosphorous.

This is the only method that has proven to be effective, ensuring compliance with the future phosphorous discharge limits.

The three methods explored were: Sand Filtration, Polyester Disc Filtration, and Cloth Disc Filtration.

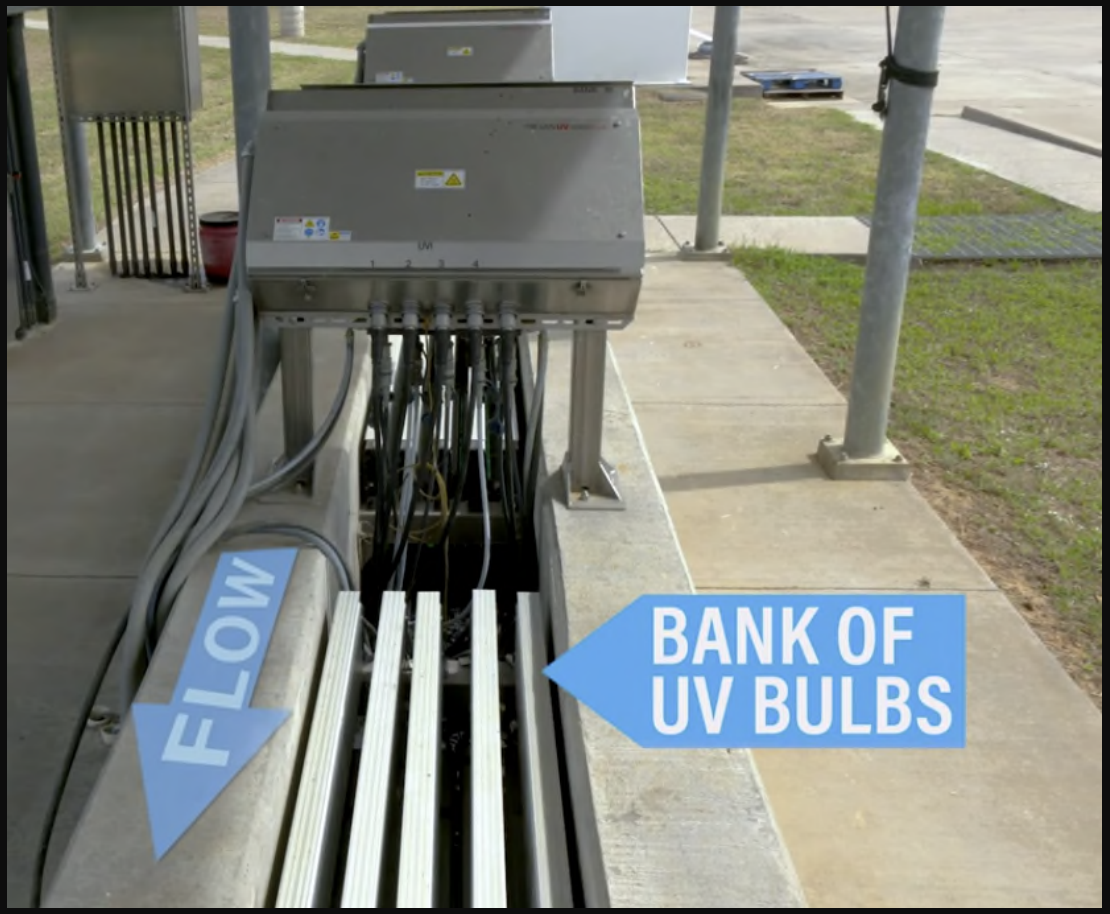
The permittee shall comply with the TMDL (Total Maximum Daily Load) derived effluent limitations for TP as specified.

Required Action	Due Date
Submit Facility Plan: The permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code for complying with the final TMDL derived effluent limitations for total phosphorus.	~~04/30/2025~~ 9/30/2025
Progress Report on Plans & Specifications: Submit progress report regarding the progress of preparing final plans and specifications. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	~~09/30/2025~~ 6/30/2026
Final Plans and Specifications: Unless the permit has been modified, revoked and reissued, or reissued to include Adaptive Management or Water Quality Trading measures or to include a revised schedule based on factors in s. NR 217.17, Wis. Adm. Code, the permittee shall submit final construction plans to the Department for approval pursuant to s. 281.41, Stats., specifying treatment plant upgrades that must be constructed to achieve compliance with final phosphorus WQBELs, and a schedule for completing construction of the upgrades by the complete construction date specified below. (Note: Permit modification, revocation and reissuance, and reissuance are subject to s. 283.53(2), Stats.) Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	~~03/31/2026~~ 12/31/2026
Treatment Plant Upgrade to Meet WQBELs: The permittee shall initiate construction of the upgrades. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41. Stats. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	~~09/30/2026~~ 6/30/2027
Construction Upgrade Progress Report #1: The permittee shall submit a progress report on construction upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	~~12/31/2026~~ 12/31/2027
Construction Upgrade Progress Report #2: The permittee shall submit a progress report on construction upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	12/31/2028
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	~~03/31/2027~~ 12/30/2029
Achieve Compliance: The permittee shall achieve compliance with final phosphorus WQBELs. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	~~04/01/2027~~ 12/31/2029

COMPLIANCE SCHEDULE

The Neenah-Menasha Sewerage Commission, MCO staff, McMahon staff, and DNR staff have worked hard to explore all possible alternatives.

In order to comply with the enhanced Compliance Schedule, the plant upgrade must proceed.



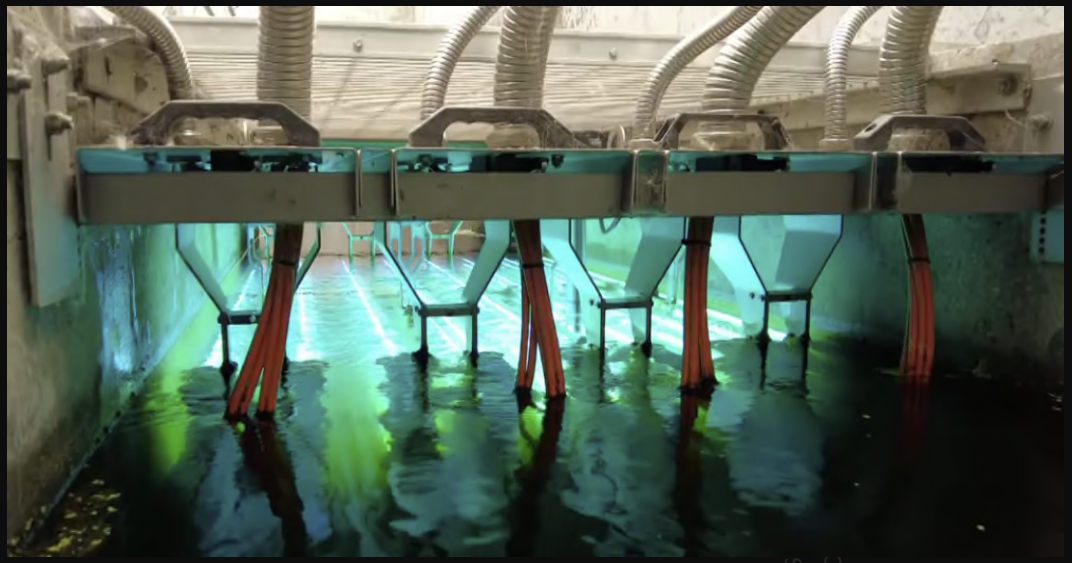
ULTRAVIOLET DISINFECTION

SODIUM HYPOCHLORITE (BLEACH) VS. ULTRAVIOLET (UV) EFFLUENT DISINFECTION

The plant currently uses Sodium Hypochlorite Disinfection.

Optionally, a UV Disinfection system can be added to the plant. This type of disinfection uses UV light to inactivate pathogens in the effluent.

This treatment is not required by the DNR or EPA.



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ULTRAVIOLET DISINFECTION

SODIUM HYPOCHLORITE (BLEACH) VS. ULTRAVIOLET (UV) EFFLUENT DISINFECTION

UV Disinfection is very environmentally friendly as no chemicals are used – only ultraviolet light.

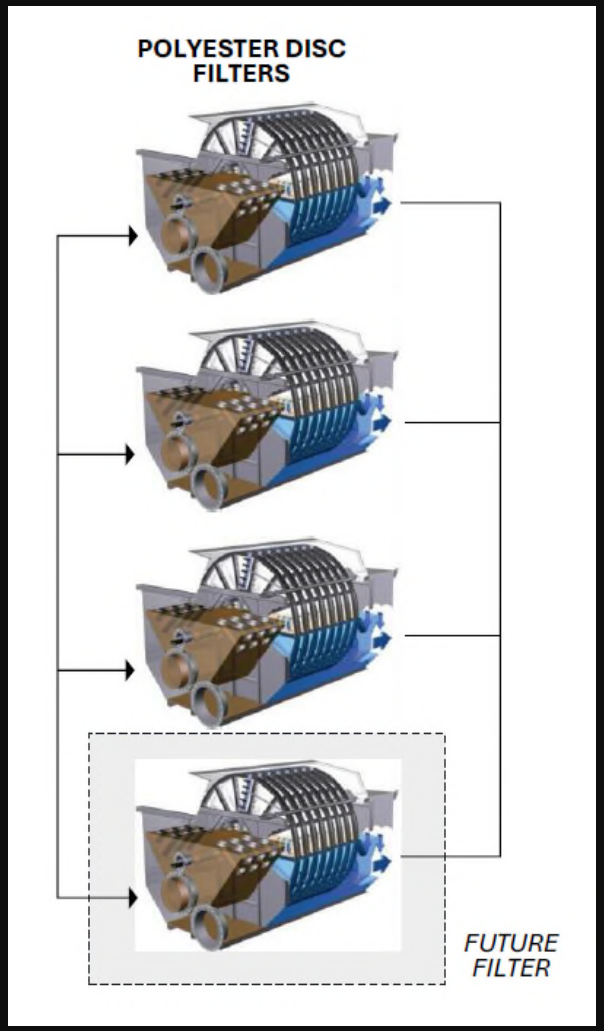
However, Sodium Hypochlorite is still required as it is used to combat filamentous bacteria outbreaks and chlorinate non-contact cooling water within the treatment plant.

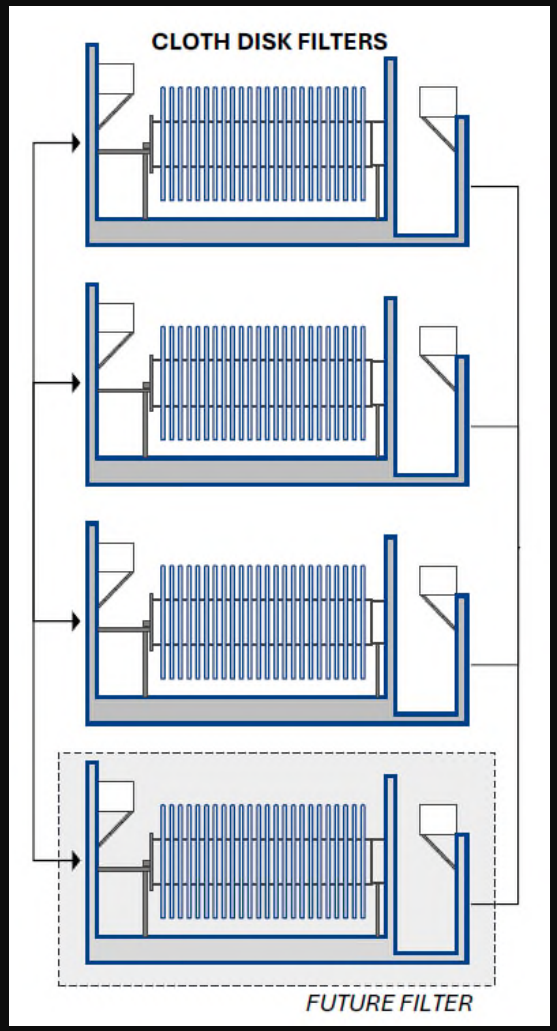
ANALYSIS OF TREATMENT SYSTEMS

McMahon and MCO staff toured several wastewater plants and interviewed staff and administrators to determine which phosphorus removal technologies had the best mix of installation cost, longevity, reliability, and long-term O&M cost.

UV Disinfection systems were assessed under the same criteria.

Both Polyester and Cloth Disc Filter systems were chosen for further analysis.





ANALYSIS OF DISC FILTERS

Both Polyester and Cloth Disc Filters offer excellent phosphorus removal performance. **Cloth Filters have a less overall cost of ownership along with lower O&M costs.**

Option of Probable Costs:

Polyester Disc Filters: Installation cost of $27,915,000 and an annual operating cost of $730,000.

Cloth Disc Filters: Installation cost of $21,609,000 and an annual operating cost of $676,000.

ANALYSIS OF UV DISINFECTION

The optional UV Disinfection system is from Trojan Technologies.

Option of Probable Costs:
Trojan UV System: Installation cost of $11,569,500 and an annual operating cost of $69,000.

The existing Sodium Hypochlorite system will need to remain in service even if UV Disinfection is installed.

Staff recommend allocating funding to refurbish the existing Sodium Hypochlorite System.

Site Work	
Miscellaneous Site Work	$50,000
New Parking	$75,000
48" Bypass Line	$1,230,000
Effluent Piping	$449,000
Effluent Flow Meter	$40,000
Storm Piping Modifications	$60,000
Subtotal	**$1,904,000**
Generator	
Base Slab	$33,000
Generator & Transfer Switch	$903,000
Install	$150,000
Subtotal	**$1,086,000**

ADDITIONAL PLANT REQUIREMENTS

Additional equipment and upgrades will be necessary.

If UV Disinfection is installed, an additional generator and a new 48” bypass line will be required

Costs are detailed in the graphic.

These costs do not include reconfiguration of the existing Sodium Hypochlorite system (estimate not available at this time).

	Approx. % of Total
City of Neenah	54%
City of Menasha	22%
Village of Fox Crossing	16%
Village of Harrison	8%
Town of Neenah	1%
Plant Total	**100%**

FUTURE DECISIONS

Each municipality will need to decide how to finance the plant upgrade.

Neenah's share is estimated to be 54% of the total upgrade costs.

Staff will be aggressively searching additional funding options, such as Municipal Grants and Congressionally Directed Spending.

REFERENCES

FACILITY PLAN AMENDMENT TERTIARY TREATMENT, UV DISINFECTION, & EFFLUENT FLOW MONITORING FOR THE NEENAH-MENASHA SEWERAGE COMMISSION WINNEBAGO COUNTY, WISCONSIN, McMahon Associates, Inc.

https://dnr.wisconsin.gov/topic/Wastewater/AdaptiveManagement.html

https://wiclearinghouse.org/

https://dnr.wisconsin.gov/topic/Wastewater/WaterQualityTrading.html

https://www.trojantechnologies.com/en/applications/municipal/wastewater

https://dnr.wisconsin.gov/topic/TMDLs

https://dnr.wisconsin.gov/sites/default/files/topic/TMDLs/TMDL_flyer.pdf

https://dnr.wisconsin.gov/sites/default/files/topic/TMDLs/TMDLFAQweb.pdf

https://dnr.wisconsin.gov/topic/TMDLs/LowerFox/index.html

QUESTIONS?

THANK YOU!

ANTHONY L. MACH
PRESIDENT - NMSC