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Wastewater Facilities Plan

Report

Rib Mountain Metropolitan

Sewerage District, WI

December 2015

STRAND ASSOCIATES

Report for
Rib Mountain Metropolitan Sewerage District, Wisconsin

Wastewater Facilities Plan

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December 2015

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EXECUTIVE SUMMARY

SUMMARY OF REPORT

This report is a Facility Plan that includes a cost-effectiveness analysis and environmental information document in compliance with the Wisconsin Department of Natural Resources (WDNR) Administrative Code Requirements for reviewable projects. The report does the following for use by the WDNR in its review of the Facility Plan.

1. Reviews the existing Rib Mountain Metropolitan Sewerage District (RMMSD) interceptor sewer (Section 2).

2. Reviews existing treatment facilities, flows, and loadings (Section 3).

3. Develops proposed design flows and loadings (Section 4).

4. Discusses the current and anticipated permit requirements (Section 5).

5. Evaluates the existing facilities and identifies plant needs (Section 6).

6. Evaluates alternatives for selected unit processes, provides opinions of probable cost for improvements, and recommends an implementation plan (Section 7).

7. Presents the recommended alternatives, recommended implementation schedule, and fiscal impact analysis (Section 8).

8. Includes an environmental impact summary (Section 9).

9. Documents the public participation efforts (Section 10)*.

**Pending public hearing*

This executive summary focuses on key elements of the facilities plan including the following:

1. Documentation of Needs
2. Recommended Plan Summary
3. Proposed Schedule and Implementation Plan
4. Impact of Recommended Plan on Overall Operational Costs
5. Recommendations for RMMSD Commission

DOCUMENTATION OF NEEDS

The review of the plant performance, conditions, assessment, anticipated regulatory requirements, and plant hydraulics identified the following critical needs:

1. Future Phosphorus Removal Requirements

More stringent phosphorus limits as a result of the Wisconsin River total maximum daily load (TMDL) are being proposed that may require increased phosphorus removal by chemical addition, tertiary filtration, or a combination.

2. Age and Utilization of the Equipment and Facilities

Since most of the processes and facilities were constructed as a part of the original plant in 1986, these facilities have exceeded the typical design life of 20 years and are nearing 30 years in service. Each facility and/or process was reviewed for structural, mechanical, and electrical (including instrumentation and controls) adequacy. The administration building was also evaluated for office, operations, restrooms, and locker room requirements.

3. Biosolids Disposal Challenges

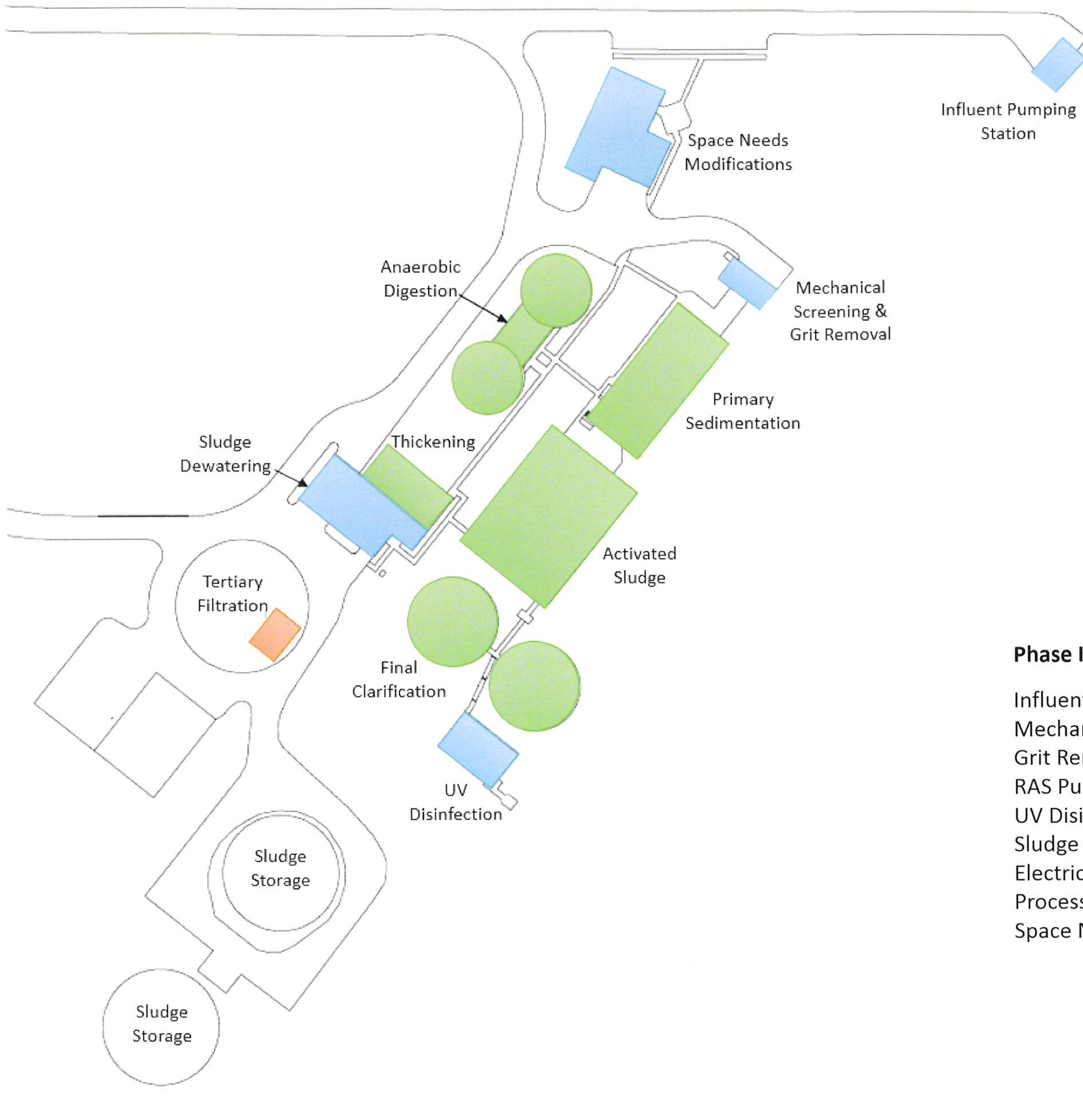
RMMSD has been experiencing increasing difficulty in finding and securing sites for land application. Local farmers, feeling pressure from nutrient management planning, have been considering limiting land application of biosolids. This may result in RMMSD needing up to five times more land for the same amount of biosolids, which would present a challenge. This plan explores cost-effective alternatives for beneficial reuse of biosolids.

These challenges need to be addressed to satisfy the long-term facilities planning needs for the RMMSD WWTP.

RECOMMENDED PLAN SUMMARY

The recommended plan presented in detail in Section 8 of the Facilities Plan addresses all the documented needs for the RMMSD WWTP and provides effective reuse of existing facilities along with appropriate modifications and additions to allow for successful operation for the next 20 years and beyond. Figure ES-1 depicts the key recommended plan elements. The recommended plan includes the following items:

1. Replace the five original influent pumps with five new chopper pumps.
2. Replace the existing recycle flow Parshall flume with a larger recycle flow Parshall flume, replace wet well level floats with new radar transmitters, replace influent gates, and replace the recycle flow sampler with a new automatic sampler. Inspect and replace or refurbish wet well piping.
3. Replace the diesel generator with a new natural gas generator and relocate it to the location of the plant electrical service entrance switch.
4. Replace the existing influent mechanical step screen and wash press with a larger new mechanical step screen and new wash press.



Phase I

Influent Pumping Station
Mechanical Screening
Grit Removal
RAS Pumping
UV Disinfection
Sludge Dewatering
Electrical Modifications
Process Piping Modifications
Space Needs Modifications

Phase II

Primary Sedimentation
Activated Sludge
Final Clarification
Thickening
Anaerobic Digestion

Future

Tertiary Filtration

PRELIMINARY SITE PLAN

WASTEWATER TREATMENT FACILITY
RIB MOUNTAIN METROPOLITAN SEWERAGE DISTRICT
MARATHON COUNTY

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FIGURE ES-1
1165.011

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5. Replace the existing aerated grit removal system with a vortex grit removal system and grit washer.

6. Replace the primary clarifier flights, chains, and sludge pumps, and add clean outs on the primary sludge lines.

7. Replace one activated sludge blower with a turbo blower and the piping between the blower room and aeration tanks.

8. Replace final clarifier drives, collector mechanisms, and RAS pumps equipped with new VFDs.

9. Evaluate phosphorus removal alternatives during the phosphorus compliance schedule included in an updated WPDES permit.

10. Install an additional ultraviolet disinfection system bank.

11. Replace the internal equipment of the dissolved air floatation thickening system and the thickened sludge pumps.

12. Replace both digester covers (after inspection), digester recirculation pumps, transfer pumps, digester gas safety equipment, the waste gas burner, heat exchanger and add hot water boiler, and install a pumped mixing system for the secondary digester.

13. Demolish biosolids dewatering equipment and refurbish building to be reusable for alternative purposes as part of the phased projects in the future.

14. Update the plant power equipment to provide a new service entrance switchboard, back-up power generator, three new MCCs, SCADA PLC upgrades, and provide a big screen monitor.

15. Replace all existing buried valves, valves in manholes, and interior valves with new valves.

16. Make modifications to the Administration Building including repurposing of garage space, the addition of SCADA displays, and improvements to offices, locker rooms, and storage space to meet staff needs.

17. Paint all interior spaces and piping concurrently with improvements in each building.

In addition to the items above, RMMSD will replace one blower with a turbo blower and SCADA system computers and software prior to initiating the Phase I improvements.

PROPOSED SCHEDULE AND IMPLEMENTATION OPTIMIZES USEFUL EQUIPMENT LIFE

The recommended plan and proposed schedule provide the RMMSD rate payers with a timeline that will allow projects to be completed between now and 2030. Projects have been designated Phase I or Phase II projects based on project need, age of existing facilities, cost, and regulatory requirements. Phase I projects will be designed and constructed between 2016 and 2020, and

Phase II projects will be completed between 2021 and 2030. For instance, the influent pumping station pump replacement is planned as a Phase I improvement because of the significant maintenance nuisance concerning the existing pumps. Staging projects in this manner will provide improvements to the WWTP when they are needed and will help control project costs for each phase. Based on the projected annual operating costs and anticipated debt service, the average revenue in 2017 will need to be increased to approximately $2,340,000. This is an increase of 25 percent over the average 2010 to 2014 revenue for debt services. The proposed project phasing and associated opinion of project cost are shown in Table ES-1. The summary of funding for the Phase I and Phase II Improvements is included in Table ES-2.

	Phase I	Phase II	Future
Influent Pumping Station	$584,000	---	
Mechanical Screening	$853,000	---	
Grit Removal	$1,123,000	---	
Primary Sedimentation	---	$948,000	
Activated Sludge	---	$309,000	
Final Clarification & RAS Pumping	$235,000	$787,000	
UV Disinfection	$340,000	---	
Phosphorus Removal	---	---	TBD*
Thickening	---	$1,469,000	
Anaerobic Digestion	---	$4,432,000	
Biosolids Disposal	---	---	TBD*
Sludge Dewatering	$100,000	---	
Electrical Modifications	$3,870,000	---	
Valve Replacement and Piping Modifications	$655,000	---	
Space Needs Modifications	$773,000	---	
Painting	$263,000	$234,000	
Total Opinion of Probable Capital Cost	**$8,796,000**	**$8,179,000**	TBD*

*Future costs to be determined (TBD).

Table ES-1 Phased Project Costs

	Phase I Improvements	Phase II Improvements
Opinion of Probable Cost	$8,796,000	$8,179,000
Replacement Fund Contribution	$1,456,000	$964,000
CWFP Loan Amount	$7,340,000	$7,215,000
Anticipated Blended Loan Rate	2.275%	2.278%
Estimated Annual Debt Service Payment	$461,000	$453,000

Table ES-2 Summary of Funding for Phase I and Phase II Improvements (September 2015 Dollar Basis)

IMPACT OF RECOMMENDED PLAN ON OPERATIONAL, REPLACEMENT, AND MAINTENANCE COSTS

These improvements are expected to have a neutral effect on the operation, maintenance, and replacement costs. Expansion of the UV disinfection system will likely have little, if any, impact on the facility's energy use since the system operates primarily at the average daily flow and only one UV bank will be in service. Replacement of the positive displacement blowers with turbo blowers will reduce operation costs; however, sludge production will increase over time increasing operation costs. In the immediate future, none of these costs are expected to significantly impact the overall revenue needs.

With the replacement of many aged equipment items, it is very likely that the overall maintenance costs will be decreased through adoption of the recommended plan. Of particular note is the replacement of the existing influent pumps with chopper pumps. The existing influent pumps require daily attention because of clogging, and their replacement would reduce demands on plant staff.

As part of the loan application and closing process for each phased project, a new replacement fund annual deposit will be calculated by subtracting any abandoned or removed equipment allocations and adding appropriate allocations for new equipment. RMMSD reviews their rates on an annual basis. Any operation, maintenance, and replacement costs that increase over time and require additional revenue can be included in annual rate modifications. The annual rate reviews would address needs from impacts such as inflation, increased electrical and natural gas rates, and increase staff compensation or benefit expenses.

RECOMMENDATIONS–RMMSD COMMISSION ACTION

1. Submit Draft Facilities Plan to WDNR for their review pending successful review at October 2015 Commission Meeting.

2. Submit a PERF and Intent to Apply (ITA) to WDNR prior to the October 31, 2015, deadline for the Phase I Improvements to allow use of the Clean Water Fund Program (CWFP) for project financing. Phase II improvements will be addressed in the future.

3. Schedule a Public Hearing on the Facilities Plan for November 2015.

4. Prepare a Record of Public Hearing following the public hearing. The record will address comments and suggestions made by the public, and any modifications to the proposed report as a result of public comment will be identified. The hearing records should then be sent to the WDNR for its review in conjunction with the Environmental Information Document and Cost-Effective Analysis. RMMSD should pass a motion to accept the Facilities Plan.

5. Begin preparation of drawings and specifications for the recommended Phase I improvements to allow obtaining a CWFP loan on a timely basis.

6. Submit a CWFP loan application document with the drawings and specifications. The submittal needs to include proposed modifications to the user charge system.

SECTION 1
INTRODUCTION

This section describes the purpose and scope of this report and the location of the study area. It also summarizes previous and related studies and reports. A list of definitions is provided as an aid to the reader.

1.01 PURPOSE AND SCOPE OF REPORT

The Rib Mountain Metropolitan Sewerage District (RMMSD) operates a wastewater treatment plant (WWTP) that treats primarily domestic wastewater. This facility and the RMMSD's interceptor sewer began operation in January 1986.

This facilities plan was prepared for the purpose of developing an overall plan for wastewater management at the RMMSD WWTP for the next 20 years. This plan must be implemented to meet the requirements of federal and state regulations related to water quality in the Wisconsin River and to maintain the significant investment RMMSD has made at the WWTP.

The treatment facility consistently achieves compliance with all Wisconsin Pollutant Discharge Elimination System (WPDES) requirements. Average wastewater flows and pollutant loadings to the treatment plant have generally been below the plant's rated capacity (refer to Appendix A for a copy of the WPDES Permit). However, several issues require a comprehensive review of the facility including:

1. Future Phosphorus Removal Requirements

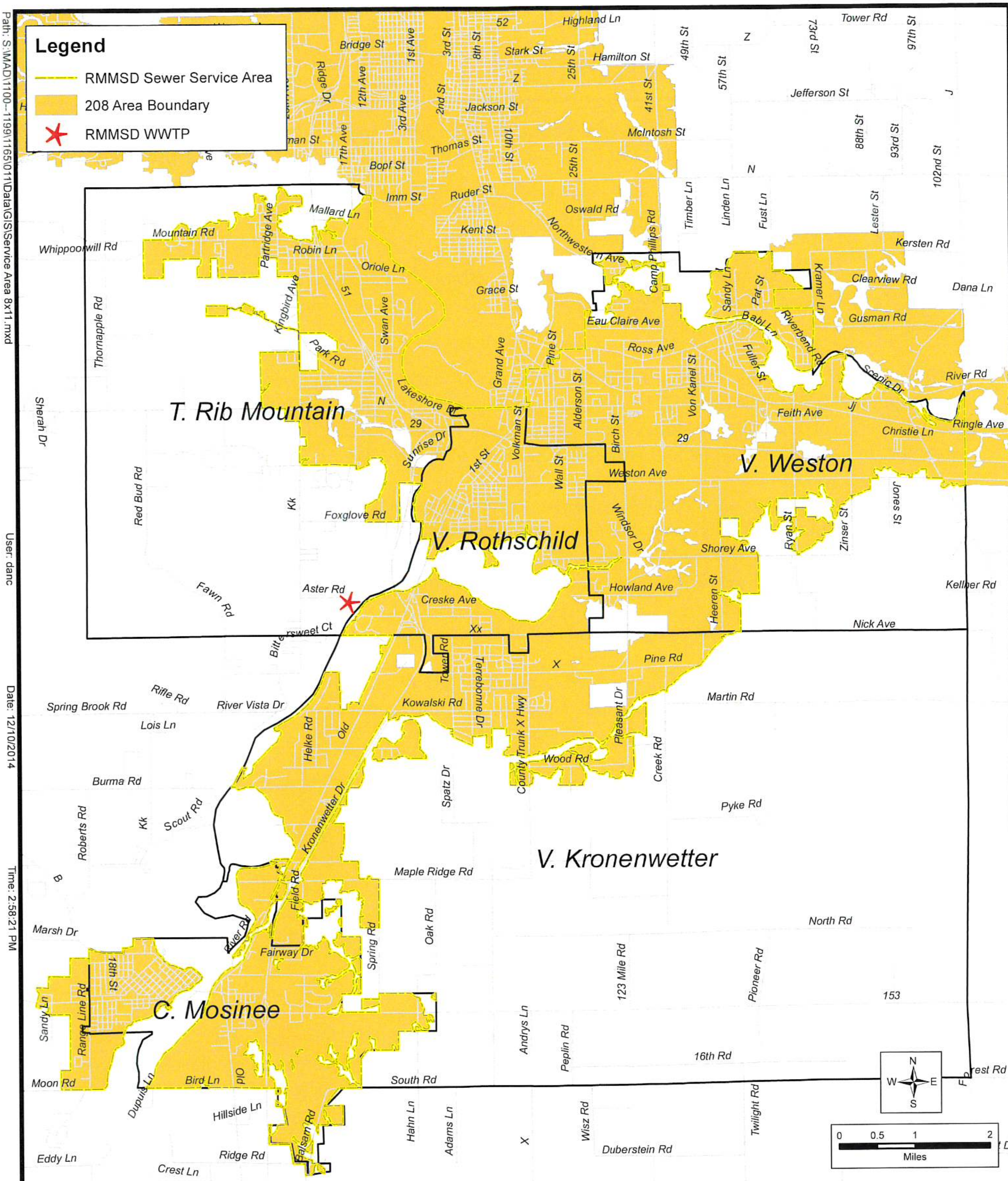
   More stringent phosphorus limits as a result of the Wisconsin River total maximum daily load (TMDL) are being proposed that may exceed the capacity of several of the wastewater treatment processes.

2. Age and Utilization of the Equipment and Facilities

   Since most of the processes and facilities were constructed as a part of the original plant in 1986, these facilities have exceeded the typical design life of 20 years and are nearing 30 years in service. Each facility and/or process was reviewed for structural, mechanical, and electrical (including instrumentation and controls) adequacy. The administrative building was also evaluated for office, operations, restrooms, and locker room requirements.

1.02 LOCATION OF STUDY

The RMMSD WWTP serves five communities of Marathon County in a region known as the 208 sewer service area that contributes wastewater to the RMMSD WWTP. These five communities include parts of the Town of Rib Mountain, the Village of Rothschild, part of the Village of Weston, the Village of Kronenwetter, and the City of Mosinee. The RMMSD sewer service area is shown in Figure 1.02-1. An aerial photo of the existing RMMSD WWTP is shown in Figure 1.02-2.



RMMSD SEWER SERVICE AREA

FACILITY PLANNING
RIB MOUNTAIN METROPOLITAN SEWERAGE DISTRICT
MARATHON COUNTY, WISCONSIN

Information provided by Marathon County Planning and Zoning

STRAND ASSOCIATES

FIGURE 1.02-1
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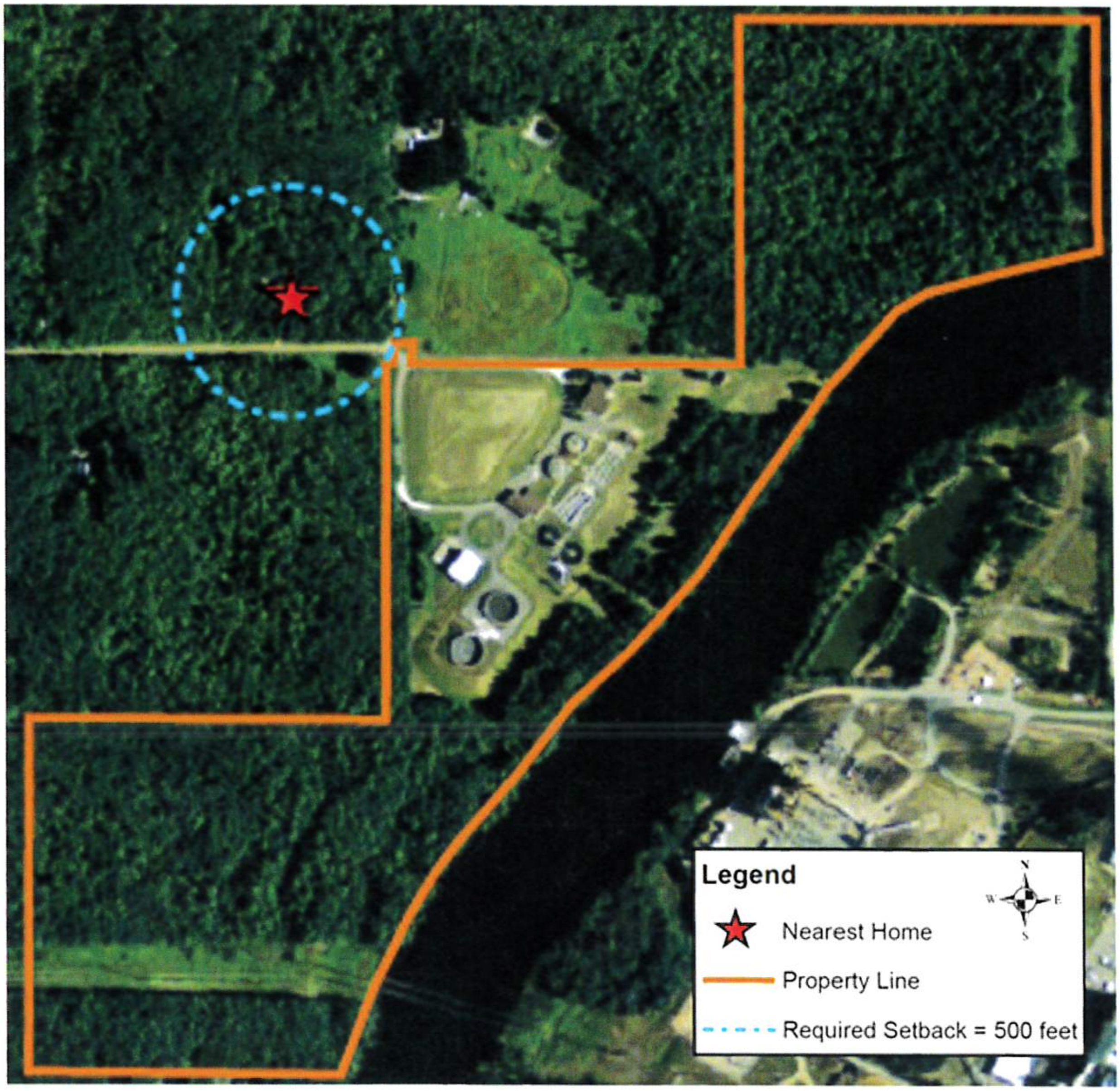


Figure 1.02-2 Aerial Photo of Existing RMMSD WWTP

1.03 RELATED STUDIES AND REPORTS

The following drawings, specifications, and reports were used in the preparation of this facilities plan for background information, existing design criteria, and other information as required.

A. *Interceptor Capacity Evaluation,* Strand Associates, Inc., 2011.

B. *Facilities Upgrade and Long-Range Strategic Plan*, Strand Associates, Inc.®, December 2009.

C. *Rib Mountain UV Disinfection Facilities for the Rib Mountain Metropolitan Sewerage District*, drawings prepared by Strand Associates, Inc.®, August 2009.

D. *Sludge Storage Facilities for the Rib Mountain Metropolitan Sewerage District*, drawings prepared by Strand Associates, Inc.®, January 2009.

E. *2025 Wausau Urban Area Sewer Service Plan*, Becher-Hoppe Associates, Inc., June 2007.

F. *Facilities Upgrade and Long-Range Strategic Plan*, Strand Associates, Inc.®, October 2001.

G. *Wastewater Treatment Plant Improvements for the Rib Mountain Metropolitan Sewerage District*, drawings prepared by Strand Associates, Inc.®, March 2001.

H. *Sludge Storage Facilities for the Rib Mountain Metropolitan Sewerage District*, drawings prepared by Strand Associates, Inc.®, November 1999.

i. *Report of Sludge Storage Facilities Planning Amendment*, Strand Associates, Inc.,® July 1999.

J. *Petenwell and Castle Rock Flowages Comprehensive Management Plan*, Publ-WR0422-95, Wisconsin Department of Natural Resources (WDNR), January 1996.

K. *Operation and Maintenance Manual for Wastewater Treatment Rib Mountain Metropolitan Sewerage District*, Strand Associates, Inc.®, August 1985.

L. *Water Pollutions Control Facilities for Rib Mountain Metropolitan Sewerage District, Marathon County, Wisconsin*, drawings prepared by Strand Associates, Inc.®, January 1984.

1.04 ABBREVIATIONS AND DEFINITIONS

ACL	alternative concentration limit
ATS	automatic transfer switch
BMP	best management practices
BOD_5	five day biochemical oxygen demand
BPR	biological phosphorus removal
CMAR	Compliance Maintenance Annual Report
CMOM	Compliance, Management, Operation, and Maintenance
DAFT	dissolved air flotation device
DO	dissolved oxygen
DOA	Department of Administration
FOE	Focus on Energy
gcd	gallons per capita per day
gfd	gallons per foot per day
I/I	infiltration and inflow
kW	kilowatt(s)

lbs/day	pounds per day
lbs/hr	pounds per hour
µg/L	micrograms per liter
MCC	motor control center
mg/L	milligrams per liter
mgd	million gallons per day
ML	mixed liquor
MPN	most probable number
MS4s	municipal separate storm sewer systems
ng/L	nanograms per liter
NRDC	Natural Resources Defense Council
NTU	turbidity units of measurement
O&M	operation and maintenance
pcd	pounds per capita per day
PERF	Priority Evaluation and Ranking Form
PI	plant influent
PLC	programmable logic controller
PMP	pollutant minimization program
POTW	publicly owned treatment works
PRE	primary effluent
PRF	process return flow
PRS	primary sludge
psig	pounds per square inch gauge
RAS	return activated sludge
RMMSD	Rib Mountain Metropolitan Sewerage District
RW	raw water
SCADA	supervisory control and data acquisition
scfm	standard cubic feet per minute
SE	secondary effluent
SES	Service Entrance Switchboard
SOP	standard operating procedure
SSO	sanitary sewer overflow
TKN	total Kjeldahl nitrogen
TMDL	total maximum daily load
TP	total phosphorus
TPAD	temperature-phased anaerobic digestion
TSS	total suspended solids
TWAS	thickened waste activated sludge
USEPA	United States Environmental Protection Agency
UV	ultraviolet
VFA	volatile fatty acids
VFD	variable frequency drive
WAS	waste activated sludge
WDNR	Wisconsin Department of Natural Resources
WEF	Water Environment Federation
WET	whole effluent toxicity

WLA	waste load allocation
WPDES	Wisconsin Pollutant Discharge Elimination System
WQBEL	water quality-based effluent limit
WWTP	wastewater treatment plant

SECTION 2
EVALUATION OF EXISTING INTERCEPTOR SEWER

2.01 BACKGROUND

RMMSD owns and maintains the interceptor sewer that brings wastewater to the WWTP. The sewer was constructed in 1986 and has been maintained routinely since installation. The original interceptor location plan is shown in Figure 2.01-1. The sewer extends 9,967 feet in length and has 22 manholes (MH). The interceptor is 36 inches in diameter from MH 1 to MH 7 and is set at a 0.14 slope with a capacity of 16.2 million gallons per day (mgd). From MH 7 to MH 14, the interceptor is 36 inches in diameter and is set at a 0.11 percent slope with a capacity of 14.4 mgd. The remaining portion of the interceptor from MH 14 to MH 21 is 30 inches in diameter and is set at a 0.17 percent slope with a capacity of 11 mgd. From MH 21 to MH 22, the interceptor is 24 inches in diameter and is set at a 0.16 percent slope with a capacity less than 11 mgd. Beyond the interceptor, individual communities own their collection systems.

The interceptor condition is routinely monitored by televised inspections. It is in good condition and identified issues are addressed as soon as possible. The interceptor was evaluated in 2011 as part of adding Mosinee to RMMSD.

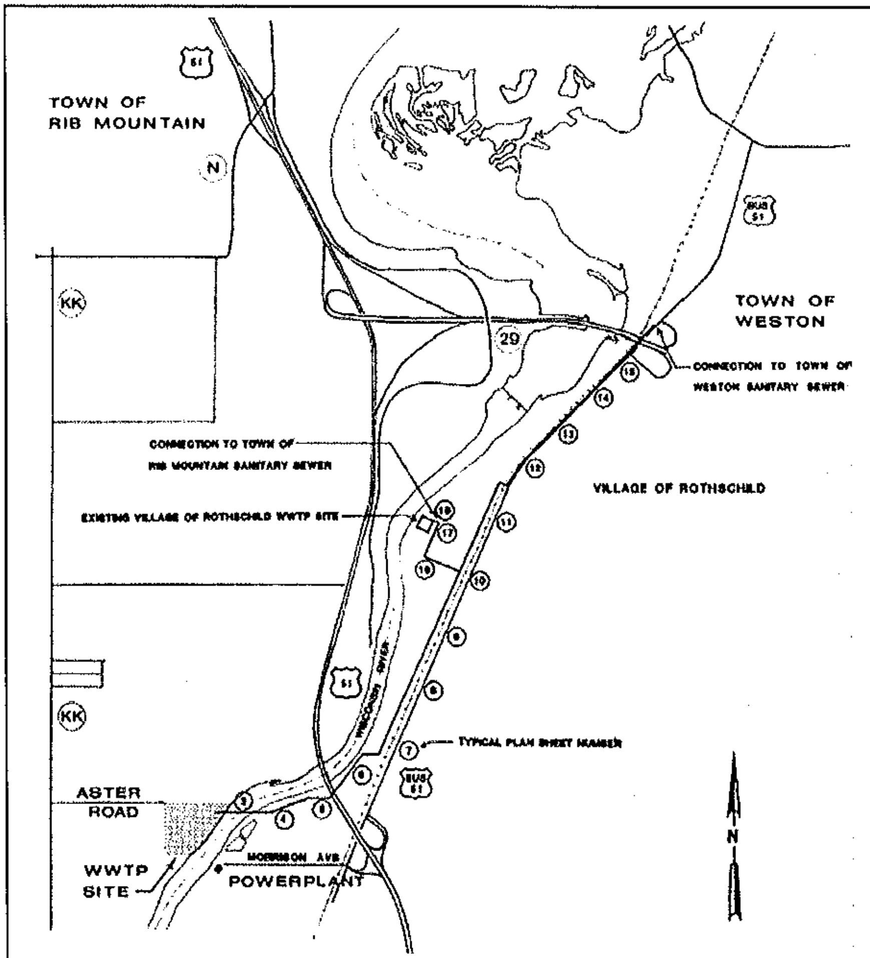


Figure 2.01-1 Sewer Interceptor Location Plan

2.02 INFILTRATION AND INFLOW EVALUATION

Per capita infiltration and inflow (I/I) are identified in Section 4 of this report using the metered flow method. The peak day flow is about twice the average dry weather flows. This is comparable to other similar facilities and does not indicate that there is excessive I/I.

2.03 PLANNED FUTURE INTERCEPTOR SEWER IMPROVEMENTS

The interceptor capacity was evaluated in 2011 for 2030 and 2050 flows. At the time of the evaluation, the 2030 peak hour instantaneous flow was 9.8 mgd, the 2030 peak instantaneous flow was 14.1, the 2050 peak hour instantaneous flow was 14.7 mgd, and the 2050 peak instantaneous flow was 21.3 mgd. The conclusions of that capacity analysis are included in Table 2.03-1. The interceptor was projected to have sufficient capacity for 2030 and 2050 flows. When the capacity is compared to the 2050 system flow, capacity is exceeded in the MH 20 to MH 14 section of the interceptor. Flow from the Cedar Creek pumping station will need to be relocated to MH 14 prior to this. The hydraulic grade line of the system in 2050 after relocating the Cedar Creek flow from MH 19 to MH 14 is shown in Figure 2.03-1. Calculations in this figure use Manning's equation to calculate velocity for a full-flowing pipe. The interceptor has sufficient capacity through 2035, which is the timeline of this facility plan. During the interim, RMMSD should continue to monitor and maintain the interceptor and meet the requirements of the Compliance, Management, Operation, and Maintenance (CMOM) program as outlined in Section 5 of this report.

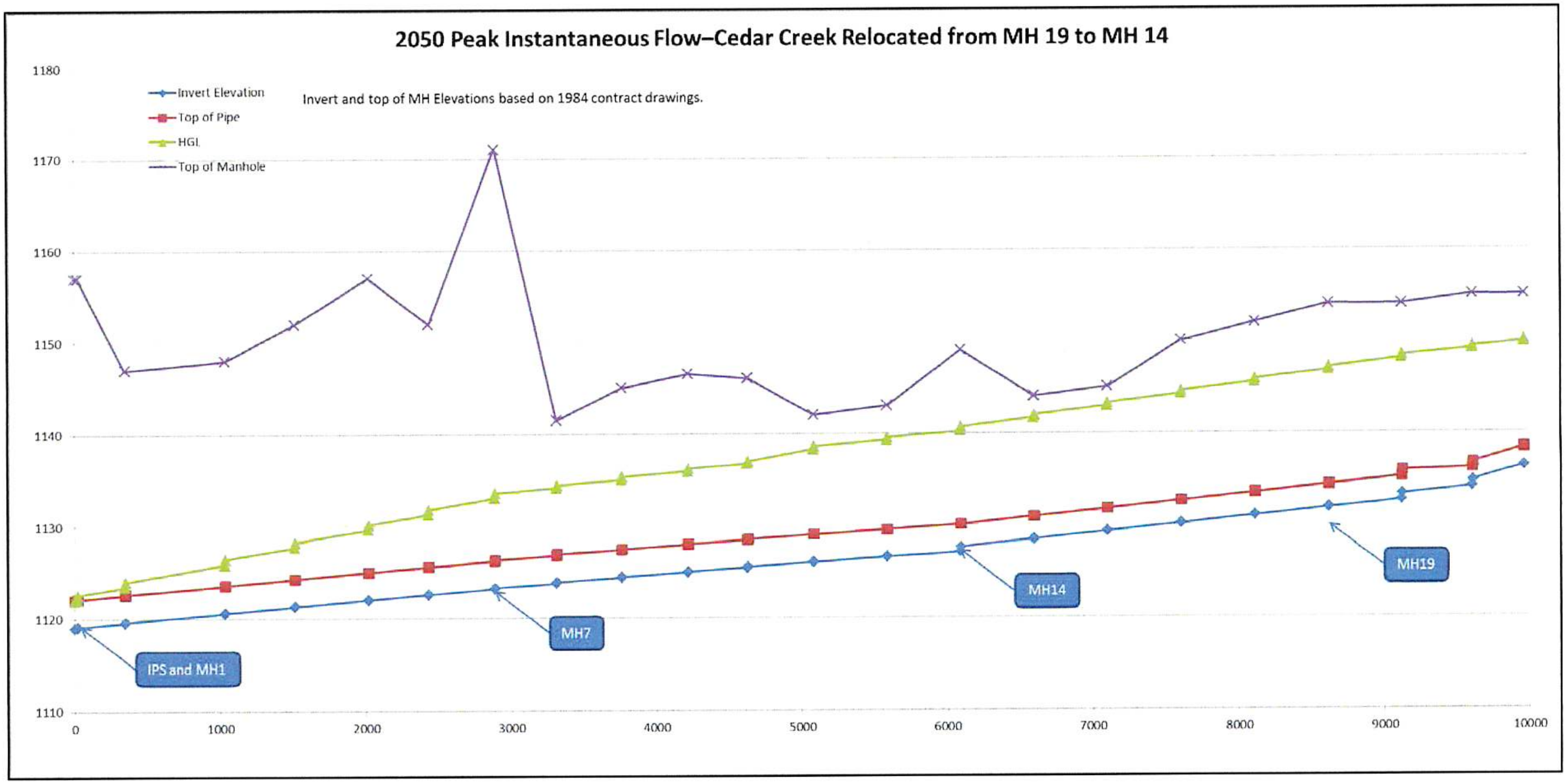
Table 2.03-1 RMMSD Interceptor Capacity Calculation

RMMSD Interceptor Capacity Calculation														
Manhole Identification		Upstream Manhole		Downstream Manhole		Pipe Length (ft)	Pipe Size (in)	Pipe Slope		Pipe Area (ft^2)	Mannings Number	Calculated Velocity (fps)	Calculated Capacity		
Upstream Manhole	Downstream Manhole	Rim Elevation	Outgoing Pipe Elevation	Rim Elevation	Incoming Pipe Elevation			(%)	ft/ft				(cfs)	(gpm)	(mgd)
MH 20 to MH 14 (30-inch segment @ 0.17%)															
20	19	1154	1132.70	1154	1131.85	500	30	0.17	0.0017	4.91	0.013	3.45	16.96	7,610	10.96
19	18	1154	1131.85	1152	1131.00	500	30	0.17	0.0017	4.91	0.013	3.45	16.96	7,610	10.96
18	17	1152	1131.00	1150	1130.15	500	30	0.17	0.0017	4.91	0.013	3.45	16.96	7,610	10.96
17	16	1150	1130.15	1145	1129.30	500	30	0.17	0.0017	4.91	0.013	3.45	16.96	7,610	10.96
16	15	1145	1129.30	1144	1128.45	500	30	0.17	0.0017	4.91	0.013	3.45	16.96	7,610	10.96
15	14	1144	1128.45	1149	1127.60	500	30	0.17	0.0017	4.91	0.013	3.45	16.96	7,610	10.96
MH 14 to MH 7 (36-inch segment @ 0.11%)															
14	13	1149	1127.10	1143	1126.55	500	36	0.11	0.0011	7.07	0.013	3.14	22.18	9,955	14.33
13	12	1143	1126.55	1142	1126.00	500	36	0.11	0.0011	7.07	0.013	3.14	22.18	9,955	14.33
12	11	1142	1126.00	1146	1125.50	450	36	0.11	0.0011	7.07	0.013	3.15	22.29	10,005	14.41
11	10	1146	1125.45	1146.5	1125.00	405	36	0.11	0.0011	7.07	0.013	3.15	22.29	10,005	14.41
10	9	1146.5	1124.95	1145	1124.45	450	36	0.11	0.0011	7.07	0.013	3.15	22.29	10,005	14.41
9	8	1145	1124.39	1141.5	1123.90	445	36	0.11	0.0011	7.07	0.013	3.14	22.19	9,960	14.34
8	7	1141.5	1123.76	1171	1123.30	420	36	0.11	0.0011	7.07	0.013	3.13	22.13	9,933	14.30
MH 7 to MH 1 (36-inch segment @ 0.14%)															
7	6	1171	1123.20	1152	1122.57	450	36	0.14	0.0014	7.07	0.013	3.54	25.02	11,231	16.17
6	5	1152	1122.57	1157	1122.00	410	36	0.14	0.0014	7.07	0.013	3.53	24.94	11,191	16.12
5	4	1157	1122.00	1152	1121.30	500	36	0.14	0.0014	7.07	0.013	3.54	25.02	11,231	16.17
4	3	1152	1121.27	1148	1120.60	475	36	0.14	0.0014	7.07	0.013	3.55	25.12	11,273	16.23
3	2	1148	1120.55	1147	1119.60	680	36	0.14	0.0014	7.07	0.013	3.54	25.00	11,219	16.15
2	1	1147	1119.55	1157	1119.10	320	36	0.14	0.0014	7.07	0.013	3.55	25.08	11,256	16.21

Summary	Calculated Capacity		
	(cfs)	(gpm)	(mgd)
MH 20 to MH 14 (30-inch segment @ 0.17%)	**16.96**	**7,610**	**10.96**
MH 14 to MH 7 (36-inch segment @ 0.11%)	**22.22**	**9,974**	**14.36**
MH 7 to MH 1 (36-inch segment @ 0.14%)	**25.03**	**11,233**	**16.18**

Note: Calculations use Manning's equation to calculate velocity for a full-flowing pipe.

Figure 2.03-1 Interceptor 2050 Peak Instantaneous Flow–Cedar Creek Relocated



SECTION 3
DESCRIPTION OF EXISTING WASTEWATER TREATMENT FACILITIES

3.01 BACKGROUND

RMMSD owns and operates the RMMSD WWTP that provides wastewater treatment to the residents and businesses of portions of the Town of Rib Mountain, the Village of Rothschild, part of the Village of Weston, the Village of Kronenwetter, and the City of Mosinee. The WWTP has been operating since January 1986. The facility has had interim upgrades for biosolids storage, wastewater screening, phosphorus removal, and ultraviolet (UV) disinfection, but much of the WWTP processes are the same as they were originally installed.

The current liquid treatment facilities include influent pumping, raw wastewater screening and grit removal, primary sedimentation, activated sludge treatment with chemical phosphorus removal, final clarification, UV disinfection, and cascade aeration. The solids processing facilities include waste activated sludge (WAS) thickening by dissolved air floatation (DAFT), primary and secondary stage anaerobic digestion of primary and thickened waste active sludge (TWAS), and liquid biosolids storage. RMMSD has belt filter presses for dewatering and cake storage; however, biosolids are not dewatered at this time. Biogas generated during anaerobic digestion is used to fire a hot water boiler that provides heat to the digestion process, digester building, and solids processing building. In addition, excess biogas is used to operate gas generators during peak electrical demand hours.

The facilities were designed for a daily maximum flow of 4.27 mgd and an average daily five-day biochemical oxygen demand (BOD_5) loading of 7,950 pounds per day (lbs/day). With in-plant recycle, the design BOD_5 load is 8,350 lbs/day. The average daily design total suspended solids (TSS) is 9,460 lbs/day, and the TSS load is 9,935 lbs/day with in-plant recycle. Figure 3.01-1 shows a site plan of the facility. Figure 3.01-2 shows a process flow diagram. Existing design criteria is included in Appendix B.

3.02 UNIT PROCESS DESCRIPTIONS

This subsection summarizes the plant unit processes.

A. Influent Pumping Station

In the influent wet well, raw wastewater (RW) is mixed with plant sewer recycle flows. This mixture of wastewater, called plant influent (PI), is pumped via a 20-inch-diameter force main to the preliminary treatment facilities. There are five pumps (four plus one backup) in the dry well. The pumps share two variable frequency drives (VFDs).

B. Preliminary Treatment

PI is discharged to an open channel and flows through a mechanical step screen. The step screen removes rags and large solids from the wastewater. Screenings discharge to a wash press that partially cleans and compresses the screenings before discharge to a bagged disposal unit. The screenings are then hauled to a landfill. A bypass bar screen is also provided. After passing through the step screen, the PI is metered using a Parshall flume and discharged into the aerated grit tank. Coarse inorganic material is removed in the grit tank, partially dewatered, and discharged to a bagging unit. This material is also hauled to a landfill. From the grit tank, PI flows to a division box where it is split into three equal streams and flows to the primary sedimentation tanks.

C. Primary Sedimentation

The three primary sedimentation tanks allow removal of a portion of the settable solids, and with this material, about 50 percent of the influent BOD_5 is removed; this is greater than the typical removal rate of approximately 30 percent. Typical TSS removal through primary sedimentation is 50 percent. Removal through RMMSD's primary sedimentation is expected to exceed the typical rates based on the high BOD removal rates. Settled solids are pumped to the primary digester as raw primary sludge (PRS). Clarified wastewater that leaves the tanks, called primary effluent (PRE), flows to the aeration tanks for biological treatment.

D. Activated Sludge Treatment and Phosphorus Removal

Before entering the aeration tanks, the PRE is mixed with return activated sludge (RAS) to form mixed liquor (ML). Within the aerated ML, an active mass of organisms is produced and sustained that stabilizes organic material. The ML flows out of the aeration tanks and into the final clarifiers. Phosphorus removal chemical (alum) is added at the division box before the final clarifiers to meet WPDES permit effluent phosphorus limits.

E. Final Clarification

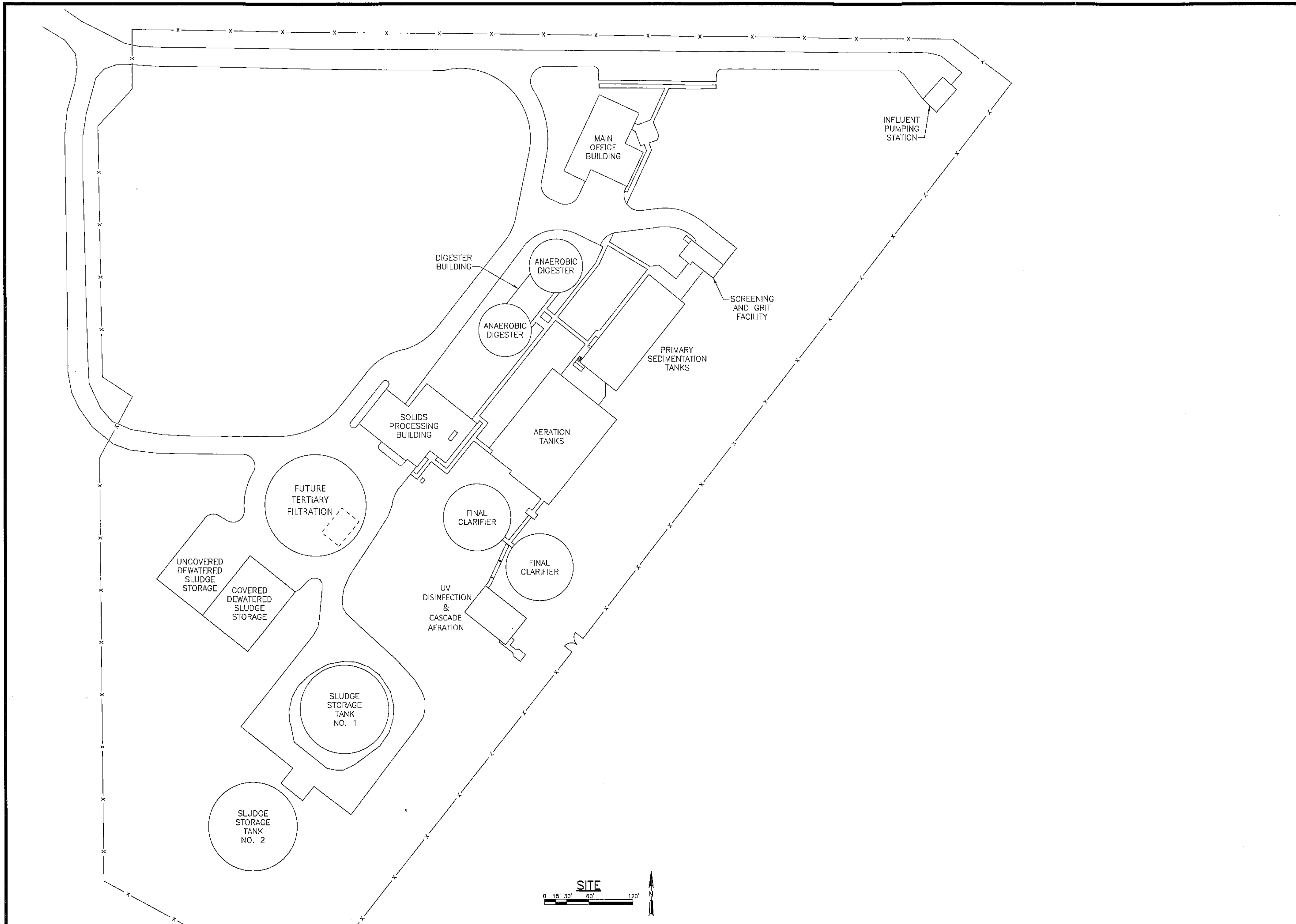
Two center-feed clarifiers remove solids from the ML leaving the aeration tanks. Settled solids from the clarifiers are returned to the aeration tanks as return activated sludge (RAS) or wasted as waste activated sludge (WAS) to the DAFT tanks. Clarified wastewater flows to the UV disinfection system as secondary effluent (SE).

F. Disinfection

SE enters the UV disinfection channel and is disinfected by an open-channel, low-pressure, high-intensity UV lamp system. The system is a phased design with only the first phase in place at this time. Flows above the UV design flow of 4.34 mgd can be diverted to the adjacent chlorine contact tank, stored, and returned to the head of the treatment plant for reprocessing; however this is an infrequent occurrence. A Parshall flume meters the flow before discharge to a cascade aerator. The cascade aerator at the south end of the tank functions as a postaeration system to add oxygen to the plant effluent. The UV disinfection system operates seasonally from May through October.

G. Solids Processing

The existing solids handling system includes DAFT for WAS thickening. TWAS and primary sludge are pumped to the primary digester for anaerobic digestion. The primary digester is mixed with a pumped jet mixing system and heated to mesophilic temperatures of about 95°F. The biosolids are transferred to the secondary digester where it is allowed to settle. After digestion, the digested biosolids are pumped to the biosolids storage tanks for storage. If necessary, biosolids can be dewatered on the belt filter presses, but this equipment is not normally used. The RMMSD land-applies biosolids for beneficial reuse on agricultural land for final disposal.

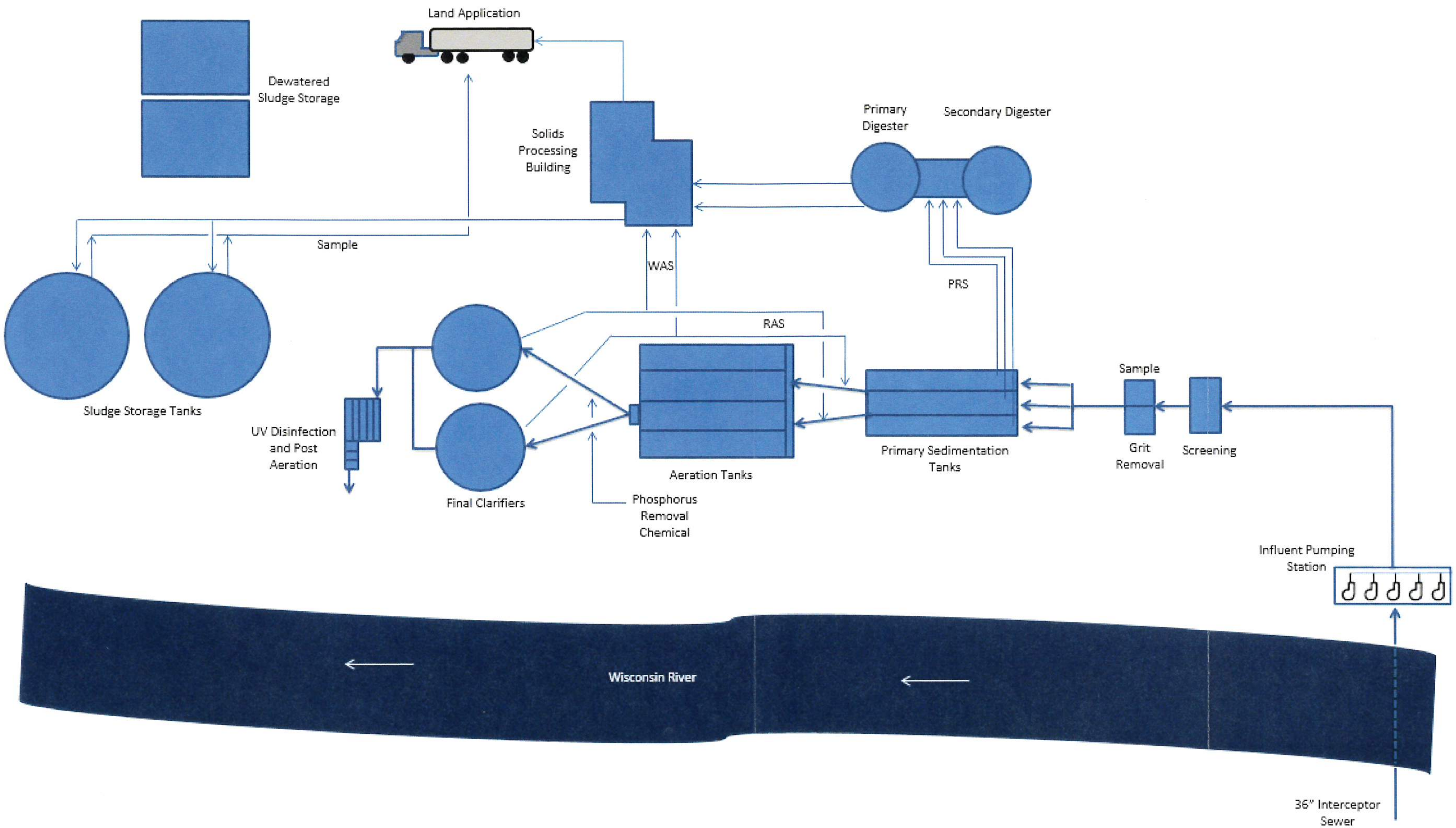


SITE PLAN

WASTEWATER TREATMENT FACILITY
RIB MOUNTAIN METROPOLITAN SEWERAGE DISTRICT
MARATHON COUNTY

STRAND ASSOCIATES®

FIGURE 3.01-1
1165.011



Process Flow Diagram

WASTEWATER TREATMENT FACILITY
RIB MOUNTAIN METROPOLITAN SEWERAGE DISTRICT
MARATHON COUNTY

STRAND ASSOCIATES®

FIGURE 3.01-2
1165.011

H. Electrical

1. Power Distribution Equipment

The service entrance switchboard (SES) for the incoming electrical service is installed in the Solids Processing Building and is used to power the individual structures and motor control centers (MCCs) throughout the WWTP. The SES is a GE 8000 Series switchboard consisting of circuit breakers and analog metering.

Throughout the plant at each of the individual structures, MCCs are installed to serve loads associated with each building and adjacent areas of the site. MCCs are also manufactured by GE and include feeder breakers, motor starters, and limited relay-based control logic for operation of equipment within the plant.

In order to provide standby power to the WWTP, a generator is installed in the Influent Pumping Station Building and this generator, by design, serves only limited equipment throughout the plant. Each of the individual MCCs includes dedicated “emergency” sections that can be powered by the standby generator in the event of a power failure.

2. Supervisory Control and Data Acquisition (SCADA) System

The WWTP is currently controlled with a programmable logic controller (PLC)-based system using Allen-Bradley PLCs and a personal computer as the operator interface. The PLCs were installed after the original installation of equipment and communicate between the various buildings using fiber-optic cabling. The operator interface computer provides monitoring and control of the system, as well as history of alarms, data, and a means to generate plant reports. The PLC network, SCADA computer, and associated software were upgraded around 2008.

3.03 INFLUENT FLOWS AND LOADINGS

A. Influent Flows

Influent flow to the RMMSD WWTP is measured in the screening building by an 18-inch Parshall flume. Monthly average influent flows for 2009 through July 2014 are presented in Table 3.03-1. Figure 3.03-1 graphically depicts daily influent flows for the same period. The average daily flows during the 2009 through July 2014 period were 2.39 mgd, 2.57 mgd, 2.83 mgd, 2.96 mgd, 3.37 mgd, 3.49 mgd, respectively. The maximum monthly average flow was 4.40 mgd in March 2014. The design average flow was exceeded on a monthly basis one time, in March 2014. The design maximum daily flow of 4.27 mgd was exceeded 72 times over the six years analyzed. The current design peak-hour flow is 12.29 mgd and with in-plant recycle is 12.96 mgd. Note that water customers were requested to keep taps running from January through April 2014 to minimize frozen pipes and water main breaks during unusually low winter temperatures. This made the influent flow data during this period artificially high.

B. Influent Loadings

Summaries of the influent wastewater concentrations and loadings for BOD_5 and TSS are shown in Table 3.03-2 and Table 3.03-3, respectively. These data are presented as monthly averages of daily influent values. The average monthly values for each of the wastewater constituents are also presented graphically in Figure 3.03-2. The annual average loadings for BOD_5, and TSS increased by 12 and 21 percent, respectively, during the time reviewed. Figure 3.03-3 presents the annual average loadings for each of the last six years.

Figure 3.03-2 shows the monthly average loadings for BOD_5 and TSS in comparison with the design loadings for each of these characteristics. This figure shows that the average monthly BOD_5 and TSS loadings have not exceeded the design loading in the 6-year period. Figure 3.03-4 shows the influent phosphorus from August 2014 through February 2015. The concentration averaged slightly above 6.0 milligrams per liter (mg/L) during this time.

	2009	2010	2011	2012	2013	2014
January	2.23	2.32	2.49	2.87	3.16	3.01
February	2.28	2.31	2.52	2.86	3.13	3.67
March	2.52	2.47	2.73	3.09	3.22	4.40
April	2.59	2.37	3.64	2.99	4.24	4.17
May	2.51	2.34	3.10	3.00	3.70	3.49
June	2.55	2.58	2.73	2.96	3.78	2.92
July	2.34	2.86	2.57	2.91	3.29	2.77
August	2.39	2.64	2.79	2.91	3.07	-
September	2.28	2.97	2.65	2.82	3.13	-
October	2.37	2.73	2.93	2.86	3.33	-
November	2.36	2.60	2.85	3.11	3.19	-
December	2.29	2.61	2.94	3.15	3.18	-
Average	2.39	2.57	2.83	2.96	3.37	3.49
Maximum	2.59	2.97	3.64	3.15	4.24	4.40
Minimum	2.23	2.31	2.49	2.82	3.07	2.77

Table 3.03-1 Monthly Average Daily Influent Flows (mgd)

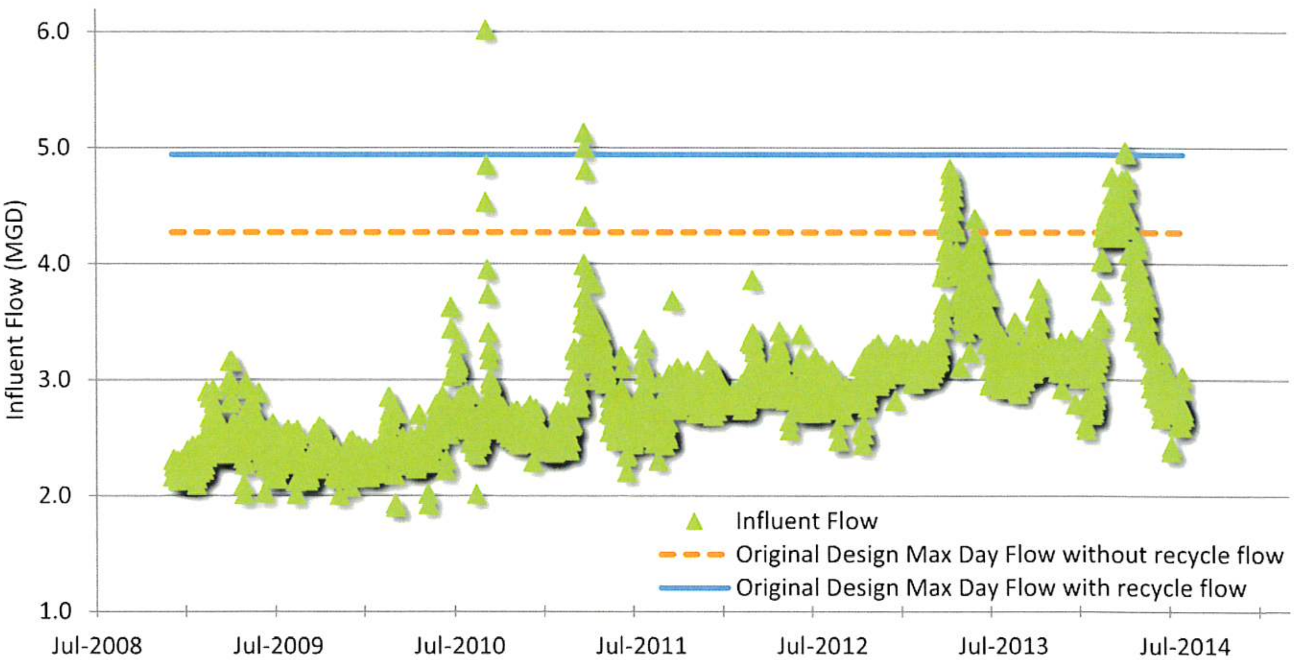


Figure 3.03-1 Daily Influent Flow (2009-2014)

	2009		2010		2011		2012		2013		2014	
	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day
January	299	5,514	268	5,199	267	5,519	235	5,644	245	6,431	237	5,892
February	271	5,099	320	6,085	256	5,366	226	5,355	239	6,250	194	5,820
March	256	5,374	267	5,453	244	5,492	211	5,525	228	6,080	162	5,962
April	240	5,191	306	6,050	194	5,961	226	4,841	183	6,456	171	5,890
May	241	5,043	254	5,031	191	4,923	212	5,346	202	6,233	224	6,602
June	251	5,331	267	5,748	212	4,819	221	5,492	209	6,597	256	6,022
July	294	5,842	277	6,812	224	4,827	228	5,561	233	6,510	256	6,023
August	255	5,139	293	6,491	205	4,774	242	5,943	239	6,091	-	-
September	264	5,077	252	5,750	222	4,950	240	5,681	233	6,146	-	-
October	259	5,104	253	5,762	231	5,689	233	5,610	220	6,117	-	-
November	293	5,792	246	5,360	236	5,636	233	6,100	232	6,197	-	-
December	310	5,936	270	5,946	235	5,216	254	6,675	227	6,021	-	-
Average	269	5,370	273	5,807	226	5,264	230	5,648	224	6,261	214	6,030
Maximum	310	5,936	320	6,812	267	5,961	254	6,675	245	6,597	256	6,602
Minimum	240	5,043	246	5,031	191	4,774	211	4,841	183	6,021	162	5,820

Table 3.03-2 Monthly Average Influent BOD_5 Concentration and Loadings

	2009		2010		2011		2012		2013		2014	
	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day
January	272	5,011	288	5,593	286	5,936	248	5,952	220	5,779	264	6,601
February	278	5,243	323	6,151	318	6,685	257	6,122	264	6,896	226	6,757
March	252	5,302	300	6,146	271	6,102	294	7,800	261	6,955	189	6,943
April	253	5,504	312	6,201	231	7,167	255	6,341	205	7,252	196	6,817
May	253	5,253	305	6,046	239	6,190	253	6,377	256	7,895	269	7,902
June	271	5,757	295	6,395	284	6,467	288	7,188	275	8,695	301	7,425
July	331	6,552	297	7,332	264	5,719	289	7,069	298	8,300	299	7,058
August	307	6,173	279	6,186	260	6,078	309	7,574	298	7,612	-	-
September	303	5,797	268	6,213	282	6,269	297	7,020	275	7,263	-	-
October	320	6,336	264	6,005	257	6,367	272	6,530	275	7,694	-	-
November	348	6,910	268	5,832	246	5,883	261	6,839	256	6,839	-	-
December	341	6,546	313	6,875	261	6,399	270	7,093	256	6,784	-	-
Average	294	5,865	293	6,248	267	6,272	274	6,826	262	7,330	249	7,072
Maximum	348	6,910	323	7,332	318	7,167	309	7,800	298	8,695	301	7,902
Minimum	252	5,011	264	5,593	231	5,719	248	5,952	205	5,779	189	6,601

Table 3.03-3 Monthly Average Influent TSS Concentration and Loadings

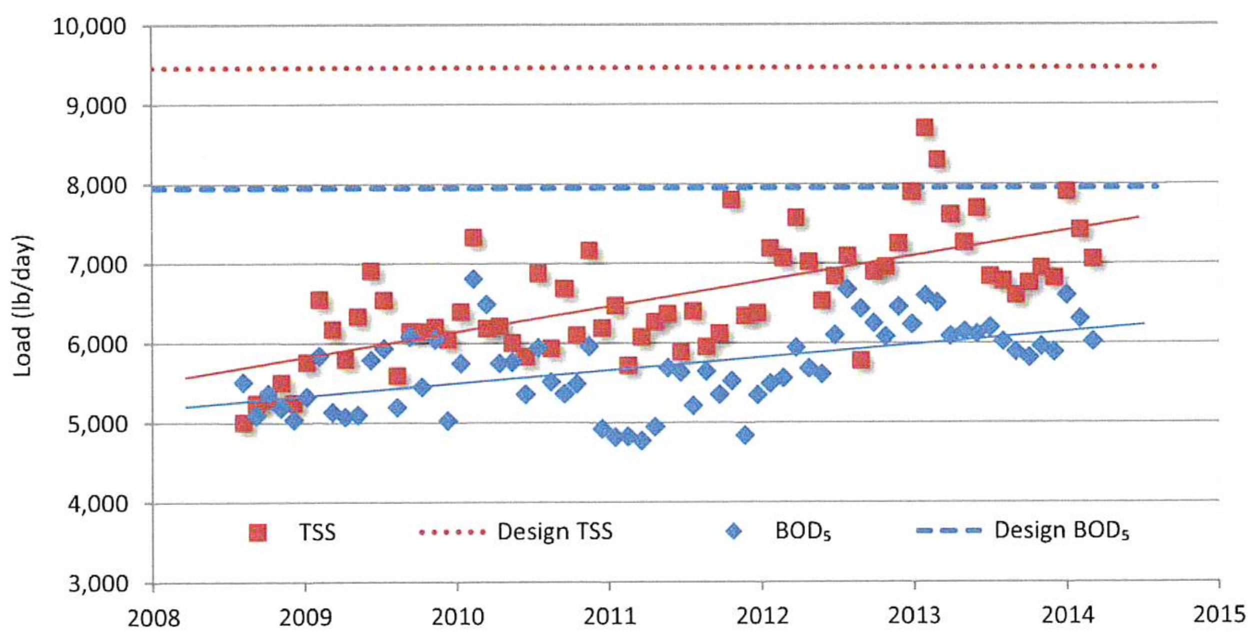


Figure 3.03-2 Monthly Influent BOD_5 and TSS Loadings

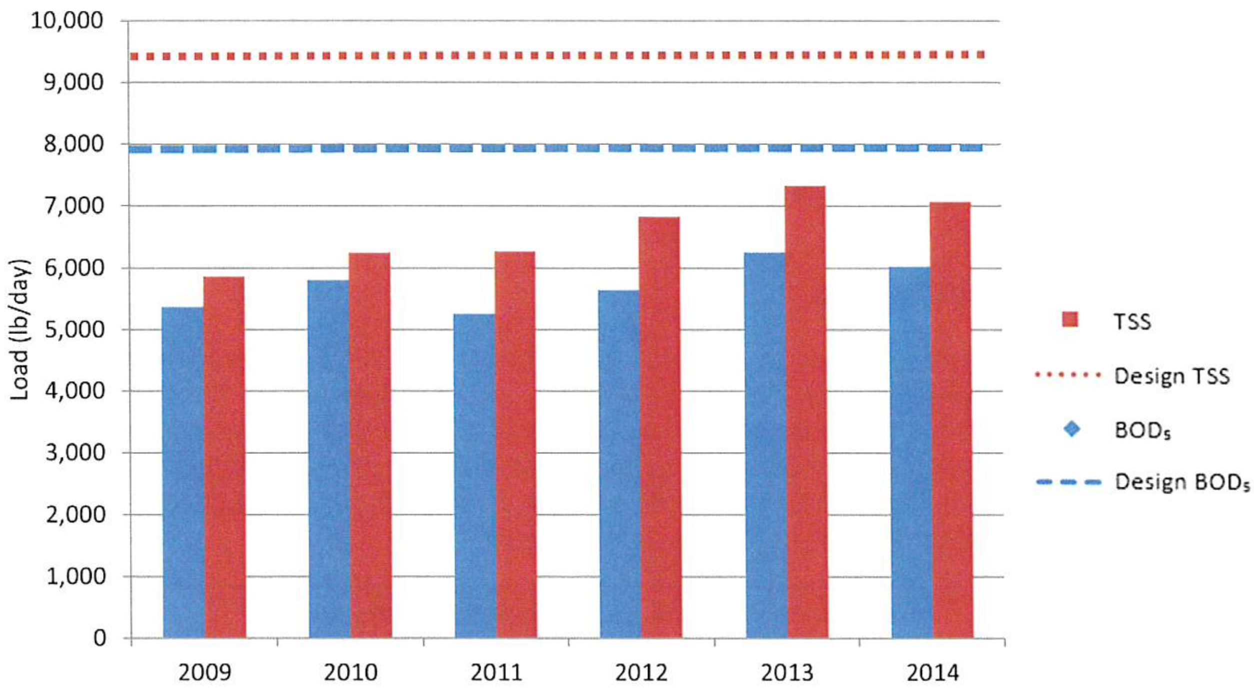


Figure 3.03-3 Annual Average Loadings

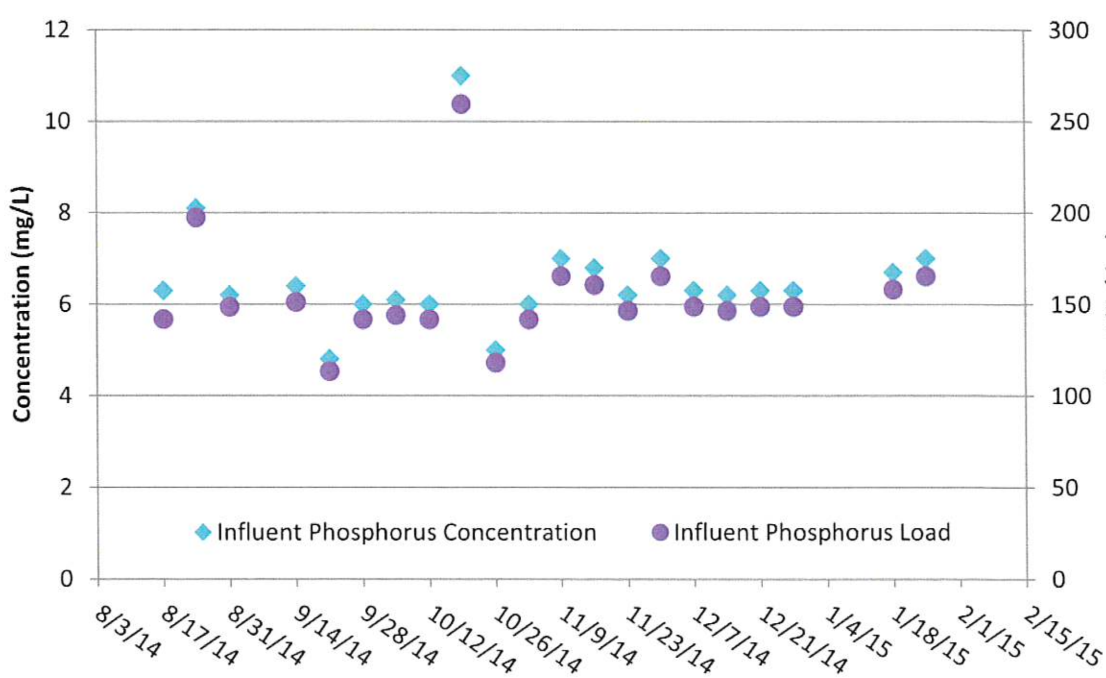


Figure 3.03-4 Influent Total Phosphorus Concentration and Load

3.04 RECYCLE FLOWS

There are several sources that contribute to plant recycle flow and loadings at the RMMSD WWTP, including the subnatant from the DAFT WAS thickeners, supernatant from the biosolids storage tanks, supernatant from the anaerobic digesters, and scum from the primary and secondary clarifiers. All are discharged to the plant sewer system and metered in a 3-inch Parshall fume at the influent pumping station before being discharged to the influent wet well. This flow averaged 0.5 mgd from 2009 through 2013.

3.05 WPDES REQUIREMENTS

The WPDES permit limits currently in effect at the RMMSD WWTP are presented in Table 3.05-1. A copy of the current permit, No. WI- 0035581-06-0, is provided in Appendix A. The facility is operating under a WPDES permit that became effective on December 1, 2010, and expires September 30, 2015. The permit requires monthly monitoring for mercury and twice a year monitoring for chronic whole effluent toxicity (WET) and acute WET testing. The permit includes compliance schedules for a mercury pollutant minimization program and mercury source reduction.

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		mgd	Continuous	Continuous	
BOD_5, Total	Monthly Avg	30 mg/L	5/Week	24-Hr Flow Prop Comp	
BOD_5, Total	Weekly Avg	45 mg/L	5/Week	24-Hr Flow Prop Comp	
BOD_5, Total	Daily Max	1,163 lbs/day	5/Week	Calculated	Limit applies May-October.
Suspended Solids, Total	Monthly Avg	30 mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	5/Week	24-Hr Flow Prop Comp	
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
Phosphorus, Total	Monthly Avg	1.0 mg/L	5/Week	24-Hr Flow Prop Comp	
Fecal Coliform	Geometric Mean	400 #/100 ml	Weekly	Grab	Limit and monitoring apply May-September.
Mercury, Total Recoverable	Daily Max	50 ng/L	Monthly	Grab	See footnote 3.2.1.2 in Appendix A
Nitrogen, Ammonia (NH_3-N) Total	-	mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring shall be monthly in all years other than 2011.
Nitrogen, Ammonia (NH_3-N) Total	-	mg/L	Weekly	24-Hr Flow Prop Comp	Monitoring shall be weekly throughout 2011.
Acute WET	-	TU_a	See Listed Qtr(s)	24-Hr Flow Prop Comp	See footnote 3.2.1.3 in Appendix A.
Chronic WET	-	rTU_c	See Listed Qtr(s)	24-Hr Flow Prop Comp	See footnote 3.2.1.3 in Appendix A.

Table 3.05-1 RMMSD WWTP WPDES Permit Limits

3.06 WASTEWATER TREATMENT PLANT PERFORMANCE

Tables 3.06-1, 3.06-2, 3.06-3, and 3.06-4 summarize the average monthly effluent BOD_5, TSS, phosphorus, and NH_3-N concentrations, respectively, from the RMMSD WWTP.

The RMMSD WWTP consistently meets the effluent limits dictated in the WPDES permit producing high quality effluent. For the period reviewed, there have been no effluent permit violations.

Table 3.06-5 shows the monthly geometric mean for fecal coliforms for the months when disinfection is required. The data show there have been no exceedances in the period analyzed.

	2009	2010	2011	2012	2013	2014
January	12	12	16	16	23	13
February	11	7	19	15	19	11
March	18	8	16	17	10	10
April	20	10	12	17	13	8
May	9	13	9	16	12	6
June	8	11	16	12	13	7
July	9	9	13	25	11	7
August	10	9	13	19	25	-
September	9	11	17	15	24	-
October	8	18	14	16	13	-
November	7	18	13	17	10	-
December	10	18	16	21	8	-
Average	11	12	14	17	15	9
Maximum	20	18	19	25	25	13
Minimum	7	7	9	12	8	6

Table 3.06-1 Average Monthly Effluent BOD_5 Concentrations (mg/L)

	2009	2010	2011	2012	2013	2014
January	10	11	13	14	10	8
February	11	8	25	14	9	7
March	9	8	15	12	10	10
April	12	11	10	10	15	11
May	6	11	9	8	16	7
June	5	11	8	7	9	5
July	5	11	7	7	5	10
August	7	8	6	8	8	-
September	9	12	8	11	13	-
October	8	9	10	9	9	-
November	6	11	9	10	8	-
December	10	15	13	11	9	-
Average	8	10	11	10	10	8
Maximum	12	15	25	14	16	11
Minimum	5	8	6	7	5	5

Table 3.06-2 Average Monthly Effluent TSS Concentrations (mg/L)

	2009	2010	2011	2012	2013	2014
January	0.6	0.7	0.9	0.9	0.6	0.6
February	0.8	0.7	0.9	0.8	0.7	0.7
March	0.9	0.8	0.8	0.7	0.9	0.9
April	0.9	0.9	0.7	0.8	0.9	0.9
May	0.6	0.8	0.8	0.8	0.8	0.7
June	0.9	0.8	0.9	0.8	0.7	0.6
July	0.9	0.6	0.8	0.7	0.7	0.6
August	0.9	0.8	0.6	0.9	0.6	-
September	0.8	0.9	0.9	1.0	0.9	-
October	0.6	0.8	0.9	0.9	0.7	-
November	0.8	0.8	0.8	0.8	0.7	-
December	0.8	1.0	0.8	0.8	0.7	-
Average	0.8	0.8	0.8	0.8	0.8	0.7
Maximum	0.9	1.0	0.9	1.0	0.9	0.9
Minimum	0.6	0.6	0.6	0.7	0.6	0.6

Table 3.06-3 Average Monthly Effluent Phosphorus Concentrations (mg/L)

	2009	2010	2011	2012	2013	2014
January	-	-	36.7	42.2	38.5	45.6
February	-	-	42.7	35.0	35.5	39.2
March	-	-	36.3	37.7	43.3	28.6
April	-	-	26.6	26.0	48.6	38.5
May	-	-	27.8	41.7	40.5	55.8
June	-	-	29.9	33.8	32.8	38.6
July	-	-	27.6	28.8	35.0	17.8
August	-	-	23.1	33.3	41.2	-
September	-	-	20.6	15.3	21.3	-
October	-	-	24.4	29.5	17.2	-
November	-	-	32.3	33.2	8.3	-
December	-	-	37.8	44.0	30.9	-
Average	-	-	30.5	33.4	32.7	37.7
Maximum	-	-	42.7	44.0	48.6	55.8
Minimum	-	-	20.6	15.3	8.3	17.8

Table 3.06-4 Average Monthly Effluent NH_3-N Concentrations (mg/L)

	2009	2010	2011	2012	2013	2014
May	79	31	63	12	86	22
June	178	6	4	23	4	34
July	172	5	6	8	94	17
August	211	8	30	10	7	-
September	221	19	30	212	7	-
Average	172	14	27	53	39	24
Maximum	221	31	63	212	94	34
Minimum	79	5	4	8	4	17

Table 3.06-5 Monthly Average Fecal Coliforms When Disinfection is Required (CFU/100 mL)

3.07 BIOSOLIDS QUANTITY AND QUALITY

Tables 3.07-1 and 3.07-2 summarize the annual biosolids production since the installation of the second biosolids holding tank and the most recent biosolids sampling from the RMMSD WWTP. Biosolids are well within the WDNR quality requirements, and the low metals content allows flexibility when meeting the lifetime metals accumulation requirements for land application sites.

	Biosolids Load-Out Volume (gal)	Average Percent Total Solids (%)
2012	4,277,000	4.9
2013	3,343,000	4.0

Table 3.07-1 Annual Biosolids Load-Out Volume and Percent Solids

Parameter	mg/kg dry weight basis			High Quality Limit
	Apr	Jul	Oct	
arsenic	8.2	<3	3.6	41
cadmium	2.1	1.9	2	39
copper	720	620	610	1,500
lead	21	23	19	300
mercury	1.5	1.2	0.96	17
molybdenum	9.5	8.7	9.6	-
nickel	24	19	23	-
selenium	<10	11	<4.6	-
zinc	890	840	830	2,800

Table 3.07-2 2013 Biosolids Quality

SECTION 4
WASTELOAD AND FLOW FORECASTS

This section develops wastewater flow and loading projections for evaluating future treatment facility capacity and needs. Data from current conditions have been used together with population forecasts and development trends to project design flows and loads for the RMMSD WWTP through 2035.

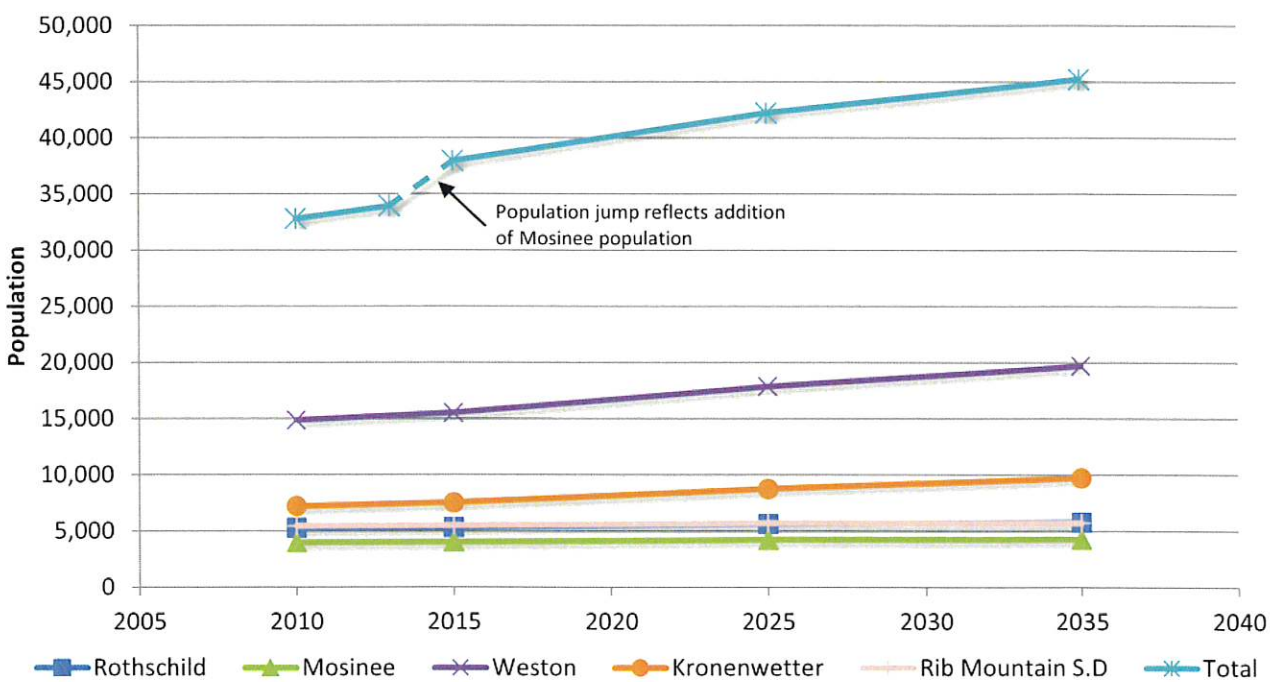
4.01 SEWER SERVICE AREA

The current sewer service area for the RMMSD WWTP is presented in Figure 1.02-1. It is anticipated the overall area served by the RMMSD WWTP will remain as identified.

4.02 POPULATION AND GROWTH PROJECTIONS

Population projections for the RMMSD WWTP are presented in Figure 4.02-1. These projections were based on those included in the *2025 Wausau Urban Area Sewer Service Plan* (2025 Sewer Service Plan) that delineated the 208 sewer service planning area for the RMMSD WWTP and Department of Administration (DOA) population projections completed in 2013. The projected growth in the 2025 Sewer Service Plan is through 2025. This report projects the growth through 2035. Each of the customer communities was contacted regarding the population projections. RMMSD has not received any updated projections and has moved forward using the DOA population projections. Copies of the correspondence with customer communities is included in Appendix C.

The year 2010 census population was approximately 32,807 using the DOA data. Mosinee's population was added in 2012-2013. Future year 2025 population projection is 42,231 and 2035 population projection is 45,227. The current and future industrial and commercial contributions are minimal with no significant growth expected, so they are accounted for in the per capita estimates.



*Mosinee not included in 2010 total population

Figure 4.02-1 RMMSD WWTP Population Projections

4.03 PROJECTED FLOWS

Projecting future wastewater flow requires identification of residential/commercial and industrial wastewater flow, base flows, I/I, peaking factors, and anticipated residential/commercial and industrial growth in areas tributary to the RMMSD WWTP. The data used in these evaluations includes daily flow measurements from the plant's influent flow metering flume from January 2009 through July 2014. It should be noted that the plant influent flow meter includes the plant process return flow that ranges in quantity between 0.2 and 0.9 mgd. However, as noted in the previous section, customers were asked to run water for several months in early 2014. The 2014 data will not be used in flow projections.

A. Dry Weather Base Flows and Per Capita Flows

Since January 2009, the annual average daily flow treated at the RMMSD WWTP has ranged from a low of approximately 2.39 mgd in 2009 to a high of 3.37 mgd in 2013. This reflects a general increasing trend during this time period; some of the increase is due to the addition of Mosinee in October 2012. Over that time period, the maximum month flow was 4.24 mgd in April 2013, the maximum week flow was 4.56 in April 2013, and the maximum day flow was 6.0 mgd on September 24, 2010. The high daily flow occurred in conjunction with a significant rainfall event, and the maximum month and week flows occurred in conjunction with a particularly wet month.

To project future design average and maximum flows, an evaluation was made to establish average dry weather flows to the WWTP and generate an estimate of I/I levels to establish future maximum design flows.

The average dry weather flow, which includes background dry weather infiltration, was established from a review of the WWTP influent flows. Weekly average flows for 2009 through 2013 were reviewed, and the minimum average weekly flow to the WWTP was established as the average dry weather flow for each year. The annual average dry weather flow over this period was 2.46 mgd, with a range of 2.18 mgd to 2.73 mgd. This flow rate is assumed to contain the minimum amount of I/I expected from RMMSD's collection system.

To determine per capita dry weather flow (sometimes referred to as base flow), the average hauled-waste flow components were subtracted from the dry weather flow, and this was divided by the contributing population. Industrial contribution is negligible. As detailed in this section, flows from 2014 were omitted from the analysis because of the atypical weather during that year. The per capita flow was calculated in this manner for 2009 through 2013 and averaged for the 2011 through 2013 period to determine the per capita flow. The average dry weather per capita flow was calculated to be 74.6 gallons per capita per day (gcd).

Because the current and historic per capita flows are lower than expected values, the per capita flow book value of 100 gcd was used to estimate future dry weather base flows from the projected growth in the number of residential and commercial customers. Hauled waste flows were estimated separately but excluded from base flows. I/I components used to estimate wet weather flows were also estimated separately, but these were also excluded from dry weather base flows.

B. Design Flow Projections–Wet Weather Design Flows

The daily flow data from 2009 through 2013 were used to develop wet weather design flows. For each year, the maximum month flows were calculated, and these values were used as the average total wet weather flow. The dry weather base flow and hauled waste flow were subtracted from each of the calculated wet weather flows to estimate wet weather I/I volumes. Table 4.03-1 presents a summary of the various flow determinations 2009 through 2013, including estimates for I/I for each flow category. For average wet weather flow (maximum month) and maximum week flow, the average of the 2011 through 2013 data was used. Because 2012 had particularly low maximum day flows, data from 2010 through 2013 were used to develop an average maximum day flow and per capita rates.

	2009	2010	2011	2012	2013	Average (2011-2013)
Population[1]	32,293	32,807	32,906	34,008	37,124	
Average Dry Weather Flows[2]						
Total Dry Weather Flow (mgd)	2.18	2.23	2.42	2.72	2.73	2.62
Average Hauled Waste Flow (mgd)[3]	0.037	0.037	0.037	0.037	0.037	
Total Flow without Hauled Waste Flows	2.15	2.19	2.38	2.68	2.69	
Per Capita Dry Weather Flows (gcd)	66	67	72	79	72	74.6
Average Annual Flows[2]						
Total Average Annual Flow (mgd)	2.39	2.57	2.83	2.96	3.37	3.05
Average Hauled Waste Flow (mgd)[3]	0.037	0.037	0.037	0.037	0.037	
Total Flow without Hauled Waste Flows	2.35	2.53	2.79	2.92	3.33	
Per Capita Average Annual Flows (gcd)	73	77	85	86	90	86.84
Average Annual I/I (mgd)	0.21	0.34	0.41	0.24	0.64	0.43
Average Wet Weather Flows (Maximum Month)[2]						
Maximum Month Flow (mgd)	2.59	2.97	3.64	3.15	4.24	3.68
Average Hauled Waste Flow (mgd)[3]	0.037	0.037	0.037	0.037	0.037	
Total Flow without Hauled Waste Flows	2.55	2.93	3.60	3.11	4.20	
Per Capita Maximum Month Flows (gcd)	79	89	109	91	113	105
Maximum Month I/I (mgd)	0.40	0.74	1.22	0.43	1.51	1.05
Max. Week Flows[2]						
Maximum Week Flow (mgd)	2.96	3.74	4.35	3.38	4.56	4.10
Average Hauled Waste Flow (mgd)[3]	0.037	0.037	0.037	0.037	0.037	
Total Flow without Hauled Waste Flows	2.92	3.70	4.31	3.34	4.52	
Per Capita Maximum Week Flows (gcd)	90	113	131	98	122	117
Maximum Week I/I (mgd)	0.77	1.51	1.93	0.66	1.83	1.48
Max. Day Flows[2]						
Maximum Day Flow (mgd)	3.16	6.02	5.13	3.86	4.83	4.96
Average Hauled Waste Flow (mgd)[3]	0.037	0.037	0.037	0.037	0.037	
Total Flow without Hauled Waste Flows	3.12	5.98	5.09	3.82	4.79	
Per Capita Maximum Day Flows (gcd)	97	182	155	112	129	145
Maximum Day I/I (mgd)	0.98	3.79	2.71	1.14	2.10	2.44

[1]City of Mosinee population and flow incorporated in October 2012.
[2]2009 and 2012 were drier than average years, while 2010 and 2013 were wetter than average years.
[3]Average 2012 and 2013 hauled waste flows used for all calculations.
[4] Data from 2010 through 2013 used for Maximum Day Flow calculations.

Table 4.03-1 Existing Per Capita Flows and I/I Calculations

C. Design Flow Development

Design flows for 2025 and 2035 were developed by multiplying the projected populations for each year by the average dry weather per capita flow of 74.6 gcd for current population and 100 gcd for future population to obtain dry weather residential/commercial base flows of approximately 3.28 mgd and 3.58 mgd, respectively. The amount of I/I in the collection system for each of the design wet weather flows (maximum month and maximum week) was assumed to remain constant as ongoing CMOM efforts aim to keep I/I to a minimum. Hauled waste volumes were assumed to increase by 5 percent and 10 percent for 2025 and 2035, respectively, which would also accommodate any unforeseen industrial flows. A 10 percent allowance for unforeseen growth has been included in the design flows as well to account for additional unforeseen industrial, residential, or commercial growth. Table 4.03-2 summarizes the projected design flows.

	2025	2035
RMMSD Population Projection	42,231	45,227
Residential/Commercial Dry Weather Flows (includes dry weather I/I)		
Per Capita Flow Existing (gcd)	74.6	74.6
Per Capita Flow Future (gcd)	100.0	100.0
Average Dry Weather Flow (mgd)	3.28	3.58
I/I		
Average Day (mgd)	0.43	0.43
Wet Weather Average Day/Maximum Month (mgd)	1.05	1.05
Maximum Week (mgd)	1.48	1.48
Maximum Day (mgd)	2.44	2.44
Hauled Waste and Unforeseen Growth		
Current Hauled Waste (mgd)	0.037	0.037
Unforeseen Hauled Waste (mgd)	0.003	0.005
Unforeseen Growth (mgd)	0.328	0.358
Design Flow Summary		
Average Dry Weather Flow (mgd)	3.65	3.98
Average Annual Flow (mgd)	4.08	4.41
Maximum Month Flow (mgd)	4.70	5.03
Maximum Week Flow (mgd)	5.12	5.45
Maximum Day Flow (mgd)	6.08	6.42

Table 4.03-2 Design Flow Development

D. Peak Hourly and Instantaneous Flow

Flow data from days with significant rainfall events were reviewed to determine peak hourly and peak instantaneous flows. These are summarized in Table 4.03-3. Of the five peak hourly flows shown in Table 4.03-3, the September 24, 2010 flow of 7.56 mgd was the highest. This day also corresponds to the maximum day flow of 6.02 mgd for 2010. By taking the ratio of peak hour to maximum day, 7.56 mgd divided by 6.02 mgd, a peaking factor of 1.26 was calculated. Multiplying this ratio by the 2035 design maximum day flow of 6.42 mgd delivers a flow of 8.09 mgd. The year 2035 design peak hour flow will be 8.09 mgd. Of the five peak instantaneous flows shown in Table 4.03-3, the

September 24, 2010, flow of 9.29 mgd was the highest. This was less than the 1984 design peak hourly flow of 12.29 mgd. For year 2035, the design peak instantaneous flow will be 12.29 mgd.

Date	Hourly Flow (mgd)	Instantaneous Flow (mgd)
September 24, 2010	7.56	9.29
April 10, 2011	6.18	9.22
April 11, 2011	5.90	8.13
April 7, 2014	5.73	8.27
April 6, 2014	5.71	6.95
Maximum	7.56	9.29

Table 4.03-3 Peak Flows

4.04 PROJECTED LOADINGS

The per capita and future design loadings for RMMSD were developed using an analysis similar to that employed for the flow projections. Per capita loadings for BOD_5 and TSS were determined using existing data for plant influent and hauled waste, while total Kjeldahl nitrogen (TKN) and phosphorus loadings were calculated using the midpoint of published municipal wastewater values. Projections of future loadings were developed using populations projected in the 208 plan and local projections, typical planning value per capita loadings, and current hauled waste loadings.

A. Calculated Per Capita Loadings

The per capita WWTP loading estimates for BOD_5 and TSS are based on data collected from 2009 to 2013. TKN and phosphorus per capita loading estimates are based on historical data and textbook values for municipal wastewater standards. Estimates of the per capita loadings are presented in Table 4.04-1 for BOD_5, TSS, TKN, and phosphorus. The average per capita BOD_5 load (no hauled wastes) was calculated as 0.153 pounds per capita per day (pcd), which is less than the typical range of 0.17 to 0.22 pcd. The average per capita TSS load of 0.177 pcd is also less than the normal range for TSS of 0.20 to 0.25 pcd. The per capita loadings for TKN and phosphorus during this time averaged 0.043 pcd and 0.0024 pcd, respectively. TKN loadings were based on information included in the *2009 Facilities Upgrade and Long-Range Strategic Plan.*

B. Projected Per Capita Loadings

The projected average design loadings for BOD_5 and TSS were developed using the midpoint of the typical ranges of the per capita loads (as noted above) for the residential/commercial portion of the projections and adding the current waste hauler loadings. A 10 percent allowance for unforeseen growth has been included in the design loadings to account for additional unforeseen industrial, residential, or commercial growth. Actual data is below typical ranges. The more conservative path of using the textbook values is being used for this design. The TKN projected average design loading was calculated similarly; however, the per capita loadings calculated above were used for the residential/commercial portion of the projections. Table 4.04-2 presents the projected design loadings for BOD_5, TSS, TKN, and phosphorus for 2025 and 2035. The projected average design loading for phosphorus was determined using the same method as the TKN projection along with the use of partial 2014 and 2015 influent phosphorus concentrations presented in Figure 3.03-4 for the residential/commercial portion of the projections.

	2009	2010	2011	2012	2013	Average
Population[1]	32,293	32,807	32,906	34,008	37,124	
Total BOD_5 (lbs/day)	5,370	5,807	5,264	5,648	6,261	
Hauled Waste BOD_5 (lbs/day)[3]	484	484	484	484	484	
Residential/Commercial (lbs/day)	4,886	5,323	4,780	5,164	5,777	
Per Capita BOD_5 Loading (pcd)	0.151	0.162	0.145	0.152	0.156	0.153
Total TSS (lbs/day)	5,865	6,248	6,272	6,826	7,330	
Hauled Waste TSS (lbs/day)[3]	504	504	504	504	504	
Residential/Commercial (lbs/day)	5,361	5,744	5,768	6,322	6,826	
Per Capita TSS Loading (pcd)	0.166	0.175	0.175	0.186	0.184	0.177
Total TKN (lbs/day)[2]	1,303	1,401	1,543	1,613	1,837	
Hauled Waste TKN (lbs/day)[3]	73.7	73.7	73.7	73.7	73.7	
Residential/Commercial (lbs/day)	1,229	1,327	1,469	1,539	1,763	
Per Capita TKN Loading (pcd)	0.038	0.040	0.045	0.045	0.047	0.043
Total phosphorus (lbs/day)[3]	87	94	103	108	120	
Hauled Waste phosphorus (lbs/day)[3]	21	21	21	21	21	
Residential/Commercial (lbs/day)	66	73	82	87	99	
Per Capita phosphorus Loading (pcd)	0.002	0.002	0.002	0.003	0.003	0.0024

[1] City of Mosinee population and flow incorporated in October 2012.

[2] Calculated from TKN loading and flow from Facilities Upgrade and *Long-Range Strategic Plan 2009.*

[3] Calculated from data from Wisconsin facilities.

Table 4.04-1 Per Capita Loading Calculations

Annual average-based peaking factors were developed for the maximum month, maximum week, and maximum day loading conditions using the approach outlined in the WDNR peaking factor worksheet (Appendix C). These peaking factors were then applied to the 2025 and 2035 average loading projections to develop the maximum design loadings for the future design years. Table 4.04-3 presents the calculated peaking factors for BOD_5 and TSS and summarizes the 2013 actual loadings with the projected 2025 and 2035 loadings, design maximum month, week, and day loadings. Figure 4.04-1 presents the projected design loading trends.

	2025	2035
Population	42,231	45,227
Per Capita BOD_5 Loading (pcd)[1]	0.195	0.195
Residential/Commercial (lbs/day)	6,685	7,270
Hauled Waste BOD_5 (lb/day)	484	484
Unforeseen Hauled Waste BOD_5 (lb/day)	24.2	48.4
Unforeseen Growth BOD_5 (lb/day)	669	727
Total BOD_5 (lb/day)	7,862	8,529
Per Capita TSS Loading (pcd)[1]	0.225	0.225
Residential/Commercial (lbs/day)	7,729	8,403
Hauled Waste TSS (lb/day)	504	504
Unforeseen Hauled Waste TSS (lb/day)	25.2	50.4
Unforeseen Growth TSS (lb/day)	773	840
Total TSS (lb/day)	9,031	9,798
Per Capita TKN Loading (pcd)	0.043	0.043
Residential/Commercial (lbs/day)	1,824	1,953
Hauled Waste TKN (lb/day)	73.7	73.7
Unforeseen Hauled Waste TKN (lb/day)	3.7	7.4
Unforeseen Growth P (lb/day)	182	195
Total TKN (lb/day)	2,084	2,230
Per Capita P Loading (pcd)	0.0024	0.0024
Residential/Commercial (lbs/day)[2]	101	108
Hauled Waste P (lb/day)	21	21
Unforeseen Hauled Waste P (lb/day)	1.1	2.1
Unforeseen Growth P (lb/day)	10	11
Total P (lb/day)	133	142

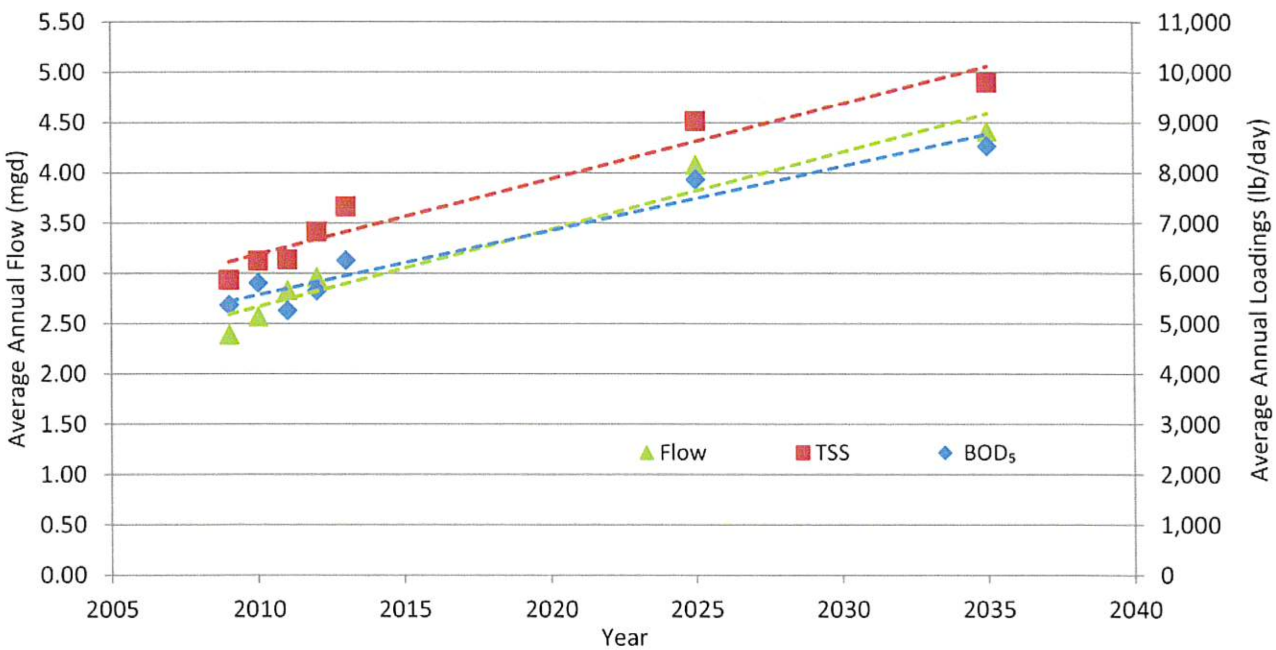
[1]Average per capita load of typical range used for future loadings.

[2]Calculated from 2014/2015 influent phosphorus concentration.

Table 4.04-2 Projected Average Design Loading

	Peaking Factor	Existing 2013	Projected 2025	Projected 2035
Average Day BOD_5 Loading (lb/day)	---	6,262	7,862	8,529
Maximum Month BOD_5 Loading	1.05	6,597	8,283	8,985
Maximum Week BOD_5 Loading	1.24	7,735	9,712	10,535
Maximum Day BOD_5 Loading	1.69	10,554	13,251	14,375
Average Day TSS Loading (lb/day)	---	7,331	9,031	9,798
Maximum Month TSS Loading	1.19	8,695	10,711	11,620
Maximum Week TSS Loading	1.33	9,769	12,034	13,056
Maximum Day TSS Loading	2.10	15,430	19,008	20,622

Table 4.04-3 Peaking Factors and Design Loadings



1. Flow from 2014 was eliminated from the evaluation as a result of unusually low temperatures requiring residents to keep water running.
2. 2009 through 2013 data is actual data.
3. City of Mosinee flow and loadings were incorporated in October 2012.

Figure 4.04-1 Design Loading Trends

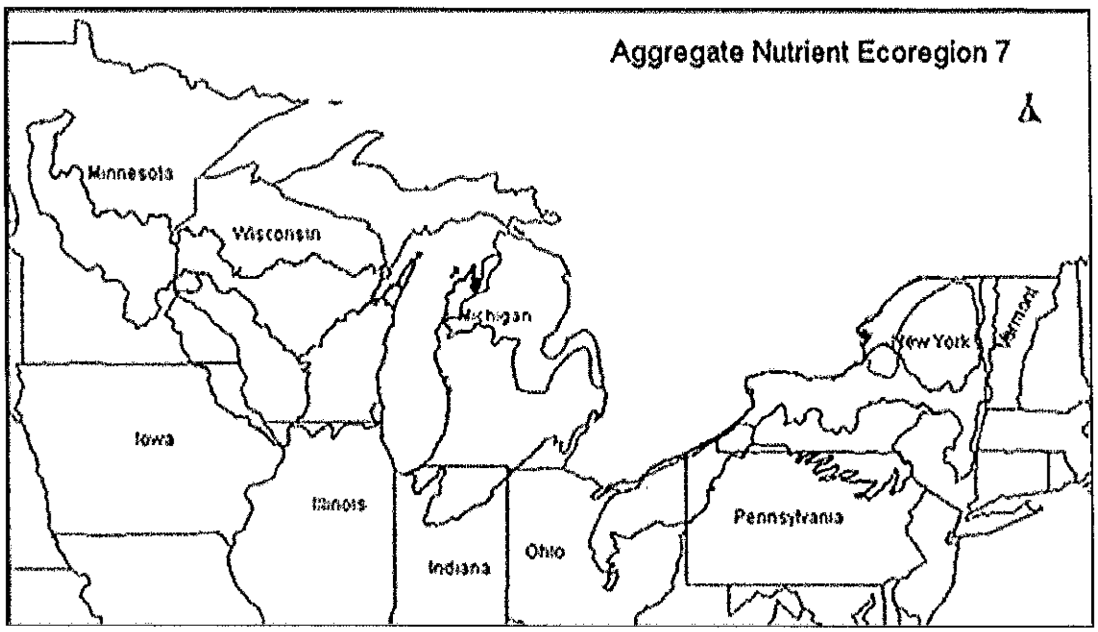
SECTION 5
WATER QUALITY STANDARDS AND DISCHARGE PERMIT REQUIREMENTS

Permit limits and regulatory standards are revised as society's understanding of its environmental impact grows. Implementation of new permit limits and regulatory standards can require substantial changes in WWTP operations and treatment facility needs. New regulations affect effluent limits and the disposal of biosolids, among other things. This section discusses current and anticipated future national and state regulatory strategies and how these might apply to the WWTP. It also recommends provisions that should be included in any proposed WWTP modifications to address these future regulatory concerns.

5.01 NATIONAL NUTRIENT STRATEGY

In December 2000, the United States Environmental Protection Agency (USEPA) published recommended regional water quality criteria with the goal of reducing the impact of excess nutrients to waterbodies. The USEPA is now working with states to adopt appropriate water quality criteria for nutrients. States were expected to adopt the recommended water quality criteria or develop their own by 2004, but this schedule was revised to allow states more time to develop rules.

The RMMSD WWTP discharges to the Wisconsin River downstream of Wausau and upstream of the Mosinee Flowage. This discharge location is in Rivers and Streams Ecoregion VII as shown in Figure 5.01-1. The USEPA's recommended aggregate criteria for rivers and streams in this ecoregion are presented in Table 5.01-1. Permit limits will sometimes be higher than a criterion because consideration can be given to dilution of the effluent with the receiving water. In the case where the receiving water's background water quality is higher than the criterion, or the receiving water's dilutional flow is low, the permit limit may be set at the criterion.



Source: USEPA *Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria for Rivers and Streams in Ecoregion VII*, Washington, D.C.: GPO, 2000) 7.

Figure 5.01-1 Aggregate Nutrient Region for Region VII Rivers and Streams

Parameter	Nutrient Criteria
Total Phosphorus	33 μg/L
Total Nitrogen	0.54 mg/L
Chlorophyll *a*	3.50 μg/L
Turbidity	1.7 NTU

Table 5.01-1 USEPA Recommended Nutrient Criteria for Rivers and Streams in Ecoregion VII

In 2007, an environmental advocacy group, the Natural Resources Defense Council (NRDC), petitioned the USEPA to revise its secondary treatment regulations to include numeric effluent limitations for discharges of nitrogen and phosphorus. The petition proposes an effluent limit of 0.3 mg/L for total phosphorus (TP) and 3 to 8 mg/L for total nitrogen. It is possible these or similar effluent limitations would be adopted instead of, or in addition to, water quality-based criteria.

Concern over the Gulf of Mexico hypoxia could impact nutrient limits, particularly nitrogen. On June 16, 2008, the USEPA and other agencies submitted an action plan to the United States Congress that outlined a strategy to reduce the size of the hypoxic zone off the coast of Louisiana. The hypoxic zone was approximately 7,900 square miles at that time. Nutrients from the Mississippi River Basin, which includes the Wisconsin River, are identified as one of the causes of hypoxia. Hypoxia refers to a condition where dissolved oxygen concentrations in the water drop to a level that does not adequately support fish and other desirable aquatic species. To decrease the size of the hypoxic zone, the action plan depends on incentives and voluntary-based approaches to reduce agricultural runoff and restore wetlands. Additionally, permitting authorities within the Mississippi River Basin may require publicly owned treatment works (POTWs) to remove nutrients to reduce loadings. (*Mississippi River/Gulf of Mexico Watershed Nutrient Task Force 2008 Action Plan for Reducing, Mitigating, and Controlling Hypoxia in the Northern Gulf of Mexico*, Washington, D.C.)

5.02 WISCONSIN NUTRIENT STRATEGY

According to the Wisconsin Department of Natural Resources (WDNR), nutrients, particularly phosphorus, will remain a primary focus of regulatory concern.

A. New Phosphorus Regulations

Phosphorus rule revisions were passed by the Wisconsin State Legislature and became effective on December 1, 2010. These regulations established numeric water quality criteria for phosphorus. The criterion for the Wisconsin River is 0.1 mg/L. A different (downstream) criterion can be used by the WDNR to improve and protect downstream waters, if deemed necessary. Stratified reservoirs, such as Petenwell Flowage, have a criterion of 0.03 mg/L. If dilution is not available in the receiving stream because of high upstream phosphorus concentrations or low stream flow, the WWTP water quality-based effluent limit (WQBEL) may be set at the criterion as described in Wisconsin Administrative Code Chapter NR 217 at s. 217.13. The Wisconsin River has adequate dilution and meets the water quality criteria for phosphorus in the Wisconsin River at the RMMSD WWTP discharge location.

To date, several WPDES permits have been reissued with the new, more stringent phosphorus limits. The compliance schedule for stringent WQBELs is typically listed as seven to nine years. These permits require an initial phosphorus optimization study in the first year after permit reissuance, facilities planning in the next three years, and drawings and specifications, if required for new or enhanced phosphorus removal facilities, before the end of the first five-year permit term. Chapter NR 217 includes several options for compliance with the stringent phosphorus limits, and some of these are shown in Figure 5.02-1 and described in the next subsection. Permittees are encouraged to explore these options during facilities planning to determine the best, most cost-effective alternative for their particular situation.

B. Anticipated Impact of New Phosphorus Regulations on the RMMSD WWTP

The expected NR 217.13 WQBEL for the RMMSD WWTP would be 1 mg/L (the current effluent limit, unchanged) because the Wisconsin River meets the water quality criterion at the location of the RMMSD discharge. However, RMMSD may receive a lower limit based on the outcome of the Wisconsin River TMDL. Should RMMSD receive a lower phosphorus limit, several options are available in NR 217 that could mitigate this effluent limit. Options that appear most applicable to RMMSD include a TMDL-based WQBEL, water quality trading, and the state-wide variance.

1. TMDL-Based WQBEL

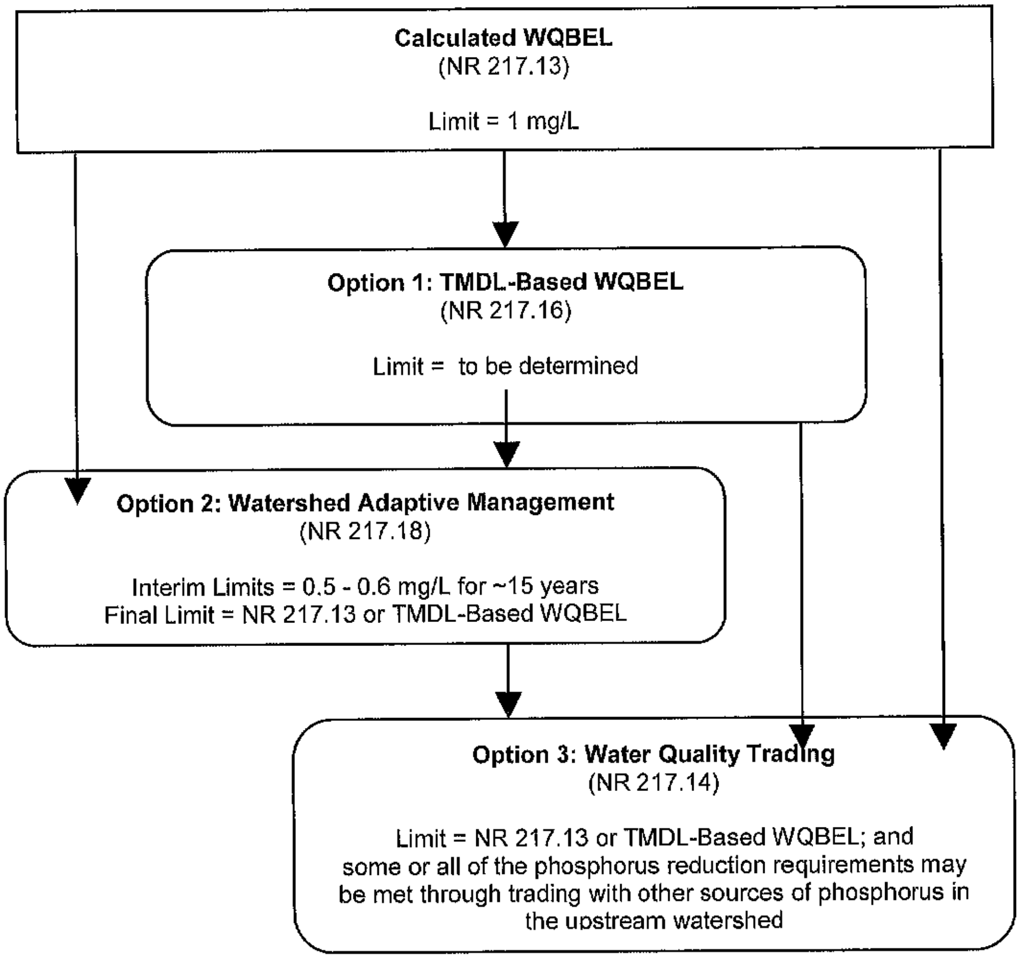
This option may be available in locations where a phosphorus TMDL has been completed and approved by the USEPA. A TMDL is under development for the Wisconsin River. A TMDL-based WQBEL may be available in lieu of, or in addition to, an NR 217.13 WQBEL. Typically, a TMDL-based WQBEL in an agricultural watershed will be higher than an NR 217.13 WQBEL because the TMDL accounts for all the sources in a watershed, point and nonpoint. However, in RMMSD's case, the TMDL-based phosphorus limit may be significantly lower than the WQBEL because the TMDL-based phosphorus limit is developed to meet the lower stratified reservoir criterion. Compliance schedules for TMDL-based phosphorus limits are similar to those for NR 217.13 WQBELs.

The approved TMDLs in Wisconsin have used different methodologies for assigning daily wasteload allocations (WLAs) to WWTPs for TP and TSS. Limits have been incorporated into permits as monthly or annual mass allocations. Annual or six-month mass allocations have typically resulted in higher limits for WWTPs. Detailed descriptions of each approved TMDL in Wisconsin are available on the WDNR's Web site in the WDNR's *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs Edition No. 3* document.

Regardless of the exact approach used by the WDNR in developing WLAs for the Wisconsin River TMDL, the WLAs will be mass-based. Because the TMDL WLAs are mass-based (lbs/mo or lbs/day), RMMSD will be able to discharge a higher effluent phosphorus concentration at current WWTP flows and still meet the limits.

Assuming the Wisconsin River TMDL progresses on schedule and is completed in 2017, we expect the TMDL-based limits will be incorporated into RMMSD's permit when it is reissued. This means that if the WDNR reissues RMMSD's permit in the next year, TMDL limits will be expected to be incorporated in the 2021 reissuance.

Figure 5.02-1 Chapter NR 217 Compliance Options



Notes:
Other options include variances or site-specific standards, although these are less likely.
WQBEL = water quality-based effluent limit.
NR 217 = Wisconsin Administrative Code chapter NR 217.

2. Watershed Adaptive Management

A watershed adaptive management option is available to WWTPs when at least 50 percent of the phosphorus load to the receiving stream comes from nonpoint sources and permitted municipal separate storm sewer systems (MS4s). WWTPs must apply to the WDNR for this option. If accepted, it will allow three extra permit terms before a WQBEL goes into effect. There are interim phosphorus limits of 0.6 mg/L for the first permit term and 0.5 mg/L for the second and third permit terms. The fourth permit term would include the (possibly recalculated) NR 217.13 or TMDL-based WQBEL, after which there will be a five-year compliance schedule. During the interim time period, WWTPs are expected to optimize the WWTP process, work with other dischargers in the watershed to reduce point and nonpoint sources of phosphorus, and monitor phosphorus in the surface water and report results to WDNR.

RMMSD discharges to a nonpoint source dominated reach of the Wisconsin River; however, the large watershed upstream of RMMSD makes adaptive management an infeasible alternative.

3. Water Quality Trading

Once an NR 217.13 or TMDL-based WQBEL is included in a WPDES permit, water quality trading may be an option. In this alternative, RMMSD would pay for land or modified agricultural or urban practices that would reduce the amount of phosphorus reaching the Wisconsin River upstream of the WWTP. A trade ratio of about 2 to 1 typically applies, whereby nonpoint load reductions would need to remove twice the phosphorus that the WWTP would have had to remove. This is because of uncertainties associated with nonpoint source phosphorus reduction modeling, lack of required in-stream monitoring, and other factors. Water quality trading may be used to meet some or all of the required phosphorus reduction and could be implemented after watershed adaptive management is implemented. This may be a reasonable approach for RMMSD since there are many agricultural and other nonpoint sources discharging to the river upstream of the WWTP. RMMSD's customer communities MS4s could also be trading partners. In the event that RMMSD receives low phosphorus limits, trading may be a good option for offsetting peak loads. A more detailed evaluation focused on specific solutions in partnership with Marathon County's input should be completed during the phosphorus compliance schedule before selecting this option.

4. Legislative Variance

There may be an option for RMMSD to apply for the State of Wisconsin's proposed legislative variance in lieu of, or in combination with, other alternatives. This option includes a 20-year variance that would require RMMSD to pay $50 per pound for the amount of TP that is discharged over 0.2 mg/L. The proposed variance also includes interim effluent limits of 0.8 mg/L, 0.6 mg/L, and 0.5 mg/L for each of the next three (5-year) permit terms, respectively. This option could be more cost-effective than treatment to below ~0.2 mg/L and will be evaluated with the compliance alternatives. This proposed variance is under review and is not yet approved by the regulatory agencies. At this time, the WDNR is reviewing public comments on the preliminary determination and will be making a final determination on its recommendation for the multidischarger variance. If the WDNR recommends approval of the multidischarger variance, they will submit it to the USEPA for approval. A WDNR fact sheet on the multidischarger variance is included in the Appendix D.

C. Total Nitrogen, Chlorophyll a, and Turbidity

The USEPA is expecting states to develop water quality standards for total nitrogen and other nutrient-related parameters in addition to phosphorus. The WDNR's surface water quality studies have not shown good correlations between total nitrogen concentrations and algae or other biological impairments. Phosphorus is generally understood to be the limiting nutrient and, therefore, the nutrient that requires control in Wisconsin surface waters. In the past, the WDNR has stated that it may use a different approach to total nitrogen control than it did for phosphorus such as requiring a certain percent reduction for Mississippi River Basin dischargers. The required reductions would be based on regional goals for the Gulf of Mexico hypoxia control. This approach may not be acceptable to the USEPA, however. While the WDNR's approach and schedule are currently uncertain, new total nitrogen effluent limits appear likely within approximately the next 10 to 20 years for RMMSD. For 20-year planning purposes, limits in the treatment technology-based range of 3 to 8 mg/L can be assumed. It appears likely the WDNR will allow watershed-based solutions such as watershed adaptive management or water quality trading to be used for total nitrogen effluent limit compliance.

5.03 AMMONIA REGULATIONS

Ammonia surface water quality standards were previously revised by the WDNR to agree with promulgated USEPA criteria. According to the January 4, 2010, water quality effluent limits memorandum, RMMSD's associated ammonia-nitrogen effluent limit has been calculated by the WDNR, and the lowest daily maximum limit is 40 mg/L. Limits are not required when the calculated limits are greater than 40 mg/L. However, the WDNR included additional monitoring in RMMSD's permit because data indicated that the plant effluent ammonia can exceed 40 mg/L on occasion. If future evaluations indicate that ammonia limits are necessary, the limit can be addressed cost-effectively by using effluent pH adjustment facilities. This is because as pH decreases, ammonia toxicity is reduced, and maximum day limits are calculated based only on effluent pH and not river pH.

The current state and federal water quality standards for ammonia are based primarily on toxicity to fish. The USEPA developed more stringent ammonia criteria for surface waters that have the ability to support mussels and snails that are more sensitive to ammonia. This could include the Wisconsin River. The USEPA released its draft mussel and snail-based ammonia criteria in 2009 and public comments have been received. The USEPA has adopted these criteria, but the schedule for subsequent state implementation is unknown at this time. It appears this initiative will result in more stringent effluent ammonia-nitrogen limits for the RMMSD WWTP within approximately the next five to ten years.

5.04 CHLORIDE REGULATIONS

Several years ago, the WDNR reviewed chloride regulations and the way chloride limits are implemented. These regulations will not likely impact the RMMSD WWTP because of the soft groundwater in the area and the large dilution of treated effluent in the Wisconsin River. The primary source of chlorides in wastewater in Wisconsin comes from water softening. Since the groundwater is already soft, communities served by RMMSD do not need to soften their water and hence do not add enough chlorides to significantly affect the WWTP.

RMMSD should continue to track its effluent chloride concentrations as required with each WPDES permit application.

5.05 MERCURY REGULATIONS

The effluent limits for mercury as shown in Table 3.05-1 and included in the January 4, 2010, water quality memorandum are based on wildlife and human threshold criteria and are set equal to the criteria in accordance with NR 106.06(6) because the background concentration in the Wisconsin River exceeds the wildlife and human threshold criteria. RMMSD's 30-day P99 was 16 nanograms per liter (ng/L), which is above the Wisconsin wildlife criterion for mercury of 1.3 ng/L. In lieu of an effluent limit, s. NR 106.145 allows a variance for mercury in light of its ubiquitous presence in the environment. An alternative concentration limit (ACL) has been calculated for RMMSD equal to the 1-day P99 of 50 ng/L and expressed as a daily maximum limit. This ACL is included in RMMSD's permit.

RMMSD has partnered with the Marathon County Health Department and is voluntarily implementing a mercury pollutant minimization program (PMP). The PMP includes requiring dental offices to install and maintain amalgam separators because this is known to be a source of mercury in collection systems, a thermometer exchange program, and a public education campaign. The 2014 RMMSD annual report is included in Appendix D and contains a full description of the program.

The WDNR has asserted that the primary source of mercury in most systems is dental offices. Past discharges from other various sources including schools, medical labs, and residences may also contribute mercury since small amounts remaining in portions of the collection system may dissolve slowly over a long time frame. Additional surveys, inspections, and discussions with customers with regard to mercury may be required if RMMSD has difficulty complying with its mercury ACL.

5.06 THERMAL STANDARDS

The State of Wisconsin has adopted thermal standard rule revisions in Chapters NR 102 and NR 106 of the Wisconsin Administrative Code. The rules have an effective date of October 1, 2010. Chapter NR 102 was revised to create water quality standards for heat in surface waters. Chapter NR 106 was revised to include procedures to implement the thermal standards in WPDES permits issued to point sources discharging to surface waters of the state. The WDNR has stated that it does not expect the thermal standards to have an impact on existing POTWs except in unusual situations or where there is a high temperature industrial discharge to the POTW. The WDNR staff has been active in developing guidance documents and training modules to help interested parties understand the various elements of the thermal rule revisions. Thermal dissipative cooling evaluations are an option for POTWs to show that temperature dissipates quickly in the receiving stream such that effluent limits are not required. The WWTP is currently monitoring effluent temperature in accordance with the guidelines. Once the monitoring is complete, RMMSD should determine its potential to exceed the proposed limits. Because of the large amount of dilution available in the Wisconsin River, it is unlikely that RMMSD's effluent causes a thermal disruption that warrants a limit. At this time it appears unlikely that RMMSD's reissued permit will include temperature limits.

5.07 ANTIDEGRADATION ANALYSIS

Within the USEPA's framework of water quality criteria, the nation's waterbodies are to be protected through compliance with water quality standards. Water quality standards are comprised of the following:

1. Designated uses.
2. Instream water quality criteria (both numeric and narrative) required to support the designated use.
3. An antidegradation policy intended to prevent waterbodies that do meet water quality criteria from deteriorating beyond their current condition.

The WDNR intends to update its antidegradation rules in the near future, possibly within the next three years.

The RMMSD WWTP permit does not currently include mass limits related to antidegradation, except for a mass limit for daily maximum BOD_5. This limitation is equal to an effluent BOD_5 concentration of 33 mg/L times the current design average flow (4.27 mgd) times a conversion factor (8.34). An effluent BOD_5 concentration of 33 mg/L is between the monthly average and weekly average effluent limits. It is only in effect from May to October and is intended to limit future impacts upon the stream caused by population growth. Currently, the RMMSD WWTP effluent easily meets permit limits for both BOD_5 and TSS. Since the 20-year flow projections will only increase the design average flow by a limited amount, it is unlikely that the antidegradation policy will have a large impact on the RMMSD WWTP within the next 20 years. This policy may play a larger role in the distant future (beyond 20 years) when effluent filtration or other means may be required to meet decreasing concentration limits that will result from increasing design flows.

5.08 BIOSOLIDS HANDLING AND BENEFICIAL REUSE

Biosolids handling at the RMMSD WWTP follows the requirements of Chapter NR 204, Domestic Sewage Sludge Management. RMMSD generates Class B biosolids, which by definition has a higher level of pathogenic bacteria than Class A. The digested biosolids fecal coliform count at the RMMSD WWTP is consistently below 2,000,000 Most Probable Number (MPN) required by NR 204 for Class B biosolids. Additionally, the anaerobic digester typically meets the 38 percent volatile solids reduction requirement in NR 204 and/or biosolids are incorporated into the soil as required. Local farmers have accepted the Class B biosolids for disposal on agricultural land. The majority of POTWs in Wisconsin produce Class B biosolids. A WDNR official indicated the department likely would not require WWTPs to produce a Class A biosolids in the foreseeable future. However, the official stated that the decision to produce a Class A biosolids is a local one based on local conditions.

Class A biosolids must have a fecal coliform concentration of less than 1,000 MPN. They also must meet high quality criteria for metals, if you want them to be labeled "exceptional quality." Biosolids that are considered "exceptional quality" or Class A do not need to meet the lifetime cumulative metal loadings to be land-applied according to NR 204. Land application site evaluation reports would not be required. No bulk biosolids land application reports would need to be filed with the WDNR, and the

WWTP would not need to receive approval from the WDNR before applying biosolids. More sites would potentially be available to apply the biosolids. Since Class A biosolids have lower levels of pathogens, there is a lower threat to human health, and therefore, fewer measures are required to minimize human contact with the sludge.

To be considered Class A, the sludge must undergo certain processes to further reduce pathogens. The processes might include temperature-phased anaerobic digestion (TPAD), lime stabilization, composting, heat drying, thermophilic aerobic digestion, heat treatment, pasteurization, or an equivalent process. Any of these processes would be costly to implement at RMMSD. Therefore, RMMSD intends to continue its successful Class B biosolids program for the foreseeable future.

The USEPA conducted a Targeted National Sewage Sludge Survey from 2006 to 2007 at 74 facilities. Analyses included metals, organics, inorganic ions, and other targeted pollutants. Data from the survey will help determine exposure to target pollutants in biosolids and whether target pollutants may need to be regulated pursuant to 40 CFR 503. The USEPA intends to assess the need and appropriate level for a numerical standard for molybdenum in sewage sludge using the sewage sludge survey and other data. The USEPA planned to complete this assessment in 2009, with rulemaking for revised molybdenum standards following the assessment. However, this has not been completed. The USEPA is also assessing the potential use of various microbial risk assessment models such as salmonella via the ingestion pathway. This assessment is ongoing and may eventually affect the way RMMSD monitors pathogens and manages biosolids.

The WDNR and other states have also been considering requiring agronomic phosphorus application rates, which could make phosphorus the limiting nutrient for land application of biosolids instead of nitrogen. There has been some discussion of restricting sludge application to the amount of TP required for plant growth, and some farms are now required to or choose to develop nutrient management plans that may restrict phosphorus application. This restriction is intended to reduce the amount of phosphorus runoff from agricultural land into surface waters. The increasing concern over nutrients in surface water and groundwater may result in lower sludge application rates in the future (meaning more area and longer hauling distances will be required), more careful selection of land application sites, and possibly installation of best management practices (BMP) at biosolids application sites to reduce soil erosion and runoff. These requirements will likely result in higher future costs for biosolids disposal.

RMMSD has been experiencing increasing difficulty in finding and securing sites for land application. Local farmers, feeling pressure from nutrient management planning, have been considering limiting land application of biosolids. This may result in RMMSD needing up to five times more land for the same amount of biosolids which would present a challenge. RMMSD should evaluate biosolids handling alternatives to determine the most sustainable and cost-effective means of disposing biosolids.

5.09 SANITARY SEWER OVERFLOW (SSO) RULES

On August 1, 2013, new regulations pertaining to sewage collection systems became effective. These rules, typically referred to as the "SSO Rules," are intended to focus attention on the proper operation of collection systems. The regulations will not only impact the RMMSD, but they will also impact the satellite communities that discharge to the District. The new rules include the following key components:

1. RMMSD and the customer communities will be required to develop a CMOM program by August 31, 2016. The goal of a CMOM program is to make sure that the collection system is properly managed, operated and maintained, and that the system has adequate capacity to convey peak flows, even during wet weather. All feasible steps are to be taken to reduce I/I, eliminate SSOs, and mitigate the effects of SSOs.

2. When SSOs or chronic basement backups occur, the rules require the following:

    a. Notification of the WDNR within 24 hours of the occurrence, with a written follow-up report within 5 days. A new "fillable" PDF form is available on the WDNR Web site.

    b. Public notification of SSO events is required.

    c. If drinking water systems will be impacted, notification of the impacted parties is also required.

    d. Satellite communities are required to notify downstream collection and treatment systems. This would mean that Mosinee, Kronenwetter, Rothschild, Weston, and Rib Mountain Sanitary District would need to notify the District if an SSO event occurred within their systems. Satellite communities were issued a general permit in October 2013.

3. CMOM compliance and SSO events will be documented on the Compliance Maintenance Annual Report (CMAR) reports that the District is required to submit each year. A plan to address such events will be required and must be documented in the CMAR.

For many entities, the impact of the new regulations will be administrative. The new rules place an emphasis on documentation of SSO events and CMOM program elements. Many communities that have good operation and maintenance (O&M) programs in place do not necessarily have them well-documented. Standard Operating Procedures (SOPs) will need to be developed for the major O&M activities and records maintained regarding maintenance activities. For some entities, ordinances may need to be reviewed and updated, especially the ordinances that address I/I sources and their removal.

5.10 MICROCONSTITUENTS AND OTHER EMERGING ISSUES

According to the Water Environment Federation (WEF) Government Affairs Committee, the main issues emerging at the national level are sustainability, financing, nutrients, and microconstituents. Nutrient regulations are probably the most imminent issue affecting the RMMSD WWTP and were discussed earlier in this section.

WEF is supporting sustainability measures, particularly with respect to stormwater management or "green infrastructure" measures and energy conservation measures. In Wisconsin, funding is available for certain stormwater management projects through various programs including the state revolving fund. Funding is available from Focus on Energy (FOE), WPPI Energy, and some power and gas companies for studying and implementing energy conservation measures.

Microconstituents are also known as "compounds of emerging concern." They include pharmaceuticals, personal care products, and other compounds that are currently not specifically regulated in wastewater. The WDNR currently has the ability to regulate microconstituents in WWTP effluent only if a specific problem such as a directly linked adverse impact on aquatic life is demonstrated. Eventually, advanced oxidation processes or membrane treatment may be required to treat microconstituents. Some communities have taken a pollution prevention approach and have implemented drug take-back programs to help reduce the concentrations of pharmaceuticals in wastewater. Successful drug take-back programs have been implemented in Stoughton, Marshfield, Madison, and other Wisconsin communities, and permanent sites are set up in a few locations in Marathon County.

5.11 CONCLUSIONS

This review has identified four major areas that may be affected by changes in the regulatory climate in the foreseeable future:

1. New TMDL-based limits for phosphorus are expected in the next two permit terms. Total nitrogen limits are possible within the next decade or so. Depending on how stringent the limits are, these may have significant impacts on upgrades that need to be performed at the WWTP. RMMSD will need to evaluate alternative means of addressing new phosphorus limits. Total nitrogen can be removed using biological nitrification-dentrification processes or through trading.

2. A pH-dependent maximum day ammonia limit based on acute toxicity is expected in the reissued permit. Revised ammonia criteria or rerating of the WWTP to increase the WWTP's design flows may result in lower effluent limits in the future. New ammonia limits may require modifications of the outfall, pH adjustment, or possibly increased nitrification capabilities.

3. Programs and regulations related to phosphorus and nitrogen in surface waters and groundwater may reduce the allowable biosolids application rate or may make land application site criteria more restrictive. This may result in the need for more land and/or longer hauling distances over the next several years and associated higher disposal costs.

4. The development of a CMOM program will be required by RMMSD for the interceptor by August 1, 2016. RMMSD should continue to actively maintain the interceptor and address any additional sources of I/I that are discovered to help avoid issues related to this regulatory initiative. This also extends to the customer communities.

SECTION 6
EVALUATION OF EXISTING FACILITIES

This section presents an evaluation of the ability of the existing WWTP to treat the projected future flows and loadings developed in Section 4 while meeting the anticipated future WPDES permit requirements. This section also presents a compliance evaluation of the current facilities with the current WDNR NR 110 design standards and other applicable design criteria. The review focuses on the rated capacity, age, reliability, and other factors related to operating and maintaining the existing facilities. Appendix B includes the design criteria for the current treatment plant. Table 6.01-1 summarizes the 2025 and 2035 design flows and loads for the facility.

6.01 UNIT PROCESS EVALUATION

A. Influent Pumping Station

The influent pumping station houses five centrifugal influent pumps each with a capacity of 2,300 gallons per minute (gpm) (3.3 mgd), a Parshall flume with an automatic sampler for process return flow (PRF) metering and sampling, and a backup generator. The pumps have a capacity of 12.96 mgd with the largest unit out of service, which is the plant's peak instantaneous design flow including the recycle flow. This flow rate exceeds the 2035 design peak flow requirements, and it meets the requirements set forth in NR 110. The diesel generator only serves the influent pumps, emergency lighting, and components of the disinfection process during periods when the main power fails.

All the influent pumping station equipment has been in place since the original construction in 1986. The influent pumps (Figures 6.01-1 and 6.01-2) were rebuilt in 2004-2005. Although the influent pumping station meets the future capacity requirements, plant staff reported that the pumps require labor-intensive daily cleanouts of rags and other materials that clog the pumps. The amount of time dedicated to maintenance and the age of the equipment warrants a total replacement of the influent pumps within the next five years.

	Projected 2025	Projected 2035
Average Dry Weather Flow (mgd)	3.65	3.98
Average Annual Flow (mgd)	4.08	4.41
Maximum Month Flow (mgd)	4.7	5.03
Peak Hourly Flow (mgd)	7.66	8.09
Peak Instantaneous Flow (mgd)	12.29	12.29
Average Day BOD_5 Loading (lb/day)	7,862	8,529
Maximum Month BOD_5 Loading (lb/day)	8,283	8,985
Average Day TSS Loading (lb/day)	9,031	9,798
Maximum Month TSS Loading (lb/day)	10,711	11,620

Table 6.01-1 2025 and 2035 Design Flows and Loads

Figure 6.01-1 Influent Pumps

Figure 6.01-2 Influent Pumps

When the equipment is replaced, it should be updated to reflect technological advancements in the past 30 years and should be improved to reduce operations issues. Proposed improvements include the following:

1. Replace the five influent pumps with chopper pumps to reduce clogging and maintenance issues. Pumps will be designed to meet the design peak instantaneous flow rate with the one unit out of service. A VFD will be included for each pump.

2. Enlarge and replace the PRF Parshall flume. The controls for the PRF metering and influent wet well levels should be updated. Radar and back-up radar transmitters are suggested to replace the original wet well level floats. A high-high wet well float alarm will be maintained.

3. Replace the three influent gates on the influent wet well. Inspect and replace or repair all internal wet well piping.

4. Replace the out-of-date PRF sampler with a new automatic sampler.

5. The diesel generator should be replaced with a natural gas generator. The new generator will be located near the plant's service entrance switch and is discussed in the electrical portion of this facility plan.

B. Preliminary Treatment

The preliminary treatment processes at the RMMSD WWTP include mechanical step screening and aerated grit removal. Screenings are discharged to a wash press for washing and bagging and are disposed at a landfill; grit is dewatered and bagged for disposal as well. The mechanical step screen was installed in 2002, and the grit equipment was upgraded in 2001.

The mechanical step screen (Figure 6.01-3) and wash press have a capacity of 13 mgd and are both nearing the end of their useful service lives and should be replaced within the next five years. A larger width mechanical screen and a new wash press with a peak capacity exceeding the 12.29 mgd design capacity are recommended. The screen should be able to meet the design flow with a maximum blinding rate of 40 percent. This new screen would have 1/8-inch (3 mm) openings, and it would require channel modifications to create an opening for a 5-foot screen with 4-foot-deep channels.

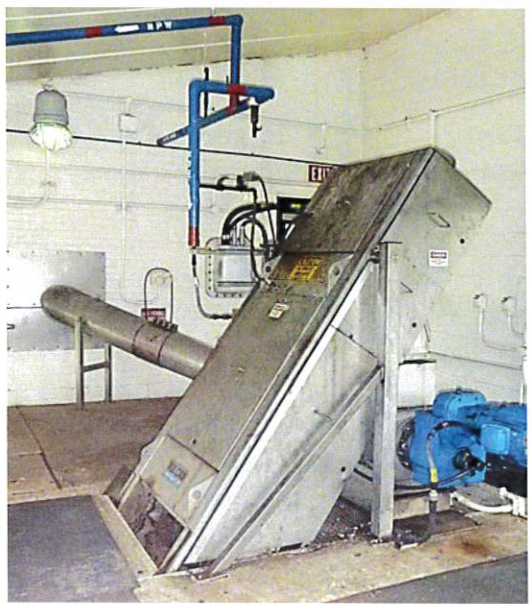


Figure 6.01-3 Mechanical Step Screen

The aerated grit removal tank (Figure 6.01-4) and associated equipment were designed for a maximum daily flow of 4.94 mgd and a peak hour flow of 12.96 mgd and have surpassed their design life. An equipment update would include rebuilding or replacing the chains, blower, grit conveyor (Figure 6.01-5), dewatering screw, grit auger, and grit bucket elevator. A second alternative would be the installation of a new vortex-style grit removal system with a grit washer. A cost comparison is included in Section 7 of this facility plan to select the most appropriate alternative.

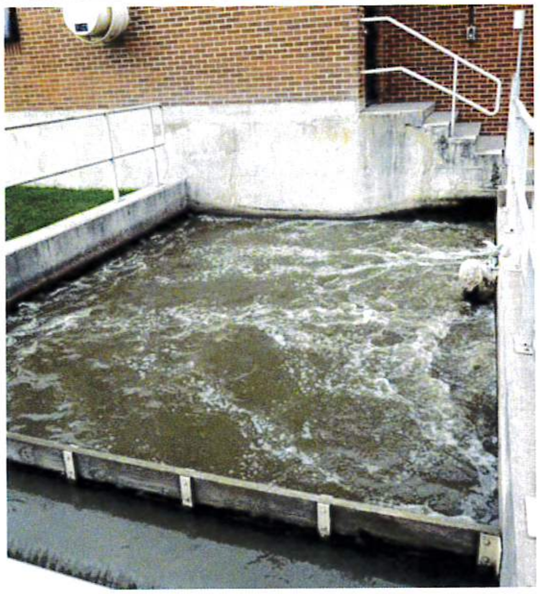


Figure 6.01-4 Aerated Grit Tank

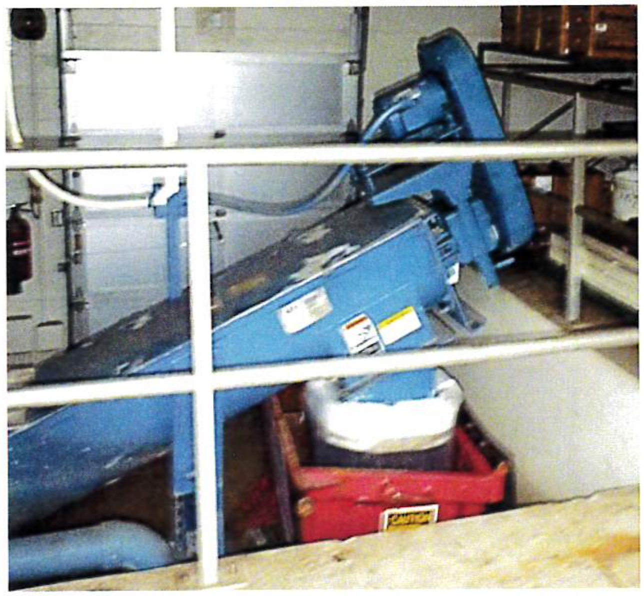


Figure 6.01-5 Grit Classifier

C. Primary Sedimentation

The three primary sedimentation tanks (Figure 6.01-6), were installed in 1984 and placed in service in January 1986. WDNR NR 110 requires that primary clarifiers have a surface loading rate of 1,000 gallons per square foot per day (gpd/ft^2) or less at average design flow and 1,500 gpd/ft^2 at maximum hourly flow. It also requires that the weir overflow rate be less than 10,000 gallons per foot per day (gfd) at the design average flow. With one tank out of service, the clarifiers will have a surface loading rate of 765 gpd/ft^2 at the 2035 design average day flow and a rate of 1,404 gpd/ft^2 at the 2035 peak hourly flow. The clarifiers will have a weir overflow rate of 13,781 gpd/ft at the 2035 design average flow rate with one unit out of service and a weir overflow rate of 9,188 gpd/ft at the 2035 design average flow rate with all units operating. The clarifiers have received regular maintenance and operate with equipment similar to the original. The flights, chains, weirs, and primary sludge pumps should be replaced with new equipment within the next 11 to 15 years.

Plant staff report the primary sludge line plugs and there is not a good means to flush the line. It is recommended that cleanouts be added in the yard to allow for flushing of the primary sludge line. Installation of additional primary sedimentation tank(s) is not recommended because the existing tanks have provided excellent removal and the system meets the WDNR NR 110 requirements at the future design flow rates.

Figure 6.01-6 Primary Sedimentation Tanks

D. Activated Sludge Treatment

The four aeration tanks (Figure 6.01-7) and equipment were installed in 1984. The four tanks will be loaded at approximately 31 lbs BOD/1,000 cf at the 2035 average day BOD_5 loading, assuming 30 percent BOD_5 removal in the primary clarifiers. Air was originally supplied by three positive displacement blowers, each with the capacity of 1,700 standard cubic feet per minute (scfm) at 8 pounds per square inch gauge (psig) discharge pressure. The plant installed a new turbo blower in 2014. The 75 hp blower works as the primary blower, has a capacity of 1,275 scfm at 8 psig discharge pressure, and runs on a VFD. The two 100 hp positive displacement blowers with VFDs from the original plant installation are near the end of their useful service life. These blowers should be replaced in the next 6 to 10 years. Power consumption could be reduced through the use of more efficient aeration blowers. New blowers will need to meet the future air requirements for BOD_5 removal of 10,542 pounds of oxygen per day, which equals approximately 3,690 scfm. The capacity of the existing blowers is not sufficient to meet the future design requirements with one unit out of service. The future design capacity is calculated using 30 percent BOD_5 removal in the primary clarifiers. However, the existing primary clarifiers currently achieve around 50 percent BOD_5 removal. If the primary clarifiers continue to perform in the same manner, two blowers each with a capacity of 1,300 scfm would be sufficient. If the plant needs to accomplish BOD_5 and nitrogen removal in the activated sludge process, even more blower capacity will be added.

RMMSD could also consider staging blower addition. For instance, assuming 50 percent BOD_5 removal in the primary clarifiers and if two 1,300 scfm blowers were added in the next 6 to 10 years, a fourth blower of similar size could be added if BOD_5 removal decreases. However, the fourth blower may require an addition to the blower room. The air piping should be considered for replacement when new blowers are installed. The fine bubble aeration diffusers were replaced in 2012 with new ceramic diffusers and should not require replacement for at least 15 to 20 years. The tanks appear to be in good condition and do not need replacement in the near term.

The plant monitors dissolved oxygen (DO) in the aeration tanks through the use of DO probes. The air supply is controlled to maintain a DO of 1.8 to 2.0 mg/L. If the operating blower reaches its capacity and the system still senses an oxygen deficit, a second blower is called to run.

The RMMSD WWTP currently uses approximately 310 to 420 gpd of alum to meet the WPDES phosphorus permit limit of 1.0 mg/L. The facility produces an excellent quality effluent with an annual average phosphorus concentration of less than 0.8 mg/L. The chemical usage will need to increase in the future because of the implementation of more stringent phosphorus limits as described in Section 5. Modifications to the activated sludge system to enhance biological phosphorus removal (BPR) would help reduce the amount of chemical required and reduce the amount of chemical sludge produced. RMMSD performed a full-scale BPR test in the 1990s, but phosphorus removal was limited in part because of the low amount of volatile fatty acids (VFAs) available in the wastewater. The plant has determined that BPR would have limited success; therefore, costs for BPR alternatives will not be evaluated.

Because of the anticipated high effluent ammonia limit (40 mg/L), nitrification should not be required at the treatment plant. In addition, RMMSD has noticed that the alkalinity drops excessively when it nitrifies and causes operational challenges.

Figure 6.01-7 Aeration Tanks

E. Final Clarification and RAS Pumping

Two 85-foot-diameter final clarifiers (Figure 6.01-8) with a side water depth of 14 feet were installed in 1984 and still operate with all original internal equipment and RAS pumps that have been maintained or rebuilt at regular intervals. WDNR NR 110 requires that activated sludge final clarifiers have a surface overflow rate of 1,200 g/ft^{2}d or less at maximum hourly flow and a solids loading rate of 1.4 pounds per square foot per hour (lb/ft^{2}h) or less at average design flow and 2.0 or less at maximum hourly design flow. At the 2035 design flows and loading rates, these clarifiers would have a surface overflow rate and solids loading rate of 713 gpd/ft^2 and 0.76 lb/ft^{2}h at peak hourly flow and a solids loading rate of 0.43 lb/ft^{2}h at average design flow. Structurally, the clarifiers appear to be in good condition. The clarifier drives and collector mechanisms need to be replaced within the next 11 to 15 years. The RAS pumps have met the end of their design life and should be replaced soon.

Figure 6.01-8 Final Clarifiers

F. Disinfection

The RMMSD WWTP uses UV light for effluent disinfection. The UV disinfection system was installed in 2010 (Figure 6.01-9). The UV system was designed as a phased project with the first phase having a peak-hour capacity of 4.34 mgd and the second phase doubling the capacity for a total peak-hour capacity of 8.68 mgd, greater than the year 2035 peak hourly flow of 8.09 mgd. Upsizing the effluent flume should be considered as part of the proposed improvements.

Flows above the 4.34 mgd rate are currently diverted to the existing chlorine contact tank and routed to the head of the plant. Installation of a second UV system should alleviate the need for the chlorine contact tank. As flows increase, it is recommended that the second phase be installed within the next five years.

Figure 6.01-9 UV Disinfection and Postdisinfection Settling

G. WAS Thickening

The two dissolved air flotation thickening tanks were installed in 1984, and new air entraining recirculation pumps were installed in 2014. The remaining internal equipment is from the original installation (Figure 6.01-10). Structurally, the tanks appear to be in good condition; however, the associated equipment and controls are reaching the end of their design life. The sprockets, shafts, chains, and valves should be replaced within the next five years. The DAFT tanks have a design solids loading rate of 560 pounds per hour (lbs/hr) assuming they operate for 12 hours a day, 5 days per week, which is a solids surface loading rate of 0.42 pounds per hour per square foot. These design loadings are based on a plant total BOD_5 loading (with recycle) of 8,350 lb/day. This is close to the WWTP's year 2035 average day BOD_5 loading of 8,529 lbs/day, so the DAFT tanks are sufficiently sized for future loadings assuming similar yield rates.

Figure 6.01-10 DAFT Chains and Sprocket

Figure 6.01-11 DAFT Flow Measuring

H. Solids Processing

Solids are processed in the anaerobic digesters (Figures 6.01-12 and 6.01-13). Sludge is heated to mesophilic temperatures in the primary digester and then transferred to the secondary digester for storage and further processing. The primary digester has a recirculated pumping mixing system and is heated. The secondary digester is not mixed or heated. Much of the equipment in the digestion system is nearing the end of its useful service life and may need replacement in the near term. The digester equipment and covers should be inspected to determine remaining life. For planning purposes, covers on the primary and secondary digesters, the heat exchanger, two transfer pumps, two recirculation pumps, digester gas safety equipment, and the waste gas burner are being included for replacement. Additionally, the plant would like to add a mixing system to the secondary digester to reduce settling in the digester. An alternatives evaluation for three mixing systems is included in Section 7 of this report comparing draft tube mixing, pumped mixing, and linear motion mixing.

The primary digester was designed for a solids retention time of 22.5 days with a volatile solids loading rate of 78.9 pounds of volatile solids per day per 1,000 cubic feet (lb VS/day/1,000 cu ft). At the 2035 design loading rate, the primary digester will have a solids retention time of 26 days and a volatile solids loading rate of 60 lb VS/day/1,000 cu ft based on the historical average of 64 percent volatile solids in the feed sludge and 0.1 mg/L future phosphorus limit, resulting in additional chemical sludge volume. Actual percent volatile solids would be lower since the sludge would contain more inert chemical sludge than the current feed sludge.

Figure 6.01-12 Anaerobic Digesters

Figure 6.01-13 Anaerobic Digestion Facility

I. Biosolids Storage and Land Application

RMMSD has two biosolids storage tanks that each have a capacity of 1.93 million gallons and meet the 180-day storage requirement of WDNR NR 110. The first tank was constructed in 2000 and the second tank was constructed in 2009. Pumped mixing was included in each tank and a new sludge load-out pump was also installed as part of the 2009 project. Liquid sludge is currently land-applied; however, it has been increasingly difficult to identify land for the application of biosolids. The WWTP would like to consider alternatives to land application. Biosolids disposal alternatives to land application are discussed in Section 7.

J. Biosolids Dewatering and Thickening

The RMMSD WWTP has two 2-meter belt filter presses for dewatering purposes that were installed in 1984 and have not received any upgrades. These units have a design capacity of 9,144 pounds of solids per work day and can produce 686 cubic feet of 22 percent dewatered biosolids per 8-hour work day. They have a dry polymer system that can feed up to 50 gallons per hour of polymer. Operations staff prefer to use liquid sludge hauling, and the belt filter presses are rarely used. The belt filter presses are exercised on a routine basis and can be used if liquid sludge storage space is limited because prolonged wet weather prevents land application of liquid sludge. If the WWTP is going to change its routine operation to regularly dewatering biosolids, new dewatering and polymer systems would be needed because of the age of the existing equipment. The belt filter presses and polymer system should be removed if they will not be used regularly in the foreseeable future. The sludge dewatering options are evaluated with solids disposal alternatives in Section 7.

K. Electrical

This subsection discusses the electrical components associated with various parts of the WWTP and provides recommendations for improvements to the electrical system.

1. Influent Pump Station

The existing MCC in the Influent Pump Station was originally installed in 1984 and has exceeded its typical working life of 20 to 30 years. Because of the age of this equipment, replacement parts will become more difficult to obtain and more expensive in the future. Therefore, we recommend replacement of the MCC within the next five years. In addition, the conductors feeding this MCC are also original and should be replaced when the MCC is replaced.

The five existing influent pumps are currently operated from two VFDs. One VFD is able to power pump Nos. 1, 3, and 5 and the second VFD is able to power pump Nos. 2 and 4. When not operating from the VFD, the pumps are operated from full-voltage nonreversing starters. When the influent pumps are replaced, each pump will be provided with a VFD. This will provide more operating flexibility when a VFD is out of service and will simplify control of the pumps. The two existing VFDs are Allen-Bradley Powerflex 700 drives and were installed in 2009. Although these VFDs are currently only six years old, by the time construction of the new influent pumps takes place, they will be over 10 years old and approaching the end of their useful service lives. Therefore, we recommend replacing these VFDs with new units and retaining the existing VFDs as spares.

The existing submersible level transducers and back-up floats used for control of the influent pumps are old and in need of replacement. For replacement of the submersible level transducers, it is recommended that alternate noncontact level measurement devices such as ultrasonic- or radar-type level devices be installed.

The existing diesel generator is also originally installed equipment from 1984. While the generator is not necessarily past its useful service life based on the hours of operation on the unit, replacement parts will become more difficult to obtain and more expensive in the future. In addition, the current configuration of the power distribution system powered by the generator only allows a portion of the plant to be powered from the standby generator. Therefore, it is recommended that the standby generator be replaced with a new unit that is connected to the plant service entrance switchgear to allow more flexibility regarding what loads are powered from the generator. The new generator can be sized to power additional plant loads as desired by the plant staff, and the plant SCADA system can be used to shut down noncritical loads when the plant is operating under generator power. The use of the SCADA system to shut down noncritical loads when under generator power provides the plant staff with the flexibility to use alternate equipment if the primary equipment is out of service for repairs.

The existing interior lighting in the Influent Pump Station is fluorescent lighting that uses T12 lamps. Federal energy legislation has mandated phasing out many of the older T12 fluorescent lamps, so replacement lamps could become more difficult and expensive in the future. In addition, T8, T5, or LED lamp sources are more energy-efficient than the older T12 lamps. We recommend replacing the existing 4-foot fluorescent fixtures with new 4-foot LED fixtures. Rebates for these upgrades may be available through Focus on Energy. The plant has already changed all exterior building-mounted and site lighting to LED fixtures.

2. Tunnel

The existing conduit and wiring to the light fixtures in the tunnel were installed within the concrete ceiling space of the tunnel, which has multiple expansion joints along its length. The existing conduits within the concrete have corroded over time and wiring within the conduit has failed. We recommend replacing the existing T12 fluorescent lighting within the tunnel along with all the existing conduit and wiring. In addition, motion sensors for control of the tunnel lighting are recommended. This would save energy by preventing the lights from being left on all day during normal working hours.

3. Digester Building

The existing MCC in the Digester Building is originally installed equipment from 1984 and has exceeded its typical service life of 20 to 30 years. Because of the age of this equipment, replacement parts will become more difficult to obtain and more expensive in the future. Therefore, we recommend replacement of the MCC within the next five years. In addition, the conductors feeding this MCC are also original and should be replaced when the MCC is replaced.

The existing interior lighting in the Solids Processing Building is fluorescent lighting that uses T12 lamps. As noted for the Influent Pumping Station, we recommend replacing the existing fluorescent fixtures with new LED fixtures.

Plant staff indicated that the existing exterior conduits entering the basement of this building leak water, primarily in the spring of the year. Our recommendation is to evaluate this condition further as part of the next design project.

In accordance with NFPA 820, certain spaces of the Digester Building should have a hazardous location rating. Our recommendation is to complete a review of each space of this building as it relates to NFPA 820 as part of other design improvements to this building.

4. Solids Processing Building

The existing MCCs in the Solids Processing Building are originally installed equipment from 1984 and have exceeded their typical service life of 20 to 30 years. Because of the age of this equipment, replacement parts will become more difficult to obtain and more expensive in the future. Therefore, we recommend replacement of the MCCs within the next five years. In addition, the conductors feeding these MCCs are also original and should be replaced when the MCCs are replaced. To aid in constructability and to accommodate a smoother start up with less downtime, the new MCCs will be installed in a new electrical room constructed within the abandoned dewatering space.

The existing service entrance switchboard in the Solids Processing Building is also originally installed equipment from 1984 and has exceeded its typical service life of 30 years. Because this model of switchboard is no longer manufactured, obtaining replacement parts may take several weeks, and the cost of those parts may be significantly higher than a comparable off-the-shelf unit for the current model switchboard. In addition, this switchboard does not have the capacity and could not function directly with a standby generator unless significant modifications are made or additional equipment is provided. Therefore, we recommend replacing the service entrance switchboard with a new switchboard that incorporates an automatic transfer switch (ATS) to interface with a new standby generator.

As discussed previously, a new standby generator is recommended. The most cost-effective location for the new standby generator is in the vicinity of the Solids Process Building since it will feed into the new service entrance switchboard/ATS. The new standby generator could be located exterior to the Solids Processing Building in a weather-protective enclosure, possibly in the abandoned chlorine storage and chlorinator rooms (with some structural modifications), or in the abandoned dewatering area. In order to determine whether installation of the new standby generator in the abandoned chlorine storage room is a viable option, the required size kilowatts (kW) of the generator will need to be determined. A 750 kW generator is planned at this time. The approximate footprint for a generator of this size is 204 inches by 90 inches by 108 inches (LxWxH). This footprint would fit in the abandoned chlorine storage and chlorinator rooms.

The existing interior lighting in the Solids Processing Building is fluorescent lighting that uses T12 lamps. As noted for the Influent Pumping Station and Digester Building, we recommend replacing the existing fluorescent fixtures with new LED fixtures.

Plant staff indicated that the existing exterior electrical service entrance conduits entering the basement of this building leak water significantly, primarily in the spring of the year. Our recommendation is to evaluate this condition further as part of the next design project.

5. SCADA system

The existing PLCs used for the SCADA system are the Allen-Bradley SLC series with SLC 5/05 Ethernet processors. The SLC product line was introduced in 1993 and is not commonly used for new PLC installations. Allen-Bradley has not yet determined a date of obsolescence for these products, but they have been placed in the "Active Mature" category, which has a description of "Product is fully supported, but a newer product exists. Gain value by migrating." The cost of the SLC components has increased significantly over the past several years and is expected to continue rising. Consideration should be given to replacing the existing SLC series PLCs with Allen-Bradley's CompactLogix series PLCs, which is its latest product offering.

It has been at least six years since the existing SCADA computer and software have been updated. In addition, the existing SCADA computer operating system is Windows XP that is no longer supported. Therefore, we recommend that the existing SCADA computer and associated SCADA graphic software and the process reporting software be upgraded. As part of this upgrade, the plant staff indicated the desire to replace the original graphics board with a new big screen monitor. The majority of these upgrades are currently being installed outside of the facility plan upgrades. Any remaining enhancements will be included as part of the facility plan improvements.

6. Miscellaneous

The existing paging system is originally installed equipment from 1984 and has exceeded its typical service life. The telephone system has been replaced several times and is currently being replaced with the most current technology. We recommend upgrading the new phone system to an enhanced all-in-one telephone and paging system that allows both features to be accomplished from a single handset. Based on our discussion with plant staff, if a new hardwired telephone and paging system is installed, new conduits will need to be provided between the various buildings. An option that could be evaluated would be the use of a wireless telephone and paging system.

Based on our discussion with plant staff, it is our understanding the fire alarm and intrusion systems are operating satisfactorily and do not need to be upgraded at this time.

J. <u>HVAC</u>

1. Influent Pump Station

The majority of the existing equipment within this structure was installed as a part of the original construction and is at the end of its useful service life. We recommend replacement of the existing supply fan, exhaust fan, the original gas unit heaters, and the damper actuators. It has been noted there is a new gas unit heater on the first floor that may be able to be reused and the HVAC associated with the generator would not be replaced since the generator would be removed. The existing dampers, louvers, and ductwork appear to be in good condition and they may be reused.

2. Preliminary Treatment Building

The environment within this structure is corrosive and generally causes the life of HVAC equipment to be shortened. We recommend all HVAC equipment, fans, heaters, dampers, and actuators be replaced. As a part of any future HVAC design, we recommend increasing the ventilation rate to help extend the life of other equipment within the space and keep the environment fresh.

3. Digester Building

The existing equipment within this structure was installed as a part of the original construction. The HVAC equipment supplies the digester building and the tunnels with heat and ventilation. We recommend replacement of the existing supply fans, hot water unit heaters, the damper actuators, hot water boiler, and associated pumping and piping. The existing louvers and ductwork appear to be in good condition and could potentially be reused in the future if design conditions permit.

4. Solids Processing Building

The existing HVAC equipment within this structure was installed as a part of the original construction. We recommend replacement of the existing air handling units, supply fans, exhaust fans, hot water unit heaters, and the damper actuators. As a part of any future HVAC design, we recommend increasing the ventilation rate within the Sludge Thickener Room to help extend the life of other equipment within the space and keep the environment fresh. The existing louvers and ductwork appear to be in good condition and could potentially be reused in the future if design conditions permit.

5. Miscellaneous

NFPA 820 is a design standard used within the wastewater industry to establish minimum requirements for protection against fire and explosion hazards in wastewater treatment plants. This standard prescribes ventilation rates for different spaces and an associated national electrical code classification based on the type of space and the ventilation rate. It is our recommendation, prior to any future HVAC design, to conduct a review for each building as it relates to NFPA 820.

K. Process Piping

Most process piping has been in place since the plant start-up in 1986. Valves have reached the end of their useful service life and all valves located in structures, buried valves, and valves located in manholes should be replaced as part of the next construction project.

L. Space Needs

The Administration Building at the WWTP has served RMMSD's needs well since its initial construction. The building is in need of improvements to update the space and make it more functional for staff. Recommended improvements include the following:

1. Reconfigure the reception and office area to provide more space for storage, optimized clerical staff space, and improved customer and guest interface.
2. Reconfigure the Board Room to include permanent audio-visual display for board meetings.
3. Replace carpeting, paint, and finishes throughout building.
4. Reconfigure the locker rooms to provide accessible facilities for men and women and provide additional men's locker room space. This may require repurposing some of the garage space.
5. Replace furnishings to match.
6. Replace lighting.
7. Provide large SCADA display (LCD or other television style) for plant staff use as discussed in the SCADA section.
8. Replace existing HVAC equipment with new equipment designed to meet current mechanical and energy codes.

M. Painting

All interior spaces and process piping are in need of repainting. Each building will be repainted concurrent with any upgrades in each structure.

SECTION 7
TREATMENT PROCESS ALTERNATIVE EVALUATIONS

7.01 INTRODUCTION

This section develops costs for the alternatives and recommended improvements.

An opinion of probable capital cost was developed for each alternative and recommended upgrade. Additionally, an opinion of present worth costs was developed for each alternative where more than one viable alternative was identified. Capital costs were developed by obtaining equipment costs from equipment manufacturers or recent projects that had similar equipment. An installation factor of 35 percent was added to all equipment costs. New structures or structural modifications costs are included where necessary. The equipment subtotal was then used to develop cost estimates for demolition, electrical, mechanical (valves and piping), HVAC, and site work elements of the project based on typical factors. In some cases, actual HVAC costs were developed. Those costs were then subtotaled, and 10 percent of that subtotal was added for the contractor's general conditions. This subtotal was multiplied by a factor of 40 percent to account for contingencies and technical services.

All present worth evaluations were completed on a 20-year basis. A discount rate of 4.625 percent obtained from the WDNR was used for the present worth evaluations. Please note, present worth evaluations were completed to compare alternatives, but may not include all the O&M costs for an alternative. For example, O&M costs are meant to represent the incremental difference in these costs between alternatives rather than the actual O&M costs of a specific alternative. Detailed present worth evaluations are included in Appendix E.

Along with the capital and present worth costs, each cost table in this section includes a proposed phase when the improvements will be made. Phase I indicates improvements will be made within 0 to 5 years, while Phase II indicates improvements will be made within 6 to 15 years.

7.02 ALTERNATIVES EVALUATION

A. Influent Pumping Station

The condition and performance of some of the aged equipment in the influent pumping station necessitate replacement. Following is discussion of the items costed out and listed in Table 7.02-1.

1. Influent Pumps

Replacement of the influent pumps is considered a high priority because of the constant maintenance required to remove rags and debris from the existing pumps. Costs for replacement of the five influent pumps with five chopper pumps were obtained from an equipment manufacturer's representative; VFD costs are also included. The new pumps can meet a peak instantaneous design flow rate of 12.3 mgd with one unit out of service.

2. PRF Parshall Flume, Wet Well Level Floats, Influent Gates, and Automatic Sampler

Replacing the PRF Parshall flume, wet well floats, influent gates and automatic sampler should occur within the next five years because of age. The costs for a new PRF Parshall flume, new influent gates, and a new automatic sampler were determined from budgetary quotes of recent projects, while the costs of new radar transmitters were obtained from an instrumentation manufacturer.

3. Natural Gas Generator

The natural gas generator opinion of probable capital costs are included with the electrical cost opinion.

Element	Cost	Phase
Influent Grinder Pumps (5)	$110,000	I
Influent Pump VFDs (5)	$68,000	I
Slide Gates (3)	$23,000	I
Parshall Flume	$2,000	I
Automatic Sampler	$8,000	I
Wet Well Radar Transmitters (2)	$5,000	I
Subtotal	$216,000	
Demolition	$11,000	
Electrical (20%)	$43,000	
Mechanical (25%)	$54,000	
HVAC	$55,000	
Site Work (0%)	$0	
Subtotal	**$379,000**	
General Conditions (10%)	$38,000	
Subtotal	**$417,000**	
Contingencies and Technical Services (40%)	$167,000	
Opinion of Probable Capital Costs	**$584,000**	

Table 7.02-1 Influent Pumping Station Modifications

B. Preliminary Treatment

While there are no capacity issues related to any of the processes in this structure, the age, condition, and performance of some of the equipment necessitate replacement of the equipment or modification of the process.

1. Mechanical Fine Screen

The mechanical fine screen and wash press should be replaced within the next five years. Costs for replacing the mechanical fine screen and wash press with a larger mechanical fine screen and wash press are included in Table 7.02-2. A preliminary layout is shown in Figure 7.02-1.

Element	Cost	Phase
Mechanical Step Screen and Wash Press	$284,000	I
Slide Gates (4)	$29,000	I
Manually Cleaned Bar Screen	$2,400	I
Channel Modifications	$25,000	I
Subtotals	$340,000	
Demolition	$40,000	
Electrical (20%)	$68,000	
Mechanical (15%)	$51,000	
HVAC	$55,000	
Site Work (3%)	$0	
Subtotals	$554,000	
General Conditions (10%)	$55,000	
Subtotals	$609,000	
Contingencies and Technical Services (40%)	$244,000	
Opinion of Probable Capital Costs	$853,000	

Table 7.02-2 Screening Modifications

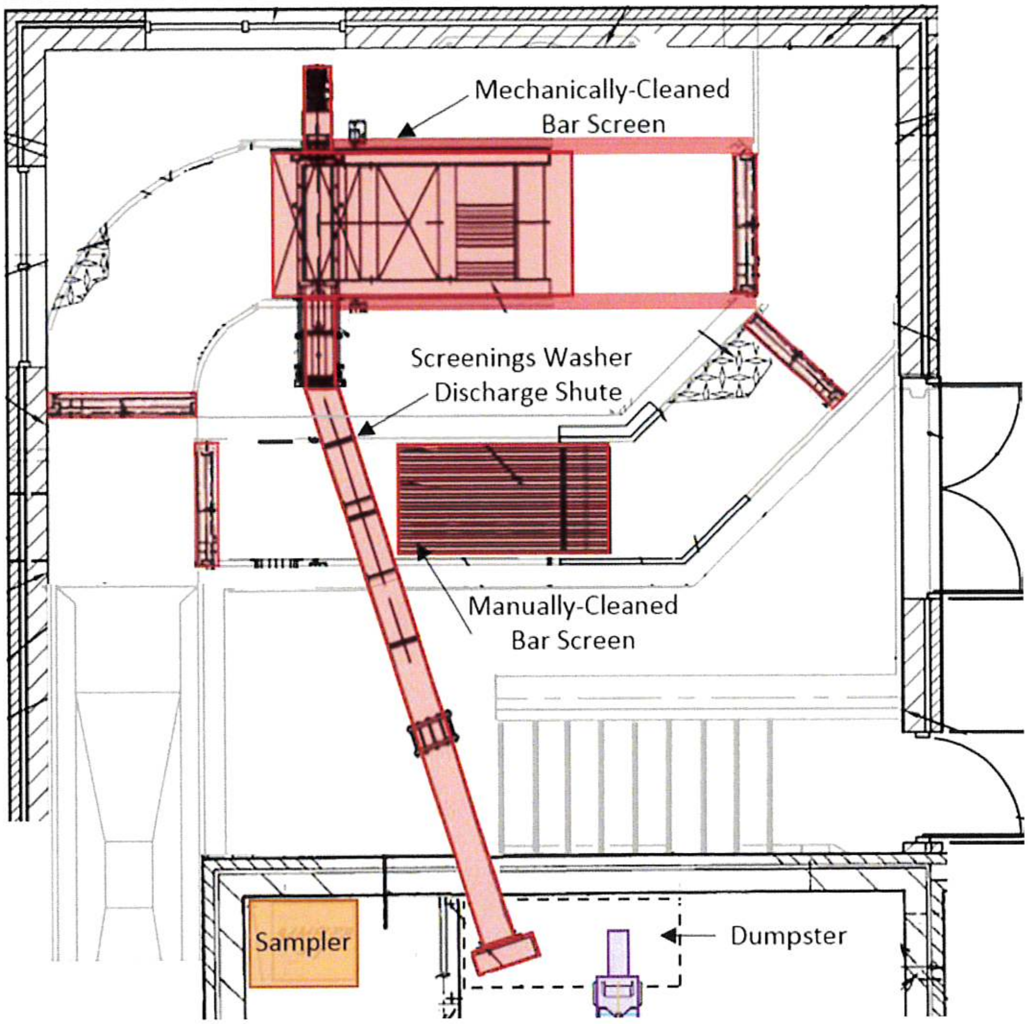


Figure 7.02-1 Screening Modifications Layout

2. Grit Removal System

The aerated grit removal tank and associated equipment are out of date and should be replaced within the next five years. Two grit removal alternatives introduced in Section 6 were evaluated.

1. Alternative G1–Equipment Replacement

2. Alternative G2–Vortex Style Grit Removal System

Alternative G1–Equipment Replacement. Alternative G1 consists of replacing the existing outdated equipment including the chains, blower, grit conveyor, washing and dewatering screw, grit auger, and bucket elevator.

Alternative G2–Vortex Style Grit Removal System. Alternative G2 consists of a vortex style grit removal system in combination with a grit washer. A vortex style grit removal system allows material heavier than water to settle out as the wastewater flows through the system. Grit is removed by directing influent flow into the grit tank inlet ramp, which provides a vortex effect and directs the grit downward to the grit trap. Grit slurry is pumped from the grit trap by a grit pump to a grit classifier or grit washer. The grit washer removes organics from the grit slurry before the grit is collected in a dumpster for disposal. Organics are returned to the forward flow. A preliminary layout of vortex grit system is shown in Figure 7.02-2. The total present worth costs presented in Table 7.02-3 include a grit washer for each alternative. Some savings will be possible if a grit classifier is used in lieu of a grit washer.

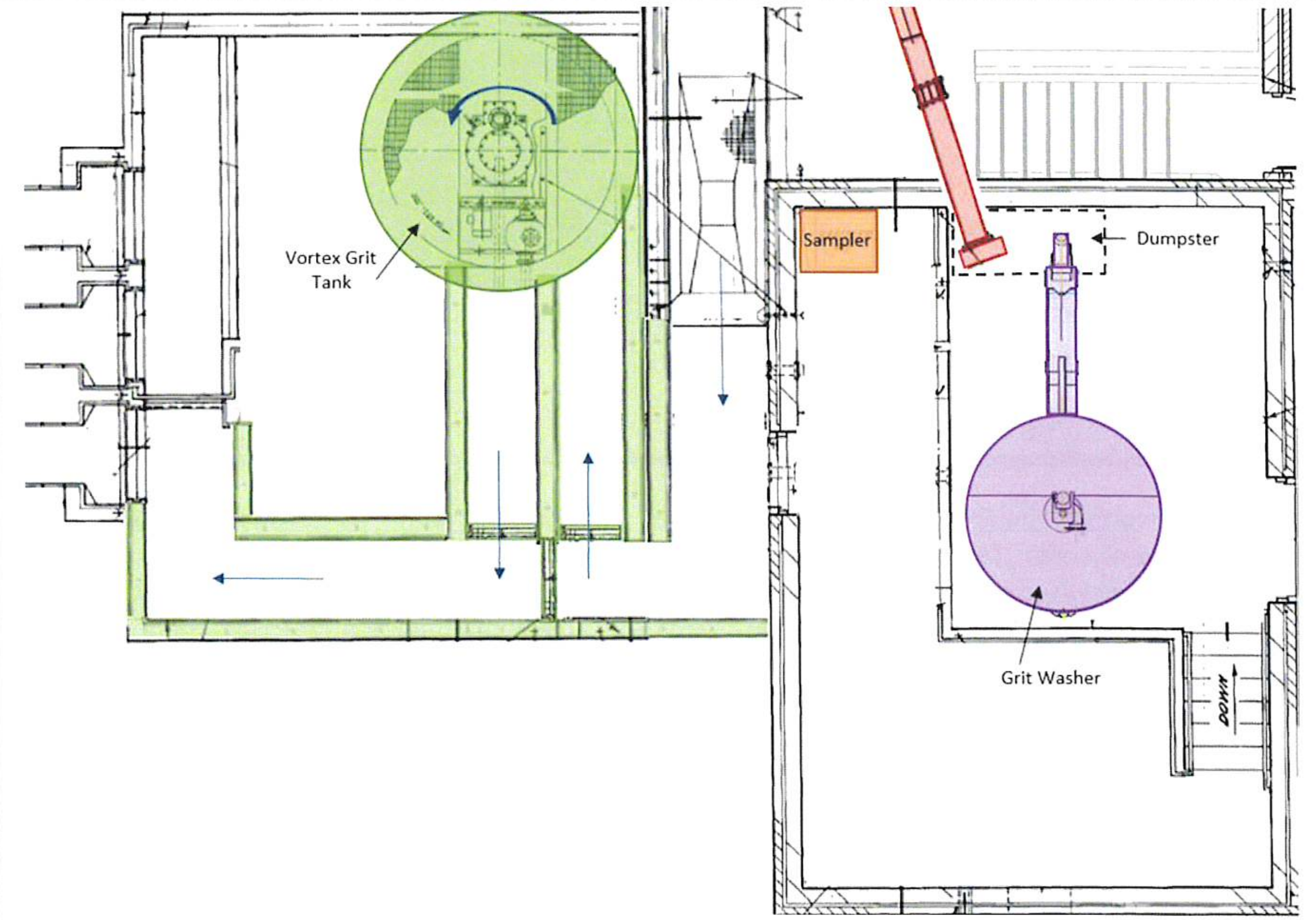


Figure 7.02-2 Vortex Style Grit Removal System and Grit Washer

	Alternative G1 Aerated Grit Removal	Alternative G2 Vortex Grit Removal	Phase
Opinion of Capital Costs*	$788,000	$1,123,000	I
Annual O&M Costs			
Labor	$23,000	$23,000	
Power	$4,700	$1,900	
Maintenance and Supplies	$6,800	$3,700	
Subtotal of Annual O&M Costs	$34,500	$28,600	
Present Worth of O&M	$444,000	$368,000	
Present Worth of Future Equipment	$0	$0	
Present Worth of Salvage	-$7,000	-$10,000	
Total Opinion of Total Present Worth	$1,225,000	$1,481,000	

*See Appendix E for detailed cost estimates.

Table 7.02-3 Grit Removal Alternatives

The present worth of the O&M costs was determined by estimating labor, power use, and maintenance and replacement costs. The labor was estimated at one hour per day for each alternative, and power cost estimates included the aeration blower, grit conveyor, and grit washer for Alternative G1 and a grit pump, paddle stirrer, and grit washer for Alternative G2. The maintenance and replacement costs were estimated as a small percentage of the capital costs.

The estimated total present worth cost is lower for Alternative G1–updating existing equipment. The O&M cost estimates are somewhat higher for Alternative G1. Aerated grit technology is an older, less efficient grit-removal technology. Therefore, Alternative G2, vortex style grit removal, is the recommended alternative.

C. Primary Sedimentation

As discussed in Section 6, the primary clarifiers have sufficient capacity to handle plant flows. However, the associated equipment should be evaluated for replacement within the next 11 to 15 years. Costs for the primary sedimentation tank upgrades are included in Table 7.02-4 and include the flights, chains, primary sludge line cleanouts, and primary sludge pumps. The costs also include the addition of cleanouts to the sludge pumping in the yard.

Element	Cost	Phase
Flights (3), Chains (3), and Primary Sludge Line Cleanouts (3)	$369,000	II
Primary Sludge Pumps (2)	$68,000	II
Subtotals	$437,000	
Demolition	$25,000	
Electrical (15%)	$66,000	
Mechanical (20%)	$87,000	
HVAC	$0	
Site Work (0%)	$0	
Subtotals	$615,000	
General Conditions (10%)	$62,000	
Subtotals	$677,000	
Contingencies and Technical Services (40%)	$271,000	
Opinion of Probable Capital Costs	**$948,000**	

Table 7.02-4 Primary Sedimentation Modifications

D. Activated Sludge Treatment

The two original aeration tank blowers are reaching the end of their useful service life and should be replaced within the next 6 to 10 years. The plant will be replacing one of the blowers in the next year and the second one is planned for the Phase II improvements. Biological loading and primary clarifier removal rates should be verified before final blower selection to provide sufficient air capacity for peak conditions. Additionally, air piping should be considered for replacement in the yard. Costs for a new blower slightly larger than the one installed in 2014 are found in Table 7.02-5. The cost to replace buried air piping is also included in the mechanical factor.

Element	Cost	Phase
Activated Sludge Blower (1)	$123,000	II
Subtotals	$123,000	
Demolition	$12,000	
Electrical (25%)	$31,000	
Mechanical (20%)	$25,000	
HVAC	$10,000	
Site Work (0%)	$0	
Subtotals	$201,000	
General Conditions (10%)	$20,000	
Subtotals	$221,000	
Contingencies and Technical Services (40%)	$88,000	
Opinion of Probable Capital Cost	**$309,000**	

Table 7.02-5 Activated Sludge Modifications

E. Final Clarification and RAS Pumping

The final clarifiers have sufficient capacity and appear to be structurally sound, while the internal equipment should be replaced within the next 11 to 15 years because of age. The RAS pumps were installed during the original construction and should be replaced as part of the Phase I improvements. The costs for upgraded final clarification equipment and RAS pumps in Table 7.02-6 include two final clarifier drives, two collector mechanisms, and three RAS pumps with VFDs.

Element	Cost		Phase
Final Clarifier Drives and Collector Mechanisms (2)	-	$378,000	II
RAS Pumps (3)	$113,000	-	I
Subtotals	$113,000	$378,000	
Demolition (5%)	$6,000	$19,000	
Electrical (20%)	$23,000	$76,000	
Mechanical (10%)	$11,000	$38,000	
HVAC (0%)	$0	$0	
Site Work (0%)	$0	$0	
Subtotals	$153,000	$511,000	
General Conditions (10%)	$15,000	$51,000	
Subtotals	$168,000	$562,000	
Contingencies and Technical Services (40%)	$67,000	$225,000	
Opinion of Probable Capital Costs	**$235,000**	**$787,000**	

Table 7.02-6 Final Clarification Modifications

F. Phosphorus Removal

Currently, the WWTP discharges an average phosphorus concentration of 0.8 mg/L, and a recent document from the WDNR recommended an effluent phosphorus six-month average limit of 0.1 mg/L. This document is preliminary and no permit language has been finalized at this time. If RMMSD's permit is issued in January 2016 and includes a low-level phosphorus limit, the anticipated final compliance date for meeting the effluent phosphorus limits is January 2025 (two permit cycles from now or future phasing). Each year of the compliance schedule includes interim deliverables. The first four years include planning milestones that will allow RMMSD to refine its plan for meeting ultimate effluent phosphorus regulations. This facility plan includes two alternatives that represent the endpoints of a broad range of alternatives. Because of uncertainty in the ultimate phosphorus limit for the RMMSD WWTP, the following two alternatives were selected for evaluation to provide an idea of the range of alternatives available.

1. Alternative PR1–Phosphorus Variance

2. Alternative PR2–Tertiary Treatment

Alternative PR1–Phosphorus Variance. The state is pursuing a statewide multidischarger variance. This proposed variance is under review and is not yet approved by the regulatory agencies. At this time, WDNR is reviewing public comments on the preliminary determination and will be making a final determination on its recommendation for the multidischarger variance. If WDNR recommends approval of the multidischarger variance, it will submit it to USEPA for approval. This variance would allow dischargers to pay a fee of $50 per pound of phosphorus discharged above 0.2 mg/L, provided the WWTP meets certain conditions, which are briefly outlined in Appendix D. There will be eligibility requirements for dischargers to qualify for the variance, which should be evaluated when they are finalized, and payment would not be required until WDNR approves a request for the variance and modifies or reissues the WPDES permit with variance terms included.

Beginning in 2025, the phosphorus variance issued to the RMMSD WWTP will require a payment of $50 per pound of phosphorus discharged above a concentration of 0.2 mg/L. The annual cost of discharging phosphorus concentrations greater than 0.2 mg/L at a plant flow of 4.41 mgd can be found in Figure 7.02-3, while the present worth cost can be found in Table 7.02-7, conservatively assuming that the WWTP continues to discharge phosphorus at a concentration of 0.8 mg/L. Note that present worth cost estimates for the phosphorus variance include inflation rates calculated from 2025 values.

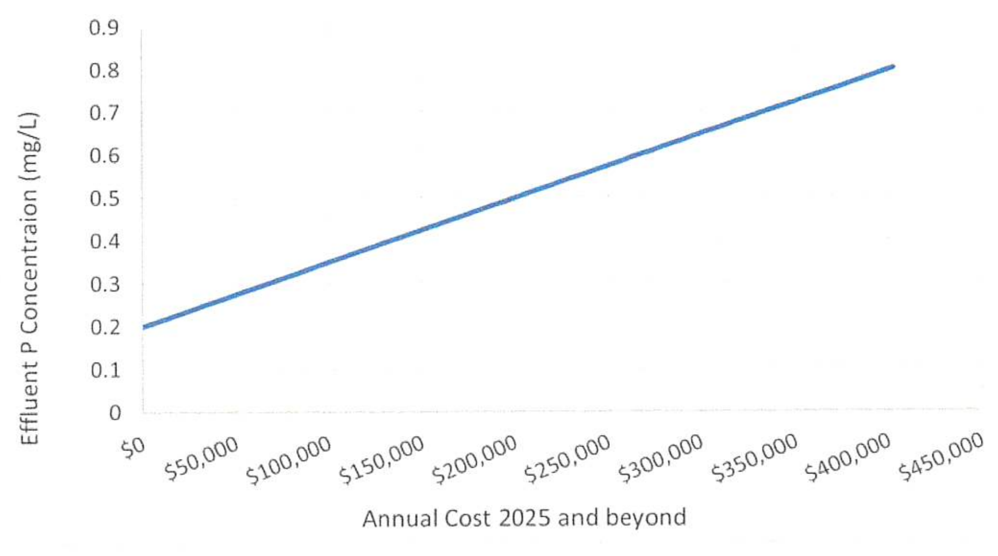


Figure 7.02-3 Phosphorus Variance Annual Cost for 2025 through 2045

Alternative PR2–Tertiary Treatment. There are a variety of tertiary treatment alternatives for low level phosphorus removal and most systems rely on additional chemical phosphorus removal and same type of filtration. For example, Blue Pro developed by Blue Water Technologies is a sand filter assembly while the AquaDisk filter from Aqua-Aerobic Systems removes solids and phosphorus via a cloth media. Costs for typical tertiary treatment options were extrapolated from the 2010 Municipal Environmental Group report titled *Opinions of Probable Cost for Achieving Lower Effluent Phosphorus Concentrations at Wastewater Treatment Plants in Wisconsin*. This report summarized expected capital and O&M costs for Wisconsin WWTPs at various flow rates and effluent concentrations. Each size of treatment plant and effluent concentration had appropriate technologies selected. These costs did not include any site-specific costs such as land acquisition or intermediate pumping.

If RMMSD were to implement tertiary treatment, it would need to select a specific technology that could reach the expected effluent limit. If the effluent limit were 0.1 mg/L or less, technologies such as an iron impregnated sand filter, ballasted settling, cloth disk filtration, or membrane filtration would be appropriate alternatives. The treatment plant would need to pump secondary effluent to the new tertiary treatment and route flow back through the UV system. Additional chemical storage and feed pumps would likely be necessary. RMMSD has adequate land for tertiary treatment; however, it may not be adjacent to secondary clarification and UV disinfection.

	Project Total	Phase
Alternative PR 1	$2,015,000	Future
Alternative PR 2	$16,790,000	Future

Table 7.02-7 Opinion of Total Present Worth Cost for Phosphorus Removal Alternatives

The opinion of total present worth costs for the two alternatives are shown in Table 7.02-7. Note that the costs for Alternative PR1 do not include the additional chemical costs to meet future interim phosphorus limits. Also, the PR1 costs do not include the costs to construct future phosphorus removal processes and equipment. Also note the costs for PR2 are considered conservative and are for preliminary planning only. More detailed costs will need to be developed as part of the upcoming WPDES permit compliance schedule (within the next five years). It is recommended that RMMSD not select a phosphorus removal alternative at this time, and that they study the available alternatives in detail during their WPDES permit phosphorus compliance schedule.

G. Disinfection

As previously discussed, the UV system was designed as a phased project with the first phase having a capacity of 4.34 mgd and the second phase having a total capacity of 8.68 mgd. The first phase was constructed in 2009, and the second phase should be constructed within the next five years. Costs for the additional UV system (UV-10-02) are shown in Table 7.02-8 and a preliminary layout is shown in Figure 7.02-4. The costs presented in Table 7.02-8 do not include demolition or capping the former chlorine contact tank because the WWTP wishes to keep it open at this time. Use of the chlorine contact tank area for future tertiary treatment can be evaluated in the future.

Element	Cost	Phase
UV System	$154,000	I
Subtotal	$154,000	
Demolition and Structural Modifications	$5,000	
Electrical (25%)	$39,000	
Mechanical (10%)	$23,000	
HVAC	$0	
Site Work (0%)	$0	
Subtotal	$221,000	
General Conditions (10%)	$22,000	
Subtotal	$243,000	
Contingencies and Technical Services (40%)	$97,000	
Opinion of Probable Capital Cost	**$340,000**	

Table 7.02-8 Disinfection Modifications

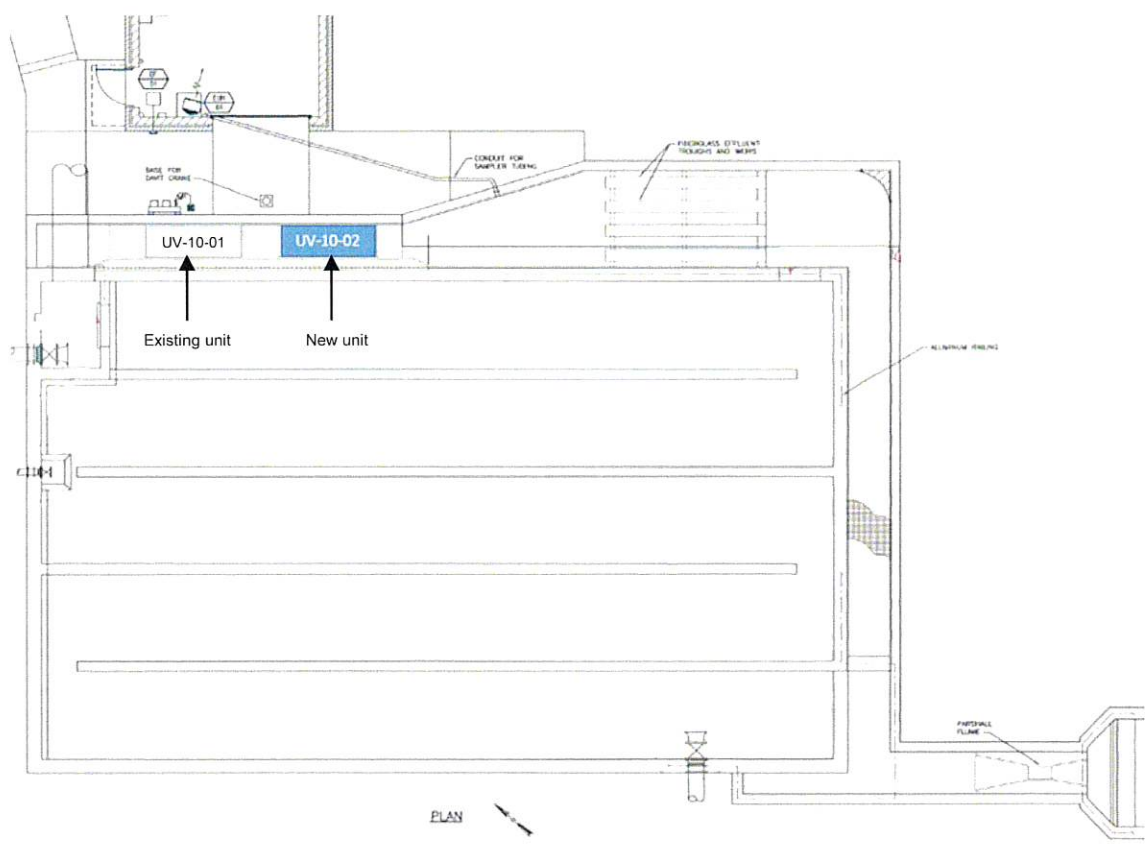


Figure 7.02-4 UV Disinfection Modifications Layout

H. Sludge Thickening

Because of the age and condition of the equipment and controls, the dissolved air flotation thickening units require equipment updates as part of the Phase II improvements. Estimated costs for the rehabilitation are shown in Table 7.02-9. The costs include the internal equipment of sprockets, shafts, chains, air pumps, and valves.

Element	Cost	Phase
Internal Equipment	$459,000	II
Thickened WAS Pumps	$50,000	
Subtotals	$509,000	
Demolition	$41,000	
Electrical (20%)	$102,000	
Mechanical (20%)	$102,000	
HVAC	$200,000	
Site Work (0%)	$0	
Subtotals	$954,000	
General Conditions (10%)	$95,000	
Subtotals	$1,049,000	
Contingencies and Technical Services (40%)	$420,000	
Opinion of Probable Capital Costs	**$1,469,000**	

Table 7.02-9 Sludge Thickening Modifications

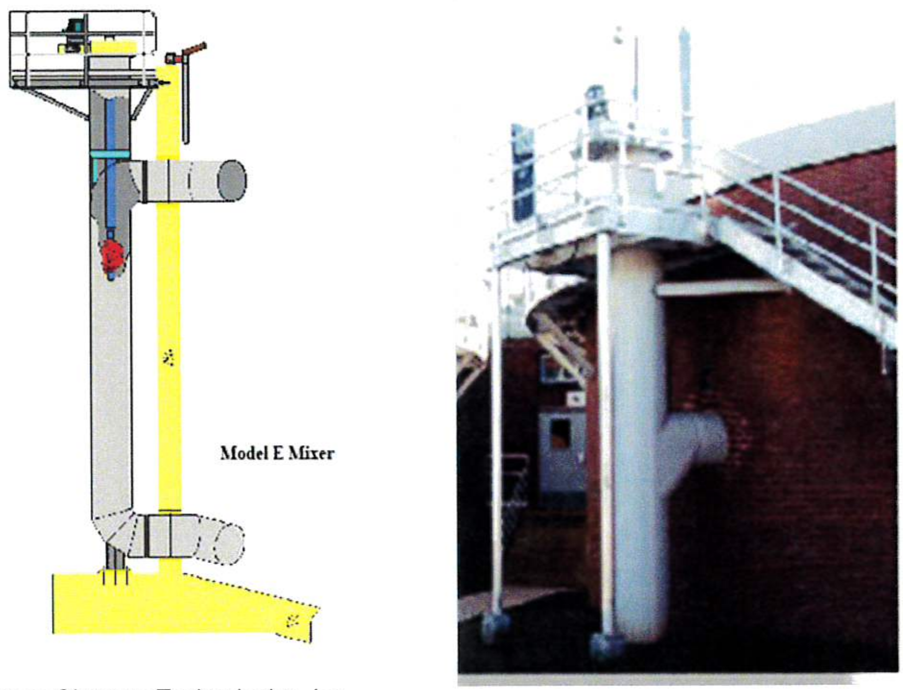
I. Solids Processing

Three mixing alternatives for the secondary digester were introduced in Section 6. Draft tube mixing, pumped mixing, and linear motion mixing were considered based on the need to replace aging equipment and the opportunity to maximize digester mixing and subsequent biogas production.

1. Alternative DG1–Draft Tube Mixing
2. Alternative DG2–Pumped Mixing
3. Alternative DG3–Linear Motion Mixing

Alternative DG1–Draft Tube Mixing. Draft tube mixing is an established mixing alternative for anaerobic digesters. A tube on the outside or inside of the digester contains a mixing impeller to move digester contents through the tube and back into the digester. This alternative would require the construction of concrete sumps (exterior option) and access platforms external to the digester tanks for the installation of the mixers. In addition, mixer nozzle penetrations through the sidewalls of digesters would be required.

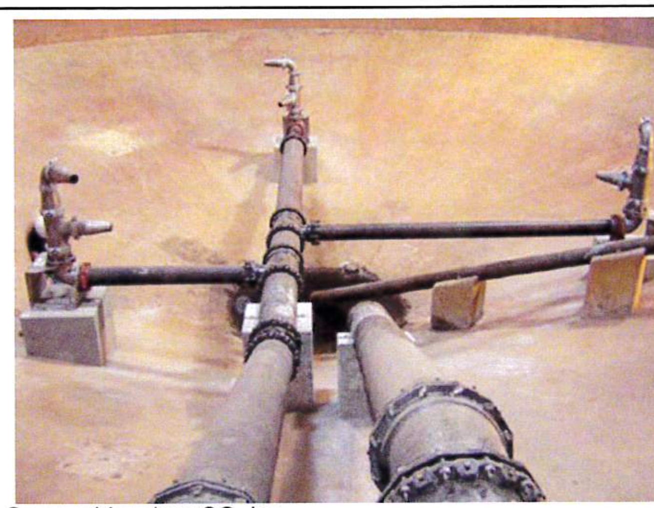
The draft tube mixers can be periodically operated in the reverse direction to help minimize the potential for ragging and subsequent clogging in the tubes, as well as aid in control of digester foaming. Examples of the draft tube mixers are shown in Figure 7.02-5.



Source: Olympus Technologies, Inc.

Figure 7.02-5 Example External Draft Tube Mixer Layout (Left) and Installation (Right)

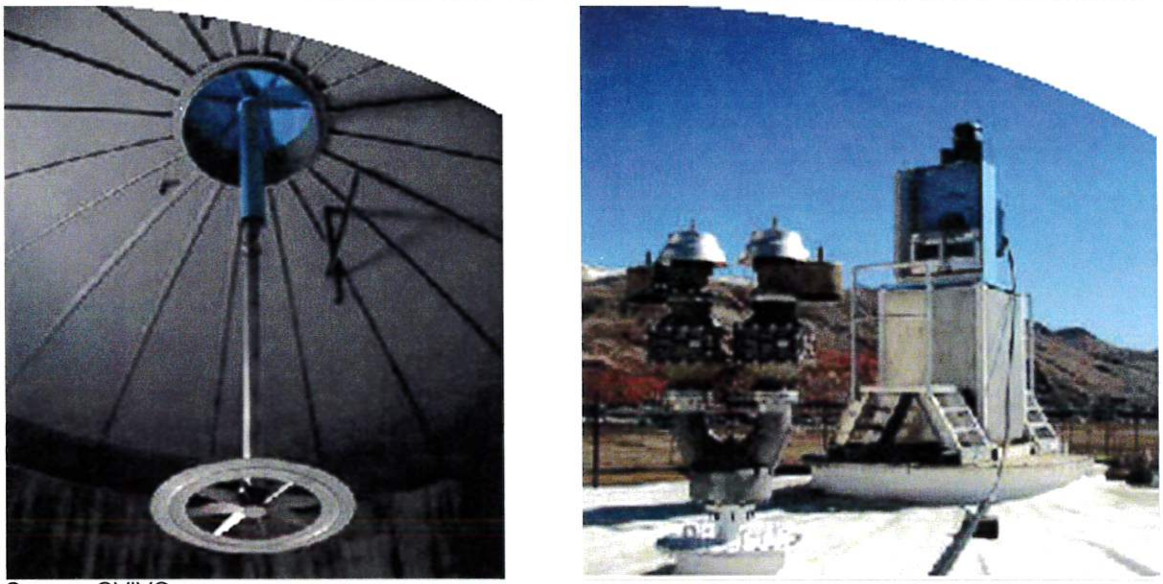
Alternative DG2–Pumped Mixing. Pumped mixing for anaerobic digesters is an established mixing alternative that has shown reliable success for many years. The primary digester was retrofitted with this equipment in 2001, as were the sludge storage tanks; however, the geometry of the digesters have a diameter to depth ratio that makes it easier to mix the tank contents with this system. Digester contents are pulled out of the digester and pumped back in at various locations through nozzles to mix the contents. Chopper pumps are used to pump the tank contents and minimize the potential for ragging and subsequent clogging. The chopper pumps can run intermittently while still maintaining adequate mixing for the process. An example of pumping mixing nozzles and piping are shown in Figure 7.02-6.



Source: Vaughan CO, Inc.

Figure 7.02-6 Example Pumped Mixing Nozzle

Alternative DG3-Linear Motion Mixing. The application of linear motion (LM) mixing in anaerobic digesters is relatively new (approximately 10 years), and it is marketed as being able to resuspend heavy solids and reduce foaming and scum formation with significantly less power costs in comparison to conventional mixing. The mixer is suspended in the digester from the digester cover. The shaft has a ring-shaped disk at the end that oscillates up and down at about 30 cycles per minute. Because the mixer is installed at the center of the tank, modifications would be required to the existing sludge and digester gas piping. Examples of linear motion mixers are shown in Figure 7.02-7.



Source: OVIVO

Figure 7.02-7 Example LM Mixer Installations

Table 7.02-10 shows the total present worth costs for the digester mixing alternatives. The costs include a new floating cover for the primary digester, a floating gas-holder cover for the secondary digester, two digester recirculation pumps, two transfer pumps, digester gas safety equipment, one waste gas burner, heat exchangers, hot water boiler and associated piping, and the indicated digester mixing system alternative. It may be possible to reuse the existing covers for another 15 to 20 years with only painting and repairs needed during this time frame. The actual condition of the covers could be determined when the digesters are taken out of service for cleaning or when the new mixing is installed. Detailed cost opinions are included in Appendix E.

	Alternative DG1 Draft Tube Mixers	Alternative DG2 Pumped Mixing	Alternative DG3 LM Mixer
Opinion of Capital Costs	$5,240,000	$4,432,000	$4,733,000
Annual O&M Costs			
Labor	$57,000	$57,000	$57,000
Power	$9,100	$12,200	$4,600
Maintenance and Supplies	$9,100	$1,800	$4,400
Subtotal of Annual O&M Costs	$75,200	$71,000	$66,000
Present Worth of O&M	$968,000	$914,000	$849,000
Present Worth of Future Equipment	$0	$0	$0
Present Worth of Salvage	-$171,000	-$162,000	-$166,000
Total Opinion of Total Present Worth	**$6,037,000**	**$5,184,000**	**$5,416,000**

*See Appendix E for detailed cost estimates.

Table 7.02-10 Solids Processing Alternatives

As shown in Table 7.02-10, the pumped mixing system and LM Mixer are similar in total present worth cost, and the draft tube mixing has the highest capital and present worth costs of these three alternatives. Further selection between pumped and LM mixing requires the analysis of nonmonetary factors. Nonmonetary considerations are evaluated and summarized in Table 7.02-11. Alternative DG2 is recommended because RMMSD is familiar with the technology and it is the alternative with the lowest present worth cost.

Alternative	Advantages	Disadvantages
External Draft Tube Mixing	▪ Years of proven performance. ▪ Normal maintenance can be completed without taking digester out of service. ▪ Reversible flow direction option. ▪ Equipment redundancy. ▪ Ability to add supplemental heat.	▪ Maintenance must be performed in exposed areas. ▪ Mixer maintenance or removal requires equipment the WWTP does not have readily available (e.g., crane) for removal of impellers. ▪ Higher energy use. ▪ Operation dependent of minimum liquid level.
Pumped Mixing	▪ Years of proven performance. ▪ Equipment located in interior space. ▪ Maintenance can be completed without taking digester out of service. ▪ No moving parts inside the tank. ▪ Standard 10-year nozzle warranty. ▪ Intermittent operation and variable frequency drives (VFDs) to reduce energy costs. ▪ Equipment redundancy. ▪ Staff familiarity with equipment. ▪ Operation independent of liquid level.	▪ Increased frequency of normal maintenance. ▪ Potentially higher energy use than linear motion. ▪ No dedicated method of breaking up foam/scum. ▪ Long downtime for any issues with the nozzles in digester. ▪ Possible limited space available for mixing pumps. ▪ Less mixing intensity compared to draft tube mixers.
Linear Motion Mixing	▪ Normal maintenance can be completed without taking digester out of service. ▪ Simple controls. (Continuous, single speed.) ▪ Operation independent of liquid level. ▪ Lower energy use. ▪ Spare drives available for equipment redundancy.	▪ One equipment manufacturer; less competition. ▪ Requires specialized flexible joints and supports for exterior digester gas piping and modification to gas takeoff locations. ▪ Requires digester cover modifications for mixer support to be incorporated in new cover design (can be incorporated with cover replacement). ▪ Maintenance must be performed In exposed areas; cover may be difficult to access in the winter. ▪ Mixer removal or spare drive replacement requires equipment the WWTP may not have readily available (e.g., crane).

Table 7.02-11 Digester Mixing Nonmonetary Considerations

J. Biosolids Disposal

As mentioned in Section 6, RMMSD is having a more difficult time securing and locating land for the application of liquid sludge. There are many biosolids disposal alternatives including purchasing and managing land for land application, dewatering and drying biosolids, dewatering biosolids with disposal of at the biomass power plant in Rothschild, or creating Class A biosolids. RMMSD has made significant investment into liquid biosolids disposal including building two liquid biosolids storage tanks and maintaining the equipment and staff to haul and dispose of the liquid biosolids. Operational costs to haul and land-apply sludge are between \$0.04 and \$0.05 per gallon hauled for an actual annual cost between \$200,000 and \$225,000 in 2015 dollars. The operating costs do not include depreciation or fuel costs and may underestimate the labor involved because they are paid from the plant's annual operating budget.

There are no regulatory pressures to meet Class A biosolids standards. Considering the plant's significant investment in liquid biosolids storage and commitment to its mesophilic anaerobic digestion process, these options were not explored further.

We Energies owns and operates a biomass power plant in Rothschild, Wisconsin, just across the river from the RMMSD facility. This plant is a cooperative effort between We Energies and Domtar Paper Corporation. The plant manager for the We Energies Rothschild facility was contacted for this project to learn about the potential of disposing of dewatered biosolids in its biomass combustion process. We Energies stated several concerns with incorporating biosolids into its process. The first concern was the potential for odor complaints from nearby residential neighbors. The second concern was the potential for glass phase byproducts being formed in the high heat combustion process because of the presence of potassium and phosphorus in the biosolids. The third concern was that using biosolids in their process is not included in its permit. From the discussions with the plant manager, it was clear that significant perception and regulatory concerns will need to be overcome before this could be considered as a viable biosolids disposal option for RMMSD. Should the regulations and power industry change to require more renewable fuel sources, this may become a more viable option in the future.

RMMSD may improve the reliability of land availability for biosolids application if it purchases and manages the land itself (or through rental agreements) rather than using contractors and producer agreements. RMMSD would need between 600 and 1,000 acres of land to accomplish this goal. Costs for 1,000 acres of land at $3,000 per acre plus 30 percent contingencies, legal, and technical services equals approximately $3,900,000 (potential future approach).

This cost represents a significant investment to RMMSD that should not be initiated without careful consideration. A full alternatives evaluation including liquid sludge, dewatering, drying, and seasonal drying may be warranted when the pressures of land availability require additional land acquisitions. At this time, it is recommended that RMMSD continue operating as is and utilize private contractors as needed to provide additional equipment or labor during critical times.

K. Biosolids Dewatering

The belt filter presses are rarely used and do not need immediate replacement or upgraded equipment. It is recommended that RMMSD continue the current liquid hauling program. Therefore, the belt filter presses, polymer equipment, and sludge pumps should be removed. The estimated demolition cost of all dewatering equipment is $100,000, and demolition should be included in Phase I of the facilities plan. Although RMMSD may be able to offset the demolition costs by selling the belt filter presses and associated equipment, the resale value of the equipment is not reflect in the demolition costs.

L. Electrical

As discussed in Section 6, there are multiple power, SCADA system, and lighting upgrades needed throughout the plant. Some SCADA improvements are being completed prior to Phase I. Table 7.02-12 summarizes the estimated costs of the electrical improvements, with the installation factor of 50 percent included in the electrical sub-estimate rather than the individual element costs. The mechanical cost estimate includes the necessary natural gas piping and appurtenances associated with the natural gas generator.

Element	Cost	Phase
Service Entrance Switchboard	$60,000	I
750 kW Natural Gas Generator	$360,000	I
Structural Modifications	$100,000	I
MCC-A	$228,000	I
MCC-B	$338,000	I
MCC-C	$178,000	I
SCADA System PLC Upgrades	$84,000	I
Telephone & Paging System	$36,000	I
Lighting Upgrades	$66,000	I
Subtotal	$1,450,000	
Demolition (10%)	$145,000	
Electrical (50%)	$725,000	
Mechanical (5%)	$73,000	
HVAC	$120,000	
Site Work (0%)	$0	
Subtotal	$2,513,000	
General Conditions (10%)	$251,000	
Subtotal	$2,764,000	
Contingencies and Technical Services (40%)	$1,106,000	
Opinion of Probable Capital Cost	**$3,870,000**	

Table 7.02-12 Electrical Modifications

M. Valve Replacement and Piping Modifications

All valves in the valve manholes have reached the end of their useful service life. Costs to replace the valves were determined from a recent project and are shown in Table 7.02-13. A valve survey should be completed as part of detailed design.

Element	Cost	Phase
Valve Replacement and Piping Modifications	$300,000	I
Subtotal	$300,000	
Demolition	$50,000	
Electrical (0%)	$0	
Mechanical (10%)	$60,000	
HVAC (0%)	$0	
Site Work (5%)	$15,000	
Subtotal	$425,000	
General Conditions (10%)	$43,000	
Subtotal	$468,000	
Contingencies and Technical Services (40%)	$187,000	
Opinion of Probable Capital Cost	**$655,000**	

Table 7.02-13 Valve Replacement and Modifications

N. Space Needs

Space requirements have been estimated to provide staff with an updated Administration Building. Costs of the project improvements in Table 7.02-14 include reconfigured reception and office areas, updated carpeting, paint, and finishes throughout the building, reconfigured locker rooms, and replacement of furnishings. The addition of a big screen SCADA display and the options for lighting were previously detailed in the Electrical description in Section 6.

Element	Cost	Phase
Reception Office	$119,000	I
Building carpet, paint, & finish	$49,000	I
Furnishings	$34,000	I
Locker Rooms	$108,000	I
Subtotal	$310,000	I
Demolition	$31,000	
Electrical (20%)	$62,000	
Plumbing (10%)	$31,000	
HVAC (20%)	$62,000	
Site Work (2%)	$6,000	
Subtotal	$502,000	
General Conditions (10%)	$50,000	
Subtotal	$552,000	
Contingencies and Technical Services (40%)	$221,000	
Opinion of Probable Capital Cost	**$773,000**	

Table 7.02-14 Administration Building Space Needs Modifications

O. Painting

Costs of interior and process piping painting effort associated with each phase of the project are shown in Table 7.02-15.

Element	Phase I Cost	Phase II Cost
Painting	$171,000	$152,000
Subtotal	$171,000	$152,000
Demolition	$0	$1
Electrical (0%)	$0	$0
Mechanical (0%)	$0	$1
HVAC (0%)	$0	$0
Site Work (0%)	$0	$1
Subtotal	$171,000	$152,003
General Conditions (10%)	$17,000	$15,000
Subtotal	$188,000	$167,000
Contingencies and Technical Services (40%)	$75,000	$67,000
Opinion of Probable Capital Costs	**$263,000**	**$234,000**

Table 7.02-15 Painting Modifications

7.03 PROJECT STAGING

Each improvement previously detailed has been prioritized based on input from plant staff. The projects have been assigned to time frames based on their priority. Table 7.03-1 shows the capital costs for the selected improvement alternatives within the suggested project intervals.

	Phase I	Phase II	Future
Influent Pumping Station	$584,000	---	
Mechanical Screening	$853,000	---	
Grit Removal	$1,123,000	---	
Primary Sedimentation	---	$948,000	
Activated Sludge	---	$309,000	
Final Clarification & RAS Pumping	$235,000	$787,000	
UV Disinfection	$340,000	---	
Phosphorus Removal	---	---	TBD*
Thickening	---	$1,469,000	
Anaerobic Digestion	---	$4,432,000	
Biosolids Disposal	---	---	TBD*
Sludge Dewatering	$100,000	---	
Electrical Modifications	$3,870,000	---	
Valve Replacement and Piping Modifications	$655,000	---	
Space Needs Modifications	$773,000	---	
Painting	$263,000	$234,000	
Total Opinion of Probable Capital Cost	**$8,796,000**	**$8,179,000**	TBD*

*Future costs to be determined (TBD).

Table 7.03-1 WWTP Improvements Opinion of Probable Cost Summary

SECTION 8
SELECTION OF RECOMMENDED ALTERNATIVES AND FISCAL IMPACT OF SUMMARY

Previous sections of the report have provided background information, described and evaluated the projected flows and loadings, and reviewed alternatives necessary to meet the projected wastewater treatment needs of RMMSD. This section presents a summary of the proposed modifications to the RMMSD WWTP, evaluates the impact of the proposed No Action Alternative, and presents an overall cost summary and a schedule for implementation.

8.01 RECOMMENDED PLAN SUMMARY

The recommended plan includes the following improvements to the existing RMMSD WWTP. Phase II improvements are in *italics*.

1. Replace the five original influent pumps with five new chopper pumps.
2. Replace the existing recycle flow Parshall flume with a larger recycle flow Parshall flume, replace wet well level floats with new radar transmitters, replace influent gates, and replace the recycle flow sampler with a new automatic sampler. Inspect and replace or refurbish wet well piping.
3. Replace the diesel generator with a new natural gas generator and relocate it to the location of the plant electrical service entrance switch.
4. Replace the existing influent mechanical step screen and wash press with a larger new mechanical step screen and new wash press.
5. Replace the existing aerated grit removal system with a vortex grit removal system and grit washer.
6. *Replace the primary clarifier flights, chains, and sludge pumps, and add clean outs on the primary sludge lines.*
7. *Replace one activated sludge blower with a turbo blower and the piping between the blower room and aeration tanks.*
8. *Replace final clarifier drives, collector mechanisms*, and RAS pumps equipped with new VFDs.
9. Evaluate phosphorus removal alternatives during the phosphorus compliance schedule included in an updated WPDES permit.
10. Install an additional ultraviolet disinfection system bank.
11. *Replace the internal equipment of the dissolved air floatation thickening system and the thickened sludge pumps.*
12. *Replace both digester covers (after inspection), digester recirculation pumps, transfer pumps, digester gas safety equipment, the waste gas burner, heat exchanger and add hot water boiler, and install a pumped mixing system for the secondary digester.*
13. Demolish biosolids dewatering equipment and refurbish building to be reusable for alternative purposes as part of the phased projects in the future.
14. Update the plant power equipment to provide a new service entrance switchboard, back-up power generator, three new MCCs, SCADA PLC upgrades, and provide a big screen monitor.

15. Replace all existing buried valves, valves in manholes, and interior valves with new valves.
16. Make modifications to the Administration Building including repurposing of garage space, the addition of SCADA displays, and improvements to offices, locker rooms, and storage space to meet staff needs.
17. Paint all interior spaces and piping concurrently with improvements in each building.

The presented plan is intended to meet RMMSD WWTP projected wastewater needs through the year 2035. The preliminary year 2035 design criteria for the RMMSD WWTP is included in Appendix F.

8.02 ENVIRONMENTAL ASSESSMENT

Previous sections of this report evaluated biological treatment, effluent disinfection, and biosolids stabilization alternatives available to RMMSD and a recommended course of action. This subsection compares the proposed recommended plan with respect to the "No Action" alternative on environmental impact.

A. Environmental Impacts of the Proposed Actions Compared with the Environmental Impact of No Action

Impacts on climate, topography, soils, water quality, water uses, air quality, land use, biology, environmentally sensitive areas, aesthetics, energy use, public use, and historical and archeological sites will be addressed.

1. Climate

Neither the No Action Alternative nor the proposed actions would have a significant impact on area climate.

2. Topography

The No Action Alternative will have no impact on area topography.

The proposed actions would have minimal impact on area topography considering the improvements are primarily equipment replacement. The improvements to the grit removal system may involve some site work. Additional ground disturbance and site work will result from various piping and valve improvement. Grading and landscaping will be limited to the immediate area of this structures.

3. Soils

Both the No Action Alternative and the proposed actions use beneficial reuse of dewatered biosolids and thereby improve the character of the solids where the biosolids are disposed.

Soil erosion and sediment will be controlled during construction through the use of mean, methods, and procedures as required by Section NR 216 of the Wisconsin Administrative Code.

4. Water Quantity

The quantity of groundwater and surface water in the area will not be affected by either the proposed actions or the No Action Alternative.

5. Water Uses

Neither the No Action Alternative nor the proposed actions would have a significant impact on groundwater uses in the area. The proposed actions, including increasing the disinfection capacity of the facility, will provide greater protection to the receiving waters from public safety (disinfection) perspectives.

6. Land Use and Population

The No Action Alternative may limit growth in the sewer service area because of limited capacity and/or reliability in various processes and equipment. The proposed actions would allow for continued growth and development in the sewer service area.

7. Biology

The proposed actions could potentially reduce the prevalence of algae in the receiving waters by maintaining the quality effluent RMMSD produces, thereby potentially affecting its biology. Future improvements for phosphorus reductions may also improve water quality.

8. Environmentally Sensitive Areas

Neither the No Action Alternative nor the proposed actions will impact area wetlands or other environmentally sensitive areas.

9. Energy Use

The proposed actions would result in similar or reduced overall energy consumption compared to the existing facility.

10. Public Health

The proposed actions provide greater protection of public health by increasing the disinfection capacity of the facility, reducing the likelihood of exposure to pathogens by residents recreating in the receiving water.

11. Historical and Archaeological Sites

Neither the No Action Alternative nor the proposed actions would have an impact on historic or archaeological sites.

B. Adverse Impacts that Cannot be Avoided Should the Proposed Actions be Implemented

There are a number of adverse impacts that cannot be avoided should the proposed actions be implemented. These impacts can be minimized by careful planning, appropriate construction practices, and program management.

	Replacement Fund Contribution Phase I	Replacement Fund Contribution Phase II
Influent Pumping Station	$24,000	
Mechanical Screening	$62,000	
Grit Removal	$95,000	
Primary Sedimentation		$68,000
Activated Sludge	$40,000	$52,000
Final Clarification and RAS Pumping	$27,000	$75,000
UV Disinfection	$50,000	
Phosphorus Removal		
Thickening		$152,000
Anaerobic Digestion		$617,000
Biosolids Disposal		
Sludge Dewatering	$385,000	
Electrical Modifications	$766,000	
Valve Replacement and Piping Modifications		
Space Needs Modifications	$7,000	
Total Opinion of Probable Capital Cost	**$1,456,000**	**$964,000**

Table 8.05-1 Approximated Replacement Fund Contribution

B. State of Wisconsin Assistance–CWFP

The State of Wisconsin administers a construction loan program termed the "Clean Water Fund Program" (CWFP). The fund provides lower interest loans for a percentage of eligible costs for construction of WWTPs.

Loans are available for projects addressing compliance maintenance improvements, changed limits, and unsewered communities. The rate for the loan is a composite rate based on a blend of the subsidized interest (70 percent of market rate in 2016) for the low interest rate eligible portions of the project and a market interest rate for market rate eligible portions of the project. Currently, the market rate is 3.250 percent and that will be used for estimating CWFP loan costs. The composite rate will be determined in accordance with the provisions of NR 162 of the Wisconsin Administrative Code. The following project elements are not eligible for the low interest rate:

1. Industrial Capacity
2. Future Capacity Needs (growth more than 10 years in the future)

A preliminary parallel cost estimate indicated a blended rate will be 2.275 percent for the Phase I Improvements based on the selected projects included in that phase. All projects in that phase are expected to be funded at the subsidized rate. The space needs modifications are expected to be funded at the market rate. The preliminary parallel cost estimate indicated a blended rate will be 2.278 percent for the Phase II Improvements as some of the activated sludge upgrades may not fully qualify for the subsidized rate and may need to be funded at the market rate. The CWFP also provides zero interest loans for portions of facilities associated with septage receiving and treatment. The zero interest loan portions of the project have not been specifically accounted for in the blended rate calculations. RMMSD WWTP may see some savings when these costs are included at the time of completing the loan application. All loan projections are based on the preliminary blended rates, and a more detailed parallel cost estimate will be completed along with a future loan application.

C. Local Costs

Local costs will be dependent on the availability of CWFP loans. Table 8.05-2 shows the opinion of probable cost, anticipated replacement fund contribution, anticipated loan amount, anticipated blended loan rate, and expected annual debt payment breakdown for the Phase I and Phase II projects.

The average annual revenue between 2010 and 2014 was approximately $1,875,000, excluding debt service. Since that time frame, all debts have been retired. It is anticipated the current rates will be increased in 2016 to help pay for Phase I improvements. Based on the projected annual operating costs and anticipated debt service, the average revenue in 2017 will need to be increased to approximately $2,340,000. This is an increase of 25 percent over the average 2010 to 2014 revenue.

Revenue will also need to be increased later for the Phase II improvements. The estimated annual debt service for that project is approximately $453,000 (September 2015 dollars). RMMSD could consider a couple options for increasing revenue to meet this need. The district could gradually increase rates between 2017 and 2021 to meet the increased need or do a one-time increase at the time of loan closing. During this time frame, RMMSD will also need to pay for phosphorus removal projects. As RMMSD reviews and modifies its rates each year, it will account for this upcoming need appropriately.

	Phase I Improvements	Phase II Improvements
Opinion of Probable Cost	$8,796,000	$8,179,000
Replacement Fund Contribution	$1,456,000	$964,000
CWFP Loan Amount	$7,340,000	$7,215,000
Anticipated Blended Loan Rate	2.275%	2.278%
Estimated Annual Debt Service Payment	$461,000	$453,000

Table 8.05-2 Summary of Funding for Phase I and Phase II Improvements (September 2015 Dollar Basis)

SECTION 9
RESOURCE IMPACT SUMMARY

This section summarizes project environmental impacts and is included as an aid to the WDNR in its review of the project.

9.01 PROJECT IDENTIFICATION

Applicant:	Rib Mountain Metropolitan Sewerage District
Address:	2001 Aster Road, Wausau, WI 54401
Title of Proposal:	Wastewater Facilities Plan
Location:	Rib Mountain Metropolitan Sewerage District Wastewater Treatment Plant

9.02 PROJECT DESCRIPTION

A. <u>Why is this Project Needed?</u>

The project will provide new and upgraded facilities for the RMMSD WWTP. A large portion of the recommended projects are equipment replacement projects for aging equipment. Additionally, several upgrades are included to reduce labor requirements and improve staff facilities.

The new treatment plant facilities will be constructed at the existing RMMSD WWTP site (see Figure 3.01-1). The following elements are included.

1. Replace the five original influent pumps with five new chopper pumps.

2. Replace the existing recycle flow Parshall flume with a larger recycle flow Parshall flume, replace wet well level floats with new radar transmitters, replace influent gates, and replace the recycle flow sampler with a new automatic sampler. Inspect and replace or refurbish wet well piping.

3. Replace the diesel generator with a new natural gas generator and relocate it to the location of the plant electrical service entrance switch.

4. Replace the existing influent mechanical step screen and wash press with a larger new mechanical step screen and new wash press.

5. Replace the existing aerated grit removal system with a vortex grit removal system and grit washer.

6. Replace the primary clarifier flights, chains, and sludge pumps, and add clean outs on the primary sludge lines.

7. Replace one activated sludge blower with a turbo blower and the piping between the blower room and aeration tanks.

8. Replace final clarifier drives, collector mechanisms, and RAS pumps equipped with new VFDs.

9. Evaluate phosphorus removal alternatives during the phosphorus compliance schedule included in an updated WPDES permit.

10. Install an additional ultraviolet disinfection system bank.

11. Replace the internal equipment of the dissolved air floatation thickening system and the thickened sludge pumps.

12. Replace both digester covers (after inspection), digester recirculation pumps, transfer pumps, digester gas safety equipment, the waste gas burner, heat exchanger and add hot water boiler, and install a pumped mixing system for the secondary digester.

13. Demolish biosolids dewatering equipment and refurbish building to be reusable for alternative purposes as part of the phased projects in the future.

14. Update the plant power equipment to provide a new service entrance switchboard, back-up power generator, three new MCCs, SCADA PLC upgrades, and provide a big screen monitor.

15. Replace all existing buried valves, valves in manholes, and interior valves with new valves.

16. Make modifications to the Administration Building including repurposing of garage space, the addition of SCADA displays, and improvements to offices, locker rooms, and storage space to meet staff needs.

17. Paint all interior spaces and piping concurrently with improvements in each building.

Figure 9.02-1 presents the preliminary site plan including the recommended improvements.

B. What Area is to be Served (Service Area and Projected Population)?

The existing RMMSD sewer service area is shown in Figure 1.02-1. The projected service population is 45,227.

C. What is the Design Flow and Loadings?

During the year 2035, the expected flows and loadings are as follows:

Annual Average Daily Flow	4.41 mgd
Peak Hourly Design Flow	8.09 mgd
Peak Instantaneous Flow	12.29 mgd
BOD_5 Loading Average	8,529 lb/day
TSS Loading Average	9,798 lb/day

D. What are the Applicable Stream Classifications and Effluent Limits?

The receiving water body is the Wisconsin River which is classified as a river. Effluent limits were discussed in Section 5.

Phase I

Influent Pumping Station
Mechanical Screening
Grit Removal
RAS Pumping
UV Disinfection
Sludge Dewatering
Electrical Modifications
Process Piping Modifications
Space Needs Modifications

Phase II

Primary Sedimentation
Activated Sludge
Final Clarification
Thickening
Anaerobic Digestion

Future

Tertiary Filtration

PRELIMINARY SITE PLAN

WASTEWATER TREATMENT FACILITY
RIB MOUNTAIN METROPOLITAN SEWERAGE DISTRICT
MARATHON COUNTY

STRAND ASSOCIATES®

FIGURE 9.02-1
1165.011

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E. How will the Project be implemented (construction schedules, financing, and user charges)?

Table 9.02-1 presents the proposed implementation schedule for the RMMSD WWTP projects and associated costs.

Project	Opinion of Capital Cost	Year
Phase I Improvements	$8,796,000	2016-2020
Phase II Improvements	$8,179,000	2021-2030

Table 9.02-1 Implementation Schedule and Project Capital Costs

9.03 AFFECTED ENVIRONMENT

A. Physical: Describe Existing Resource Features (including wetlands, lakes, streams, shorelands, floodplains, groundwater, soils, and topography) that may be affected by the Proposed Project.

1. Wetlands: There will be no lands classified as wetlands that will be affected by the proposed project.

2. Lakes: There will be no lands classified as lakes that will be affected by the proposed project.

3. Rivers: The current discharge for the RMMSD WWTP is the Wisconsin River. The proposed project will provide improved treatment plant reliability and performance.

4. Shorelands: Shoreland areas will not be affected by the proposed project.

5. Floodplains: The project improvements will not be within the 100-year flood elevation.

6. Groundwater: The proposed project includes minimal excavation in the area of existing structures, and groundwater is not expected to be an issue.

B. Biological: Identify plant and animal communities in the planning area with an emphasis upon those species likely to be impacted. Threatened or endangered status should be discussed where applicable.

1. The project area is located in an area already designated for the wastewater treatment facilities.

C. Cultural: Describe zoning and land use, ethnic and cultural groups, and archaeological and historic resources that may be affected by the Proposed Project. Describe the economic setting of the area.

1. Land Use: The proposed construction of facilities will not occur within 500 feet of a residence.

2. There will be no impact on ethnic or cultural groups.

3. Economic Setting: RMMSD serves five communities of Marathon County. These five communities include parts of the Town of Rib Mountain, the Village of Rothschild, part of the Town of Weston, the Village of Kronenwetter, and the City of Mosinee. These communities represent a stable and vibrant part of the county with several established business and commercial operations.

D. Other Resource Features: Identify Parks, Natural Areas, Prime Agricultural Land, etc.

1. The RMMSD WWTP property borders the Wisconsin River on the southeast boundary.

9.04 PROJECT IMPACTS

A. Primary

1. Describe expected changes in surface water or groundwater quality. List any required Chapter 30 permits.

The proposed project will not require a Chapter 30 permit.

2. Describe construction-related impacts such as noise, traffic disruptions, and air emissions.

During the period of construction, there would likely be an unavoidable increase in noise levels, dust, and congestion, near construction sites. In addition, the construction process may necessitate the disturbance of surface improvements and vegetation, excavation, storage of materials, and backfill operations. Movement of heavy equipment to and from the site, delivery of construction materials, and traffic of workers to and from the construction locations would also be necessary.
There will be no construction near residences.

3. Describe impacts on natural flora and fauna.

The construction of the new WWTP facilities will not have an impact on the flora and fauna of the area since all construction occurs on lands currently used for wastewater treatment.

4. Describe loss of prime agricultural land or disruption of agricultural activities.

No prime agricultural lands will be impacted by this project.

5. Describe project impacts on wetlands and floodplains. Explain why such impacts are necessary.

There would be no impacts on wetlands or construction within the floodplain.

6. Describe project impacts upon scientific or other aesthetic resource features.

There are no scientific or unique areas that would be impacted by the proposed project.

7. Describe impacts on cultural, historic, and archaeological features.

There are no known resources that would be impacted.

B. Secondary

1. Describe the future environmental impacts resulting from increased urbanization and land use changes potentially induced by the availability of wastewater collection and treatment services. Special attention should be given to impacts upon wetlands and other surface water including those resulting from stormwater runoff and erosion. Other secondary impacts on flora, fauna, air quality, agriculture, urban services, science values, and cultural, historic, and archaeological resources should also be addressed.

The proposed project is consistent with anticipated and planned growth in the area. Providing adequate municipal wastewater treatment facilities would promote controlled development.

9.05 MITIGATED MEASURES

Describe measures proposed to mitigate adverse primary and secondary impacts.

A. Construction Impacts

During construction, certain practices would be required of contractors including compliance with any applicable stormwater-related construction ordinances. These practices include backfill, reseeding, and restoration of excavated and disturbed areas as soon as possible after construction; runoff control measures to minimize sediment runoff from construction sites; and appropriate scheduling of heavy equipment. Roadway access would be maintained during construction.

B. Noise

Equipment and processes having high noise levels are not included in the design. Construction activities would be expected to follow noise agreements the RMMSD WWTP has with its neighbors.

C. Odors and Visual Impacts

The proposed facilities will mitigate the impacts of odors and noise in the vicinity of the RMMSD WWTP., such as replacing aerated grit removal with vortex grit removal. Appropriate design features will be included to improve the appearance of the overall site including proper restoration of all disturbed areas.

9.06 ALTERNATIVES CONSIDERED

A. Provide a Description and Cost Comparison of Alternatives Considered

Section 7 of this report includes the alternatives that were considered, descriptions of the alternatives, and summaries of the present worth evaluations. Detailed present worth calculations are included in Appendix E. Projects that replace existing aged or undersized equipment with similar equipment were not evaluated on a present worth basis. Those elements include equipment of the influent pumping structure, mechanical fine screens, UV disinfection, DAFT equipment and controls, SCADA and power upgrades, buried yard valves, and modifications to the Administration Building.

B. Describe the environmental impacts of the nonselected alternatives identified above that differ from those expected for the selected alternative.

1. Impact evaluations for nonselected alternatives are included in Section 7 of this report.

2. No-Action Alternative: Should RMMSD not proceed with the construction of necessary facilities to comply with environmental protection regulations, there would be a number of negative impacts.

    a. Additional maintenance of existing equipment will be required because of the age of the facility.

    b. Potential loss of benefits gained through labor efficiency.

    c. Potential loss of equipment reliability through advanced age.

9.07 CONTACTS

List agencies, groups, and individuals contacted regarding the proposed projects.

1. WDNR–Nathan Wells, Pat Oldenburg, Mike Vollrath, Thomas Mugan
2. RMMSD–Ken Johnson, Commissioners
3. Marathon County–Department of Conservation, Planning, and Zoning
4. Rib Mountain Sanitary District–Michael Heyroth
5. City of Mosinee–Jeff Gates
6. Village of Kronenwetter–Duane Gau
7. Village of Rothschild–George Peterson
8. Village of Weston–Keith Donner
9. We Energies

A public hearing will be held on November 10, 2015.

SECTION 10
PUBLIC PARTICIPATION EFFORTS

This section summarizes the public participation efforts employed as part of RMMSD's facility planning effort.

10.01 PUBLIC HEARING

A public hearing was held on November 10, 2015, at the RMMSD office. This public hearing announcement was published in the Wausau Daily Herald. A record of the announcement is included in Appendix G.

The public hearing was attended by the following individuals:

Metro Commissioners:
James Strehlow
Robert Stavran
Thomas Wittkopf
Galen Olson
Paul Wirth

RMMSD Staff:
Ken Johnson
Kathi Kunze

Speakers/Audience Members:
Duane Gau, Village of Kronenwetter
George Peterson, Village of Rothschild
Dave Erickson, Wausau Water Works
Rachel Lee, Strand Associates, Inc.®
Kevin Hopkins, Strand Associates, Inc.®
Phil Budde, Strand Associates, Inc.®
Jeff Pritchard, Marathon County
David Mack, Marathon County
Tonia Speener, Clark Dietz Engineers
Michael Wodalski, Village of Weston
Mike Heyroth, Rib Mountain Sanitary District

Rachel Lee from Strand Associates, Inc.® made a presentation to the audience. The presented slides are included in Appendix G along with a transcript of the meeting.

10.02 PUBLIC COMMENTS

The public comment period was open from October 22, 2015, through November 22, 2015. Written comments were received from Rib Mountain Sanitary District, the Village of Kronenwetter, Marathon County Conservation, Planning & Zoning Department, and the Village of Rothschild. Each letter was responded to individually. Copies of the comments and responses are included in Appendix G.

APPENDIX A
WPDES PERMIT

WPDES PERMIT

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

PERMIT TO DISCHARGE UNDER THE WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM

Rib Mountain Metropolitan Sewerage District WWTF

is permitted, under the authority of Chapter 283, Wisconsin Statutes, to discharge from a facility located at
2001 Aster Road, Wausau, WI
to
the Wisconsin River in the Mosinee Flowage Watershed of the Central Wisconsin River Basin in Marathon County

in accordance with the effluent limitations, monitoring requirements and other conditions set forth in this permit.

The permittee shall not discharge after the date of expiration. If the permittee wishes to continue to discharge after this expiration date an application shall be filed for reissuance of this permit, according to Chapter NR 200, Wis. Adm. Code, at least 180 days prior to the expiration date given below.

State of Wisconsin Department of Natural Resources
For the Secretary

By ______________________

Scott Watson
Central Wisconsin Watershed Program Supervisor

____

Date Permit Signed/Issued

PERMIT TERM: EFFECTIVE DATE – January 1, 2011 **EXPIRATION DATE – December 30, 2015**

TABLE OF CONTENTS

1 Influent Requirements

1.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
701	Representative influent samples shall be collected at the inlet to the aerated grit chamber

1.2 Monitoring Requirements

The permittee shall comply with the following monitoring requirements.

1.2.1 Sampling Point 701 - INFLUENT @ GRIT CHAMBER

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Continuous	Continuous	
BOD_5, Total		mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	5/Week	24-Hr Flow Prop Comp	
Mercury, Total Recoverable		ng/L	Quarterly	24-Hr Flow Prop Comp	See footnote 1.2.1.1 below

1.2.1.1 Mercury Monitoring

The permittee shall collect and analyze all mercury samples according to the data quality requirements of ss. NR 106.145(9) and (10), Wisconsin Administrative Code. The limit of quantitation (LOQ) used for the effluent and field blank shall be less than 1.3 ng/L, unless the samples are quantified at levels above 1.3 ng/L. The permittee shall collect at least one mercury field blank for each set of mercury samples (a set of samples may include combinations of intake, influent, effluent or other samples all collected on the same day). The permittee shall report results of samples and field blanks to the Department on Discharge Monitoring Reports.

2 In-Plant Requirements

2.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
101	The field blank shall be collected using standard handling procedures every day that mercury samples are collected at influent and effluent.

2.2 Monitoring Requirements and Limitations

The permittee shall comply with the following monitoring requirements and limitations.

2.2.1 Sampling Point 101 - FIELD BLANK-MERCURY MONITORING

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable		ng/L	Quarterly	Blank	See footnote 2.2.1.1 below

2.2.1.1 Mercury Monitoring

The permittee shall collect and analyze all mercury samples according to the data quality requirements of ss. NR 106.145(9) and (10), Wisconsin Administrative Code. The limit of quantitation (LOQ) used for the effluent and field blank shall be less than 1.3 ng/L, unless the samples are quantified at levels above 1.3 ng/L. The permittee shall collect at least one mercury field blank for each set of mercury samples (a set of samples may include combinations of intake, influent, effluent or other samples all collected on the same day). The permittee shall report results of samples and field blanks to the Department on Discharge Monitoring Reports.

3 Surface Water Requirements

3.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
001	Representative effluent samples shall be collected at the outfall after the UV disinfection channel and prior to discharge to the Wisconsin River.

3.2 Monitoring Requirements and Effluent Limitations

The permittee shall comply with the following monitoring requirements and limitations.

3.2.1 Sampling Point (Outfall) 001 - EFFLUENT TO WISCONSIN RIVER

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Continuous	Continuous	
BOD_5, Total	Monthly Avg	30 mg/L	5/Week	24-Hr Flow Prop Comp	
BOD_5, Total	Weekly Avg	45 mg/L	5/Week	24-Hr Flow Prop Comp	
BOD_5, Total	Daily Max	1,163 lbs/day	5/Week	Calculated	Limit applies May-Oct
Suspended Solids, Total	Monthly Avg	30 mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	5/Week	24-Hr Flow Prop Comp	
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
Phosphorus, Total	Monthly Avg	1.0 mg/L	5/Week	24-Hr Flow Prop Comp	
Fecal Coliform	Geometric Mean	400 #/100 ml	Weekly	Grab	Limit & monitoring apply May-Sept
Mercury, Total Recoverable	Daily Max	50 ng/L	Monthly	Grab	See footnote 3.2.1.2 below
Nitrogen, Ammonia (NH_3-N) Total		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring shall be monthly in all years other than 2011
Nitrogen, Ammonia (NH_3-N) Total		mg/L	Weekly	24-Hr Flow Prop Comp	Monitoring shall be weekly throughout 2011
Acute WET		TU_a	See Listed Qtr(s)	24-Hr Flow Prop Comp	See footnote 3.2.1.3 below
Chronic WET		rTU_c	See Listed Qtr(s)	24-Hr Flow Prop Comp	See footnote 3.2.1.3 below

3.2.1.1 Average Annual Design Flow

The average annual design flow of the permittee's wastewater treatment facility is 4.27 MGD.

3.2.1.2 Mercury Monitoring

The permittee shall collect and analyze all mercury samples according to the data quality requirements of ss. NR 106.145(9) and (10), Wisconsin Administrative Code. The limit of quantitation (LOQ) used for the effluent and field blank shall be less than 1.3 ng/L, unless the samples are quantified at levels above 1.3 ng/L. The permittee shall collect at least one mercury field blank for each set of mercury samples (a set of samples may include combinations of intake, influent, effluent or other samples all collected on the same day). The permittee shall report results of samples and field blanks to the Department on Discharge Monitoring Reports. See the compliance schedule for more information.

3.2.1.3 Whole Effluent Toxicity (WET) Testing

Primary Control Water: Wisconsin River

Instream Waste Concentration (IWC): 3%

Dilution series: At least five effluent concentrations and dual controls must be included in each test.

- **Acute:** 100, 50, 25, 12.5, 6.25% and any additional selected by the permittee.
- **Chronic:** 100, 30, 10, 3, 1% (if the IWC ≤30%) or 100, 75, 50, 25, 12.5% (if the IWC >30%) and any additional selected by the permittee.

WET Testing Frequency: Acute and Chronic WET tests are required during the following quarters.

- 1st quarter (Jan-March) 2011
- 2nd quarter (April-June) 2012
- 3rd quarter (July-Sept) 2013
- 4th quarter (Oct-Dec) 2014
- 1st quarter (Jan-March) 2015

Reporting: The permittee shall report test results on the Discharge Monitoring Report form, and also complete the "Whole Effluent Toxicity Test Report Form" (Section 6, "*State of Wisconsin Aquatic Life Toxicity Testing Methods Manual, 2nd Edition*"), for each test. The original, complete, signed version of the Whole Effluent Toxicity Test Report Form shall be sent to the Biomonitoring Coordinator, Bureau of Watershed Management, 101 S. Webster St., P.O. Box 7921, Madison, WI 53707-7921, within 45 days of test completion. The original Discharge Monitoring Report (DMR) form and one copy shall be sent to the contact and location provided on the DMR by the required deadline.

Determination of Positive Results: An acute toxicity test shall be considered positive if the Toxic Unit - Acute (TU_a) is greater than 1.0 for either species. The TU_a shall be calculated as follows: If $LC_{50} \geq 100$, then $TU_a = 1.0$. If LC_{50} is < 100, then $TU_a = 100 \div LC_{50}$. A chronic toxicity test shall be considered positive if the Relative Toxic Unit - Chronic (rTU_c) is greater than 1.0 for either species. The rTU_c shall be calculated as follows: If $IC_{25} \geq IWC$, then $rTU_c = 1.0$. If $IC_{25} < IWC$, then $rTU_c = IWC \div IC_{25}$.

Additional Testing Requirements: Within 90 days of a test which showed positive results, the permittee shall submit the results of at least 2 retests to the Biomonitoring Coordinator on "Whole Effluent Toxicity Test Report Forms". The 90 day reporting period shall begin the day after the test which showed a positive result. The retests shall be completed using the same species and test methods specified for the original test (see the Standard Requirements section herein).

4 Land Application Requirements

4.1 Sampling Point(s)

The discharge(s) shall be limited to land application of the waste type(s) designated for the listed sampling point(s) on Department approved land spreading sites or by hauling to another facility.

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
002	Representative liquid sludge samples shall be collected from the storage tank quarterly and monitored for Lists 1, 2, 3, & 4. Representative samples shall be collected once in 2011 and monitored for PCBs and a priority pollutant scan shall also be conducted.
003	If the permittee wishes to resume production of cake sludge, representative cake sludge samples shall be collected from the sludge storage pad quarterly and monitored for Lists 1, 2, 3 & 4. Prior to resuming production of cake sludge, the permittee shall notify the Department 14 days in advance so that additional sludge forms can be provided.

4.2 Monitoring Requirements and Limitations

The permittee shall comply with the following monitoring requirements and limitations.

4.2.1 Sampling Point (Outfall) 002 - LIQUID SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Quarterly	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Quarterly	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Quarterly	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Quarterly	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Quarterly	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Quarterly	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Quarterly	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Quarterly	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Quarterly	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Quarterly	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Quarterly	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Quarterly	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Quarterly	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Quarterly	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Quarterly	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Quarterly	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Quarterly	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Quarterly	Composite	
Nitrogen, Total Kjeldahl		Percent	Quarterly	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Ammonium (NH_4-N) Total		Percent	Quarterly	Composite	
Phosphorus, Total		Percent	Quarterly	Composite	
Phosphorus, Water Extractable		% of Tot P	Quarterly	Composite	
Potassium, Total Recoverable		Percent	Quarterly	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Once in 2011
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	
Municipal Sludge Priority Pollutant Scan			Once	Composite	As specified in ch. NR 215.03 (1-4), Wis. Adm. Code

Other Sludge Requirements	
Sludge Requirements	**Sample Frequency**
List 3 Requirements – Pathogen Control: The requirements in List 3 shall be met prior to land application of sludge.	**Quarterly**
List 4 Requirements – Vector Attraction Reduction: The vector attraction reduction shall be satisfied prior to, or at the time of land application as specified in List 4.	**Quarterly**

4.2.1.1 List 2 Analysis

If the monitoring frequency for List 2 parameters is more frequent than "Annual" then the sludge may be analyzed for the List 2 parameters just prior to each land application season rather than at the more frequent interval specified.

4.2.1.2 Changes in Feed Sludge Characteristics

If a change in feed sludge characteristics, treatment process, or operational procedures occurs which may result in a significant shift in sludge characteristics, the permittee shall reanalyze the sludge for List 1, 2, 3 and 4 parameters each time such change occurs.

4.2.1.3 Multiple Sludge Sample Points (Outfalls)

If there are multiple sludge sample points (outfalls), but the sludges are not subject to different sludge treatment processes, then a separate List 2 analysis shall be conducted for each sludge type which is land applied, just prior to land application, and the application rate shall be calculated for each sludge type. In this case, List 1, 3, and 4 and PCBs need only be analyzed on a single sludge type, at the specified frequency. If there are multiple sludge sample points (outfalls), due to multiple treatment processes, List 1, 2, 3 and 4 and PCBs shall be analyzed for each sludge type at the specified frequency.

4.2.1.4 Sludge Which Exceeds the High Quality Limit

Cumulative pollutant loading records shall be kept for all bulk land application of sludge which does not meet the high quality limit for any parameter. This requirement applies for the entire calendar year in which any exceedance of

Table 3 of s. NR 204.07(5)(c), is experienced. Such loading records shall be kept for all List 1 parameters for each site land applied in that calendar year. The formula to be used for calculating cumulative loading is as follows:

[(Pollutant concentration (mg/kg) x dry tons applied/ac) ÷ 500] + previous loading (lbs/acre) = cumulative lbs pollutant per acre

When a site reaches 90% of the allowable cumulative loading for any metal established in Table 2 of s. NR 204.07(5)(b), the Department shall be so notified through letter or in the comment section of the annual land application report (3400-55).

4.2.1.5 Sludge Analysis for PCBs

The permittee shall analyze the sludge for Total PCBs one time during **2011**. The results shall be reported as "PCB Total Dry Wt". Either congener-specific analysis or Aroclor analysis shall be used to determine the PCB concentration. The permittee may determine whether Aroclor or congener specific analysis is performed. Analyses shall be performed in accordance with Table EM in s. NR 219.04, Wis. Adm. Code and the conditions specified in Standard Requirements of this permit. PCB results shall be submitted by January 31, following the specified year of analysis.

4.2.1.6 Lists 1, 2, 3, and 4

List 1 **TOTAL SOLIDS AND METALS** See the Monitoring Requirements and Limitations table above for monitoring frequency and limitations for the List 1 parameters
Solids, Total (percent)
Arsenic, mg/kg (dry weight)
Cadmium, mg/kg (dry weight)
Copper, mg/kg (dry weight)
Lead, mg/kg (dry weight)
Mercury, mg/kg (dry weight)
Molybdenum, mg/kg (dry weight)
Nickel, mg/kg (dry weight)
Selenium, mg/kg (dry weight)
Zinc, mg/kg (dry weight)

List 2 **NUTRIENTS** See the Monitoring Requirements and Limitations table above for monitoring frequency for the List 2 parameters
Solids, Total (percent)
Nitrogen Total Kjeldahl (percent)
Nitrogen Ammonium (NH4-N) Total (percent)
Phosphorus Total as P (percent)
Phosphorus, Water Extractable (as percent of Total P)
Potassium Total Recoverable (percent)

List 3
PATHOGEN CONTROL FOR CLASS B SLUDGE

The permittee shall implement pathogen control as listed in List 3. The Department shall be notified of the pathogen control utilized and shall be notified when the permittee decides to utilize alternative pathogen control.

The following requirements shall be met prior to land application of sludge.

Parameter	Unit	Limit
Fecal Coliform*	MPN/gTS or CFU/gTS	2,000,000
OR, ONE OF THE FOLLOWING PROCESS OPTIONS		
Aerobic Digestion	Air Drying	
Anaerobic Digestion	Composting	
Alkaline Stabilization	PSRP Equivalent Process	

* The Fecal Coliform limit shall be reported as the geometric mean of 7 discrete samples on a dry weight basis.

List 4
VECTOR ATTRACTION REDUCTION

The permittee shall implement any one of the vector attraction reduction options specified in List 4. The Department shall be notified of the option utilized and shall be notified when the permittee decides to utilize an alternative option.

One of the following shall be satisfied prior to, or at the time of land application as specified in List 4.

Option	Limit	Where/When it Shall be Met
Volatile Solids Reduction	$\geq$38%	Across the process
Specific Oxygen Uptake Rate	$\leq$1.5 mg O_2/hr/g TS	On aerobic stabilized sludge
Anaerobic bench-scale test	<17 % VS reduction	On anaerobic digested sludge
Aerobic bench-scale test	<15 % VS reduction	On aerobic digested sludge
Aerobic Process	>14 days, Temp >40°C and Avg. Temp > 45°C	On composted sludge
pH adjustment	>12 S.U. (for 2 hours) and >11.5 (for an additional 22 hours)	During the process
Drying without primary solids	>75 % TS	When applied or bagged
Drying with primary solids	>90 % TS	When applied or bagged
Equivalent Process	Approved by the Department	Varies with process
Injection	-	When applied
Incorporation	-	Within 6 hours of application

4.2.1.7 Daily Land Application Log

Daily Land Application Log		
Discharge Monitoring Requirements and Limitations		
The permittee shall maintain a daily land application log for biosolids land applied each day when land application occurs. The following minimum records must be kept, in addition to all analytical results for the biosolids land applied. The log book records shall form the basis for the annual land application report requirements.		
Parameters	**Units**	**Sample Frequency**
DNR Site Number(s)	Number	Daily as used
Outfall number applied	Number	Daily as used
Acres applied	Acres	Daily as used
Amount applied	As appropriate * /day	Daily as used
Application rate per acre	unit */acre	Daily as used
Nitrogen applied per acre	lb/acre	Daily as used
Method of Application	Injection, Incorporation, or surface applied	Daily as used

*gallons, cubic yards, dry US Tons or dry Metric Tons

5 Schedules of Compliance

5.1 Mercury Pollutant Minimization Program

The permittee shall implement or continue to implement a pollutant minimization program as defined in s. NR 106.145(2), Wis. Adm. Code.

Required Action	Date Due
Implement the Mercury Pollutant Minimization Program: The permittee shall implement the pollutant minimization program as initially received by the Department on July 23, 2009 and accepted by the Department on January 15, 2010. This shall occur upon permit reissuance.	
Submit Annual Status Reports: The permittee shall submit to the Department an annual status report on the progress of the PMP as required by s. NR 106.145(7), Wis. Adm. Code. Submittal of the first annual status report is required by the Date Due. Note: If the permittee wishes to apply for an alternative mercury effluent limitation, that application is due with the application for permit reissuance by 6 months prior to permit expiration. The permittee should submit or reference the PMP plan as updated by the Annual Status Report or more recent developments as part of that application.	12/31/2010
Submit Annual Status Report #2:	12/31/2011
Submit Annual Status Report #3:	12/31/2012
Submit Annual Status Report #4:	12/31/2013
Submit Annual Status Report #4:	12/31/2014

5.2 Mercury Source Reduction Compliance Schedule

Required Action	Date Due
Identify Sources: Review potential sources of mercury in the collection system and identify which ones should be sent a letter to determine what sources of mercury they use.	01/31/2011
Send Letters: Send letters to identified sources requesting information on what sources of mercury they use.	03/31/2011
Action Plan: Develop an action plan for responding to the identified sources of mercury. Plan shall be reviewed by the Department.	09/30/2011
Ordinance Revision: Update or pass any required ordinance changes to enforce the action plan.	06/30/2013

6 Standard Requirements

NR 205, Wisconsin Administrative Code: The conditions in ss. NR 205.07(1) and NR 205.07(2), Wis. Adm. Code, are included by reference in this permit. The permittee shall comply with all of these requirements. Some of these requirements are outlined in the Standard Requirements section of this permit. Requirements not specifically outlined in the Standard Requirement section of this permit can be found in ss. NR 205.07(1) and NR 205.07(2).

6.1 Reporting and Monitoring Requirements

6.1.1 Monitoring Results

Monitoring results obtained during the previous month shall be summarized and reported on a Department Wastewater Discharge Monitoring Report. The report may require reporting of any or all of the information specified below under 'Recording of Results'. This report is to be returned to the Department no later than the date indicated on the form. When submitting a paper Discharge Monitoring Report form, the original and one copy of the Wastewater Discharge Monitoring Report Form shall be submitted to the return address printed on the form. A copy of the Wastewater Discharge Monitoring Report Form or an electronic file of the report shall be retained by the permittee.

All Wastewater Discharge Monitoring Reports submitted to the Department should be submitted using the electronic Discharge Monitoring Report system. Permittees who may be unable to submit Wastewater Discharge Monitoring Reports electronically may request approval to submit paper DMRs upon demonstration that electronic reporting is not feasible or practicable.

If the permittee monitors any pollutant more frequently than required by this permit, the results of such monitoring shall be included on the Wastewater Discharge Monitoring Report.

The permittee shall comply with all limits for each parameter regardless of monitoring frequency. For example, monthly, weekly, and/or daily limits shall be met even with monthly monitoring. The permittee may monitor more frequently than required for any parameter.

An Electronic Discharge Monitoring Report Certification sheet shall be signed and submitted with each electronic Discharge Monitoring Report submittal. This certification sheet, which is not part of the electronic report form, shall be signed by a principal executive officer, a ranking elected official or other duly authorized representative and shall be mailed to the Department at the time of submittal of the electronic Discharge Monitoring Report. The certification sheet certifies that the electronic report form is true, accurate and complete. Paper reports shall be signed by a principal executive officer, a ranking elected official, or other duly authorized representative.

6.1.2 Sampling and Testing Procedures

Sampling and laboratory testing procedures shall be performed in accordance with Chapters NR 218 and NR 219, Wis. Adm. Code and shall be performed by a laboratory certified or registered in accordance with the requirements of ch. NR 149, Wis. Adm. Code. Groundwater sample collection and analysis shall be performed in accordance with ch. NR 140, Wis. Adm. Code. The analytical methodologies used shall enable the laboratory to quantitate all substances for which monitoring is required at levels below the effluent limitation. If the required level cannot be met by any of the methods available in NR 219, Wis. Adm. Code, then the method with the lowest limit of detection shall be selected. Additional test procedures may be specified in this permit.

6.1.3 Recording of Results

The permittee shall maintain records which provide the following information for each effluent measurement or sample taken:

- the date, exact place, method and time of sampling or measurements;

- the individual who performed the sampling or measurements;
- the date the analysis was performed;
- the individual who performed the analysis;
- the analytical techniques or methods used; and
- the results of the analysis.

6.1.4 Reporting of Monitoring Results

The permittee shall use the following conventions when reporting effluent monitoring results:

- Pollutant concentrations less than the limit of detection shall be reported as < (less than) the value of the limit of detection. For example, if a substance is not detected at a detection limit of 0.1 mg/L, report the pollutant concentration as < 0.1 mg/L.

- Pollutant concentrations equal to or greater than the limit of detection, but less than the limit of quantitation, shall be reported and the limit of quantitation shall be specified.

- For the purposes of reporting a calculated result, average or a mass discharge value, the permittee may substitute a 0 (zero) for any pollutant concentration that is less than the limit of detection. However, if the effluent limitation is less than the limit of detection, the department may substitute a value other than zero for results less than the limit of detection, after considering the number of monitoring results that are greater than the limit of detection and if warranted when applying appropriate statistical techniques.

6.1.5 Compliance Maintenance Annual Reports

Compliance Maintenance Annual Reports (CMAR) shall be completed using information obtained over each calendar year regarding the wastewater conveyance and treatment system. The CMAR shall be submitted by the permittee in accordance with ch. NR 208, Wis. Adm. Code, by June 30, each year on an electronic report form provided by the Department.

In the case of a publicly owned treatment works, a resolution shall be passed by the governing body and submitted as part of the CMAR, verifying its review of the report and providing responses as required. Private owners of wastewater treatment works are not required to pass a resolution; but they must provide an Owner Statement and responses as required, as part of the CMAR submittal.

A separate CMAR certification document, that is not part of the electronic report form, shall be mailed to the Department at the time of electronic submittal of the CMAR. The CMAR certification shall be signed and submitted by an authorized representative of the permittee. The certification shall be submitted by mail. The certification shall verify the electronic report is complete, accurate and contains information from the owner's treatment works.

6.1.6 Records Retention

The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by the permit, and records of all data used to complete the application for the permit for a period of at least 3 years from the date of the sample, measurement, report or application. All pertinent sludge information, including permit application information and other documents specified in this permit or s. NR 204.06(9), Wis. Adm. Code shall be retained for a minimum of 5 years.

6.1.7 Other Information

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or correct information to the Department.

6.2 System Operating Requirements

6.2.1 Noncompliance Notification

- The permittee shall report the following types of noncompliance by a telephone call to the Department's regional office within 24 hours after becoming aware of the noncompliance:
  - any noncompliance which may endanger health or the environment;
  - any violation of an effluent limitation resulting from an unanticipated bypass;
  - any violation of an effluent limitation resulting from an upset; and
  - any violation of a maximum discharge limitation for any of the pollutants listed by the Department in the permit, either for effluent or sludge.

- A written report describing the noncompliance shall also be submitted to the Department's regional office within 5 days after the permittee becomes aware of the noncompliance. On a case-by-case basis, the Department may waive the requirement for submittal of a written report within 5 days and instruct the permittee to submit the written report with the next regularly scheduled monitoring report. In either case, the written report shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times; the steps taken or planned to reduce, eliminate and prevent reoccurrence of the noncompliance; and if the noncompliance has not been corrected, the length of time it is expected to continue.

NOTE: Section 292.11(2)(a), Wisconsin Statutes, requires any person who possesses or controls a hazardous substance or who causes the discharge of a hazardous substance to notify the Department of Natural Resources **immediately** of any discharge not authorized by the permit. The discharge of a hazardous substance that is not authorized by this permit or that violates this permit may be a hazardous substance spill. To report a hazardous substance spill, call DNR's 24-hour HOTLINE at **1-800-943-0003**

6.2.2 Flow Meters

Flow meters shall be calibrated annually, as per s. NR 218.06, Wis. Adm. Code.

6.2.3 Raw Grit and Screenings

All raw grit and screenings shall be disposed of at a properly licensed solid waste facility or picked up by a licensed waste hauler. If the facility or hauler are located in Wisconsin, then they shall be licensed under chs. NR 500-536, Wis. Adm. Code.

6.2.4 Sludge Management

All sludge management activities shall be conducted in compliance with ch. NR 204 "Domestic Sewage Sludge Management", Wis. Adm. Code.

6.2.5 Prohibited Wastes

Under no circumstances may the introduction of wastes prohibited by s. NR 211.10, Wis. Adm. Code, be allowed into the waste treatment system. Prohibited wastes include those:

- which create a fire or explosion hazard in the treatment work;
- which will cause corrosive structural damage to the treatment work;
- solid or viscous substances in amounts which cause obstructions to the flow in sewers or interference with the proper operation of the treatment work;
- wastewaters at a flow rate or pollutant loading which are excessive over relatively short time periods so as to cause a loss of treatment efficiency; and
- changes in discharge volume or composition from contributing industries which overload the treatment works or cause a loss of treatment efficiency.

6.2.6 Unscheduled Bypassing

Any unscheduled bypass or overflow of wastewater at the treatment works or from the collection system is prohibited, and the Department may take enforcement action against a permittee for such occurrences under s. 283.89, Wis. Stats., unless:

- The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
- There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
- The permittee notified the Department as required in this Section.

Whenever there is an unscheduled bypass or overflow occurrence at the treatment works or from the collection system, the permittee shall notify the Department within 24 hours of initiation of the bypass or overflow occurrence by telephoning the wastewater staff in the regional office as soon as reasonably possible (FAX, email or voice mail, if staff are unavailable).

In addition, the permittee shall within 5 days of conclusion of the bypass or overflow occurrence report the following information to the Department in writing:

- Reason the bypass or overflow occurred, or explanation of other contributing circumstances that resulted in the overflow event. If the overflow or bypass is associated with wet weather, provide data on the amount and duration of the rainfall or snow melt for each separate event.
- Date the bypass or overflow occurred.
- Location where the bypass or overflow occurred.
- Duration of the bypass or overflow and estimated wastewater volume discharged.
- Steps taken or the proposed corrective action planned to prevent similar future occurrences.
- Any other information the permittee believes is relevant.

6.2.7 Scheduled Bypassing

Any construction or normal maintenance which results in a bypass of wastewater from a treatment system is prohibited unless authorized by the Department in writing. If the Department determines that there is significant public interest in the proposed action, the Department may schedule a public hearing or notice a proposal to approve the bypass. Each request shall specify the following minimum information:

- proposed date of bypass;
- estimated duration of the bypass;

- estimated volume of the bypass;
- alternatives to bypassing; and
- measures to mitigate environmental harm caused by the bypass.

6.2.8 Ammonia Limit Not Needed - Continue to Optimize Removal of Ammonia

Applying the procedures in s. NR 106.05, Wis. Adm. Code, to ammonia data that is representative of the current operations of the wastewater treatment plant resulted in a determination that ammonia effluent limits are not necessary in this permit. Pursuant to NR 106.33, throughout the term of this permit, the wastewater treatment plant shall continue to be operated in a manner that optimizes the removal of ammonia within the design capabilities of the wastewater treatment plant.

6.2.9 Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control which are installed or used by the permittee to achieve compliance with the conditions of this permit. The wastewater treatment facility shall be under the direct supervision of a state certified operator as required in s. NR 108.06(2), Wis. Adm. Code. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training as required in ch. NR 114, Wis. Adm. Code, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

6.3 Surface Water Requirements

6.3.1 Permittee-Determined Limit of Quantitation Incorporated into this Permit

For pollutants with water quality-based effluent limits below the Limit of Quantitation (LOQ) in this permit, the LOQ calculated by the permittee and reported on the Discharge Monitoring Reports (DMRs) is incorporated by reference into this permit. The LOQ shall be reported on the DMRs, shall be the lowest quantifiable level practicable, and shall be no greater than the minimum level (ML) specified in or approved under 40 CFR Part 136 for the pollutant at the time this permit was issued, unless this permit specifies a higher LOQ.

6.3.2 Appropriate Formulas for Effluent Calculations

The permittee shall use the following formulas for calculating effluent results to determine compliance with average limits and mass limits:

Weekly/Monthly average concentration = the sum of all daily results for that week/month, divided by the number of results during that time period.

Weekly Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the week.

Monthly Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the month.

6.3.3 Visible Foam or Floating Solids

There shall be no discharge of floating solids or visible foam in other than trace amounts.

6.3.4 Percent Removal

During any 30 consecutive days, the average effluent concentrations of BOD_5 and of total suspended solids shall not exceed 15% of the average influent concentrations, respectively. This requirement does not apply to removal of total suspended solids if the permittee operates a lagoon system and has received a variance for suspended solids granted under NR 210.07(2), Wis. Adm. Code.

6.3.5 Fecal Coliforms

The limit for fecal coliforms shall be expressed as a monthly geometric mean.

6.3.6 Seasonal Disinfection

Disinfection shall be provided from May 1 through September 30 of each year. Monitoring requirements and the limitation for fecal coliforms apply only during the period in which disinfection is required. Whenever chlorine is used for disinfection or other uses, the limitations and monitoring requirements for residual chlorine shall apply. A dechlorination process shall be in operation whenever chlorine is used.

6.3.7 Whole Effluent Toxicity (WET) Monitoring Requirements

In order to determine the potential impact of the discharge on aquatic organisms, static-renewal toxicity tests shall be performed on the effluent in accordance with the procedures specified in the *"State of Wisconsin Aquatic Life Toxicity Testing Methods Manual, 2nd Edition" (PUB-WT-797*, November 2004) as required by NR 219.04, Table A, Wis. Adm. Code). All of the WET tests required in this permit, including any required retests, shall be conducted on the *Ceriodaphnia dubia* and fathead minnow species. Receiving water samples shall not be collected from any point in contact with the permittee's mixing zone and every attempt shall be made to avoid contact with any other discharge's mixing zone.

6.3.8 Whole Effluent Toxicity (WET) Identification and Reduction

Within 60 days of a retest which showed positive results, the permittee shall submit a written report to the Biomonitoring Coordinator, Bureau of Watershed Management, 101 S. Webster St., PO Box 7921, Madison, WI 53707-7921, which details the following:

- A description of actions the permittee has taken or will take to remove toxicity and to prevent the recurrence of toxicity;
- A description of toxicity reduction evaluation (TRE) investigations that have been or will be done to identify potential sources of toxicity, including some or all of the following actions:

  (a) Evaluate the performance of the treatment system to identify deficiencies contributing to effluent toxicity (e.g., operational problems, chemical additives, incomplete treatment)
  (b) Identify the compound(s) causing toxicity
  (c) Trace the compound(s) causing toxicity to their sources (e.g., industrial, commercial, domestic)
  (d) Evaluate, select, and implement methods or technologies to control effluent toxicity (e.g., in-plant or pretreatment controls, source reduction or removal)

- Where corrective actions including a TRE have not been completed, an expeditious schedule under which corrective actions will be implemented;
- If no actions have been taken, the reason for not taking action.

The permittee may also request approval from the Department to postpone additional retests in order to investigate the source(s) of toxicity. Postponed retests must be completed after toxicity is believed to have been removed.

6.4 Land Application Requirements

6.4.1 Sludge Management Program Standards And Requirements Based Upon Federally Promulgated Regulations

In the event that new federal sludge standards or regulations are promulgated, the permittee shall comply with the new sludge requirements by the dates established in the regulations, if required by federal law, even if the permit has not yet been modified to incorporate the new federal regulations.

6.4.2 General Sludge Management Information

The General Sludge Management Form 3400-48 shall be completed and submitted prior to any significant sludge management changes.

6.4.3 Sludge Samples

All sludge samples shall be collected at a point and in a manner which will yield sample results which are representative of the sludge being tested, and collected at the time which is appropriate for the specific test.

6.4.4 Land Application Characteristic Report

Each report shall consist of a Characteristic Form 3400-49 and Lab Report, unless approval for not submitting the lab reports has been given. Both reports shall be submitted by January 31 following each year of analysis.

The permittee shall use the following convention when reporting sludge monitoring results: Pollutant concentrations less than the limit of detection shall be reported as < (less than) the value of the limit of detection. For example, if a substance is not detected at a detection limit of 1.0 mg/kg, report the pollutant concentration as < 1.0 mg/kg .

All results shall be reported on a dry weight basis.

6.4.5 Calculation of Water Extractable Phosphorus

When sludge analysis for Water Extractable Phosphorus is required by this permit, the permittee shall use the following formula to calculate and report Water Extractable Phosphorus:
Water Extractable Phosphorus (% of Total P) =
[Water Extractable Phosphorus (mg/kg, dry wt) ÷ Total Phosphorus (mg/kg, dry wt)] x 100

6.4.6 Monitoring and Calculating PCB Concentrations in Sludge

When sludge analysis for "PCB, Total Dry Wt" is required by this permit, the PCB concentration in the sludge shall be determined as follows.

Either congener-specific analysis or Aroclor analysis shall be used to determine the PCB concentration. The permittee may determine whether Aroclor or congener specific analysis is performed. Analyses shall be performed in accordance with the following provisions and Table EM in s. NR 219.04, Wis. Adm. Code.

- EPA Method 1668 may be used to test for all PCB congeners. If this method is employed, all PCB congeners shall be delineated. Non-detects shall be treated as zero. The values that are between the limit of detection and the limit of quantitation shall be used when calculating the total value of all congeners. All results shall be added together and the total PCB concentration by dry weight reported. **Note**: It is recognized that a number of the congeners will co-elute with others, so there will not be 209 results to sum.

- EPA Method 8082A shall be used for PCB-Aroclor analysis and may be used for congener specific analysis as well. If congener specific analysis is performed using Method 8082A, the list of congeners tested shall include at least congener numbers 5, 18, 31, 44, 52, 66, 87, 101, 110, 138, 141, 151, 153, 170, 180, 183, 187, and 206 plus any other additional congeners which might be reasonably expected to occur in the particular sample. For either type of analysis, the sample shall be extracted using the Soxhlet extraction (EPA Method 3540C) (or the Soxhlet Dean-Stark modification) or the pressurized fluid extraction (EPA Method 3545A). If Aroclor analysis is performed using Method 8082A, clean up steps of the extract shall be performed as necessary to remove interference and to achieve as close to a limit of detection of 0.11 mg/kg as possible. Reporting protocol, consistent with s. NR 106.07(6)(e), should be as follows: If all Aroclors are less than the LOD, then the Total PCB Dry Wt result should be reported as less than the highest LOD. If a single Aroclor is detected then that is what should be reported for the Total PCB result. If multiple Aroclors are detected, they should be summed and reported as Total PCBs. If congener specific analysis is done using Method 8082A, clean up steps of the extract shall be performed as necessary to remove interference and to achieve as close to a limit of detection of 0.003 mg/kg as possible for each congener. If the aforementioned limits of detection cannot be achieved after using the appropriate clean up techniques, a reporting limit that is achievable for the Aroclors or each congener for the sample shall be determined. This reporting limit shall be reported and qualified indicating the presence of an interference. The lab conducting the analysis shall perform as many of the following methods as necessary to remove interference:

3620C – Florisil	3611B - Alumina
3640A - Gel Permeation	3660B - Sulfur Clean Up (using copper shot instead of powder)
3630C - Silica Gel	3665A - Sulfuric Acid Clean Up

6.4.7 Land Application Report

Land Application Report Form 3400-55 shall be submitted by January 31, following each year non-exceptional quality sludge is land applied. Non-exceptional quality sludge is defined in s. NR 204.07(4), Wis. Adm. Code.

6.4.8 Other Methods of Disposal or Distribution Report

The permittee shall submit Report Form 3400-52 by January 31, following each year sludge is hauled, landfilled, incinerated, or when exceptional quality sludge is distributed or land applied.

6.4.9 Approval to Land Apply

Bulk non-exceptional quality sludge as defined in s. NR 204.07(4), Wis. Adm. Code, may not be applied to land without a written approval letter or Form 3400-122 from the Department unless the Permittee has obtained permission from the Department to self approve sites in accordance with s. NR 204.06 (6), Wis. Adm. Code. Analysis of sludge characteristics is required prior to land application. Application on frozen or snow covered ground is restricted to the extent specified in s. NR 204.07(3) (l), Wis. Adm. Code.

6.4.10 Soil Analysis Requirements

Each site requested for approval for land application must have the soil tested prior to use. Each approved site used for land application must subsequently be soil tested such that there is at least one valid soil test in the four years prior to land application. All soil sampling and submittal of information to the testing laboratory shall be done in accordance with UW Extension Bulletin A-2100. The testing shall be done by the UW Soils Lab in Madison or Marshfield, WI or at a lab approved by UW. The test results including the crop recommendations shall be submitted to the DNR contact listed for this permit, as they are available. Application rates shall be determined based on the crop nitrogen recommendations and with consideration for other sources of nitrogen applied to the site.

6.4.11 Land Application Site Evaluation

For non-exceptional quality sludge, as defined in s. NR 204.07(4), Wis. Adm. Code, a Land Application Site Request Form 3400-053 shall be submitted to the Department for the proposed land application site. The Department will evaluate the proposed site for acceptability and will either approve or deny use of the proposed site. The permittee may obtain permission to approve their own sites in accordance with s. NR 204.06(6), Wis. Adm. Code.

6.4.12 Class B Sludge: Fecal Coliform Limitation

Compliance with the fecal coliform limitation for Class B sludge shall be demonstrated by calculating the geometric mean of at least 7 separate samples. (Note that a Total Solids analysis must be done on each sample). The geometric mean shall be less than 2,000,000 MPN or CFU/g TS. Calculation of the geometric mean can be done using one of the following 2 methods.

Method 1:

Geometric Mean = $(X_1 \times X_2 \times X_3 \ldots x\ X_n)^{1/n}$

Where X = Coliform Density value of the sludge sample, and where n = number of samples (at least 7)

Method 2:

Geometric Mean = antilog$[(X_1 + X_2 + X_3 \ldots + X_n) \div n]$

Where X = $\log_{10}$ of Coliform Density value of the sludge sample, and where n = number of samples (at least 7)

Example for Method 2

Sample Number	Coliform Density of Sludge Sample	$\log_{10}$
1	6.0×10^5	5.78
2	4.2×10^6	6.62
3	1.6×10^6	6.20
4	9.0×10^5	5.95
5	4.0×10^5	5.60
6	1.0×10^6	6.00
7	5.1×10^5	5.71

The geometric mean for the seven samples is determined by averaging the $\log_{10}$ values of the coliform density and taking the antilog of that value.

$(5.78 + 6.62 + 6.20 + 5.95 + 5.60 + 6.00 + 5.71) \div 7 = 5.98$

The antilog of 5.98 = 9.5×10^5

6.4.13 Class B Sludge: Anaerobic Digestion

Treat the sludge in the absence of air for a specific mean cell residence time at a specific temperature. Values for the mean cell residence time and temperature shall be between 15 days at 35° C to 55° C and 60 days at 20° C. Straight-line interpolation to calculate mean cell residence time is allowable when the temperature falls between 35° C and 20° C.

6.4.14 Vector Control: Volatile Solids Reduction

The mass of volatile solids in the sludge shall be reduced by a minimum of 38% between the time the sludge enters the digestion process and the time it either exits the digester or a storage facility. For calculation of volatile solids reduction, the permittee shall use the Van Kleeck equation or one of the other methods described in "Determination of Volatile Solids Reduction in Digestion" by J.B. Farrell, which is Appendix C of EPA's *Control of Pathogens in Municipal Wastewater Sludge* (EPA/625/R-92/013). The Van Kleeck equation is:

$$VSR\% = \frac{VS_{IN} - VS_{OUT}}{VS_{IN} - (VS_{OUT} \times VS_{IN})} \times 100$$

Where: VS_{IN} = Volatile Solids in Feed Sludge (g VS/g TS)

VS_{OUT} = Volatile Solids in Final Sludge (g VS/g TS)

VSR% = Volatile Solids Reduction, (Percent)

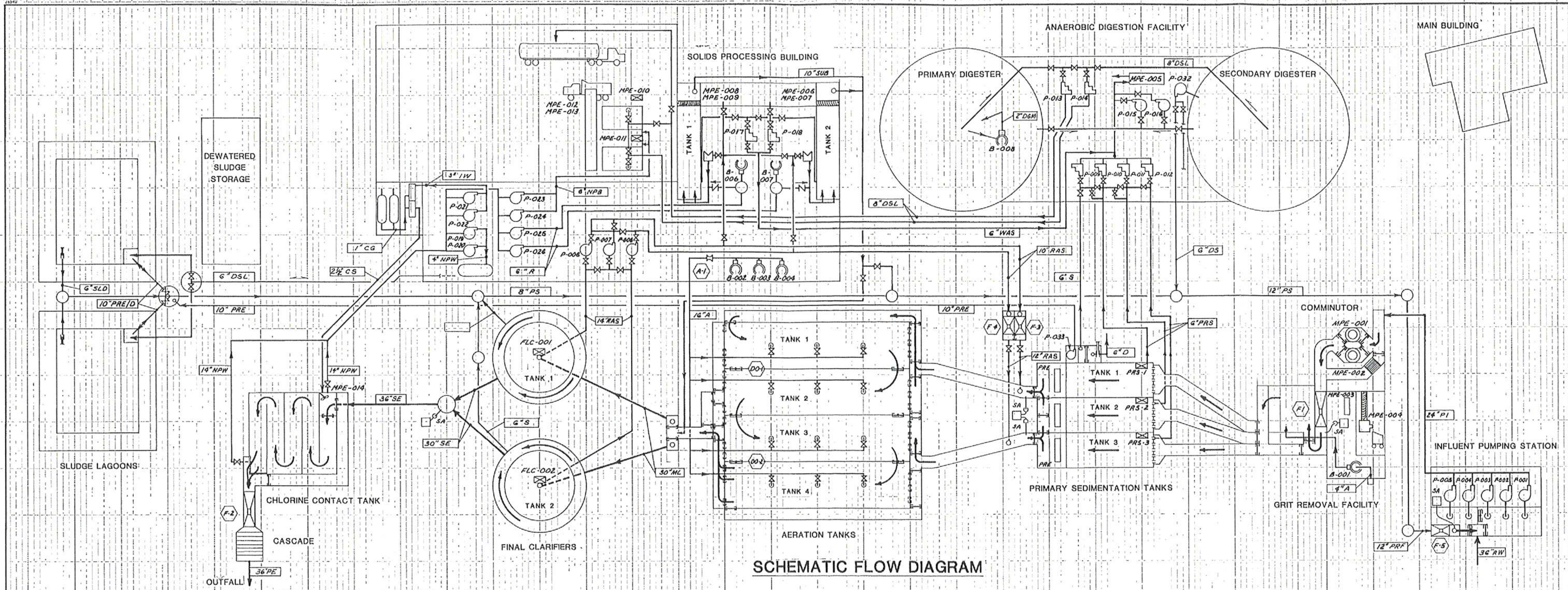
7 Summary of Reports Due

FOR INFORMATIONAL PURPOSES ONLY

Description	Date	Page
Mercury PMP -Implement the Mercury Pollutant Minimization Program	See Permit	11
Mercury PMP -Submit Annual Status Reports	December 31, 2010	11
Mercury PMP -Submit Annual Status Report #2	December 31, 2011	11
Mercury PMP -Submit Annual Status Report #3	December 31, 2012	11
Mercury PMP -Submit Annual Status Report #4	December 31, 2013	11
Mercury PMP -Submit Annual Status Report #4	December 31, 2014	11
Mercury Source Reduction Compliance Schedule -Identify Sources	January 31, 2011	11
Mercury Source Reduction Compliance Schedule -Send Letters	March 31, 2011	11
Mercury Source Reduction Compliance Schedule -Action Plan	September 30, 2011	11
Mercury Source Reduction Compliance Schedule -Ordinance Revision	June 30, 2013	11
Compliance Maintenance Annual Reports (CMAR)	by June 30, each year	13
General Sludge Management Form 3400-48	prior to any significant sludge management changes	18
Characteristic Form 3400-49 and Lab Report	by January 31 following each year of analysis	18
Land Application Report Form 3400-55	by January 31, following each year non-exceptional quality sludge is land applied	19
Report Form 3400-52	by January 31, following each year sludge is hauled, landfilled, incinerated, or when exceptional quality sludge is distributed or land applied	19
Wastewater Discharge Monitoring Report	no later than the date indicated on the form	12

Report forms shall be submitted to the address printed on the report form. Any facility plans or plans and specifications for municipal, industrial, industrial pretreatment and non industrial wastewater systems shall be submitted to the Bureau of Watershed Management, P.O. Box 7921, Madison, WI 53707-7921. All other submittals required by this permit shall be submitted to: West Central Region - Wausau, 5301 Rib Mountain Drive, Wausau, WI 54401

APPENDIX B
CURRENT DESIGN CRITERIA



SCHEMATIC FLOW DIAGRAM

DESIGN CRITERIA

DESIGN LOADS AND FLOWS (2005)

Flow:

Maximum Day	4.27 mgd
Peak Hour	12.29 mgd
With in-plant recycle	
Maximum Day	4.94 mgd
Peak Hour	12.96 mgd

Loads:

BOD_5	7,950 ppd = 238 mg/L
SS	9,460 ppd = 284 mg/L
With in-plant recycle	
BOD_5	8,350 ppd = 203 mg/L
SS	9,935 ppd = 241 mg/L

Population Served (year 2005)

Rothschild	5,900
Weston	18,990
Rib Mountain	8,650
Kronenwetter	6,160
	39,700 persons

Effluent Limits:

Always Meet	Monthly Average	Maximum
BOD_5	30 mg/L	45 mg/L
SS	30 mg/L	45 mg/L

Waste Load Allocation May 1 through October 31 until 1/1/1990

Maximum Daily BOD_5 Load = 3.1 mgd x 8.34 x 45 mg/L = 1,163.4 lb BOD_5/day

SLUDGE QUANTITY AND QUALITY (PER DAY)

	Dry Wt.	Volume	% Solids	Volatile Solids
Primary Sludge	5,960 lb	18,000 gal	4%	4,172 lb
Thickened WAS	4,560 lb.	14,000 gal	4%	3,420 lb
	10,520 lb	32,000 gal	4%	7,592 lb
Digested (50% VS (Reduction)	6,724 lb	32,000 gal	2.5%	3,796 lb

UNIT DESIGN DATA

Influent Pumping Station	
Pump type	Non-clog centrifugal
Number	4 + 1 standby
Capacity, each	2,300 gpm
Firm station capacity	9,000 gpm
Control	Variable speed
~~**Comminutor**~~	
~~Type~~	~~Involute~~
~~Number~~	~~2~~
~~Capacity~~	~~7.5 mgd each~~
~~Bypass Bar Screen~~	~~1~~
Influent Flow Metering	
Type	Parshall Flume
Size	18" throat
Grit Removal	
Type	Aerated
Number	1
Size (D x W x L)	11 ft x 16.5 ft x 17.0 ft
Volume	3,085 cu ft
Detention Time	
@ Max. Daily (4.94 mgd)	6.7 minutes
@ Peak Hour (12.96 mgd)	2.6 minutes
Air Rate	3 to 8 scfm/ft of length
Primary Sedimentation	
Type	Rectangular-Chain & Scraper
Number	3
Size: L x W x Avg. D.	144 x 20 x 9 = 2,880 sq ft/each
Volume (each)	25,920 cu ft = 194,000 gal
Detention Time/Overflow Rate	
@ Max. Daily (4.94 mgd)	2.8 hour/570 gpd/sq ft
@ Peak Hour (12.96 mgd)	1.1 hour/1,500 gpd/sq ft
Weir Overflow Rate (4.94 mgd)	≤ 10,000 gpd/ft
Aeration	
Type	Activated Sludge
Tanks - Number	4
Size - each (LxWxSWD)	133 ft x 24 ft x 15 ft
Volume Total	1,440,000 gal = 192,500 cu ft
Detention Time	7.0 hour @ 4.94 mgd
Air Requirement (peak load)	9,620 lb O_2/day
Aeration Equipment.	
Diffusers	Fine Bubble/Grid System
Blower - 3 each	1,700 scfm @ 8 psig
BHP, each	75
Firm Blower Capacity	3,400 scfm
Corrected OTE	11.5%
Loading Rate	30.4 lb BOD/day/1,000 cu ft
Final Clarifiers	
Type	Circular, Suction withdrawal
Number	2
Size - each	85 ft dia x 14 ft SWD
Volume each	79,443 cu ft = 594,000 gal
Detention Time	5.9 hour @ 4.80 mgd
Surface Overflow Rate	
@ 4.80 mgd	423 gpd/sq ft
@ 12.82 mgd	1,129 gpd/sq ft
RAS Pumps:	
Type	VS, non-clog centrifugal
Number	3 each
Capacity each	1,700 gpm max., 400 gpm min.
Firm Capacity	3,400 gpm (nominal) or 100% of max. day flow rate
~~**Chlorination**~~	
~~Chlorination Contact Tank:~~	
~~Number~~	~~1~~
~~Size (LxWxD)~~	~~66 ft x 36.7 ft x 10 ft~~
~~L:W Ratio~~	~~45:1~~
~~Volume~~	~~24,000 cu ft~~
~~Detention Time~~	~~1 hour @ 4.27 mgd~~
~~Feed Equipment~~	
~~Type~~	~~Solution Feed/Vacuum-Type~~
~~Number of Units~~	~~2~~
~~Capacity (Max.) each~~	~~1,000 ppd Cl_2~~
~~Uses~~	~~1 - effluent chlorination~~
	~~1 - RAS chlorination~~
~~Control~~	~~Flow paced automatic/manual~~
Effluent Metering & Aeration	
Effluent Flow Meter	(Same as Influent)
Post Aeration.	
Type	Cascade
Outfall Sewer	
Size	36" diameter
Length	250 feet‡
WAS Thickening	
Type	Dissolved Air Flotation
Number of Units	2
Size Units LxW	12 ft x 55 ft = 660 sq ft/each
Design Loading Rate (5 days/week, 12 hr/day)	560 lb/hr total
Surface Loading Rate	0.42 lb/hr/sq ft
Primary Anaerobic Digester	
Type	Heated, Mixed, Mesophylic
Number of Units	1
Size	70 ft dia. x 26 ft Effective Depth
~~Mixing~~	~~Compressed Gas~~
Heating	Hot Water, External
Solids Retention Time	22.5 days
Volatile Solids Loading Rate	78.9 lb VS/day/1,000 cu ft
Secondary Digester	
Type	Stand-by to Primary Digester
Number of Units	1
Size	70 ft dia. x 24 ft Effective Depth
Cover Type	Floating Gas Holder
~~**Sludge Lagoons:**~~	
~~Number of Cells~~	~~2~~
~~Volume Capacity each~~	~~144,000 cu ft~~
~~Retention, each~~	~~40 days storage at 3% sludge, 26,900 gpd~~
Sludge Dewatering Belt Press:	
Number	2
Size	2 Meter
Loading Rate/5 Day Week	9,144 lb/work day
Volume/work day @ 22% TSS	686 cu ft = 25 yd
On-site Sludge Storage.	
Size	90 work days 2,250 yd
Area at 4 ft Depth	1,690 sq yd = 15,210 sq ft
Sludge Hauling Equipment	
Truck with Dump Box	1 (5 to 7 yd capacity)
Farm Tractor with End Loader	2 (140 hp) (1 loader)
Box Spreader (Field use)	1 (419 cu ft)
Tank Trailer (Field use)	1 (3,000 gal)
Truck Tractor	1
Tank Trailer (Road use-nurse)	1 (5,500 gal)
Tractor End Loader	1 (70 hp)
Truck with Spreader Box	1

ABBREVIATIONS

FLUID ABBREVIATIONS

- A - AERATION
- CG - CHLORINE GAS
- CS - CHLORINE SOLUTION
- D - DRAIN
- DGD - DIGESTER GAS DISTRIBUTION
- DGM - DIGESTER GAS MIXING
- DIV - DIVERSION
- DS - DIGESTER SUPERNATANT
- DSL - DIGESTED SLUDGE
- G - NATURAL GAS
- IW - INJECTOR WATER SUPPLY
- ML - MIXED LIQUOR
- NPB - NON-POTABLE BOOSTER
- NPW - NON-POTABLE WATER
- PE - PLANT EFFLUENT
- PEC - POLYELECTROLYTE CHEMICAL
- PI - PLANT INFLUENT
- PRE - PRIMARY EFFLUENT
- PRF - PROCESS RETURN FLOWS
- PRS - PRIMARY SLUDGE
- PS - PLANT SANITARY SEWER
- PSS - PLANT STORM SEWER & PERFORATED PIPE
- PW - POTABLE WATER
- R - RECYCLE
- RAS - RETURN ACTIVATED SLUDGE
- RW - RAW WASTEWATER
- S - SCUM
- SA - SAMPLE
- SC - SPARE CHEMICAL
- SE - SECONDARY EFFLUENT
- SLD - SLUDGE LAGOON DECANT
- SPD - SUMP PUMP DISCHARGE
- SUB - FLOTATION THICKENER SUBNATANT
- SWS - SEAL WATER SUPPLY
- V - VENT
- WAS - WASTE ACTIVATED SLUDGE

EQUIPMENT ABBREVIATIONS

- AHU - AIR HANDLING UNIT
- B - BLOWER
- FLC - FINAL CLARIFIER DRIVE
- MPE - MISCELLANEOUS PROCESS EQUIPMENT
- P - PUMP
- PST - PRIMARY SEDIMENTATION TANK DRIVE
- UH - UNIT HEATER

MATERIAL ABBREVIATIONS

- BI - BLACK IRON
- CI - CAST IRON
- CP - COPPER PIPING
- DI - DUCTILE IRON
- GI - GALVANIZED IRON
- PDP - PERFORATED DRAIN PIPE
- PVC - PVC PIPE
- RCP - REINFORCED CONCRETE PIPE
- SS - STAINLESS STEEL

STRAND ASSOCIATES INC
CONSULTING ENGINEERS
910 West Wingra Drive
Madison, Wisconsin 53715
Tel (608) 251 4843

WASTEWATER TREATMENT FACILITIES
RIB MOUNTAIN METROPOLITAN
SEWERAGE DISTRICT

SCHEMATIC FLOW DIAGRAM
AND DESIGN CRITERIA

SCALE NONE DATE DECEMBER, 1983

DES BY PEB
DWN BY RRF
CHK BY ROG
APP BY TJR

DRAWING NO 165-230-8

Rib Mountain Metropolitan Sewerage District Wastewater Treatment Plant
Design Criteria for Plant Improvements

B. Preliminary Treatment

Mechanically Cleaned Screen		
	Type	Stair Screen
	Number of Units	1
	Capacity (mgd)	13
	Screen Opening Size (in)	1/4
Screenings Handling		
	Type	Wash Press
	Number of Units	1
Aeration Blowers		
	Type	Rotary, Positive Displacement
	Number of Units	3
	Capacity, 1 unit @ 8 psig(scfm)	1,275
	Motor, 1 unit (hp)	75

E. Alum Feed

Storage Tank	Type	Fiberglass Reinforced Tank
	Number of Units	1
	Capacity (gal)	6000
Chemical Feed Pumping		
	Type	Positive Displacement Diaphragm
	Number of Units	2
	Capacity, each (minimum gph)	20
	Capacity, each (maximum gph)	40

F. Ultraviolet System

	Type	Low-Pressure, High Intensity, Variable Output
	Number of Channels	1
	Number of Banks	1+1 future
	Capacity, total (mgd)	4.34 (8.68 future)
	Number of Modules per Bank	8
	Number of Lamps per Module	6
	Total Number of Lamps	48 (96 future)
	Minimum UV Transmittance @ 254 nm	0.65
Final Effluent Flow Meter		
	Type	Parshall Flume
	Number of Units	1
	Width, each (in)	12
	Capacity, mgd	10.4

H. Digestion

	Type	Anaerobic
	Number of Units	2
Primary Digester	Type	Heated, Mixed, Mesophilic
	Diameter (ft)	70
	Side Water Depth (ft)	26
	Volume (cu ft)	100,000
	Volume (gpd)	750,000
	Solids Retention Time (days)	41
	Volatile Solids Loading Rate (lbs VS/day/1,000 cu ft)	45
	Mixing	Pumped Vortex Mixing
	Number of Pumps	1
	Capacity, each (gpm)	2,700
	TDH (ft)	40
	Number of Nozzles	3
	Heating	Hot Water, External Heat Exchanger
	Number	1
	Boiler Output Capacity (BTU/hr)	1,500,000
	Heat Exchanger Capacity (BTU/hr)	375,000
	Solids Retention Time (days)	22.5

I. Liquid Sludge Storage

	Number of Units	2
	Diameter (ft)	120
	Side Water Depth (ft)	21
	Volume, each (gal)	1,930,000
	Volume, total (gal)	3,860,000
Mixing		
	Type	Pumped Mixing
	Number of Units	1
	Capacity, each (gpm)	7,040
	TDH (ft)	39
Biosolids Loadout Pump		
	Number of Units	1
	Capacity, each (gpm)	1,075
	TDH (ft)	32

APPENDIX C
WDNR PEAKING FACTOR WORKSHEET AND POPULATION PROJECTION LETTERS

APPENDIX C
WDNR PEAKING FACTOR WORKSHEET

WORK SHEET FOR ESTIMATING
MAXIMUM DESIGN FLOWS FOR MUNICIPAL WWTPs

INSTRUCTIONS: This work sheet should be used to estimate your maximum day, maximum week and maximum month design flows given your average design flow. Where an approved facilities plan has evaluated the peak design flows, those values should be used.

The person filling out this form will need the average design flow value for the facility (usually from a facility plan), records on continuous flow monitoring (copies of your Discharge Monitoring Reports) for at least 3 years of record and a calculator.

When selecting data from flow records to enter onto the form, exercise some judgement. You may want to exclude certain extreme values from consideration. An example might be data from an extremely unusual event or circumstance which would not be expected to be duplicated during the design life of the treatment plant.

This work sheet should be completed for EACH of a minimum of three years of data used. The corresponding peak design flows should then be averaged. Start by making at least two more copies of this form. Complete one of the forms for the most recent 12 month period. Then take a second copy for the 12 months before that. And so on. Then average each of the maximum design flows for the number of 12 month periods you analyzed to obtain final values for your maximum daily, maximum weekly and maximum monthly design flows.

COMPLETE THE FOLLOWING SECTIONS AS APPROPRIATE:

12 MONTH RECORD from _____/_____ (Month/Year) through _____/_____ (Month/Year)

A. Enter Average Design Flow (may also be called Average Daily Design Flow or Average Annual Design Flow) __________ A.

B. Calculate CURRENT AVERAGE FLOW by determining an annual average of the DMR Monthly Average Effluent Flows.

Average of Monthly Average Flows = __________ B.

Data Used from: ____/____ - ____/____
(Enter Month/Year Info)

For Estimate of Maximum Day Design Flow:

C. Within this reporting period, what is the Daily Maximum Flow recorded in the DMRs?

Date of Daily Maximum Flow: ____/____/____ __________ C.

D. To estimate a MAXIMUM DAY PEAKING FACTOR, divide C by B.

$(C \div B) =$ __________ D.

DESIGN FLOW WORKSHEET (continued)

E. To estimate a MAXIMUM DAY DESIGN FLOW, multiply A by D.

(A X D) = ________ E.

For Estimate of Maximum Week Design Flow:

F. Within this reporting period, what are the FOUR HIGHEST Daily Maximum Flow Values recorded on the DMRs?

__________ MGD ____/____/____ (Date)

__________ MGD ____/____/____ (Date)

__________ MGD ____/____/____ (Date)

__________ MGD ____/____/____ (Date)

G. For each of the four highest Daily flow values, calculate a weekly average flow value using seven consecutive days from the DMRs and including the daily maximum value

__________ MGD From ____/____/____ to ____/____/____ (Date)

__________ MGD From ____/____/____ to ____/____/____ (Date)

__________ MGD From ____/____/____ to ____/____/____ (Date)

__________ MGD From ____/____/____ to ____/____/____ (Date)

H. To estimate a MAXIMUM WEEK PEAKING FACTOR, divide the HIGHEST average in G by B.

(G ÷ B) = ________ H.

I. To estimate a MAXIMUM WEEK DESIGN FLOW, multiply A by H.

(A X H) = ________ I.

For Estimate of Maximum Month Design Flow:

J. Within this reporting period, what is the highest Monthly Average Flow recorded on the DMRs?

. Date of Highest Monthly Average Flow: ____/____ (Month/Year)

__________J.

DESIGN FLOW WORKSHEET (continued)

K. To estimate a MAXIMUM MONTH PEAKING FACTOR, divide J by B.

(J ÷ B) = __________ K.

L. To estimate a MAXIMUM MONTH DESIGN FLOW, multiply A by K.

(A X K) = __________ L.

NOTE: This is one of any number of ways to estimate the peak design flows. Using this work sheet, even a permittee who is dependent on the DMR forms and a calculator should be able to estimate peak design flows. However, permittees with more sophisticated data management systems may want to determine the current weekly and monthly maximum plant flows through rolling averages. The permittee may also want to determine the current average annual flow by averaging the totaled flow over the record review period by the number of days, which may be more accurate than the proposed grand average of monthly average flows. We have recommended using three years of data because the permittee is legally obligated to keep only three years of data. The permittee can use more data if they wish.Instructions for Use of Preliminary Limits

To help you or your lab determine if you should perform additional monitoring above the minimum required or perform re-testing, we have provided you with preliminary limits for many of the substances we require you to monitor for. The preliminary limits for your facility are attached. Use the following narrative instructions to help guide you through Figures 1 and 2 to find out if you should stop or continue to collect sample results.

APPENDIX C
POPULATION PROJECTION LETTERS

STRAND ASSOCIATES®

Strand Associates, Inc.®
910 West Wingra Drive
Madison, WI 53715
(P) 608-251-4843
(F) 608-251-8655

December 29, 2014

Michael Heyroth
Rib Mountain Sanitary District
5073 Lilac Avenue
Wausau, WI 54401

Re: Rib Mountain Metropolitan Sewerage District Facility Planning
Population Projections

Dear Michael Heyroth:

Rib Mountain Metropolitan Sewerage District (RMMSD) is in the midst of facility planning. A key part of this process incorporates population projections. Strand Associates, Inc.® is using the future population projections from the most recently published Wisconsin Department of Administration (WDOA) population estimates and projections and the population projections included in the 2025 Wausau Urban Area Sewer Service Plan (208 Plan). Please review these numbers, shown in the table below. The facilities plan will evaluate RMMSD's needs through 2035, but the 208 Plan only incorporated local estimates through 2025. If you would like Marathon County to update the 208 Plan to incorporate local estimates through 2035 so that they can be incorporated into the RMMSD facility plan, please promptly make a request to Marathon County.

	Rothschild	**Mosinee**	**Weston**	**Kronenwetter**	**Rib Mountain S.D.***	**Total**
Population–WDOA Estimations and Projections						
2010	5,269	3,988	14,868	7,210	6,434	37,769
2015	5,340	4,050	15,520	7,540	5,516	37,966
2025	5,655	4,225	17,870	8,765	5,716	42,231
2035	5,795	4,270	19,700	9,730	5,732	45,227
Population–Local Estimations and Projections (From 208 Plan)						
2005	5,071	4,176	13,361	6,149	6,220	34,977
2025	6,671	4,693	18,941	8,825	7,081	46,211

*Note: Only includes sewered population estimated at 80 percent of total population.

We appreciate your cooperation on this important project.

Sincerely,

STRAND ASSOCIATES, INC.®

Kevin K. Hopkins

Kevin K. Hopkins, P.E.
Senior Associate

Rachel M. Lee

Rachel M. Lee, P.E

c: Ken Johnson, RMMSD

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STRAND ASSOCIATES®

Strand Associates, Inc.®
910 West Wingra Drive
Madison, WI 53715
(P) 608-251-4843
(F) 608-251-8655

December 29, 2014

Jeff Gates
City of Mosinee
225 Main Street
Mosinee, WI 54455

Re: Rib Mountain Metropolitan Sewerage District Facility Planning
Population Projections

Dear Jeff Gates:

Rib Mountain Metropolitan Sewerage District (RMMSD) is in the midst of facility planning. A key part of this process incorporates population projections. Strand Associates, Inc.® is using the future population projections from the most recently published Wisconsin Department of Administration (WDOA) population estimates and projections and the population projections included in the 2025 Wausau Urban Area Sewer Service Plan (208 Plan). Please review these numbers, shown in the table below. The facilities plan will evaluate RMMSD's needs through 2035, but the 208 Plan only incorporated local estimates through 2025. If you would like Marathon County to update the 208 Plan to incorporate local estimates through 2035 so that they can be incorporated into the RMMSD facility plan, please promptly make a request to Marathon County.

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Sincerely,

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Kevin K. Hopkins

Kevin K. Hopkins, P.E.
Senior Associate

Rachel M. Lee

Rachel M. Lee, P.E

c: Ken Johnson, RMMSD

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STRAND ASSOCIATES®

Strand Associates, Inc.®
910 West Wingra Drive
Madison, WI 53715
(P) 608-251-4843
(F) 608-251-8655

December 29, 2014

Duane Gau
Village of Kronenwetter
1582 Kronenwetter Drive
Mosinee, WI 54455

Re: Rib Mountain Metropolitan Sewerage District Facility Planning
Population Projections

Dear Duane Gau:

Rib Mountain Metropolitan Sewerage District (RMMSD) is in the midst of facility planning. A key part of this process incorporates population projections. Strand Associates, Inc.® is using the future population projections from the most recently published Wisconsin Department of Administration (WDOA) population estimates and projections and the population projections included in the 2025 Wausau Urban Area Sewer Service Plan (208 Plan). Please review these numbers, shown in the table below. The facilities plan will evaluate RMMSD's needs through 2035, but the 208 Plan only incorporated local estimates through 2025. If you would like Marathon County to update the 208 Plan to incorporate local estimates through 2035 so that they can be incorporated into the RMMSD facility plan, please promptly make a request to Marathon County.

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Sincerely,

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Kevin K. Hopkins

Kevin K. Hopkins, P.E.
Senior Associate

Rachel M. Lee

Rachel M. Lee, P.E

c: Ken Johnson, RMMSD

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STRAND
ASSOCIATES®

Strand Associates, Inc.®
910 West Wingra Drive
Madison, WI 53715
(P) 608-251-4843
(F) 608-251-8655

December 29, 2014

George Peterson
Village of Rothschild
211 Grand Avenue
Rothschild, WI 54474

Re: Rib Mountain Metropolitan Sewerage District Facility Planning
Population Projections

Dear George Peterson:

Rib Mountain Metropolitan Sewerage District (RMMSD) is in the midst of facility planning. A key part of this process incorporates population projections. Strand Associates, Inc.® is using the future population projections from the most recently published Wisconsin Department of Administration (WDOA) population estimates and projections and the population projections included in the 2025 Wausau Urban Area Sewer Service Plan (208 Plan). Please review these numbers, shown in the table below. The facilities plan will evaluate RMMSD's needs through 2035, but the 208 Plan only incorporated local estimates through 2025. If you would like Marathon County to update the 208 Plan to incorporate local estimates through 2035 so that they can be incorporated into the RMMSD facility plan, please promptly make a request to Marathon County.

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Senior Associate

Rachel M. Lee

Rachel M. Lee, P.E

c: Ken Johnson, RMMSD

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STRAND ASSOCIATES®

Strand Associates, Inc.®
910 West Wingra Drive
Madison, WI 53715
(P) 608-251-4843
(F) 608-251-8655

December 29, 2014

Keith Donner
Village of Weston
5500 Schofield Avenue
Weston, WI 54476

Re: Rib Mountain Metropolitan Sewerage District Facility Planning
Population Projections

Dear Keith Donner:

Rib Mountain Metropolitan Sewerage District (RMMSD) is in the midst of facility planning. A key part of this process incorporates population projections. Strand Associates, Inc.® is using the future population projections from the most recently published Wisconsin Department of Administration (WDOA) population estimates and projections and the population projections included in the 2025 Wausau Urban Area Sewer Service Plan (208 Plan). Please review these numbers, shown in the table below. The facilities plan will evaluate RMMSD's needs through 2035, but the 208 Plan only incorporated local estimates through 2025. If you would like Marathon County to update the 208 Plan to incorporate local estimates through 2035 so that they can be incorporated into the RMMSD facility plan, please promptly make a request to Marathon County.

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Sincerely,

STRAND ASSOCIATES, INC.®

Kevin K. Hopkins
Kevin K. Hopkins, P.E.
Senior Associate

Rachel M. Lee
Rachel M. Lee, P.E

c: Ken Johnson, RMMSD

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January 6, 2015

Ms. Rebecca Frisch, Director
Marathon County
Department of Conservation, Planning, and Zoning
210 River Drive
Wausau, WI 54403

Re: Wausau Urban Area Sewer Service Plan Update

Dear Rebecca:

Late in 2014 the Rib Mountain Metropolitan Sewerage District (RMMSD) authorized Strand Associates, Inc., (RMMSD's engineering consultant) to begin work on a wastewater treatment facilities planning study to evaluate the improvements necessary to serve its tributary communities through the year 2035. It is my understanding that the City of Wausau may also soon be undertaking a facilities planning study for their wastewater treatment facility.

Each of the RMMSD tributary communities recently received a letter from Strand Associates, Inc., dated December 29, 2014, (copy attached) related to the facilities plan update and the population projections to be used in the study. The basic question from Strand is whether the tributary communities wish to update the Wausau Urban Area Sewer Service Plan, a.k.a. "208 Plan," for a planning period extending to 2035 to coincide with the planning period of the RMMSD facilities plan.

As tributary communities to RMMSD, the Villages of Weston, Rothschild, and Kronenwetter; Rib Mountain Sanitary District; and the City of Mosinee; are interested in the RMMSD facilities plan being based on the most up to date projections for future sewer service and wastewater treatment needs.

The current Wausau Urban Area Sewer Service Plan was last updated in 2007 and encompasses a planning period through 2025. It would be prudent to coordinate an update of the Wausau Urban Area Sewer Service Plan with the facilities planning studies by RMMSD and the City of Wausau.

While wastewater treatment capacity has historically been the focus of the sewer service plan (at least as I perceive it), it would seem there are other issues that should be considered at this time as well; namely, additional communities that may be served (e.g., Village of Marathon City) and phosphorous regulation implications for both point and non-point dischargers. As these are inter-related issues with implications to surface water quality, this may also be an opportunity to explore cooperative long term strategies rather than independent ones for specific stakeholders.

On behalf of the Village of Weston, I request that the Marathon County Planning Organization schedule a meeting of the Technical Advisory Committee at the earliest possible date to discuss the process of updating the Wausau Urban Area Sewer Service Plan through the year 2035. I would recommend we include invitations to Ken Johnson, Manager of RMMSD, and Dave Erickson from the City of Wausau, or their designated representatives and/or agents. We may also wish to consider other interested stakeholders, such as members of the North Central Wisconsin Storm Water Coalition and/or representatives of the agricultural community.

Please contact me at 715-241-2610 or kdonner@westonwi.gov with any questions, etc.

Sincerely,
Village of Weston

Keith E. Donner, P.E.
Director of Public Works & Utilities
5500 Schofield Avenue
Weston, WI 54476

Attachment

Cc: (via e-mail attachment)

Duane Gau, Village of Kronenwetter
Mike Heyroth, Rib Mountain Sanitary District
Tim Vergara, P.E., Village of Rothschild
Kevin King, City of Schofield
Brad Lenz, City of Wausau
Kevin Breit, City of Mosinee
Ken Johnson, Rib Mountain Metropolitan Sewerage District

STRAND ASSOCIATES

Strand Associates, Inc.

RECEIVED
JAN 02 2015
VILLAGE OF WESTON

December 29, 2014

Mr. Keith Donner
Village of Weston
5500 Schofield Avenue
Weston, WI 54476

Re: Rib Mountain Metropolitan Sewerage District Facility Planning
Population Projections

Dear Mr. Donner:

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*Note: Only includes sewered population estimated at 80 percent of total population.

We appreciate your cooperation on this important project.

Sincerely,

STRAND ASSOCIATES, INC.®

Kevin K. Hopkins, P.E.
Senior Associate

Rachel M. Lee

Rachel M. Lee, P.E

c: Ken Johnson, RMMSD

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APPENDIX D
MULTIDISCHARGER VARIANCE WNDR FACT SHEET AND 2014 RMMSD YEAR END REPORT

APPENDIX D
MULTIDISCHARGER VARIANCE WNDR FACT SHEET

Multi-discharger Phosphorus Variance

Act 378 was enacted in April 2014 which required DOA in consultation with DNR to determine if complying with phosphorus causes Wisconsin substantial and widespread hardship. If so, DNR will work with EPA to implement a phosphorus MDV to help point sources comply with phosphorus in a more economically viable way. The legal requirements of the MDV determination as well as general implementation procedures can be found in s. 283.16, Wis. Stat.

What is a multi-discharger variance?

A MULTIDISCHARGE VARIANCE (MDV) IS...

- A time extension for point sources facing restrictive phosphorus limits to comply with limits
- An opportunity for point sources to make meaningful strides towards water quality improvements in a more economically effective manner
- Implemented in a WPDES permit with a maximum 20-year project life

A MDV IS NOT...

- An individual variance pursuant to s. 283.15
- A final compliance option for point sources
- Water quality trading or adaptive management
- Permanent

What the MDV requires:

A point source is responsible for evaluating its compliance options such as facility upgrades, water quality trading, adaptive management, and, potentially, a phosphorus MDV. If a facility meets the eligibility requirements and requests the MDV, the WPDES permit will, upon approval, be modified or reissued with the following requirements:

1. Reductions of effluent phosphorus: Point sources are required to reduce their phosphorus load each permit term. Act 378 specifies default limitations, but these limits may be adjusted if they are not achievable:
   - Permit term 1: 0.8 mg/L
   - Permit term 2: 0.6 mg/L
   - Permit term 3: 0.5 mg/L
   - Permit term 4: Phosphorus WQBEL

2. Implement a watershed project: Point sources must implement one of the following watershed project options to help reduce nonpoint source of phosphorus pollution:

- Enter into an agreement with DNR to implement a project to offset the amount of phosphorus their discharge exceeds the target value.
- Enter into a DNR-approved agreement with a third party to implement a project to offset the amount of phosphorus their discharge exceeds the target value.
- Make payments to county LCDs of $50 per pound times the number of pounds of phosphorus their discharge exceeds the target value.

The approval determination must be re-evaluated each permit reissuance of the MDV project timeline.

ELIGIBLE POINT SOURCES:

A point source must meet all of the following to request a MDV:

- Must be an **existing facility**
- Requires **a major facility upgrade** to comply with their phosphorus WQBELs
- Meets the primary and secondary **substantial** indicators
- Agrees to **reduce its phosphorus load** during the variance timeline
- Implements a **watershed project** to help curb non-point source phosphorus pollution

Urban BMPs can be used as part of a watershed project for a MDV.

ACRONYMS

DNR: Wisconsin Department of Natural Resources

DOA: Wisconsin Department of Administration

EIA: Economic Impact Analysis

LCD: Land and Water Conservation Department

MDV: Multi-Discharger Variance

REMI: Regional Economic Models, Inc.

WPDES: Wisconsin Pollutant Discharge Elimination System

WQBEL: Water quality-based effluent limit

SEEKING EXPERTISE

Three consulting firms were retained to help provide information and analysis in support of the preliminary determination: ARCADIS, Sycamore Advisors, and University of Massachusetts Donahue Institute. The methods, analyses and results provided by these consultants are available in the "EIA Report" and "EIA Addendum". See "more information" section for details.

A grass waterways is an example of an agricultural BMP that can be used as part of a watershed project.

METHODS

Compliance costs:

Cost curves were developed by ARCADIS to estimate compliance costs based on the restrictiveness of the phosphorus WQBEL, and the permitted flow of the facility. Utilizing cost curves is a standard and straightforward way of estimating the compliance costs for various facilities when site-specific analyses are unavailable or infeasible.

THE ESTIMATED TOTAL CAPITAL INVESTMENT FOR POINT SOURCES:
$7 BILLION (including interest)

Widespread Impacts:

The Regional Economic Models, Inc. (REMI) model was used to demonstrate the widespread economic impacts of phosphorus compliance costs. The REMI model is a dynamic economic forecasting software application that is used by many consulting firms, educational institutes, and government agencies for a number of applications including determining the economic impacts of highway projects and projecting the economic impacts of environmental policies.

ESTIMATED WIDESPREAD IMPACTS INCLUDE:

Jobs lost:	3,361
Gross State Product lost:	$478.9 MILLION
Reduction of wages:	$184.1 MILLION
Fewer Wisconsin Residences:	7,545

Determining Substantial Impacts

A two-step process was used to determine if phosphorus standards compliance has a substantial impact to point source discharges. The purpose of the first step, commonly referred to as the "primary screener", is to determine the phosphorus standards' economic impact on dischargers in each category. The second step, referred to as the "secondary screener", gauges the wider community's socioeconomic well-being and ability to adapt to changes that accompany implementation of phosphorus standards. In order to meet the "substantial determination" test, a facility must meet the primary screener and one or more secondary screeners.

Primary Screeners:

- Median household income (municipal WWTFs)
- Estimated compliance costs within the discharge category (industries)
- Estimated compliance costs within the county (industries)

Secondary Screeners:

- Median household income (industries only)
- Transfer receipts as a share of total personal income
- Jobs per square mile
- Population change
- Net earnings by place of residence
- Job growth
- Capital costs as a share of total wages

NEXT STEPS

Several actions must be taken before the phosphorus MDV can be implemented for an individual point source:

1. DOA, in consultation with DNR, must make a final determination that phosphorus causes a "substantial and widespread adverse social and economic impact."
2. If so, DNR will utilize the final determination to create a variance package for EPA review and approval.
3. EPA must review and approve the MDV package.
4. Point sources can evaluate the MDV as part of their compliance options and request the MDV, if appropriate.
5. DNR must approve the request and modify, reissue, or revoke and reissue the WPDES permit with MDV requirements built in. Like other permitting decisions, public input will be solicited during this permitting process.

FOR MORE INFORMATION

- Visit the DNR website: http://dnr.wi.gov/, search "phosphorus"
- Visit the DOA website: http://doa.wi.gov/, search "phosphorus"
- Send comments on the preliminary determination by June 11th to phosphorus@wisconsin.gov

WISCONSIN DEPT. OF NATURAL RESOURCES

Fact sheet for information only
Prepared by:
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APPENDIX D
2014 RMMSD YEAR END REPORT

Health Department
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Wausau, WI 54403-6797

MARATHON COUNTY

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www.co.marathon.wi.us

RMMSD
Mercury Reduction Program
Year End Report 2014

This is the year-end report of the education and outreach activities conducted by the Marathon County Health Department surrounding mercury reduction and recycling in the RMMSD service area. This report covers all activities for January 1 – December 31, 2014.

Dental providers continue to be a primary focus for outreach and education efforts in 2014. Dental providers were contacted for e-mail addresses and sent reminders to provide their recycling/disposal information to the Marathon County Health Department. Follow-up reminder e-mails and phone calls were made to the dental offices that did not provide Marathon County Health Department with any disposal information.

The enclosed Dental Amalgam Separator Installation spreadsheet includes installation data and mercury disposal information. The information provided is a reflection of the information provided to Marathon County by the respective dental offices. Thirteen out of 16 (81%) of the dental offices have reported installation of an amalgam separator and reported mercury recycling data. A total of 60.5 pounds of dental amalgam waste and containers were recycled from 9 of the 13 dental offices, while the other 4 offices reported that their separators were not in need of replacement during 2014. No new dental offices were identified in the RMMSD service area.

The thermometer exchange program continues to be implemented as part of the community outreach aspect of the Mercury Reduction Program. In 2014, exchange of thermometers was once again made available year around to make the service more convenient to the public. Quarterly press releases were issued on April 25, July 25, October 25, and December 1, 2014, to remind the public to recycle their mercury thermometers. Seven satellite collection sites were utilized including, Kronenwetter Municipal Center, Rothschild Village Hall, Rib Mountain Fire Department, Wausau Fire Department, Schofield Municipal Center, Mosinee City Hall, and Marathon County Health Department. Mercury-containing thermometers continued to be exchanged for digital thermometers free of charge. An additional supply of digital thermometers was purchased and each exchange site was provided a recycling bucket and a supply of digital thermometers in 2014.

On April 28, 2014, in response to the press release, the Wausau Daily Herald published a brief article promoting the mercury thermometer exchange program. Approximately 75 thermometers, 6 thermostats, 10 mercury switches, and a bottle containing liquid mercury were recycled through the exchange locations in 2014. This is a significant increase from the 4 thermometers collected in 2013.

Additional education and outreach to schools, auto repair and salvage businesses, and HVAC contractors was provided. A cover letter and an updated mercury newsletter were sent in October 2014. No follow up phone calls were received from any of the groups as a result of the mailings.

An e-mail was sent to each City, Village and Town Clerk in Marathon County and contained an attachment of the Mercury Program newsletter for posting and reference. Each of the Clerks was surveyed for whether they copy and distribute the newsletter to each resident in their service area or if they simply post it at a common location for residents to see. A mixture of responses was received from a small handful of Clerks, providing no reason to change the current method of distribution.

The Marathon County Health Department mercury website received some upgrades. A link for the DNR Fish Consumption Advisory was added as well as a list of items that may contain mercury commonly found in households. 207 hits to the MCHD mercury website were counted for 2014. Also, the updated mercury program newsletter was added to the brochure display area near the Marathon County Health Department laboratory entrance.

The Conservation, Planning, and Zoning Department for Marathon County was contacted to determine the feasibility of incorporating some outreach materials into the septic tank pumping reminder letter that is sent to residents on private wastewater systems installed post 1980. The idea must be approved by the CPZ Department prior to implementation in 2015.

On February 13, 2014, a meeting was held with RMMSD, WWW, DNR, and MCHD, to review the program efforts and to determine the next phase of education and outreach. It was determined that additional outreach efforts were needed in the medical office area to enhance the number of completed and returned mercury minimization surveys. Phone calls were made to all of the medical offices that had not previously completed the survey. Contact names were collected and surveys were mailed directly to the responsible individuals. An additional 3 completed surveys were received bringing the total to 26 out of 47 (55%) medical facilities responding to the survey.

Marathon County Health Department continues to promote the use of alternate equipment and materials and encourage the proper disposal of existing mercury-containing items.

Respectfully submitted,

Michelle M. Schwoch

Michelle Schwoch
Environmental Health Sanitarian

Enc: Mercury Newsletter
Dental Amalgam Separator Installation spreadsheet
WDH article

APPENDIX E
PRESENT WORTH COSTS

RMMSD Facilities Plan
Alternative G1
Replace Aerated Grit Equipment + Grit Washer

Discount Rate 4.63%

ITEM	Initial Capital Cost	Replacement Cost	Replacment Interval (Yr)	Replacement P.W.	Service Life	20 yr Salvage Value	Salvage Value (P.W.)
Demolition	$15,000	$0	20	$0	20	$0	$0
Updated Equipment & controls	$172,665	$0	20	$0	20	$0	$0
Grit washer	$169,000	$0	20	$0	20	$0	$0
Subtotal	$357,000						
Piping/Mechanical (15%)	$54,000			$0	30	$18,000	$7,000
Electrical (20%)	$71,000			$0	20	$0	$0
HVAC	$30,000			$0	20	$0	$0
Sitework (0%)	$0			$0	20	$0	$0
Subtotal	$512,000						
Contractor's General Conditions (10%)	$51,000						
Total Construction Costs	$563,000						
Contingencies, Legal & Engineering Services (40%)	$225,000						
Total Capital Costs	**$788,000**	$0		$0		$18,000	$7,000
Present Worth	$788,000			$0			$7,000

Estimated Annual O&M Costs		
Labor	$23,000	
Power	$4,700	blower (10 hp), screw collector (3/4 hp), grit washer drive (1 hp) & grit washer auger (1.5 hp)
Chemical	$0	
Maintenance and Supplies	$6,800	
Total	$34,500	
Present Worth of O&M	$444,000	

Summary of Present Worth Costs	
Capital Cost	$788,000
Replacement	$0
O&M Cost	$444,000
Salvage Value	($7,000)
TOTAL PRESENT WORTH	**$1,225,000**
Annualized PW	$95,000

Notes:

All costs are second quarter 2015 dollars.

Present worth is calculated on a 20-year basis at discount rate shown.

Unit cost assumptions:

Labor	$63	per hour
Power	$0.07	per kwh
Maintenance and Supplies	2%	percent of equipment capital cost
Additional sludge handling and disposal	$0.05	per gallon
Biogas value	$9.70	per MMBTU

RMMSD Facilities Plan
Alternative G2
Vortex Grit Removal System + Grit Washer

Discount Rate 4.63%

ITEM	Initial Capital Cost	Replacement Cost	Replacment Interval (Yr)	Replacement P.W.	Service Life	20 yr Salvage Value	Salvage Value (P.W.)
Demolition	$40,000	$0	20	$0	20	$0	$0
Vortex Grit Removal System	$203,000	$0	20	$0	20	$0	$0
Grit Washer	$169,000	$0	20	$0	20	$0	$0
Concrete Tank and Channel	$65,000	$0	40	$0	20	$0	$0
Side Gates (3)	$22,000	$0	20	$0	20	$0	$0
Subtotal	$499,000						
Piping/Mechanical (15%)	$75,000			$0	30	$25,000	$10,000
Electrical (20%)	$100,000			$0	20	$0	$0
HVAC	$30,000			$0	20	$0	$0
Sitework (5%)	$25,000			$0	20	$0	$0
Subtotal	$729,000						
Contractor's General Conditions (10%)	$73,000						
Total Construction Costs	$802,000						
Contingencies, Legal & Engineering Services (40%)	$321,000						
Total Capital Costs	**$1,123,000**	$0		$0		$25,000	$10,000
Present Worth	$1,123,000			$0			$10,000

Estimated Annual O&M Costs		
Labor	$23,000	
Power	$1,900	grit pump (7.5 hp), rotating baffle (2 hp), grit washer drive (1 hp) & grit washer auger (1.5 hp)
Chemical	$0	
Maintenance and Supplies	$3,700	
Total	$28,600	
Present Worth of O&M	$368,000	

Summary of Present Worth Costs	
Capital Cost	$1,123,000
Replacement	$0
O&M Cost	$368,000
Salvage Value	($10,000)
TOTAL PRESENT WORTH	**$1,481,000**

Annualized PW	$115,000

Notes:

All costs are second quarter 2015 dollars.

Present worth is calculated on a 20-year basis at discount rate shown.

Unit cost assumptions:

Labor	$63 per hour
Power	$0.07 per kwh
Maintenance and Supplies	1% percent of equipment capital cost
Additional sludge handling and disposal	$0.05 per gallon
Biogas value	$9.70 per MMBTU

RMMSD Facilities Plan
Alternative DG1
Draft Tube Mixers

Discount Rate 4.63%

ITEM	Initial Capital Cost	Replacement Cost	Replacment Interval (Yr)	Replacement P.W.	Service Life	20 yr Salvage Value	Salvage Value (P.W.)
Demolition	$200,000	$0	20	$0	20	$0	$0
Floating cover for primary digester	$375,000	$0	30	$0	30	$125,000	$51,000
Floating gas-holder cover for secondary digester	$436,000	$0	30	$0	30	$145,000	$59,000
Digester mixing system for secondary digester (3 Draft Tubes)	$454,000	$0	20	$0	20	$0	$0
Digester Mixing System External Sumps (3)	$60,000	$0	40	$0	40	$30,000	$12,000
Digester recirculation pump (2)	$108,000	$0	20	$0	20	$0	$0
Transfer pump (2)	$54,000	$0	20	$0	20	$0	$0
Digester gas safety equipment	$203,000	$0	20	$0	20	$0	$0
Waste gas burner	$74,000	$0	20	$0	20	$0	$0
Combination Boiler-Heat exchanger	$284,000	$0	20	$0	20	$0	$0
Hot Water Boiler and Appurtenances	$150,000	$0	20	$0	20	$0	$0
Subtotal	$2,398,000						
Piping/Mechanical (15%)	$360,000			$0	30	$120,000	$49,000
Electrical (20%)	$480,000			$0	20	$0	$0
HVAC	$160,000			$0	20	$0	$0
Sitework	$5,000			$0	20	$0	$0
Subtotal	$3,403,000						
Contractor's General Conditions (10%)	$340,000						
Total Construction Costs	$3,743,000						
Contingencies, Legal & Engineering Services (40%)	$1,497,000						
Total Capital Costs	**$5,240,000**	$0		$0		$420,000	$171,000
Present Worth	$5,240,000			$0			$171,000

Estimated Annual O&M Costs		
Labor	$57,000	
Power	$9,100	*only mixing power here
Chemical	$0	
Maintenance and Supplies	$9,100	
Total	$75,200	
Present Worth of O&M	$968,000	

Summary of Present Worth Costs

Capital Cost	$5,240,000
Replacement	$0
O&M Cost	$968,000
Salvage Value	($171,000)
TOTAL PRESENT WORTH	**$6,037,000**
Annualized PW	$469,000

Notes:

All costs are second quarter 2015 dollars.

Present worth is calculated on a 20-year basis at discount rate shown.

Unit cost assumptions:

Labor	$63	per hour
Power	$0.07	per kwh
Maintenance and Supplies	2%	percent of equipment capital cost
Additional sludge handling and disposal	$0.05	per gallon
Biogas value	$9.70	per MMBTU

RMMSD Facilities Plan
Alternative DG2
Pumped Mixing

Discount Rate 4.63%

ITEM	Initial Capital Cost	Replacement Cost	Replacment Interval (Yr)	Replacement P.W.	Service Life	20 yr Salvage Value	Salvage Value (P.W.)
Demolition	$170,000	$0	20	$0	20	$0	$0
Floating cover for primary digester	$375,000	$0	30	$0	30	$125,000	$51,000
Floating gas-holder cover for secondary digester	$436,000	$0	30	$0	30	$145,000	$59,000
Digester mixing system for secondary digester (Pumped Mixing)	$88,000	$0	20	$0	20	$0	$0
Digester recirculation pump (2)	$108,000	$0	20	$0	20	$0	$0
Transfer pump (2)	$54,000	$0	20	$0	20	$0	$0
Digester gas safety equipment	$203,000	$0	20	$0	20	$0	$0
Waste gas burner	$74,000	$0	20	$0	20	$0	$0
Combination Boiler-Heat exchanger	$284,000	$0	20	$0	20	$0	$0
Hot Water Boiler and Appurtenances	$150,000	$0	20	$0	20	$0	$0
Subtotal	$1,942,000						
Piping/Mechanical (20%)	$388,000			$0	30	$129,000	$52,000
Electrical (20%)	$388,000			$0	20	$0	$0
HVAC	$160,000			$0	20	$0	$0
Sitework (0%)	$0			$0	20	$0	$0
Subtotal	$2,878,000						
Contractor's General Conditions (10%)	$288,000						
Total Construction Costs	$3,166,000						
Contingencies, Legal & Engineering Services (40%)	$1,266,000						
Total Capital Costs	**$4,432,000**	$0		$0		$399,000	$162,000
Present Worth	$4,432,000			$0			$162,000

Estimated Annual O&M Costs

Labor	$57,000	
Power	$12,200	*only mixing power here
Chemical	$0	
Maintenance and Supplies	$1,800	
Total	$71,000	
Present Worth of O&M	$914,000	

Summary of Present Worth Costs

Capital Cost	$4,432,000

Replacement	$0
O&M Cost	$914,000
Salvage Value	($162,000)
TOTAL PRESENT WORTH	**$5,184,000**
Annualized PW	$403,000

Notes:
All costs are second quarter 2015 dollars.
Present worth is calculated on a 20-year basis at discount rate shown.

Unit cost assumptions:

Labor	$63	per hour
Power	$0.07	per kwh
Maintenance and Supplies	2%	percent of equipment capital cost
Additional sludge handling and disposal	$0.05	per gallon
Biogas value	$9.70	per MMBTU

RMMSD Facilities Plan
Alternative DG3
LM Mixer

Discount Rate 4.63%

ITEM	Initial Capital Cost	Replacement Cost	Replacment Interval (Yr)	Replacement P.W.	Service Life	20 yr Salvage Value	Salvage Value (P.W.)
Demolition	$180,000	$0	20	$0	20	$0	$0
Floating cover for primary digester	$375,000	$0	30	$0	30	$125,000	$51,000
Floating gas-holder cover for secondary digester	$436,000	$0	30	$0	30	$145,000	$59,000
Digester mixing system for secondary digester (LM Mixing)	$218,000	$0	20	$0	20	$0	$0
Digester recirculation pump (2)	$108,000	$0	20	$0	20	$0	$0
Transfer pump (2)	$54,000	$0	20	$0	20	$0	$0
Digester gas safety equipment	$203,000	$0	20	$0	20	$0	$0
Waste gas burner	$74,000	$0	20	$0	20	$0	$0
Combination Boiler-Heat exchanger	$284,000	$0	20	$0	20	$0	$0
Hot Water Boiler and Appurtenances	$150,000	$0	20	$0	20	$0	$0
Subtotal	$2,082,000						
Piping/Mechanical (20%)	$416,000			$0	30	$139,000	$56,000
Electrical (20%)	$416,000			$0	20	$0	$0
HVAC	$160,000			$0	20	$0	$0
Sitework (0%)	$0			$0	20	$0	$0
Subtotal	$3,074,000						
Contractor's General Conditions (10%)	$307,000						
Total Construction Costs	$3,381,000						
Contingencies, Legal & Engineering Services (40%)	$1,352,000						
Total Capital Costs	**$4,733,000**	$0		$0		$409,000	$166,000
Present Worth	$4,733,000			$0			$166,000

Estimated Annual O&M Costs

Labor	$57,000	
Power	$4,600	*only mixing power here
Chemical	$0	
Maintenance and Supplies	$4,400	
Total	$66,000	
Present Worth of O&M	$849,000	

Summary of Present Worth Costs

Capital Cost	$4,733,000
Replacement	$0
O&M Cost	$849,000
Salvage Value	($166,000)
TOTAL PRESENT WORTH	**$5,416,000**
Annualized PW	$421,000

<u>Notes:</u>

All costs are second quarter 2015 dollars.

Present worth is calculated on a 20-year basis at discount rate shown.

<u>Unit cost assumptions:</u>

Labor	$63	per hour
Power	$0.07	per kwh
Maintenance and Supplies	2%	percent of equipment capital cost
Additional sludge handling and disposal	$0.05	per gallon
Biogas value	$9.70	per MMBTU

APPENDIX F
PROPOSED DESIGN CRITERIA

Rib Mountain Metropolitan Sewerage District Wastewater Treatment Plant
Proposed Design Criteria

I. Design Flows and Loadings, Year 2035

Design Flows (mgd)		
	Average Dry Weather Flow	3.98
	Average Annual Flow	4.41
	Maximum Month Flow	5.03
	Peak Hour Flow	8.09
	Peak Instantaneous Flow	12.29
Design Average Influent Loadings (lbs/day)		
	BOD_5	8,529
	TSS	9,798
Maximum Monthly Influent Loadings (lbs/day)		
	BOD_5	8,985
	TSS	11,620

II. Unit Design Criteria

A. Influent Pumping (Phase I)		
	Type	Centrifugal, Chopper
	Number of Units	4 + 1 standby
	Firm Station Capacity, (mgd)	12.29
	Control	Variable speed
B. Preliminary Treatment		
Mechanically Cleaned Screen (Phase I)		
	Type	Stair Screen
	Number of Units	1
	Capacity (mgd)	12.29
	Screen Opening Size (in)	0.118
Screenings Handling (Phase I)		
	Type	Wash Press
	Number of Units	1
	Motor, each (hp)	5
Grit Removal (Phase 1)		
	Type	Vortex
	Number of Units	1
	Capacity, (mgd)	12
Grit Pump (PhaseI)		
	Type	Centrifugal
	Number of Units	1
	Capacity (gpm)	250
Grit Washing Equipment (Phase I)		
	Type	Grit Washer
	Number of Units	1
	Capacity (gpm)	250

Flow Metering

Influent Flow Meter (type)	Parshall Flume
Number of Units	1
Size (in)	18
Recycle Flow Meter (type)	Flume
Number of Units	1
Sampler, Number of Units	1

C. Primary Sedimentation (Phase II)

Type	Rectangular-Chain & Scraper
Number of Units	3
Size, L x W x Avg. D (ft)	133 x 24 x 9
Area, each (sq ft)	2,880
Volume, total (cu ft)	1,440,000
Volume, total (gal)	192,500
Weir Length, each (ft)	160
Loading Rate (gpd/sq ft)	
@ 4.41 mgd	765
@ 8.09 mgd	1,404
Weir Overflow Rate (gpd/sq ft, Avg. flow)	9,188

Primary Sludge Pumps (Phase II)

Type	Positive displacement, rotary lobe
Number of Units	2
Capacity, each (gpm)	TBD

D. Biological Treatment

Aeration Tanks

Type	Diffused Aeration
Number of Tanks	4
Size, each L x W x SWD (ft)	133 x 24 x 15
Volume, total (gal)	1,440,000
Volume, total (cu ft)	192,500
Design Average BOD Load (lb/1,000 cf/day)	31
Diffusers	Fine Bubble
Number of Diffusers, per tank	480
Type	Ceramic

Aeration Blowers

Type	High Speed Turbo
Number of Units	1
Capacity @ 8 psig (scfm)	1,275
Type	Positive displacement, rotary lobe
Capacity, 2 units @ 8 psig (scfm)	1,700

(existing PD blowers to be replaced with 2,415 scfm turbo blowers prior to Phase I and during Phase II improvements.)

Final Clarifiers (Phase II)		
	Type	Circular, Suction Withdrawal
	Number of Units	2
	Diameter, each (ft)	85
	Side Water Depth (ft)	14
	Weir Length (ft)	267
	Volume, each (cu ft)	79,443
	Volume, each (gal)	594,000
	Solids Loading Rate	
	@ 4.41 mgd (lbs/sq ft * h)	0.43
	@ 8.09 mgd (lbs/sq ft * h)	0.76
	Surface Overflow Rate	
	@ 8.09 mgd (gpd/sq ft)	713
RAS Pumping (Phase I)		
	Type	Non-clog, centrifugal
	Number of Units	3
	Capacity, each (gpm)	1,700 max, 400 min
	Firm Capacity, (gpm)	3,400 or 100% of max day flow rate
	Motor (hp)	20

E. Alum Feed

Storage Tank	Type	Fiberglass Reinforced Tank
	Number of Units	1
	Capacity (gal)	6000
Chemical Feed Pumping		
	Type	Positive Displacement Diaphragm
	Number of Units	2
	Capacity, each (minimum gph)	20
	Capacity, each (maximum gph)	40

F. Disinfection System

	Type	Ultraviolet, Low-Pressure, High Intensity, Variable Output
	Number of Channels	1
	Number of Banks (2nd bank added in Phase I)	2
	Capacity, total (mgd)	8.68
	Number of Modules per Bank	8
	Number of Lamps per Module	6
	Total Number of Lamps	96
	Minimum UV Transmittance @ 254 nm	0.65
Post Aeration		
	Type	Cascade
Final Effluent Flow Meter		
	Type	Parshall Flume
	Number of Units	1
	Width, each (in)	12
	Capacity, mgd	10.4
Outfall Sewer		
	Diameter (in)	36

	Length (ft)	250
G. WAS Thickening (Phase II)		
	Type	Dissolved Air Flotation Thickeners
	Number of Units	2
	Size of Units, L x W (ft)	12 x 55
	Design Solids Loading Rate, total (lb TSS/hr)	
	(5 days/week, 12 hr/day)	560
	Surface Loading Rate (lb/hr/sq ft)	0.42
	Surface Skimmer Motor (hp)	1
	Bottom Scraper Motor (hp)	0.5
Recycle Pumps		
	Type	Centrifugal
	Number of Units	2
	Capacity, each (gpm)	190 @ 150 ft TDH
	Motor (hp)	15
Thickened Sludge Pump		
	Type	Positive Displacement, Rotary Lobe
	Number of Units	2
	Capacity, each (gpm)	125 @ 60 ft TDH
H. Digestion (Phase II)		
	Type	Anaerobic
	Number of Units	2
Primary Digester	Type	Heated, Mixed, Mesophilic
	Diameter (ft)	70
	Side Water Depth (ft)	26
	Volume (cu ft)	100,000
	Solids Retention Time (days)	26
	Volatile Solids Loading Rate	
	(lbs VS/day/1,000 cu ft)	60
	Mixing	Pumped Vortex Mixing
	Number of Pumps	1
	Capacity, each (gpm)	2,700
	TDH (ft)	40
	Number of Nozzles	3
	Heating	Hot Water, External Heat Exchanger
	Number	1
	Boiler Output Capacity (BTU/hr)	1,500,000
	Heat Exchanger Capacity (BTU/hr)	375,000
	Solids Retention Time (days)	22.5
Secondary Digester		
	Type	Unheated, Mixed
	Diameter (ft)	70
	Side Water Depth (ft)	24
	Volume (cu ft)	92,400
	Cover Type	Fixed
	Mixing	
	Number of Pumps	1
	Capacity, each (gpm)	1,700-2,300

	TDH (ft)	40
	Number of Nozzles	3
Transfer Pump		
	Type	Positive Displacement, Rotary Lobe
	Number of Units	2
	Capacity, each (gpm)	250
	Motor (hp)	TBD
Recirculation Pump		
	Type	Centrifugal
	Number of Units	2
	Capacity, each (gpm)	350
	Motor (hp)	TBD
Flare		
	Type	Piloted Combustion
	Number of Units	1
	Size (in)	6
	Capacity, each (scfm)	TBD
I. Liquid Sludge Storage		
	Number of Units	2
	Diameter (ft)	120
	Side Water Depth (ft)	21
	Volume, each (gal)	1,930,000
	Volume, total (gal)	3,860,000
Mixing		
	Type	Pumped Mixing
	Number of Units	1
	Capacity, each (gpm)	7,040
	TDH (ft)	39
Biosolids Loadout Pump		
	Number of Units	1
	Capacity, each (gpm)	1,075
	TDH (ft)	32
J. Biosolids Disposal		
	Location	Land Application
K. Septage Receiving		
	Number of Tanks	2

APPENDIX G
PUBLIC PARTICIPATION

DAILY HERALD media
A GANNETT COMPANY

STATE OF WISCONSIN
BROWN COUNTY

PUBLIC NOTICE
The Rib Mountain Metropolitan Sewerage District (RMMSD) has developed a new Wastewater Facilities Plan to evaluate and recommend upgrades to the facility to meet its needs over the next 20 years. A public hearing will be held on November 10, 2015, beginning at 10:30 AM at the RMMSD office for any comments, questions, and discussion on the plan. This notice provides the public the opportunity to review and comment on the plan for a period of thirty days ending November 22, 2015.
For questions, or to obtain a copy of the plan, please contact:
Mr. Ken Johnson
Rib Mountain Metropolitan Sewerage District
2001 Aster Road
Wausau, WI 54401
A copy of the plan is available for viewing at RMMSD's offices during the public notice period. Written comments on the plan will be received by RMMSD at the address listed above until November 22, 2015 at 2:30 PM. Verbal comments can be made at the public hearing. There have been no previous public notices for review of this plan.
RUN: Oct 23, 31, 2015 WNAXLP

RIB MOUNTAIN METRO SEWERAGE

2001 ASTER RD
WAUSAU WI 544019365

I, being duly sworn, doth depose and say I am an authorized representative of The Wausau Daily Herald, a newspaper at Wausau Wisconsin and that an advertisment of which the annexed is a true copy, taken from said paper, which published therein on:

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(Signed) ______________ **(Date)** 11/4/15
Legal Clerk

ALEXANDRA ZAKOWSKI NOTARY PUBLIC STATE OF WISCONSIN

Signed and sworn before me
Alexandra Zakowski

My commission expires 3/3/19

RIB MOUNTAIN METRO SEWERAGE
Re: Wastewater Facilities Plan

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435 EAST WALNUT ST.
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ATTENDANCE
NOVEMBER 10, 2015

NAME	AFFILIATION
Duane Gau Yes ✓	Vg of Kronenwetter
George Jeffer[illegible] Yes ✓	Vg of Rothschild
Dave Erickson Yes ✓	Wausau Water Works
Rachel Lee No	Strand Associates Inc
KEVIN HOPKINS No	" " " " "
PHIL BUDDE No	" " " " "
Jeff Pritchard Yes	Marathon County jeff.pritchard@co.marathon.wi.us
DAVID MACK Yes	MARATHON Co. dave.mack@co.marathon.wi.us
Tonia Speener Yes ✓	Clark Dietz Engineers
Michael Wodalski No	Village of Weston
Mike Heyroth Yes ✓	Rib Mtn Sanitary District
Rhoden ✓	
Gaylene Yes ✓	

Jess Gale Yes ✓

✓ E-Mailed Facilities Plan 11-10-15

RIB MOUNTAIN METROPOLITAN SEWERAGE DISTRICT
MEETING - NOVEMBER 10, 2015

UNIDENTIFIED SPEAKER: Welcome to our meeting today. We'll start out, first of all, with the facilities plan public hearing.

MR. JOHNSON: For the record, Jim --

UNIDENTIFIED SPEAKER: And --

MR. JOHNSON: -- why don't we have introduction of the audience and just start with Rachel. And let's have a listing of everybody that's here.

UNIDENTIFIED SPEAKER: Okay. We can start the audience with Rachel.

MS. LEE: I'm Rachel Lee with Strand Associates.

MR. HOPKINS: Kevin Hopkins with Strand Associates.

MR. ARTSON: I'm David Artson (phonetic) for the City of Wausau.

MR. PETERSON: George Peterson, Village of Rothschild.

MR. GOLLA: Duane Golla, Village of Kronenwetter.

MS. TANIA ____: Tania (inaudible).

MR. BILL ____: Bill (inaudible).

MR. PRITCHARD: (Inaudible) Pritchard, Marathon County.

MR. MACK: Dave Mack with Marathon County.

MR. ____: (Inaudible), Village of Weston.

UNIDENTIFIED SPEAKER: Welcome to our meeting today. We'll start out with the facilities plan public hearing.

UNIDENTIFIED SPEAKER: I missed the last one.

UNIDENTIFIED SPEAKER: I -- I guess this is something that Strand is going to be starting out (inaudible) --

MS. LEE: Yep.

UNIDENTIFIED SPEAKER: -- (inaudible).

UNIDENTIFIED SPEAKER: I missed the last one.

MS. LEE: I have a presentation, so we'll just kind of work through that here.

And I'm trying to think. Should we just take questions along or wait until the end? I'm (inaudible).

MR. JOHNSON: I think take them as they come, if you want to, Rachel.

MS. LEE: Okay.

UNIDENTIFIED SPEAKER: Feel free.

MS. LEE: Summary of the wastewater facility plan. It's part of the public hearing here for the Rib Mountain Metropolitan Sewerage District.

Thanks for coming. It's -- I was wondering if we were going to have an audience or not. And so it's great that you were able to be here. And, you know, the plan is for everybody in the watershed here so...

Our agenda summarizes the key report elements. We're going to talk about the methodology, identify the needs for the wastewater treatment plant. The recommended plan satisfies the documented needs. We have a proposed schedule and implementation plan. We're going to talk about the impact of the recommended plan and the operational costs here at the plant and then have some recommended next steps.

So here's a -- this graphic shows the facility plan elements. We start the report. Section 1, 2, and 3, the introduction, the discussion on the collection system, and discussion on the plant performance. And that kind of captures what we have.

Then we go on to the "What You Need" section. That talks about projected flows and loads. Sections, actually. That talks about the projected flows and loads in Section 4.

The regulatory requirements in Section 5.

And then looking at the age and condition of the HP -- of the equipment and the unit processes here at the plant in Section 6. Section 6 kind of goes unit by unit. And it says, can this meet the designed flows and loads? Is it old enough that it will function for the next 20 years, or does it need to be replaced and when does it need to be replaced, or are there different alternatives we need to consider?

In Section 7, we kind of take all those and wrap them together, answer the question of, how do we get there? This is where you're going to find any alternatives evaluations we've included here in this report.

And then Sections 8, 9, and 10 include the recommended plan. We have the implementation plan in Section 8, the environmental impact summary in Section 9, which is a requirement of DNR, and then Section 10 will be the public participation section, which will capture this public hearing and any submitted comments and responses to those comments that will be added when the plan is finalized.

(Inaudible), can you get to the next slide? (Inaudible.)

The facility plan documents the needs for the Metro. Our goals are continued regulatory compliance for changing DNR regulations and any new ADA, Americans with Disabilities Act regulations. You'll see the -- the facilities here will be handicapped accessible, certain things like that.

We all know that there are future phosphorous removal requirements. This plan will look into that.

And another struggle here has been biosolids disposal. There is a pinching on the land available, and there's some changing strategies there that we wanted to look at.

And we also had -- this plant has been here for 30 years or longer. I mean, and it -- there's aging equipment. And it needs to be replaced to minimize downtime and to make sure that this plant can run as well as it has long into the future.

I'm ready.

The recommended -- and satisfies the documented needs.

We -- here you see a schematic of the treatment plant. We're going to talk about the Phase

1 improvements, the Phase 2 improvements, and future improvements kind of in large detail here. And then I'll get into some of the specifics there.

Phase 1 shown here in blue, kind of walking through the treatment process. We have influent pumping station changes, mechanical screening and grit removal changes. We skip then to UV disinfection. Also included are some changes in sludge dewatering. This building here, some space needs modifications. There are going to be some major electrical modifications in this phase. Valve replacement and piping modifications and particularly yard valves that have been there for a very long time. And painting of all the interior spaces associated with these pieces of the plan.

The Phase 2 improvements, going to be kind of the heart of the treatment process. Primary sedi- -- sedimentation, activated sludge, final clarification. We'll also get into the anaerobic digestion improvements, thickening, and then painting of all those spaces as well.

And the future improvements are going to be this tertiary filtration and biosolids disposal.

So the Phase 1 improvements. Influent

pumping station improvements. You see the existing influent pumping station there with the pumps that have been there since the plant's first construction. We plan to replace those with grinder pumps so that some of the ongoing O&M challenges can be mitigated. I think somebody spends two hours a day in the basement there digging out rags. That's not the best use of time here. We can do something better.

We are going to upgrade the fine screening, replace the existing screening that's near -- near -- near the end of its useful life, and put in a larger screen as well just to make sure that it can handle all of the flow coming into the treatment plant in the future.

We are going to replace the aerated grit with vortex grit removal. That's a modern technology. Uses centrifugal force to settle out the grit. And also, then the grit will go through a grit classifier and washer. So the product will be less of a risk.

Also looking at replacing the RAS pumping. Those pumps need to be upgraded, and we're going to change the style of those as well.

UNIDENTIFIED SPEAKER: Frozen.

UNIDENTIFIED SPEAKER: (Inaudible.)

UNIDENTIFIED SPEAKER: Don't you just like that when that happens there?

MS. LEE: We'll also be --

UNIDENTIFIED SPEAKER: Might as well pull a chair up.

MS. LEE: -- doubling the UV disinfection capacity that was originally installed as a base project and we are ready for a Phase 2. So some of that initial infrastructure is al- -- already in place. We're going to add the second phase.

We will be demolishing the sludge dewatering equipment. This decision was kind of linked to the biosolids valuation. Sticking with liquid biosolids handling and having 30-year-old not very used belt filter presses out there doesn't make a lot of sense. So we're going to free up that space and maybe sell the equipment. That's a construction detail, really.

Some of the electrical modi- -- modifications. This includes a new service entrance switch to the treatment plant. New MCCs, new SCCs, new SCADA, PLC. In addition, the treatment plant now has back-up power at the influent pumping station that only powers the requirements. It's, like, disinfection and pumping.

It's very limited pieces of the plant that it powers right now. That back-up power is going to be relocated to near the service entrance switch. And we'll be able to put in a larger generator that can be tied to the SCADA so that the treatment plant can power, not only the needed processes required by code, but also some other things. It would be, like, aeration capacity. If you need to go through some other biosolids pumping or something like that, you could do that during that time.

The -- this building here for space needs is going to be remodeled. Some changes would be a modified reception area to make it better for guests, rework some of the office spaces and storage for files. Also, do a remodel of the bathroom facilities. And in the back here, make them handicap-accessible and more appropriate ratio of locker room to staff. And then this space here would be modified to provide even more modern technology for presentations, things like that, as well as carpet and chairs and some of the other furnishings.

We will be painting all the interior spaces of the buildings, you know. When you get in there, you can see that it's time to put a fresh coat of paint on these buildings. And no better time than when you're making major treatment process upgrades.

And then also looking into valve replacements. And we've handled that more as an allowance so that we know the best estimate based on the number of valves in the yard and then the buildings we're going to get into. But we will be able to fix that price based on the allowance.

So that's Phase 1. That's the immediate changes.

Phase 2 are more future, second part of the 20 years. Primary sedimentation. Replace all the chains and flights, pumps, and do some sludge take-off piping arrangements to allow better maintenance of those lines.

Also, activated sludge, you see here (inaudible). We have a new high-speed turbo blower and two older blowers. One of those blowers will be replaced outside of this facility planning effort to be a new high-speed turbo. And then the second -- the third blower will be replaced with part -- part of the Phase 2 improvements.

Next, final clarification. New mechanisms and drives for those as well as thickening upgrades. Replace the internals of the DAFT tanks and the pumps. The DAFT tanks currently have metallic chains, and those will be changed to new nonmetallic chains with longer life and less corrosion issues.

And the anaerobic digestion part of the treatment plant, that's going to be a major piece of these Phase 2 improvements. We are going to be replacing a lot of the pumping mechanisms. The covers, after inspection, in the primary and secondary digesters will be replaced. Replace another heat exchanger with a hot water boiler that will be switched out. And the secondary digester is not mixed at this time. And they're going to add a pump to mix in that secondary digester. We came up with that through an alternatives evaluation. That was the most cost-effective choice at this time. As well as painting of the -- of the interior of pumping rooms and things like that here.

For the future improvements, one of the big ones is phosphorous compliance. This plan is going to be dependent on what the Metro's permit looks like when it comes out. It hasn't come out yet. It is going to be de- -- dependent on the conclusions of the Wisconsin River TMDL. Those are up in the air, to say the least, right now. And we are still waiting on more information on the multidischarger variance, which is pending at this time.

When the permit comes out, it will have a compliance schedule, assuming the limits are requiring filtration. And we will use the time during that compliance schedule to evaluate the alternatives and we'll give TMDL recommendations and know whether or not the variance is truly an option and come up with a compliance plan based on those (inaudible) time.

So biosolids handling. There are land availability concerns resulting from nutrient management planning. Farms in this area have been moving from a nitrogen-based nutrient management -- management planning strategy to a phosphorous-based nutrient management planning strategy. Biosolids can be applied up to the nitrogen crop needs. If you're only applying up to the phosphorous crop needs, you need a lot more land.

So we looked at several alternatives. We looked at dewatering and drying the biosolids. We looked at purchasing land and managing it for land application only. We looked at dewatering the biosolids and then burning them at the biomass power plant over in Rothschild. But we also looked at some

Class A alternatives. None of these alternatives were cost-effective and (inaudible) at this time.

So you're smiling.

It -- it just --

UNIDENTIFIED SPEAKER: (Inaudible.)

MS. LEE: Yeah. The cost of maintaining liquid storage and land application would have to go up even more than they have to justify some of these other alternatives. So we're recommending continued land application with the use of private contractors, as necessary, to supplement the Metro's capabilities. If there's a really short land application season and we need to go further. But it would still be cost-effective to manage it this way.

So sorry. This is a little bit small. This table is included in the report. This is a proposed schedule and implementation plan. And we've designed it this way to maximize the useful life of the equipment. We went unit process by unit process. Phase 1, Phase 2, and future. Phase 1 is roughly 2016 to 2020. Phase 2 is 2021 to 2030. That's going to be design, bidding, construction, start-up kind of thing.

The total opinion of prob- --

probable capital costs for Phase 1 is approximately 8.8 million. And Phase 2 is nearing $8.2 million.

So when we look at this as to what it actually costs to do this, we're going to use a combination of funding sources for this project. You see here the opinion of probable costs matching the previous slide. There will be a replacement fund come -- contribution for each phase. The pieces that are being replaced or updated that are included in the replacement fund, that money will be used to offset the capital costs in this phase of the project. And then the remaining balance will be funded from a clean water fund program loan.

The clean water fund uses -- they have a market rate and a discounted rate. And certain pieces are funded at the discounted rate, and certain pieces are funded at the market rate. We've gone ahead and calculated an anticipated blended loan rate for the first phase. That is the discounted (inaudible) rate of 2.275 percent. And for the Phase 2 improvements, we think it's about 2.278 percent.

When you look at those, the estimated annual debt service for Phase 1 is $461,000. And Phase 2 is $453,000. If you compare this to the Metro's current revenues, that's about a 25 percent increase in revenue.

UNIDENTIFIED SPEAKER: Can -- can I ask a question?

MS. LEE: Yeah, sure.

UNIDENTIFIED SPEAKER: (Inaudible) TDMLs are going to be coming in in 2017. Those timelines, it kind of hits -- Phase 1 -- was it out to 2020. So how does that impact the second phase, future? Did you look at that at all?

MS. LEE: The timing of the --

UNIDENTIFIED SPEAKER: Uh-huh.

MS. LEE: -- phosphorous --

UNIDENTIFIED SPEAKER: Uh-huh.

MS. LEE: -- plan? The phosphorous plan would kind of be sandwiched over it. The phosphorous compliance schedule will likely be a nine-year compliance schedule.

So exactly when the TMDL comes out, I mean, I know it's probably six months delayed now. I don't know if they're actually going to finish or not.

So you -- you don't -- it will be probably five years from now that we really know what that means on an effluent limits --

UNIDENTIFIED SPEAKER: Uh-huh.

MS. LEE: -- standpoint. And that would overlap with the anticipated phosphorous compliance schedule. And so, yeah, it might happen -- it might coincide with Phase 2.

UNIDENTIFIED SPEAKER: Okay.

MS. LEE: And if it does, there's some potential efficiencies with just being wrapped into that project.

With the way the TMDL is going, there's -- it's -- I'm -- I'm very involved with the TMDL. There's no way to predict if it's going to be 1 or .1 or .04 or -- it's too hard to tell right now. So yes.

UNIDENTIFIED SPEAKER: Rachel?

MS. LEE: Yes?

UNIDENTIFIED SPEAKER: Question. Since you're having this phased out between Phase 1 and Phase 2 --

MS. LEE: Uh-huh.

UNIDENTIFIED SPEAKER: -- the urban service area 2'08 plan and service area for this area is going to be started in 2016 and going to be available in 2017. Would that be something that you want to take a look at again, how it would affect this plant?

MS. LEE: If there's significant changes, we definitely would have to look at how that's going to change things. I believe that could be done -- it's like a facilities plan amendment.

UNIDENTIFIED SPEAKER: Okay. And that's going to happen. That's what I was kind of wondering --

UNIDENTIFIED SPEAKER: Uh-huh.

UNIDENTIFIED SPEAKER: -- how we -- how we -- how the Marathon County would get that information to get that (inaudible).

MS. LEE: Yeah. And you recall, we sent those letters.

UNIDENTIFIED SPEAKER: Uh-huh.

MS. LEE: And I believe the Village of Weston contacted Marathon County, and they -- they didn't have an impetus to -- to start that process earlier or anything.

UNIDENTIFIED SPEAKER: That is true.

MS. LEE: So let's talk about the O&M costs and how this -- these recommended improvements may affect the O&M costs. The energy costs should decrease based on the high-efficiency aeration blowers and newer, more efficient equipment overall throughout the plant. We're not adding a lot of electrical demand. We're replacing old stuff, for the most part.

The biosolids handling costs may increase over time, just as they would with population growth. And that's something that -- that is slow and steady over time. It's not a jump.

The replacement fund con- -- contribution will need to change based on the new project, and that will be calculated along with the loan closing depending on even more refined costs like design costs. That goes along with the loan application.

And the Metro will continue to give annual rate reviews, just as they have in the past, to make sure that user charges are reflective of the needs of the district.

So several of the recommendations we had - some of these have been completed already - were to submit an ITA and PERF to DNR for this project for next year. And that was done before the October 31st deadline.

We are conducting this public hearing here today. When the comment period is closed - it's a 30-day comment period - all of those responses will be included in the plan, and that will be submitted to the DNR as well.

From there, we recommend getting drawings and specifications prepared based on improvements and then submitting a clean water fund loan application to the DNR along with those plans and specs when they come in.

And so with that, I can take any questions.

Oh. I have an additional piece of information based on the -- the planning and population (inaudible).

UNIDENTIFIED SPEAKER: Yeah.

MS. LEE: We used the DOA numbers because we were going up to 2030 -- 2035. And that exceeds the 2'08 plan dates. So we went -- went with the DOA numbers. And in those population planning numbers, if you see a change of 5 percent or -- you know what I mean? When I looked at all the individual communities and the planning numbers and how DOA's numbers compared to Marathon County's numbers, it seemed like maybe they changed among the communities, but the total didn't change a huge amount. So we felt pretty comfortable using those DOA 2035 numbers.

UNIDENTIFIED SPEAKER: What's the

deadline for the clean drinking water fund? Isn't there, like, an -- application deadlines, yearly deadlines for (inaudible)?

MS. LEE: Yes. That was October 31st.

UNIDENTIFIED SPEAKER: That was October 31st.

MS. LEE: Yeah.

UNIDENTIFIED SPEAKER: Okay.

UNIDENTIFIED SPEAKER: The initial period.

UNIDENTIFIED SPEAKER: Right.

UNIDENTIFIED SPEAKER: Just to get on the -- on the list.

UNIDENTIFIED SPEAKER: Oh, okay.

UNIDENTIFIED SPEAKER: So if we have comments -- because we just got that plan yesterday.

MS. LEE: Oh, sure.

UNIDENTIFIED SPEAKER: If we have comments about it, do we just provide written comment to you then?

MS. LEE: I believe they should go to Ken.

MR. JOHNSON: Yeah. Right here.

UNIDENTIFIED SPEAKER: Okay. Yeah. Because there was just some questions in terms of --

disappointed that the communities did not receive an email telling that there's a copy of the report available to us to review. And so we -- we get this notice just last week. And suddenly we've got, you know -- the half of 30 days are gone already.

MR. JOHNSON: I'd like to comment on that one.

MS. LEE: Yeah.

MR. JOHNSON: First of all, at the last meeting -- and you got the agendas. And then we were going to have a discussion on the facilities plan. And it said right there that we were scheduling the public hearing for the, you know -- at that last meeting.

Then at that time -- I mean, I think it was last week or the week before that Kathy sent an email out to people like yourself --

UNIDENTIFIED SPEAKER: Uh-huh.

MR. JOHNSON: -- and other communities that said -- reiterating what the public notice said in the paper, that they're here, to come in and get and review, if you'd like to.

The only one that even replied to anything was Keith. Keith, you know, asked, and we sent him and Marathon County.

But, you know, nobody made no comment or anything else. I know what you're saying, George, but this has been on our docket for months and months so...

UNIDENTIFIED SPEAKER: Well, I was -- I was out of town last week, so I saw it yesterday.

MR. JOHNSON: But I mean, I know what you're --

I mean, that's up to the board to decide, not myself. But I mean, it just was the -- legalized is 30 days after. And that's just the statutes that said -- and the first going in, I think it was October 22nd we'd have to --

UNIDENTIFIED SPEAKER: Uh-huh.

MR. JOHNSON: I'd have to --

UNIDENTIFIED SPEAKER: I think so.

MR. JOHNSON: -- (inaudible) here. And so that was the 30 days.

And I knew it was -- yes, I know it's the opening weekend of deer hunting. And I already figured -- I already figured it out. I'm going to be gone, but Kathy will take any comments. And I've got a computer at the cabin, which I hate to say, and will be going through it right then and there. Well, gosh.

MS. LEE: And I don't hunt, so it's okay.

MR. JOHNSON: But yes. I didn't -- we had full intention to be moving forward and also so -- at that time so we can move forward at the December meeting.

MS. LEE: Hopefully you'll have enough time. We certainly want everybody to -- to (inaudible) this plan and (inaudible) discuss it (inaudible) so...

UNIDENTIFIED SPEAKER: Do you have any comments now, George, as far as any of this information?

UNIDENTIFIED SPEAKER: Well, I -- all I've got is what she just presented because Ken handed me a copy when I came in. I called him yesterday. And he volunteered to give me one yesterday to review, but I had three board meetings last night. So, you know, I picked it up today. That's just -- I'm sorry. I was out of town. I just didn't get, you know, that notice earlier.

I talked to Dalene out in Rib Mountain. She had no idea, you know. But then again, you know, the Village and -- or the -- the Town of Kronenwetter is different from the sanitary district. So they're going to --

MR. JOHNSON: I think you're talking about --

UNIDENTIFIED SPEAKER: Rib Mountain.

MR. JOHNSON: -- Rib Mountain.

UNIDENTIFIED SPEAKER: Rib Mountain.

(Multiple speakers talking at once.)

UNIDENTIFIED SPEAKER: Right.

UNIDENTIFIED SPEAKER: They're kind of -- they're kind of removed from the whole discussion. And Dalene said she'd be here, but I guess she didn't make it.

UNIDENTIFIED SPEAKER: She said she was too busy --

UNIDENTIFIED SPEAKER: Okay.

UNIDENTIFIED SPEAKER: -- and she couldn't make it. So she asked me to pick up a copy of the plan for her. And I'm sure we'll --

MR. JOHNSON: And what might be easier -- it's up to you. We can give it to you in electronic format.

UNIDENTIFIED SPEAKER: That would be better yet.

UNIDENTIFIED SPEAKER: Better yet.

MR. JOHNSON: That's what I thought

most people would --

UNIDENTIFIED SPEAKER: (Inaudible), yeah.

MR. JOHNSON: And that's what we were trying to say. If you wanted it out (inaudible), just hit Send, and you'd get a one-inch document.

UNIDENTIFIED SPEAKER: (Inaudible.)

UNIDENTIFIED SPEAKER: Just give me -- send me one. Electronic.

The other -- the main question I was here for was to try to figure out the population. And that -- that's what I was going to say. How you looked at the population, how it bears out to the municipalities that are members -- or customers of the Metro.

MS. LEE: Let me look at the report just to make sure I get this right.

UNIDENTIFIED SPEAKER: I'll have to look at the report and look at it later.

UNIDENTIFIED SPEAKER: Ken, let me just make a suggestion. Why don't you send it to every community (inaudible) --

MR. JOHNSON: That's what I'm writing down right now.

UNIDENTIFIED SPEAKER: Even Mosinee,

that -- they're not here. Just so that everybody (inaudible) --

MR. JOHNSON: Yeah. Well, Mosinee is a customer. They would get one.

UNIDENTIFIED SPEAKER: But that would be nice to send it out to Joe (inaudible).

UNIDENTIFIED SPEAKER: (Inaudible.)

UNIDENTIFIED SPEAKER: (Inaudible) appointment.

UNIDENTIFIED SPEAKER: I'm not sure if Dalene is on the regular list. Probably not.

UNIDENTIFIED SPEAKER: No, she's not. But I will get her --

UNIDENTIFIED SPEAKER: Do you have her email?

UNIDENTIFIED SPEAKER: I will find it --

MS. LEE: So --

UNIDENTIFIED SPEAKER: -- unless you want to give it to me after --

UNIDENTIFIED SPEAKER: (Inaudible.)

UNIDENTIFIED SPEAKER: -- if you have it. Okay.

MS. LEE: For the population and projections, you guys -- each community received a letter at the end of last year, December 29th. And that kind of really breaks down -- I think that's going to give you the most detail on population projections for each community.

And we have the Wisconsin DOA projections listed in the top for -- going from 2010 to '15, 2025, 2035. And then we have the 2 -- 2'08 plan estimates and 2005 and --

UNIDENTIFIED SPEAKER: (Inaudible) estimates --

MS. LEE: -- 2025.

UNIDENTIFIED SPEAKER: Okay. (Inaudible.)

MS. LEE: And so -- yeah. The estimations and predictions for those. And you can kind of compare. And we're saying (inaudible) we're just going to use the 2035 DOA numbers. And --

UNIDENTIFIED SPEAKER: That's in Appendix --

MS. LEE: That's in Appendix C, I want --

UNIDENTIFIED SPEAKER: Uh-huh.

MS. LEE: -- to say, of the --

UNIDENTIFIED SPEAKER: Yes.

MS. LEE: -- plan.

And -- because from a -- from a planning perspective, we just -- we really are concerned with the gross population.

UNIDENTIFIED SPEAKER: Uh-huh.

UNIDENTIFIED SPEAKER: Uh-huh.

MS. LEE: It's going to be applied evenly as far as any sort of rate changes and things like that. And, you know, that's kind of up to the (inaudible) commission to really get into those details. And so that's why we contacted everybody early on in the process just to make sure.

And I know that the Village of Weston sent in a further letter to Becky Frish (phonetic) at --

UNIDENTIFIED SPEAKER: Uh-huh.

MS. LEE: -- Marathon County and just wanting -- I mean, she requested them to schedule a meeting to discuss the process. And I've been informed that that is going to be updated starting next year or the year after.

UNIDENTIFIED SPEAKER: I think it (inaudible).

UNIDENTIFIED SPEAKER: The intention is to be done by the end of 2016.

MS. LEE: Okay.

UNIDENTIFIED SPEAKER: Correct.

MS. LEE: And so they'll go through that process.

In a -- in a phone call I had, it seems like just the -- the boundary line is the hardest area. That's where there's a little bit of gray.

UNIDENTIFIED SPEAKER: In the --

MS. LEE: (Inaudible.)

UNIDENTIFIED SPEAKER: Can I ask a question about the total spread?

MS. LEE: Sure.

UNIDENTIFIED SPEAKER: You used -- you used the whole community totals --

MS. LEE: I --

UNIDENTIFIED SPEAKER: -- for the populations?

MS. LEE: No. We used Rothschild, Mosinee, Weston, Kronenwetter. And for the Rib Mountain Sanitary District, we only include -- included 80 percent of the total population because that's the estimated sewered population.

UNIDENTIFIED SPEAKER: And that's -- and my -- I guess my question gets to that is that how come that wasn't used for places like Kronenwetter where, if you used the whole village, you're talking about a larger area that's not sewered in your totals where you're only using sewer area (inaudible). There's a -- one of the questions we saw right away. We can probably get back to you on --

MS. LEE: Sure.

UNIDENTIFIED SPEAKER: -- regarding some of the totals. But there were parts of communities that are being served and are not being served --

UNIDENTIFIED SPEAKER: Okay.

UNIDENTIFIED SPEAKER: -- so...

MR. JOHNSON: I think we were kind of looking at there's -- Kronenwetter is a village.

UNIDENTIFIED SPEAKER: Right.

MR. JOHNSON: And the whole village is part of the Metro where Rib Mountain, the sanitary district, is a part of the Metro where the Town is not.

UNIDENTIFIED SPEAKER: Thank you. That's --

MR. JOHNSON: So I mean, that's what makes them a little --

UNIDENTIFIED SPEAKER: Because we're just slightly separate entities.

MR. JOHNSON: And that's what makes --
Weston was the same thing. Weston has (inaudible) --

UNIDENTIFIED SPEAKER: Sure.

MR. JOHNSON: -- on the sewer, you know --

UNIDENTIFIED SPEAKER: Right. Okay.

MR. JOHNSON: Yep.

UNIDENTIFIED SPEAKER: Just clarifying, you know, just wondering where those numbers were.

MS. LEE: Yep.

UNIDENTIFIED SPEAKER: And -- and to -- to that, just to add on to that, I think that there may be some additional towns that are included. And -- and I don't know how you calculated that, but it would have been the Town of Mosinee. And -- and I don't know if Ringle --

MR. JOHNSON: The Town of Mosinee is not part of us. The City of --

UNIDENTIFIED SPEAKER: City.

MR. JOHNSON: -- Mosinee is, but the Town is not.

UNIDENTIFIED SPEAKER: But I think there's an area that's shown on your -- on the map that's --

MS. LEE: As part of the area?

MR. JOHNSON: As part of the -- oh.

MS. LEE: But it's --

UNIDENTIFIED SPEAKER: Might get served by the City.

UNIDENTIFIED SPEAKER: (Inaudible.)

UNIDENTIFIED SPEAKER: (Inaudible.)

UNIDENTIFIED SPEAKER: It's treated here.

MS. LEE: Yeah.

UNIDENTIFIED SPEAKER: (Inaudible) maps maybe.

UNIDENTIFIED SPEAKER: Okay.

UNIDENTIFIED SPEAKER: (Inaudible.)

UNIDENTIFIED SPEAKER: And different distinctions on the maps (inaudible) --

UNIDENTIFIED SPEAKER: Yeah.

UNIDENTIFIED SPEAKER: -- where things are (inaudible).

MR. JOHNSON: Okay.

UNIDENTIFIED SPEAKER: (Inaudible.)

MR. JOHNSON: Yeah. I mean, the maps we got are what we could get the best out of them. And if the delineation is off, we'll correct them.

UNIDENTIFIED SPEAKER: So (inaudible)

your computer (inaudible).

UNIDENTIFIED SPEAKER: Yeah. I guess -- I guess it was. (Inaudible.)

UNIDENTIFIED SPEAKER: You're considering a two-way boundary? The sanitary sewer service area, one and the same?

MS. LEE: This is --

UNIDENTIFIED SPEAKER: That's a good question.

UNIDENTIFIED SPEAKER: Yeah. 2'08 plan identifies the sewer service area boundary.

MR. JOHNSON: But not necessarily our --

UNIDENTIFIED SPEAKER: Facility planning area?

MR. JOHNSON: Right.

UNIDENTIFIED SPEAKER: (Inaudible.)

UNIDENTIFIED SPEAKER: And that's --

MR. JOHNSON: So our facility area boundary will be different than the probability of the 2'08 boundary.

UNIDENTIFIED SPEAKER: Correct.

UNIDENTIFIED SPEAKER: Exactly.

MR. JOHNSON: There. I'm glad we agreed to (inaudible).

UNIDENTIFIED SPEAKER: Yeah. And I --
MS. LEE: And I --
UNIDENTIFIED SPEAKER: -- (inaudible) what we were looking at is I don't think that's depicted very easily --
MS. LEE: Okay.
UNIDENTIFIED SPEAKER: -- (inaudible) on the map --
MS. LEE: Okay.
UNIDENTIFIED SPEAKER: -- (inaudible).
MS. LEE: Well, yeah. (Inaudible.)
UNIDENTIFIED SPEAKER: We have a unique situation in Wausau with the two facilities that are independently off of one sewer service area.
UNIDENTIFIED SPEAKER: (Inaudible.)
UNIDENTIFIED SPEAKER: Right.
UNIDENTIFIED SPEAKER: It's just kind of a --
UNIDENTIFIED SPEAKER: Yes.
UNIDENTIFIED SPEAKER: -- unique --
UNIDENTIFIED SPEAKER: We have --
UNIDENTIFIED SPEAKER: -- (inaudible).
UNIDENTIFIED SPEAKER: -- zoning facility planning area boundaries. It's not really displayed very well --

MS. LEE: Okay.

UNIDENTIFIED SPEAKER: -- even from water (inaudible).

MS. LEE: Yeah. Because I think we got the GIS files from Marathon County. We had to do the best we could with figuring out (inaudible).

UNIDENTIFIED SPEAKER: (Inaudible) Wausau/Weston boundary (inaudible) problem (inaudible).

UNIDENTIFIED SPEAKER: I like (inaudible).

MS. LEE: Are there any other questions or --

UNIDENTIFIED SPEAKER: (Inaudible). But he's out today. Is there a schedule that shows potential rate increases or anything like that?

MS. LEE: No. That -- that's --

UNIDENTIFIED SPEAKER: No?

MS. LEE: In a way, that -- that's kind of up to the board to decide --

UNIDENTIFIED SPEAKER: Sure.

MS. LEE: -- if they're going to do a debt service charge in addition. And I know that they have the rates for next year determined -- or 20- --

MR. JOHNSON: '16.

MS. LEE: -- '16 determined. And so from there, it -- it will go through the (inaudible) rate.

UNIDENTIFIED SPEAKER: Sure. And then (inaudible) schedule there if the borrowing happens next year, we have to kind of set a rate or set schedule for how you (inaudible) probably have to wait until --

UNIDENTIFIED SPEAKER: (Inaudible) --

UNIDENTIFIED SPEAKER: -- to see how (inaudible) --

UNIDENTIFIED SPEAKER: -- whether there's a pro -- not prorated, but a ramp-up --

UNIDENTIFIED SPEAKER: Yeah.

UNIDENTIFIED SPEAKER: -- rate. So it wouldn't -- you wouldn't get -- first, you wouldn't get a hundred percent.

UNIDENTIFIED SPEAKER: Uh-huh.

UNIDENTIFIED SPEAKER: It would be a rate -- a slow progression to get to the rate that we need.

UNIDENTIFIED SPEAKER: Okay.

MS. LEE: You can -- yeah. (Inaudible) --

UNIDENTIFIED SPEAKER: It's one of the discussions that --

MS. LEE: -- do that.

UNIDENTIFIED SPEAKER: Sure. Okay. So nothing has been determined?

MR. JOHNSON: Nothing has been --

UNIDENTIFIED SPEAKER: Okay.

MR. JOHNSON: -- determined. 2016 is just normal. That's all gone. And this will be a discussion for 2016 for --

UNIDENTIFIED SPEAKER: (Inaudible.)

MR. JOHNSON: -- the future. Yes.

UNIDENTIFIED SPEAKER: Okay.

MS. LEE: But we haven't discussed that yet. (Inaudible.)

UNIDENTIFIED SPEAKER: Okay.

UNIDENTIFIED SPEAKER: I know it doesn't pertain to this, but I'm -- I was at some of your meetings. And I don't know the results of the discussion between Wausau and Rib Mountain Metro. I don't know how that -- I mean, you had something happen. And I didn't come back to the next meetings.

MR. JOHNSON: Okay. I can --

UNIDENTIFIED SPEAKER: I don't know the

results.

MR. JOHNSON: We've had discussions. And about a month ago, it was formalized from Wausau that they were not going to be part of this plan or to even be studying (inaudible). They would continue on to -- with their own facility.

UNIDENTIFIED SPEAKER: Didn't you mention that at our last meeting?

MR. JOHNSON: Yes.

UNIDENTIFIED SPEAKER: I wasn't at it. That's the reason --

MR. JOHNSON: Yeah.

UNIDENTIFIED SPEAKER: -- I (inaudible).

MR. JOHNSON: But I mean, that's --

UNIDENTIFIED SPEAKER: Thank you. I appreciate that.

UNIDENTIFIED SPEAKER: Any other questions or comments, or where are we going from here?

MS. LEE: (Inaudible.)

MR. JOHNSON: Yeah. So we close this public hearing. And then we'd review all the information submitted to us at the December meeting.

UNIDENTIFIED SPEAKER: Thank you.

UNIDENTIFIED SPEAKER: Can I ask the communities -- your concern over the population projections, do you feel like they're too low or too high, or do you want your populations to be more or less? What -- what is it that you're, you know, very --

MR. JOHNSON: Abe --

UNIDENTIFIED SPEAKER: -- concerned about?

MR. JOHNSON: Abe over here is the one that really handles that for the communities. And I bet he could answer that pretty --

UNIDENTIFIED SPEAKER: Potentially.

MR. JOHNSON: -- good.

UNIDENTIFIED SPEAKER: Well, I -- I guess maybe Kronenwetter might be a good example.

UNIDENTIFIED SPEAKER: Right.

UNIDENTIFIED SPEAKER: It's a very large town -- village --

UNIDENTIFIED SPEAKER: Right.

UNIDENTIFIED SPEAKER: -- with areas that are probably -- I mean, from most of our perspective, will never be served. Okay? But those populations are still being included into the calculations for what your -- so you may be overestimating your service or where your capacity needs if you're looking at populations that you know won't be served. And so -- and it could happen in -- in Weston a little bit, but maybe not so much.

UNIDENTIFIED SPEAKER: Uh-huh.

UNIDENTIFIED SPEAKER: And so there's -- maybe even Rib Mountain. (Inaudible) I know we calculated out some of the -- the rural parts of Rib Mountain. But there's -- looking at those populations would maybe -- maybe if you're looking at --

If we would have done this in the right way, we would -- would have had our plan done --

UNIDENTIFIED SPEAKER: Right.

UNIDENTIFIED SPEAKER: -- you know, a year ago at the same time you started your plan. We're going to do it backwards, of course.

But -- but that's where the (inaudible) populations -- we may want to just -- in our office, we'll look at some of those, and maybe we'll talk to some of the towns as well or talk about where they think those numbers -- how accurate they are.

MR. JOHNSON: Let me touch -- yeah.

Because sometimes, you know, you think you remember everything that went into this. But that's what -- one of the reasons of the two phases.

If you notice, the first phase is not really to increase any capacity or growth here.

UNIDENTIFIED SPEAKER: Uh-huh.

MR. JOHNSON: It's just to take care of the existing things.

And then the second phase would implement a capacity for what would be -- because we knew at that time you'd have more information, but we needed to move forward on this step. So that's why we're not building any more tanks or anything else.

And phosphorous is something nobody knows, and we're just leaving that.

UNIDENTIFIED SPEAKER: Uh-huh.

MR. JOHNSON: But that's why the population is not really pertinent to this first phase as it will be to the next one. So we're hoping there will be enough time to get the accurate data.

UNIDENTIFIED SPEAKER: Then that's the reason I asked about the (inaudible) plant.

(Multiple speakers talking at once.)

UNIDENTIFIED SPEAKER: I saw your face, and I can see that you're going to wait for that information to help you for your second phase.

UNIDENTIFIED SPEAKER: Well, I think

the other comment would be, you know, Rib Mountain is easy because, you know, you -- (inaudible) separated from the sanitary district.

But Kronenwetter, I don't know if you have that -- how you tax your residents. Do you tax the outside district different than you tax the inside?

UNIDENTIFIED SPEAKER: That's correct.

UNIDENTIFIED SPEAKER: You do tax them different?

UNIDENTIFIED SPEAKER: Uh-huh.

UNIDENTIFIED SPEAKER: Okay. So that --

UNIDENTIFIED SPEAKER: You mean from a property tax standpoint?

UNIDENTIFIED SPEAKER: No. Actually for the sewer system.

UNIDENTIFIED SPEAKER: Sewer system. Okay. The sewer system is different. Just -- customers are the ones getting taxed --

UNIDENTIFIED SPEAKER: Okay.

UNIDENTIFIED SPEAKER: -- for the --

UNIDENTIFIED SPEAKER: That would make a difference. Okay.

UNIDENTIFIED SPEAKER: Yes.

UNIDENTIFIED SPEAKER: That's -- that's the question I have --

UNIDENTIFIED SPEAKER: Yeah.

UNIDENTIFIED SPEAKER: -- for that. Everybody is saying it really wouldn't make a difference.

UNIDENTIFIED SPEAKER: No. But we only --

UNIDENTIFIED SPEAKER: I'm sorry.

UNIDENTIFIED SPEAKER: -- our customers -- your -- our customer -- and our customers (inaudible) water system are the only ones that get --

UNIDENTIFIED SPEAKER: Okay.

UNIDENTIFIED SPEAKER: -- the -- the tax from it.

UNIDENTIFIED SPEAKER: Okay. That's -- that's -- was my question. (Inaudible) if you separated the two.

UNIDENTIFIED SPEAKER: So it sounds like you don't want your populations overestimated. Is -- is that what I'm hearing?

UNIDENTIFIED SPEAKER: No. Not really. We just wanted -- I think by having the county looking at the population for two different communities.

The main thing is that you're going to be taking a look at the 2'08 plan in consideration. That's where the --

UNIDENTIFIED SPEAKER: (Inaudible.)

UNIDENTIFIED SPEAKER: -- populations show. And so the data will come to you in the right time. So we're not saying no more or less. We just want the -- what we project the actual being in 2'08. The 2'08 plan will give us a good feeling of what those populations are, the customers, us up here, and also then give you good data for you during your -- your next Phase 2.

UNIDENTIFIED SPEAKER: Uh-huh.

UNIDENTIFIED SPEAKER: So I think it's working very well, the way you put it together.

UNIDENTIFIED SPEAKER: I think it's going to be pretty close.

UNIDENTIFIED SPEAKER: Yes. And -- and --

UNIDENTIFIED SPEAKER: Real close.

UNIDENTIFIED SPEAKER: -- I think that's my point is that there --

UNIDENTIFIED SPEAKER: (Inaudible.)

UNIDENTIFIED SPEAKER: There are going

to be some areas that we -- we miss some on the low side, some that we miss on the high side, but we try and -- and get it down the middle.

The worst case scenario is that we underestimate everything --

UNIDENTIFIED SPEAKER: Yes.

UNIDENTIFIED SPEAKER: -- and -- and we don't have the capacity here.

UNIDENTIFIED SPEAKER: Uh-huh.

UNIDENTIFIED SPEAKER: The -- the communities can rest assured that -- that our rates are not predetermined by these population studies.

UNIDENTIFIED SPEAKER: We know that.

UNIDENTIFIED SPEAKER: Our rates come every year. We evaluate what you use.

UNIDENTIFIED SPEAKER: That's right.

UNIDENTIFIED SPEAKER: And that determines the rates.

UNIDENTIFIED SPEAKER: Uh-huh.

UNIDENTIFIED SPEAKER: So it doesn't matter whether your population is high or lower. Whatever you use, that's what you pay for.

UNIDENTIFIED SPEAKER: It's more about the capacity.

UNIDENTIFIED SPEAKER: Capacity.

UNIDENTIFIED SPEAKER: Correct.
UNIDENTIFIED SPEAKER: Correct.
(Multiple speakers talking at once.)
UNIDENTIFIED SPEAKER: That's --
UNIDENTIFIED SPEAKER: Correct.
UNIDENTIFIED SPEAKER: (Inaudible) future.
UNIDENTIFIED SPEAKER: Yeah.
UNIDENTIFIED SPEAKER: We're looking at 30, 40, 50 years worth of -- of capacity. That's what --
UNIDENTIFIED SPEAKER: So 30 years out from now, Ken is doing this again?
MR. JOHNSON: Wrong.
UNIDENTIFIED SPEAKER: No. I don't think --
(Multiple speakers talking at once.)
UNIDENTIFIED SPEAKER: Oh, gosh.
(Multiple speakers talking at once.)
UNIDENTIFIED SPEAKER: That's scary.
UNIDENTIFIED SPEAKER: (Inaudible) technical (inaudible) doing this.
UNIDENTIFIED SPEAKER: (Inaudible.)
UNIDENTIFIED SPEAKER: And so --
UNIDENTIFIED SPEAKER: Should be --

UNIDENTIFIED SPEAKER: -- that's probably why we're all here.

UNIDENTIFIED SPEAKER: I hope --

(Multiple speakers talking at once.)

UNIDENTIFIED SPEAKER: I hope that I'm somewhere warm and retired.

MR. JOHNSON: And Strand & Associates has assured us that these numbers are accurate and --

UNIDENTIFIED SPEAKER: Oh.

MR. JOHNSON: -- that --

MS. LEE: I really am sorry.

UNIDENTIFIED SPEAKER: (Inaudible.)

MS. LEE: We don't do population projections. We use other people's population projections.

(Multiple speakers talking at once.)

UNIDENTIFIED SPEAKER: So those comments that come in during the next --

UNIDENTIFIED SPEAKER: Yeah.

UNIDENTIFIED SPEAKER: -- couple of weeks will be --

UNIDENTIFIED SPEAKER: Yeah.

UNIDENTIFIED SPEAKER: -- well-received, and we'll take that into account.

And as Ken pointed out very accurately,

Phase 2 is more time to --

UNIDENTIFIED SPEAKER: After seeing the --

UNIDENTIFIED SPEAKER: And that's good for us (inaudible), knowing that we're going to be doing the plan next year.

UNIDENTIFIED SPEAKER: Right.

UNIDENTIFIED SPEAKER: That's --

UNIDENTIFIED SPEAKER: The timing works out.

MR. JOHNSON: That's one of the reasons we phased this, so we can get the best information that we could.

UNIDENTIFIED SPEAKER: Actually, I see the -- the presentation is very well put together based on our needs and -- on overall what the Metro needs to do to get your first phase in place.

And the plant is how old now?

UNIDENTIFIED SPEAKER: 30.

UNIDENTIFIED SPEAKER: Okay. It's been that many years, huh, Ken?

MR. JOHNSON: Yes, it has.

UNIDENTIFIED SPEAKER: I just want to open (inaudible) on the collection but -- but down the road --

Does everyone -- we all -- so everyone -- there's a customer data list, I take it? (Inaudible) all the customers served by --

MR. JOHNSON: The cust- -- for the customers for us, it's Rib Mountain Sanitary District, the Village of Weston, the Village of Rothschild, the Village of Kronenwetter, and the City of Mosinee.

UNIDENTIFIED SPEAKER: Who -- who maintains the database for that?

MR. JOHNSON: Well, it's just the five communities that are ours that -- the data of the communities are up to the communities.

UNIDENTIFIED SPEAKER: Right. Okay.

UNIDENTIFIED SPEAKER: They base --

UNIDENTIFIED SPEAKER: That's what I --

UNIDENTIFIED SPEAKER: They base it on --

UNIDENTIFIED SPEAKER: -- wanted --

UNIDENTIFIED SPEAKER: They base it on flow, what's coming (inaudible) --

MR. JOHNSON: So I sent the bill to --

UNIDENTIFIED SPEAKER: -- flow --

UNIDENTIFIED SPEAKER: Uh-huh.

MR. JOHNSON: -- Weston for the

whole -- whatever their amount was.

UNIDENTIFIED SPEAKER: Right.

MR. JOHNSON: How they spread the bill out amongst their customers is strictly their --

UNIDENTIFIED SPEAKER: (Inaudible.)

UNIDENTIFIED SPEAKER: There's a --

UNIDENTIFIED SPEAKER: Yeah.

UNIDENTIFIED SPEAKER: There's a reason (inaudible) that, you know (inaudible) --

UNIDENTIFIED SPEAKER: And Ken uses a formula based on flow (inaudible) --

UNIDENTIFIED SPEAKER: (Inaudible.)

UNIDENTIFIED SPEAKER: Yeah. So...

No. They've got their formula down real well (inaudible) so...

MS. LEE: Some of those specifics come in with the loan documentation and figure out exactly --

UNIDENTIFIED SPEAKER: (Inaudible.)

MS. LEE: -- (inaudible).

This idea of phasing the loan or escalating the loan (inaudible) the time period, that's something that has to be negotiated with the DNR and the loan documentation. And all that has to be tied to construction bidding so...

MR. JOHNSON: So if I could ask anybody who's got a comment, it would be kind of nice if you would do it electronically in an email or an attachment to rmmsd@frontier.com. Because that way then, when I get yours, as you understand, I can just forward it to Rachel or whatever. And we can do it rather than making copies on --

UNIDENTIFIED SPEAKER: And you can acknowledge receipt then --

MR. JOHNSON: Yes.

UNIDENTIFIED SPEAKER: -- easily; right?

MR. JOHNSON: Yeah.

UNIDENTIFIED SPEAKER: (Inaudible.)

MR. JOHNSON: I can just click that thank you much received and --

UNIDENTIFIED SPEAKER: And you're going to get mine on Sunday? You'll take care of mine at that time?

MR. JOHNSON: You know, if you want to do it on Sunday, I'm going to say more than likely I will.

UNIDENTIFIED SPEAKER: 1:00 (inaudible) --

UNIDENTIFIED SPEAKER: 11:59 on Sunday

night.

UNIDENTIFIED SPEAKER: I'm doing the same thing you're doing.

(Multiple speakers talking at once.)

MR. JOHNSON: I hate to say this, but my computer goes up there just as well as it runs right here.

(Multiple speakers talking at once.)

UNIDENTIFIED SPEAKER: Ken, that was rmmsd --

UNIDENTIFIED SPEAKER: At --

UNIDENTIFIED SPEAKER: At --

MR. JOHNSON: Frontier --

UNIDENTIFIED SPEAKER: -- frontier.com.

UNIDENTIFIED SPEAKER: -- com.

UNIDENTIFIED SPEAKER: Okay. We got it.

UNIDENTIFIED SPEAKER: I guess if there's nothing else, I want to thank you people for certainly coming in here and participating in this.

Anyone is welcome to stay for the balance of our meeting. It's just a matter of carrying on just some of our operations for the past month and coming months.

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Summary of Wastewater Facility Plan Public Hearing

Rib Mountain Metropolitan Sewerage District
November 10, 2015

STRAND
ASSOCIATES

Agenda Summarizes Key Report Elements

- Methodology
- Identifies Needs for WWTP
- Recommended Plan Satisfies Documented Needs
- Proposed Schedule and Implementation Plan
- Impact of Recommended Plan on Operational Costs
- Recommendations and Next Steps

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Facility Plan Elements

What You Have
- Sections 1, 2, and 3
- Collection system
- Plant performance

What You Need
- Sections 4, 5, and 6
- Flows and loads
- Regulatory requirements
- Age/condition

How Do We Get There?
- Section 7
- Alternatives evaluation

Recommended Plan
- Sections 8, 9, and 10
- Implementation plan
- Environmental impact summary
- *Public participation*

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Facilities Plan Documents Needs for RMMSD

- Continued regulatory compliance – WDNR and ADA requirements
- Future phosphorus removal requirements
- Biosolids disposal alternatives should be reviewed
- Aging equipment needs to be replaced to minimize downtime

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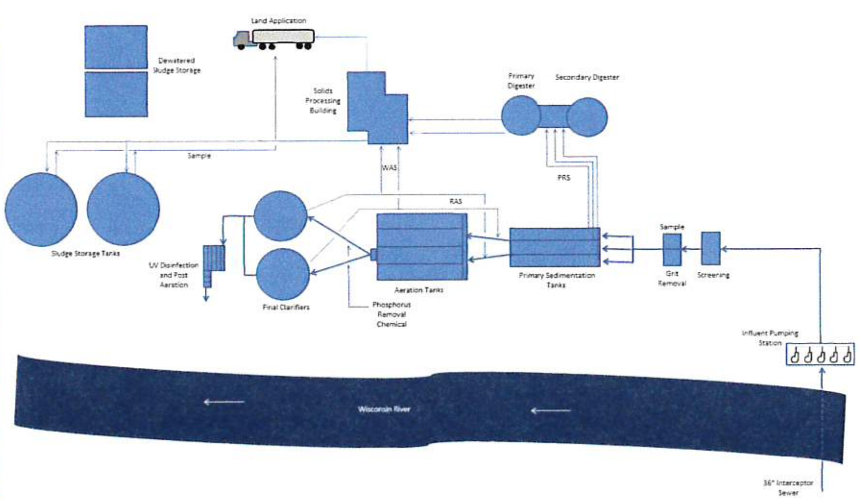
Existing Facility Has Served RMMSD Well



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Recommended Plan Satisfies Documented Needs

Phase I Improvements

- Electrical Modifications
- Valve Replacement and Piping Modifications
- Painting

Phase II Improvements

- Painting

Future Improvements

- Biosolids Disposal

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Phase I Improvements

Influent Pumping Improvements

Fine Screening

Vortex Grit Removal

RAS Pumping

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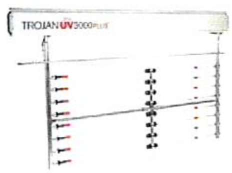
Phase I Improvements



Expand UV Disinfection

Electrical Modifications

Sludge Dewatering Demo

Space Needs Modifications
Painting
Valve Replacements

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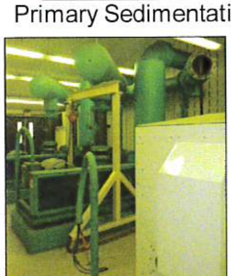
Phase II Improvements

Primary Sedimentation

Anaerobic Digestion

Thickening



Activated Sludge

Final Clarification

Painting

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Future Improvements – Phosphorus Compliance

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Future Improvements – Biosolids Handling

- Land availability concerns resulting from nutrient management planning
- Explored other alternatives
  - Dewatering and drying
  - Purchasing and managing land for land application
  - Dewatering and burning at biomass power plant in Rothschild
  - Class A biosolids
- No other alternatives were cost effective and/or feasible at this time
- Recommend continued land application with use of private contractors to supplement RMMSD's capabilities

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Proposed Schedule and Implementation Optimizes Useful Equipment Life

	Phase I 2016 – 2020	Phase II 2021 – 2030	Future
Influent Pumping Station	$584,000		
Mechanical Screening	$853,000		
Grit Removal	$1,123,000		
Primary Sedimentation		$948,000	
Activated Sludge		$309,000	
Final Clarification & RAS Pumping	$235,000	$787,000	
UV Disinfection	$340,000		
Phosphorus Removal			TBD
Thickening		$1,469,000	
Anaerobic Digestion		$4,432,000	
Biosolids Disposal			TBD
Sludge Dewatering	$100,000		
Electrical Modifications	$3,870,000		
Valve Replacement and Piping Modifications	$655,000		
Space Needs Modifications	$773,000		
Painting	$263,000	$234,000	
Total Opinion of Probable Capital Cost	$8,796,000	$8,179,000	TBD

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A Combination of Funding Sources Provide for Improvements

	Phase I Improvements	Phase II Improvements
Opinion of Probable Cost	$8,796,000	$8,179,000
Replacement Fund Contribution	$1,456,000	$964,000
CWFP Loan Amount	$7,340,000	$7,215,000
Anticipated Blended Loan Rate	2.275%	2.278%
Estimated Annual Debt Service Payment	$461,000	$453,000

Phase I will require a 25% revenue increase

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Impact of Recommended Plan on Operational, Replacement, and Maintenance Costs

- Energy costs will decrease with higher efficiency blowers and newer more-efficient equipment
- Biosolids handling costs may increase over time because of population growth
- Replacement fund contribution will be modified at the time of the CWFP loan closing
- Annual rate reviews will continue as in the past

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Recommendations

- Submit a PERF and ITA to WDNR prior to the October 31, 2015 deadline (completed)
- Conduct a public hearing on November 10, 2015
- Prepare a Record of Public Hearing and Submit to WDNR – December 2015
- Begin preparation of drawings and specifications for the recommended Phase I improvements
- Submit a CWFP loan application document to the WDNR with the drawings and specifications

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From: rmmsd@frontier.com
To: Rmmsd@aol.com
Sent: 11/11/2015 7:42:31 A.M. Central Standard Time
Subj: FW: Facilities Plan Comments

From: Michael Heyroth [mailto:Mheyroth@rmsd1.com]
Sent: Tuesday, November 10, 2015 4:03 PM
To: Metro
Subject: Facilities Plan Comments

See below for comments on RMMSD Facilities Plan

1. WDOA Population Estimations. For Rib Mountain Sanitary District there is a significant drop between the years of 2010 and 2015. I believe this may be due to statistical readjustment by the DOA, but it is unusual. The RMSD numbers for 2015(adjusted to 80% of Town Pop) would seem to be accurate based on another study RMSD had done for future population growth. I will include applicable excerpts from that study.

Overall, the DOA population increases, while statistically accurate, seem to be fairly conservative as we are starting to see some proposed developments as the economy strengthens.

2. RMSD would also appreciate a tentative schedule for future rate increases. Of course this will always depend on O & M parameters from year to year and that is completely understandable. However, incremental increases that our utility can budget for from year to year based on projections would be the preferred implementation of a significant rate increase.

approximately 60 lots per 40 acres. We will use this density for projecting future population developments of vacant land. A summary of the ultimate development potential in the service areas is provided in Table 5. In addition, Granite Peak has future plans for development west of the existing facilities. Based on the available acres for development, we estimate that 100 to 300 multi-family/townhouse/condo units could ultimately be developed.

Based on the potential service area development that may be provided water service during the planning period, we recommend that the Sanitary District plan to serve 1500 future persons which is equivalent to 600 residential customers. We recommend planning to serve 30 future commercial customers.

The Sanitary District is aware that the Granite Peak Ski Hill may not use Sanitary District water for snow making in the future. Therefore the evaluation of future needs will be made with and without supplying water for snow making.

B. Fire Protection

Water demands for fire protection depend upon the fire potential of the most valuable properties in the municipality. This value, termed the basic fireflow, is usually determined for the principal mercantile district, but is not necessarily limited to it. An adequate and reliable water supply is an essential part of the fire-fighting capability of a municipality. The Insurance Services Office (ISO), formerly the National Board of Fire Underwriters, has established grading standards by which a municipality if fire-fighting is classified. In Wisconsin, the Insurance Services Office is located in Milwaukee. ISO uses "Grading Schedule for Municipal Fire Protection," which was published in 1974, as a guide when grading the fire protection capabilities of a community. Rates for insured property are then based on the particular class attained by the community in which the property is located. The grading system contains 52 standards for fire protection including water supply, which constitutes 39 percent of the grading schedule. Other features include fire department (39 percent), fire service communications (nine percent), and fire safety control (13 percent).

TABLE 4: TOWN OF RIB MOUNTAIN POPULATION PROJECTIONS

Location	2010 Census	2015 Projection	2020 Projection	2025 Projection	2030 Projection	2035 Projection	2040 Projection
Town of Rib Mountain	6,825	6,895	7,055	7,145	7,190	7,165	7,080
Village of Kronenwetter	7,210	7,540	8,185	8,765	9,295	9,730	10,070
Village of Weston	14,868	15,520	16,770	17,870	18,890	19,700	20,330
City of Wausau	39,106	39,440	40,460	41,100	41,490	41,450	41,070
Marathon County	134,063	136,510	142,200	146,595	150,130	152,120	152,790

Mr. Michael Heyroth
Rib Mountain Sanitary District
Page 2
December 7, 2015

Please let us know if you have any further comments or questions.

Sincerely,

STRAND ASSOCIATES, INC.®

Rachel M. Lee

Rachel M. Lee, P.E.

Kevin K. Hopkins, P.E.

c: Ken Johnson, RMMSD

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village of
Kronenwetter

Mr. Ken Johnson
Rib Mountain Metropolitan Sewerage District
201 Aster Road
Wausau, Wi 54401

Subject: Wastewater Facilities Plan October 2015

We want to thank you, RMMSD Commissioners and Strand Associates, INC for the presentation at the Public Hearing held on November 10, 2015 on the subject plan. As stated in your Public Notice that any comments on the plan needs to be submitted by November 22, 2015.

As stated at the Public Hearing several of the communities that are costumers of RMMSD will be embarking on a Wausau Urban Area Sewer Service Plan (208 Plan) in conjunction with Marathon County Planning to be updated by the end of 2016. We are requesting that at the completion of the 208 Sewer Plan, RMMSD along with their consultant Strand Associates, INC include the new projected population figures that will be stated in the updated 208 Sewer Plan be incorporated into the new Wastewater facilities Plan.

As stated at the Public Hearing Phase I will be conducted between 2016-2020 which will give amble amount of time to amend the Wastewater facilities Plan to include Wausau Urban Area Sewer Service Plan (208 Plan) figures.

Thank you for giving us the opportunity to comment on new Wastewater Facilities Plan.

Sincerely

Duane Gau, DPW
Village of Kronenwetter

Cc: Marathon County Planning

STRAND ASSOCIATES

Strand Associates, Inc.
910 West Wingra Drive
Madison, WI 53715
(P) 608-251-4843
(F) 608-251-8655

December 7, 2015

Mr. Duane Gau
Village of Kronenwetter
1582 Kronenwetter Dr.
Kronenwetter, WI 54455

Re: RMMSD Facility Plan Comments

Dear Mr. Gau:

Thank you for submitting comments on the draft facility plan. Our responses are in italics.

1. As stated at the Public Hearing several of the communities that are customers of RMMSD will be embarking on a Wausau Urban Area Sewer Service Plan (208 Plan) in conjunction with Marathon County Planning to be updated by the end of 2016. We are requesting that at the completion of the 208 Sewer Plan, RMMSD along with their consultant Strand Associates, Inc. include the new projected population figures that will be stated in the updated 208 Sewer Plan be incorporated into the new Wastewater Facilities Plan.

   RMMSD is aware of the planning process and will review the conclusions of any plan that is published. Depending on how updated projections compare to those used in this facility plan, the facility plan could be updated.

2. As stated at the Public Hearing Phase I will be conducted between 2016-2020 which will give ample amount of time to amend the Wastewater Facilities Plan to include Wausau Urban Area Sewer Service Plan (208 Plan) figures.

   Phase I improvements are not as sensitive to flows and loadings changes as Phase II improvements, and therefore are not as sensitive to population changes. Assuming the plan update is completed on schedule, there will be time to review the Wausau Area Sewer Service Plan (208 Plan) figures before implementing the Phase II improvements.

Please let us know if you have any further comments or questions.

Sincerely,

STRAND ASSOCIATES, INC.®

Rachel M. Lee

Rachel M. Lee, P.E.

Kevin K. Hopkins, P.E.

c: Ken Johnson, RMMSD

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2015 Rib Mountain Metropolitan Sanitary District's (RMMSD) Facility Plan

Marathon County Conservation, Planning & Zoning Department (CPZ) comments.

1. *Section 1.02, <u>Location of Study</u>, line 1*:

Based on the RMMSD sanitary sewer service area map, the following communities are shown and include the following:

1. City of Mosinee
2. Village of Rothschild
3. Village of Weston (part)
4. Village of Kronenwetter (part)
5. Town of Rib Mountain (part)
6. Town of Mosinee (part)

2. *Figure 1.02-1, RMMSD Sewer Service Area Map*:

Please provide map(s) that better identify the following:

1. Overall 208 facility planning area boundary
2. RMMSD Sewer Service area
3. Wausau Sewer Service area
   A. Use different colors to identify these areas. Also include a distinct municipal boundary lines.
   B. The boundary delineations will help the reader identify the POTW service areas and who is providing the service.

3. *Section 4.02, <u>Population and Growth Projections</u>, Paragraph 2*:

Please provide the rational for including the 100% DOA community population estimate for the Villages of Kronenwetter and Weston vs the 80% population calculation for the Town of Rib Mountain.

Note: Marathon County CPZ is not objecting to the proposed population and growth projections relative to Phase I of the Plan; however, we are reserving our confirmation of the planning area and population projections used in RMMSD's Facility Plan until these items are clarified in the Plan.

STRAND ASSOCIATES®

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910 West Wingra Drive
Madison, WI 53715
(P) 608-251-4843
(F) 608-251-8655

December 7, 2015

Mr. Jeff Pritchard
Marathon County Conservation, Planning & Zoning Dept.
210 River Dr.
Wausau, WI 54403

Re: RMMSD Facility Plan Comments

Dear Mr. Pritchard:

Thank you for submitting comments on the draft facility plan. Our responses are included in italics.

1. Section 1.02, Location of Study, line 1:
   Based on the RMMSD sanitary sewer service area map, the following communities are shown and include the following:
   1. City of Mosinee
   2. Village of Rothschild
   3. Village of Weston (part)
   4. Village of Kronenwetter (part)
   5. Town of Rib Mountain (part)
   6. Town of Mosinee (part)

   Although a portion of the Town of Mosinee is shown as part of RMMSD sewer service area, this area is currently not sewered or served by RMMSD.

2. Figure 1.02-1, RMMSD Sewer Service Area Map:

   Please provide map(s) that better identify the following:

   1. Overall 208 facility planning area boundary
   2. RMMSD Sewer Service area
   3. Wausau Sewer Service area
      A. Use different colors to identify these areas. Also include a distinct municipal boundary lines.
      B. The boundary delineations will help the reader identify the POTW service areas and who is providing the service.

   We utilized the map that was provided by Marathon County Planning and Zoning. This is the correct sewer service area for RMMSD. Wausau sewer service area is not part of the RMMSD sewer service area and was not included in the facilities plan.

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Mr. Jeff Pritchard
Marathon County Conservation, Planning & Zoning Dept.
Page 2
December 7, 2015

3. Section 4.02, Population and Growth Projections, Paragraph 2:

Please provide the rational for including the 100% DOA community population estimate for the Villages of Kronenwetter and Weston vs the 80% population calculation for the Town of Rib Mountain.

Note: Marathon County CPZ is not objecting to the proposed population and growth projections relative to Phase I of the Plan; however, we are reserving our confirmation of the planning area and population projections used in RMMSD's Facility Plan until these items are clarified in the Plan.

We are also looking forward to clarification after the 208 plan is updated. For these planning purposes, we have considered it appropriate to use these values since capacity issues are primarily addressed under the Phase II improvements.

Please let us know if you have any further comments or questions.

Sincerely,

STRAND ASSOCIATES, INC.®

Rachel M. Lee

Rachel M. Lee, P.E.

Kevin K. Hopkins, P.E.

c: Ken Johnson, RMMSD

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From: Timothy D. Vergara [mailto:tvergara@rothschildwi.com]
Sent: Tuesday, November 24, 2015 11:13 AM
To: Hopkins, Kevin <Kevin.Hopkins@strand.com>
Cc: Ken Johnson - RMMSD <Rmmsd@aol.com>; George Peterson - Village President <gpeterson@rothschildwi.com>
Subject: DRAFT Wastewater Facilities Plan Comments - Village of Rothschild

Dear Kevin,

I have a few comments that I want to convey to you regarding the Draft RMMSD October 2015 Facilities Plan as a member of the District. Please see below:

1. I did not see any mention of the current 208 boundary Study/Revision that is currently ongoing in the metro area. That area may be significantly expanded based on the estimations of the contributing communities.
2. I did not see mention or any accommodation for the addition of the such entities as the City of Schofield, the City of Edgar, Marathon City, the City of Wausau, etc., as there has been preliminary discussion largely due to the new Phosphorous regulations/requirements and reaching plant design capacities.
3. Page ES-4 stated a 25% increase of average costs but then stated in the next page that it would be neutralized out. That causes concern as that is s significant increase in cost per member.
4. Page 1-1, 3-1 stated the "Town of Weston" and not the "Village of Weston"
5. When Manning's equation was used I question the roughness coefficient used as it is aged pipe and may have an actual higher number.
6. Page 4-5, there was a comment that that the estimated increase of waste volumes were estimated at 5% and 10%. Is that underestimated?
7. Page 4-6, 4.04 B., stated that there was only a 10% contingency. Seems on the light side.
8. Page5-2, I like the comments on the new Phosphorous regulations and possible strategies.

Please let me know if you have any questions and this information is combined into the hearing materials.

Thanks

Timothy D. Vergara, PE
Village of Rothschild - Administrator of Public Works
phone: (715) 359-3660
fax: (715) 359-7218
email: tvergara@rothschildwi.com

"When you can do the common things of life in an uncommon way, you will command the attention of the world."
- George Washington Carver

Save a tree. Don't print this e-mail unless it's necessary.

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STRAND ASSOCIATES

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Madison, WI 53715
(P) 608-251-4843
(F) 608-251-8655

December 7, 2015

Mr. Timothy Vergara
Village of Rothschild, Administrator of Public Works
211 Grand Avenue
Rothschild, WI 54474

Re: RMMSD Facility Plan Comments

Dear Mr. Vergara:

Thank you for submitting comments on the draft facility plan. Our responses are included in italics.

1. I did not see any mention of the current 208 boundary Study/Revision that is currently ongoing in the metro area. That area may be significantly expanded based on the estimations of the contributing communities

   This upcoming study is not part of this facility planning effort. However, any updates, when available, will be reviewed for potential impact on the facility plan conclusions.

2. I did not see mention or any accommodation for the addition of the such entities as the City of Schofield, the City of Edgar, Marathon City, the City of Wausau, etc., as there has been preliminary discussion largely due to the new Phosphorous regulations/requirements and reaching plant design capacities.

   Other entities were contacted during planning to see whether they wanted to be included in the planning process. No entities expressed interest in being included in this planning document. RMMSD, at the direction of the Commission, proceeded with the plan including the existing customers and sewer service area.

3. Page ES-4 stated a 25% increase of average costs but then stated in the next page that it would be neutralized out. That causes concern as that is s significant increase in cost per member.

   The debt service will increase the total budget by approximately 25 percent.

4. Page 1-1, 3-1 stated the "Town of Weston" and not the "Village of Weston"

   Acknowledged.

5. When Manning's equation was used I question the roughness coefficient used as it is aged pipe and may have an actual higher number.

   This is a valid comment, so we evaluated the capacity using a roughness coefficient of 0.014. Increasing the roughness coefficient to reflect aged pipe reduces the capacity by approximately 1 mgd for each segment evaluated. This still allows ample capacity for future growth.

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Mr. Timothy Vergara
Village of Rothschild, Administrator of Public Works
Page 2
December 7, 2015

6. Page 4-5, there was a comment that that the estimated increase of waste volumes were estimated at 5% and 10%. Is that underestimated?

   These estimates are consistent with historical growth and industry standards. There are no known increases at this time.

7. Page 4-6, 4.04 B., stated that there was only a 10% contingency. Seems on the light side.

   This level of conservatism is consistent with industry practices considering there are no known new developments at this time. Should unforeseen growth exceed the 10 percent, design flows and loadings can be reconsidered.

8. Page5-2, I like the comments on the new Phosphorous regulations and possible strategies.

   Noted.

Please let us know if you have any further comments or questions.

Sincerely,

STRAND ASSOCIATES, INC.®

Rachel M. Lee

Rachel M. Lee, P.E.

Kevin K. Hopkins, P.E.

c: Ken Johnson, RMMSD

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For more location information please visit www.strand.com

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