

**Appleton Wastewater Treatment Plant
Operations Synopsis
January 2022 – March 2022**

Wastewater Treatment Program

- The Appleton Wastewater Treatment Plant (AWWTP) final effluent met Wisconsin Department of Natural Resources (WDNR) discharge monitoring reporting limits for carbonaceous biochemical oxygen demand (CBOD), total suspended solids (TSS), phosphorous, and ammonia. The plant maintained good treatment and a healthy microbiological population with a sludge retention time of 10.5 days. Dewatering processes functioned well and converted 18.9 million gallons (MG) of primary digested sludge to biosolids.

Summary of Treatment

Parameter	January	February	March	Average
Industrial Flow (MG)	35.6	30.4	31.6	32.5
Domestic Flow (MG)	227.8	186.0	408.6	274.2
Total Flow (MG)	263.4	216.4	440.2	306.7
Influent CBOD Load (Avg Daily lbs)	29,997	23,256	22,334	25,196
Influent TSS Load (Avg Daily lbs)	48,776	47,801	45,755	47,444
Influent Phosphorous Load (Avg Daily lbs)	623	443	477	514
Influent Ammonia Load (Avg Daily lbs)	2,226	1,860	1,978	2,021
Effluent CBOD Load (Avg Daily lbs)	416	380	693	496
Effluent TSS Load (Avg Daily lbs)	250	345	604	400
Effluent Phosphorous Load (Avg Daily lbs)	14	13	26	18
Effluent Ammonia Load (Avg Daily lbs)	103	66	80	83
% Treatment Removal of CBOD	98.6	98.4	96.9	98.0
% Treatment Removal of TSS	99.5	99.3	98.7	99.1
% Treatment Removal of Phosphorous	97.8	97.1	94.5	96.5
% Treatment Removal of Ammonia	95.4	96.5	96.0	95.9

Work in Progress:

- 2019 Appleton Wastewater Plant Improvement Projects: The project includes replacement of the Return Activated Sludge (RAS) pumps, process piping modifications (e.g., blended sludge, filtrate, waste gas flare), outside secondary chemical offloading containment repairs, primary clarifiers #5 & #6 drive replacements (2020 CIP), and H-Building effluent pump replacements (2020 CIP). During the reporting period, Staab Construction (Staab) completed the replacement of the H-Building effluent pumps, installation, and commissioning of four RAS Pumps (11 of 12 installed), and replacement of the blended sludge pipe to reach the point of substantial completion. Final project completion was extended to June 30, 2022 because of ongoing supply chain disruptions (i.e. RAS Pump 11 motor) and recently approved change orders.
- Appleton Wastewater Plant Sludge Storage Building Addition: Applied Technologies, Inc. (ATI) advanced preliminary design work on the concept selected by Project Team staff which best met the needs of the AWWTP from a regulatory, functionality, reliability, efficiency, and capital cost standpoint. ATI provided +90% design plans for review during the reporting period. Ongoing delays with the DNR plan review has contributed to pushing back the public bidding phase into the second quarter of 2022.

- 2021 Appleton Wastewater Plant Solids Dewatering Equipment Upgrades: McMahon Associates, Inc. (McMahon) continued engineering services as part of the Solids Dewatering Equipment Upgrades project. The AWWTP will be adding one additional BFP (for a total of four new) which will provide the required dewatering capacity based on future growth projections and redundancy to facilitate critical maintenance events. McMahon developed the design plans during the reporting period to approximately 80%. The public bidding phase is scheduled to sometime in the second quarter of 2022 once the bid results of the Sludge Storage Building Addition project are known.
- 2021 Secondary Clarifier Drive Rebuild Project: On June 2, 2021, Common Council approved contract award for the removal, rebuilding, and reinstallation of drive equipment on Secondary Clarifiers #1 through #6 to Sabel Mechanical. Common Council also approved the sole source purchase of the associated rebuild parts through the original equipment manufacturer, Evoqua. Supply chain disruptions contributed to significant upfront delays with delivery of major parts and equipment. Complete shipments were finally received late in September 2021 which allowed Sabel to commence with the removal of drives on Secondary Clarifiers #3 and #6 on October 5, 2021. Final project completion is not anticipated to occur until late spring or early summer of 2022.

Regulatory Summary

- Monthly Discharge Monitoring reports for January, February, and March were filed electronically on time for regulatory compliance.
- The AWWTP Wisconsin Pollution Discharge Elimination System (WPDES) electronic permit application was submitted on October 2, 2021, as part of reissuance. The current WPDES permit expired on March 31, 2022. The AWWTP continues to operate under the expired permit limits until DNR reissues a permit. Procedurally, the DNR has yet to submit a draft permit for review and public comment. The exact timeline is not yet known for when that step will occur but the DNR is anticipating that the reissued permit will be administered in October 2022.

Laboratory

- All sampling and laboratory testing procedures were performed in accordance with requirements outlined in the AWWTP WPDES permit.
- Discharge Monitoring Report (DMR) and Health Department testing program objectives associated with sampling and analysis were met during the reporting period.
- Analysis of Double-Blind Proficiency samples for laboratory recertification occurred during the reporting period.
- Sampling of influent in support of Wisconsin State Lab of Hygiene COVID Sewage Surveillance continued during the reporting period.

EFFLUENT QUALITY SUMMARY
October 2020/2021 – March 2021/2022

Table 1 – 2020-2021 Monthly Permit Summary

Month	CBOD (mg/L)	TSS (mg/L)	TSS (lbs/day)	P (mg/L)	P ⁽³⁾ (lbs/day)	NH3-N ⁽¹⁾ (mg/L)	Fecal ⁽²⁾ Coliform Colonies/ (100 ml)	Chlorine ⁽²⁾ Residual (mg/L)	pH (s.u.)
<i>Permit Limit</i>	25	30	1,322 ⁽³⁾	1	23 ⁽³⁾	10, 11, 4.4, 18	400 col/100ml Geo.Mean	0.038 mg/L daily	6.0 - 9.0 daily limit
October 2020	6	4	373	0.31	25	0.88	NA	NA	7.1/7.4
November 2020	6	3	286	0.19	18	0.59	NA	NA	6.9/7.2
December 2020	7	5	347	0.28	20	3.96	NA	NA	6.9/7.1
January 2021	7	2	161	0.27	19	11.70	NA	NA	6.9/7.3
February 2021	8	6	420	0.33	24	14.20	NA	NA	7.0/7.3
March 2021	7	4	473	0.22	25	1.74	NA	NA	7.0/7.2
			Nov - April Period Average⁽³⁾		21.0				
			May - October Period Average⁽³⁾		22.5				

Table 2 – 2021-2022 Monthly Permit Summary

Month	CBOD (mg/L)	TSS (mg/L)	TSS (lbs/day)	P (mg/L)	P ⁽³⁾ (lbs/day)	NH3-N ⁽¹⁾ (mg/L)	Fecal ⁽²⁾ Coliform Colonies/ (100 ml)	Chlorine ⁽²⁾ Residual (mg/L)	pH (s.u.)
October 2021	5	4	254	0.37	24	0.50	NA	NA	7.3/7.3
November 2021	6	4	223	0.28	18	0.69	NA	NA	6.5/7.4
December 2021	6	4	281	0.18	13	1.38	NA	NA	7.1/7.2
January 2022	6	4	250	0.20	14	1.43	NA	NA	6.1/7.1
February 2022	6	5	345	0.20	13	1.03	NA	NA	6.8/7.0
March 2022	5	4	604	0.19	26	0.66	NA	NA	6.8/7.2
			Nov - April Period Average⁽³⁾		16.7				
			May - October Period Average⁽³⁾		21.1				

NOTES:

- 1) Seasonal NH3-N limits: 10 mg/L Jan. 1 – Mar. 31, 11 mg/L Apr. 1 – May 31, 4.4 mg/L June 1 – Sep 30, 18 mg/L Oct 1 – Dec 31.
- 2) Seasonal fecal and residual chlorine limits are in effect May 1st through September 30th. Limit of Detection 0.032 mg/L.
- 3) April 1, 2017 WPDES Reissuance with new TSS limits expressed as monthly concentration limit (mg/L) and loading limit (lbs).
 The future TMDL phosphorus limit will be 23 lbs/day expressed as a 6-month average during the months of May – October and November – April.

YEAR 2022 RECEIVING STATION REVENUE

Hauler	January	February	March	April	May	June	July	August	September	October	November	December	Y-T-D Total
A & B Leist Trucking	\$ 155,140.59	\$ 130,533.65	\$ 156,997.30										\$ 442,671.54
Buttles Custom Ag	\$ -	\$ -	\$ -										\$ -
Hickory Meadows	\$ 24,903.48	\$ 20,475.06	\$ 32,031.60										\$ 77,410.14
Holland Sanitary Dist 1	\$ -	\$ -	\$ -										\$ -
Jeff Waldvogel Trkg	\$ 34,629.34	\$ 34,267.37	\$ 38,307.65										\$ 107,204.36
Movin Materials	\$ -	\$ -	\$ -										\$ -
Waldvogel Trucking	\$ 1,638.34	\$ 1,815.63	\$ 1,789.65										\$ 5,243.62
2022 Total	\$ 216,311.75	\$ 187,091.71	\$ 229,126.20	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 632,529.66
2021 Total	\$ 160,614.00	\$ 157,415.55	\$ 178,568.93	\$ 193,304.25	\$ 197,959.99	\$ 183,861.33	\$ 240,826.87	\$ 261,064.97	\$ 231,369.79	\$ 217,146.14	\$ 172,718.91	\$ 173,227.16	\$ 2,368,077.89

3% Rate Increase effective 1/1/18
 1% Rate Increase effective 1/1/19
 5% Rate Increase effective 10/1/20
 4% Rate Increase effective 01/01/22

Date: April 20, 2022
 Copies: K. Rindt (via email)
 C. Shaw (via email)
 B. Kreski
 Utilities Committee