

**Appleton Wastewater Treatment Plant  
Synopsis  
July 2018 – September 2018**

**Wastewater Treatment Program**

- The Appleton Wastewater Treatment Plant (AWWTP) final effluent met all Wisconsin Department of Natural Resources (WDNR) discharge monitoring reporting limits including carbonaceous biochemical oxygen demand (CBOD), total suspended solids (TSS), phosphorous, and ammonia. (See Effluent Quality Summary). The plant maintained good treatment and a healthy microbiological population with a sludge retention time of seven and one half days. Dewatering processes functioned well and converted 17.5 Million Gallons (MG) of primary digested sludge to biosolids.

**Summary of Treatment**

<b>Parameter</b>	<b>July</b>	<b>August</b>	<b>September</b>	<b>Average</b>
Industrial Flow (MG)	50.9	53.0	51.6	51.8
Domestic Flow (MG)	198.0	270.3	399.6	289.3
Total Flow (MG)	248.9	323.3	451.2	341.1
Influent CBOD Load (Avg Daily lbs)	24,541	23,859	25,286	24,562
Influent TSS Load (Avg Daily lbs)	47,836	43,490	40,866	44,064
Influent Phosphorous Load (Avg Daily lbs)	407	421	789	539
Influent Ammonia Load (Avg Daily lbs)	1,594	1,593	2,035	1,741
Effluent CBOD Load (Avg Daily lbs)	356	586	981	641
Effluent TSS Load (Avg Daily lbs)	354	375	940	556
Effluent Phosphorous Load (Avg Daily lbs)	41	51	71	54
Effluent Ammonia Load (Avg Daily lbs)	54	159	216	143
% Treatment Removal of CBOD	98.5	97.5	96.1	97.4
% Treatment Removal of TSS	99.3	99.1	97.7	98.7
% Treatment Removal of Phosphorous	89.9	87.9	91.0	89.6
% Treatment Removal of Ammonia	96.6	90.0	89.4	92.0

**Work in Progress:**

- **2017 Appleton Wastewater Plant Improvement Projects** (WAS Pumping System Replacement, High Pressure Blower #3 Replacement, Digester Biogas Mix Compressor Glycol Cooling System): Donohue & Associates continued preliminary design services associated with the improvements project. 30% design documents were provided for review and comment during the reporting period. The start of the construction bidding phase is tentatively scheduled for November 2018.
- **Chemical Storage Room Rehab/Improvements Project:** August Winter & Sons Inc. initiated construction activities in January 2018. Construction activities continued during the reporting period with all new equipment installed. Final project punch list items are anticipated to be concluded by late October. The AWWTP intends on resuming high chemical dosing trials in the fourth quarter for TMDL phosphorus treatment evaluation purposes.
- **Biogas Utilization Study Update:** Donohue and Associates (Donohue) submitted a draft Digester Biogas Utilization Report for review in late 2017. At that time the Facilities Management Department (FMD) was concurrently working on a project that would add a high efficiency boiler to support the lower heating loop at the AWWTP. Subsequent discussions with FMD led to a decision by the Utilities Department to temporarily delay finalization of the report based on the technical support for a new lower loop boiler that would utilize a portion of the excess biogas being

produced. During the reporting period Donohue incorporated improvements within project bidding documents that will complement the proposed new biogas boiler and existing biogas boilers (e.g. new biogas conveyance piping, mixing, gas compression system, and operational strategies). These improvements are intended to further optimize the use of two existing upper loop boilers while facilitating the new lower loop biogas boiler in addition to other potential future biogas utilization upgrades. With information from that parallel project phase known, the final Biogas Utilization Study Update is now able to be completed during the next reporting period.

- **Briarcliff and Midway Improvement Projects:** Preliminary engineering activities occurred during the reporting period. McMahon provided 90% design documents for review during the reporting period. The public bidding date is scheduled for the second week of October. Pending the outcome of the bids and subsequent contract award, Construction will not likely occur until the spring of 2019.

## **Regulatory Summary**

- Monthly Discharge Monitoring reports for July, August, and September were filed electronically on time for regulatory compliance.
- August and September monthly mercury effluent concentrations (each 3.60 parts per trillion) exceeded the 3.40 parts per trillion limit. In both instances the elevated concentrations are likely attributed to the timing of sample collection in relation to rainfall induced high flow events on August 28<sup>th</sup> and September 4<sup>th</sup> (samples were collected immediately following or within one week of high flow). It is noteworthy that significant flooding throughout the city was observed during the previously mentioned high flow events. Extensive surface water inflow and scouring of solids deposited within sanitary sewer collection system piping resulting from high flow conditions can contribute to elevated mercury concentrations entering the AWWTP. Influent mercury test results collected on the same day appear support this conclusion.
- The 3,275 lbs per day weekly average effluent TSS concentration for the first week of September exceeded the WPDES permit limit of 2,434 lbs. The reported exceedance was consequence of the high flow conditions resulting from the September 4<sup>th</sup> rain event.
- Operations and Maintenance staff responded to a high flow event on September 4<sup>th</sup> following 2.61 inches of rainfall received on already saturated ground conditions over a 12 hour period. Flows in excess of plant designed hydraulic capacity resulted in a treatment facility overflow (TFO) between the hours of 6:40 am and 7:40 am. A total of 6,000 gallons of partially treated wastewater was estimated to have overflowed the primary clarifier influent channel walls. Sewage lift stations were maintained with no sanitary sewer overflows reported. The TFO was reported to the WDNR pursuant of Wisconsin Administrative Code NR 210.21 (4) including public notice requirements under NR 210.21 (5).

## **Laboratory Program**

### **Work Completed:**

- Program objectives of sampling and analysis were met for the time period, including results for the Discharge Monitoring Report (DMR) and Health Department pool testing program.
- Submitted the following eDMR reports successfully:
  - July through September 2018 Long Forms
  - 2018 Short Form for Whole Effluent Toxicity Testing
- Analysis of Single Blind Proficiency samples for laboratory recertification
- Disinfection Season completed September 30<sup>th</sup>, 2018

- Completed analysis of samples collected in large scale chemical demonstration to investigate alternate phosphorus treatment

**Work In Progress:**

- Compliance monitoring for 2018
- Second round for Pretreatment monitoring
- Implementation of new WDNR Laboratory regulatory requirements for registration
- Staff meetings to modify testing schedules to better comply with the current WPDES wastewater permit

**Proposed Projects and Activities:**

- Continue compliance monitoring requirements for 2018
- Review of completed disinfection season data
- Laboratory Chemical inventory

**EFFLUENT QUALITY SUMMARY**  
**April 2017/2018 – September 2017/2018**

**Table 1 – 2017 Monthly Permit Summary**

Month	CBOD (mg/L)	TSS (mg/L)	TSS (lbs/day)	P (mg/L)	P (lbs/day)	NH3-N <sup>(1)</sup> (mg/L)	Fecal <sup>(2)</sup> Coliform Colonies/ (100 ml)	Chlorine <sup>(2)</sup> Residual (mg/L)	pH (s.u.)
<i>Permit Limit</i>	25	30	1,322 <sup>(3)</sup>	1	23 <sup>(3)</sup>	10, 11, 4.4, 18	400 col/100ml <i>Geo.Mean</i>	0.038 mg/L <i>daily</i>	6.0 - 9.0  <i>daily limit</i>
April 2017	4	3	470	0.09	16.0	1.48	NA	NA	7.2/7.4
May 2017	3	3	388	0.12	16.0	1.43	6	<0.032	7.0/7.3
June 2017	3	2	257	0.13	15.0	1.25	4	<0.032	7.1/7.5
July 2017	3	2	231	0.17	15.8	1.10	32	<0.032	7.2/7.5
August 2017	4	4	317	0.26	22.9	1.14	19	<0.032	7.1/7.4
September 2017	4	3	284	0.30	25.4	0.66	29	<0.032	7.1/7.3

**Table 2 – 2018 Monthly Permit Summary**

Month	CBOD (mg/L)	TSS (mg/L)	TSS (lbs/day)	P (mg/L)	P (lbs/day)	NH3-N <sup>(1)</sup> (mg/L)	Fecal <sup>(2)</sup> Coliform Colonies/ (100 ml)	Chlorine <sup>(2)</sup> Residual (mg/L)	pH (s.u.)
April 2018	5	4	598	0.42	62.0	5.60	NA	NA	7.5/7.6
May 2018	4	1	205	0.38	59.0	2.11	5	<0.032	7.4/7.7
June 2018	4	3	289	0.47	46.0	1.04	13	<0.032	7.2/7.6
July 2018	5	5	354	0.61	40.8	0.77	10.5	<0.032	7.4/7.6
August 2018	6	4	375	0.64	50.6	1.40	56	<0.032	7.4/7.6
September 2018	6	4	940	0.56	71.0	1.49	10	<0.032	7.4/7.6

**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 30<sup>th</sup>. 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.

**YEAR 2018 RECEIVING STATION REVENUE**

Hauler	January	February	March	April	May	June	July	August	September	October	November	December	Y-T-D Total
A & B Leist Trucking	\$ 166,686.94	\$170,841.65	\$ 213,882.79	\$ 226,744.58	\$ 228,023.89	\$ 228,196.02	\$ 221,947.22	\$ 169,002.66	\$191,766.49				\$ 1,817,092.24
Dean Foods	\$ -	\$ -	\$ -	\$ 2,037.90	\$ 13,720.58	\$ 12,704.93	\$ 11,872.28	\$ 13,016.10	\$ 11,107.43				\$ 64,459.22
Hickory Meadows	\$ 19,432.60	\$ 17,842.90	\$ 15,000.34	\$ 46,037.59	\$ 110,250.34	\$ 30,545.91	\$ 29,156.65	\$ 42,053.31	\$ 71,641.75				\$ 381,961.39
Holland Sanitary Dist. 1	\$ -	\$ -	\$ 5,694.90	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -				\$ 5,694.90
Jeff Waldvogel Trkg.	\$ 41,977.54	\$ 34,849.86	\$ 42,214.17	\$ 53,380.94	\$ 62,244.52	\$ 59,778.35	\$ 57,347.03	\$ 50,438.03	\$ 51,878.69				\$ 454,109.13
Movin, Materials	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -				\$ -
Waldvogel Trucking	\$ 1,957.65	\$ 1,923.30	\$ 1,920.75	\$ 1,880.93	\$ 1,789.35	\$ 2,403.08	\$ 2,000.78	\$ 2,043.08	\$ 1,786.80				\$ 17,705.72
<b>2018 Total</b>	\$ 230,054.73	\$225,457.71	\$ 278,712.95	\$ 330,081.94	\$ 416,028.68	\$ 333,628.29	\$ 322,323.96	\$ 276,553.18	\$328,181.16	\$ -	\$ -	\$ -	\$ 2,741,022.60
<b>2017 Total</b>	\$172,735.08	\$184,476.03	\$223,618.34	\$231,886.70	\$227,389.07	\$273,509.72	\$244,134.28	\$214,324.93	\$222,482.09	\$257,598.16	\$225,732.80	\$ 223,705.96	\$ 2,701,593.16

Movin Materials new hauler in April 2017  
Holland Sanitary District 1 new customer in March 2018  
Dean Foods new customer in April 2018  
3% Rate Increase effective 1/1/18

Date: October 12, 2018  
Copies: K. Rindt (via email)  
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Utilities Committee