



# **Teeswater Formosa Sewer System and Wastewater Treatment Plant**

**120003735**

**2024 Summary Report**

**February 18, 2025**

**Prepared by Veolia Water**

**For the Municipality of South Bruce**

## **Contents**

ECA (#0279-8Q8JD6) Reporting Requirements

## **Plant Description**

The Teeswater Wastewater Treatment Plant is a Sequencing Batch Reactor plant with a Rated Capacity of 1,350 m<sup>3</sup>/day. Treated water is discharged into the Teeswater River. The facility receives waste from households, businesses and industries in Formosa and Teeswater included, but not limited to dairy waste from Gay Lea Food Co-operatives Limited and brewery waste from the Formosa Brewery

### **Teeswater Wastewater Treatment Plant**

- **Influent Works**

One (1) 600 mm wide and 1,300 mm deep screen channel equipped with a mechanically cleaned, 3 mm diameter perforated plate debris screen rated at 110 L/s and a bypass channel with an overflow weir and manual bar screen with custom aluminum rake.

One (1) 2.0 m diameter circular vortex grit removal unit rated with a *peak flow rate* of 110 L/s equipped with a grit removal system.

One (1) screw conveyor grit classifier serving the grit removal unit.

One (1) 9,500 L capacity alum solution storage tank, together with two (2) chemical metering pumps (one standby) each rated at 0 to 12 L/h, with an alum solution feed line to the grit tank outlet channel.

- **Secondary Treatment Facilities**

A 350 mm diameter inflow pipe connected to an influent splitter box designed to distribute the influent sewage evenly between two sequential batch reactors (SBR). The reactors are 29.5 m long x 10.5 m wide x 6.4 m (5.8 m top water level) deep parallel continuous inflow SBRs with a baffle wall at the upstream end of each tank to direct all influent into the bottom of the tank and equipped with a fine bubble aeration system.

One (1) motorized effluent decanter rated at 196 L/s peak rate for each SBR with, a fixed float scum guard, and discharging into a 26.7 m by 4 m equalization tank.

Two (2) submersible centrifugal waste activated sludge pumps for each SBR, each rated at 29 m<sup>3</sup>/h at a TDH of 8.0 m, with discharge line to the sludge digestion facility.

- **Air Blowers**

Three (3) positive displacement air blowers (one standby) serving as the compressed air supply for the SBR aeration system and sludge digestion system, each rated at 1860 m<sup>3</sup>/h at 69 kPa.

- **Effluent Filtration Systems**

Six (6) deep bed, continuous backwash effluent filters with total surface area of 27.87 m<sup>2</sup> rated at 3.3 L/m<sup>2</sup>/s for *Peak Flow Rate* of 92 L/s.

A 200 mm diameter inlet magmeter to allow supplementary flow-proportional chemical dosing to the filters;

One (1) 4,100 L chemical storage tank and two dosing pumps (one standby) to the inlet pipe to filters, each with a capacity range of 0 L/h to 12 L/h;

One (1) 2.4 m<sup>3</sup> flocculation (mixing chamber) ahead of filters equipped with a variable speed, 5 hp mixer.

Two (2) submersible, 7.5 hp well-type pumps each rated at 5 L/s at 73.7 m TDH for effluent water reuse in the headworks.

- **Effluent Disinfection Facilities**

A 4.41 m long x 406 mm wide x 780 mm deep indoor UV disinfection channel, equipped with a UV disinfection unit with a *peak flow rate* of 152 L/s, complete with a level control serpentine weir.

- **Plant Effluent Outfall Sewer**

A 525 mm diameter outfall sewer to Teeswater River;

- **Sludge Digestion and Storage Facilities**

One (1) 550 m<sup>3</sup> stage 1 sludge digestion tank and one (1) 245 m<sup>3</sup> stage 2 digestion tank, complete with aeration systems and decant assemblies.

Two (2) submersible centrifugal waste activated sludge pumps rated at 29 m<sup>3</sup>/h at a TDH of 14.5 m in digester 2, one for truck loading and one for discharge to the sludge storage facilities.

One (1) 4,461 m<sup>3</sup> capacity thickened sludge holding tank with cover.

One (1) 20 hp sludge mixer and an option for an additional second mixer if required.

- **Emergency Power Supply System**

One (1) 360 kW diesel engine standby power generator with integral fuel storage.

- **On-Site Wastewater Pumping Station**

An on-site wastewater pumping station equipped with two (2) 20 hp solids chopping centrifugal submersible sewage pumps (one standby) for pumping Formosa sewage, septage, filter backwash, domestic sewage and digester decant to the inlet works.

Includes a septage receiving station with manual bar screen and stainless steel custom rake.

### **Teeswater Sewage Collection System**

- **Teeswater Main Sewage Pumping Station**

A wet well/dry well style sewage pumping station located at the northwest corner of Mill Street and Hillcrest Street East at 6 Mill Street, Teeswater that is equipped with 2 submersible pumps, a backup generator and inlet manual bar screen complete with custom stainless steel rake.

- **Teeswater Local Sewage Pumping Station A1**

Located at the intersection of Reid Street and Logan Street, a duplex E-One grinder pump station and a 50 mm diameter forcemain along Logan Street to a maintenance hole east of Wright Street.

- **Teeswater Local Sewage Pumping Station A2**

Located at the end of Riverview Terrace, a duplex E-One grinder pump station and a 50 mm diameter forcemain along Riverview Terrace to a maintenance hole on Hillcrest Street E

- **Teeswater Local Sewage Pumping Station A3**

Located at the end of Andrew Street, a duplex pump station with grinder style centrifugal sewage pumps and a 75 mm diameter forcemain along Andrew Street to a maintenance hole on Hillcrest Street W  
This station is equipped with a backup diesel generator.


### **Formosa Sewage Collection System**

- **Formosa Main Sewage Pumping Station**

A 3.0 m diameter precast concrete wet well sewage pumping station, located on the east side of Bruce Road No. 12 at 1114 Bruce Road 12 and approximately 150 m south of Council Road equipped with two (2) submersible pumps, a backup generator, flow meter, bypass piping and alarms.

- **Formosa Teeswater Sewage Transmission Line** – a 200 mm diameter sanitary forcemain along Bruce Road 12, Concession 10, Sideroad 1B and Concession Road 8 from the pumping station to a grit removal chamber which discharges to a 300 mm/250 mm diameter gravity sewer along Concession Road 8, followed by a 250 mm/200 mm diameter sag sewer along Concession Road 8, with intermediate flush chambers, followed by a 250 mm diameter gravity sewer along Concession Road 8, followed by a second 250 mm/200 mm diameter sag sewer along Concession 8 and Sideroad 10A with intermediate flush chambers, followed by a 250 mm diameter gravity sewer along Sideroad 10A and finally discharges to the on-site sewage pumping station at the wastewater treatment plant;

- **Formosa Low Pressure Sanitary Sewer System** – Low pressure Sewers Serviced with Grinder Pumps at individual service locations.

 <b>Teeswater Wastewater Compliance Report</b>		2024												Facility Classification: Class 3 Waste Water Treatment Rated Capacity: 1350 m3/day Peak Flow: 7949 m3/day (92 l/s) Receiving Waters: Teeswater River				
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Minimum	Average	Maximum	Limit
<b>Flow</b>																		
Total Raw Flow (m3/mth)	29,639	28,329	30,307	30,558	30,446	28,904	29,067	29,513	28,982	29,194	28,978	29,484	353,401	29,450				
Raw Average Day Flow (m3/d)	956	977	978	1,019	982	963	938	952	966	942	966	951	966	966				1350
Raw Max Day Flow (m3/d)	1,279	1,173	1,193	1,233	1,141	1,176	1,266	1,176	1,197	1,620	1,112	1,298					1,620	
<b>Biochemical O2 Demand</b>																		
Influent Average BOD (mg/L)	582	630	832	562	406	598	556	487	599	448	535	764	86	581.3	1,690.00			
Effluent Average CBOD (mg/L)	2	3	2	2	2	2	2	2	3	2	2	2	2.2	4				10
Percent Removal	99.6	99.6	99.8	99.6	99.5	99.7	99.6	99.6	99.6	99.6	99.6	99.7	99.60%					
<b>Suspended Solids</b>																		
Influent Average TSS (mg/L)	212	138	273	204	276	201	158	193	209	178	285	245	210.9	447				
Effluent Average TSS (mg/L)	7	5	3	3	2	3	5	6	8	3	3	5	4.4	12				10
Percent Removal	96.7	96.2	98.8	98.5	99.1	98.3	97.1	96.8	96.4	98.2	98.8	98	97.70%					
<b>Phosphorus</b>																		
Influent Average TP (mg/L)	4.07	5.09	9.05	3.75	4.15	3.64	3.14	3.94	5.1	3.99	5.01	4.74	4.55	17.2				
Effluent Average TP (mg/L)	0.10	0.08	0.10	0.08	0.09	0.09	0.11	0.15	0.12	0.09	0.07	0.08	0.1	0.21				0.15
Percent Removal	97.6	98.5	98.9	97.8	97.9	97.6	96.5	96.2	97.6	97.7	98.6	98.4	97.80%					
<b>Nitrogen Series</b>																		
Influent Average NH3+4 (mg/l)	34.52	48.95	32.05	26.36	25.13	28.3	31.1	29.95	36.58	33.46	35.03	32.1	32.81	91.8				
Influent Average TKN (mg/L)	51.84	55.1	66.4	38.08	39.78	38.5	40.04	44.05	49.53	43.98	46.1	50.43	47.1	108				
Effluent Average NH3+NH4 (mg/L)	0.1	0.45	0.33	0.28	0.1	0.1	0.1	0.13	0.1	0.1	0.1	0.5	0.19	1				2
Effluent Average Nitrate (mg/L)	3.81	5.48	4.98	5.65	2.89	6.26	10.02	11.28	10.04	7.37	3.24	3.92	6.24	12.7				
Effluent Average Nitrite (mg/L)	0.03	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.48	0.07	1.19				
Effluent TKN (mg/L)	1.16	1.45	1.05	2.4	1.13	1.2	1.3	2	1.18	0.92	0.8	2.73	1.45	7.8				
<b>pH</b>																		
Influent Average pH	7.26	7.22	7.02	7.37	7.24	7.52	7.34	7.39	7.17	7.26	7.08	7.09	6.18	7.25	7.82			
Effluent Average pH	8.11	8.19	8.17	8.28	8.25	8.27	8.22	8.22	8.16	8.02	8.1	8.06	7.6	8.17	8.58			
UV Disinfection																		
Average UV Intensity	24.28	13.94	31.44	42.83	41.31	34.29	40.28	46.27	43.83	30.62	31.37	18.48	33.3	59.6				
<b>Disinfection</b>																		
E.Coli Geo.Mean per 100mL	2	2	2	2	3	3	2	2	3	2	2	2	2	2	12			100

\* Note: The Effluent Ammonia limit from December 1<sup>st</sup> to April 30<sup>th</sup> is 4 mg/l  
 Values exceeding Monthly Effluent limits have been highlighted red  
 Values exceeding Monthly Effluent Objectives have been highlighted yellow

## **Effluent Objectives**

In 2024 there were 3 months (July, August & September) that the Total Phosphorus (0.10 mg/l) objective was not met. The objective for Total Suspended Solids (5mg/l) was not met for the months of January, August, and September. See the Teeswater Compliance Report (Page 5) for more details.

## **Operating Problems**

During 2024 there were no major Operating problems.

## **Maintenance and Events**

Additional maintenance other than routine maintenance included:

**April 2** - Hays onsite to replace the Headworks Building dangerous atmosphere buzzer and light

**May 9** - New power supply installed at the main SPS

**August 14** - Hays installed new wet well level sensor for the on site pumping station

**December 9** - Formosa Pump #2 was removed from service. A replacement pump is to be installed in 2025.

## **QA/QC Measures**

1. Dissolved Phosphorus tests were used to indicate the required Alum dosage.
2. pH measurements were taken to ensure levels were between 6.0 and 9.0 and water quality.
3. Dissolved oxygen was measured to ensure that adequate aeration is being carried out.
4. Mixed liquor suspended solids and 30 minute settling tests are used to determine adequate microbiological populations and to set the sludge wasting rates.

All required regulatory and ECA analyses were performed by SGS Labs. In addition, routine in house laboratory sampling was undertaken to ensure compliance. These tests include: 30 minute Settling, Suspended Solids, Final Effluent Total Phosphorus, pH, and temperature.

Filamentous Bacteria analysis was completed by GAP Labs.

## **Monitoring Equipment**

The following is a list of the monitoring equipment at the Teeswater WWTP:

- Hach DR 2800 – Total Phosphorus, Dissolved Phosphorus, Ammonia, Total Solids (Effluent)
- Hach HQ 40d– pH, Dissolved Oxygen, Temperature (Effluent, and SBR Tanks)
- Endress Hauser online Analyzer - Dissolved Oxygen, Temperature (SBR Tanks)
- Digital Scale for MLSS and TSS (Effluent, SBR Tanks)
- Lab Oven for MLSS and TSS (Effluent, SBR Tanks)

## **Calibration and Service of Equipment**

- July 3, 2024 – Annual inspection of lifting equipment.
- April 8, 2024 - Calibration of flow monitoring equipment at the Wastewater Treatment Plant and Teeswater Collection System
- June 6, 2024 - Calibration of gas detectors by Hetek
- November 6, 2024 – Calibration of gas detectors by Hetek

## **Bio Solids Volume**

In 2024 approximately 5,349 m<sup>3</sup> of Biosolids were hauled and land applied. Based on the volume of Sludge that was in the holding tank compared to the prior year the total volume generated was approximately 5,556 m<sup>3</sup>. The hauled Bio-Solids were applied to the following sites: Gowland (NASM #24460), Batte (NASM#23697), Gowland (NASM #22521).

Overall the Biosolids production increased by 1458 m<sup>3</sup> in 2024 compared to 2023. Biosolids production can vary due to a number of factors. Based on plant operations and biosolids production so far in 2025 we expect the total volume to be similar to 2024.

## **Customer Complaints**

2024 (Throughout) – Odor complaints continued to be received from Formosa residents, however the number of residents with complaints appears to have been reduced. Veolia and South Bruce will continue to take additional measures to further reduce odor complaints. Several sewer deodorizing units have been installed into suspect man holes. Additionally, more frequent sewer main flushing has been implemented. In May of 2020 smoke testing was conducted to help identify odor sources from the sewer system. This also helped identify issues with some of the property owner's plumbing.

In 2024 further studies were completed to identify the causes of the issue. The results of the study are going to be analyzed in 2025, and used to come up with the best strategy moving forward.

**Information for the District Manager**

No additional information was known to have been requested from the District Manager.

**Recommendations**

No significant recommendations at this time.

**By-Passes**

There were no by-passes or spills to report for 2024.

**Table 2 BYPASS AND OVERFLOW SUMMARY FOR 2024**

MONTH	Primary Bypass			Secondary Bypass			Plant Overflows			Collection System Overflows		
	No. of Events (events)	Duration (hours)	Volume (1000m3)	No. of Events (events)	Duration (hours)	Volume (1000m3)	No. of Events (events)	Duration (hours)	Volume (1000m3)	No. of Events (events)	Duration (hours)	Volume (m3)
January	0			0			0			0		
February	0			0			0			0		
March	0			0			0			0		
April	0			0			0			0		
May	0			0			0			0		
June	0			0			0			0		
July	0			0			0			0		
August	0			0			0			0		
September	0			0			0			0		
October	0			0			0			0		
November	0			0			0			0		
December	0			0			0			0		
<b>TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Note: An 'Event' means an occurrence or occurrences of a bypass or overflow separated by a period of more than 12 hours between the occurrence(s) or the event(s) and the previous event, at each location.