

## 2020 Year End Report: Huntsville Mountview Clean Water Plant (CWP)



Environmental Compliance Approval: # 1-0088-67-763806

Engineering and Public Works Department

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## Introduction

The Huntsville Mountview Clean Water Plant (CWP), which services the Town of Huntsville, is owned and operated by the District Municipality of Muskoka. The plant is located at 20 Mountview Drive, Huntsville. It services a population of approximately 9,000 people.

The Plant operates under the Ministry of Environment and Climate Change (MOECC) Environmental Compliance Approval (ECA) (Sewage) #1-0088-67-763806, and as amended May 13 2010, and MOECC ECA (Air) # 1771-7FJJZ5, issued June 2008. Under the terms of the ECA, the plant is permitted to treat an average daily flow of 3,640 m<sup>3</sup>/day, and a peak flow of 13,638 m<sup>3</sup>/day. Additionally, effluent limit criteria are as follows:

Table 1 Effluent Limit Criteria

Effluent Parameter	Concentration
CBOD	15 mg/L
Total Suspended Solids	15 mg/L
Total Phosphorous	0.50 mg/L 227.9 kg/year (combined with the Huntsville Golden Pheasant CWP)

The plant is comprised of two separate facilities, both of which are conventional activated sludge treatment processes, consisting of primary and secondary clarifiers with aeration basins. Disinfection is accomplished by chlorination. The facility is also equipped with anaerobic digesters for bio-solids stabilization. The initial plant was commissioned in 1958 and is capable of handling approximately one-third of the total treatment capacity of the facility. The remaining portion of the plant was commissioned in 1976.

Waste sludge from the plant process is digested anaerobically at the plant and periodically hauled off site for disposal.

## General Information

A review of the District of Muskoka's infrastructure needs is conducted annually by the Director of Water and Sewer Services, Area Manager and Chief Operator, and recommendations for maintenance, rehabilitation and renewal programs are considered.

Efforts to eliminate the discharge of untreated or partially treated wastewater to receiving waters are being accomplished by a long term financial commitment to correct excessive infiltration into the wastewater collection system by means of sewer main rehabilitation / replacement, manhole rehabilitation and pumping station rehabilitation programs.

The treatment facility is capable of effective operation during emergencies; maintenance shut downs, and power failures. This is achieved through such measures as preventive maintenance of duty / standby units, the duplication of major treatment components, the provision of standby power sources and extensive use of the SCADA systems. All pumping stations and treatment control systems use SCADA (Supervisor control and Data Acquisition), in combination with Data Highway Plus, and programmable logic controllers.

All operators are qualified to operate the systems efficiently and effectively in order to achieve the highest level of treatment at all times. A commitment to provide Operator training and certification is being sustained.

Regulatory sampling is carried out to meet the requirements outlined in the ECA, and additional in house operational sampling beyond these regulatory requirements is being performed on a routine basis. These efforts have resulted in an effective treatment process which ensures that effluent discharges consistently meet effluent objectives and are environmentally safe. All final effluent sample results for the MBR facilities met their effluent limits.

All data in this report is a compilation of test results received from SGS Canada and their accredited laboratory, Lakefield Research. All in-plant sampling, analysis and recording of results conforms, in order of precedence, to the following 3 standards: Ministry's Procedure F-10-1, "Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works", Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" and the American Water Works Association/Water Environment Federation (AWWA/WEF) publication "Standard Methods for the Examination of Water and Wastewater".

### Executive Summary

In all respects, test results of the treated effluent for the parameters of CBOD5, suspended solids, ammonia, total phosphorous, and E. Coli are in compliance with the limits outlined in the ECA regarding monthly allowable concentrations and total effluent loading throughout the entire year.

Overall, the plant treatment processes performed satisfactorily and are deemed to be adequate. All sample test results of the final effluent were within levels outlined in the plant ECA (#1-0088-67763806).

### Quantity of Flow Summary

The plant has a daily average flow design capacity of 3,640 m<sup>3</sup>/day. The actual average daily flow for the 2020 was 2,820m<sup>3</sup>/day, however, the 3 year average is 2,899m<sup>3</sup>/day, which represents 80% of the plant capacity. None of the individual system components exceeded the design flow rating.

### Plant Operational Upsets or Process Failures

There were no plant operational problems in 2020.

### Summary of Maintenance

There were no significant plant upgrades on major infrastructure in 2020.

All equipment information at this plant is entered into a computer database. From this information, a scheduled preventive maintenance program has been established. The maintenance program includes (and not limited to):

- Monthly testing (under load) of the standby generators.
- Annual servicing of emergency standby generators.
- Annual calibration of flow metering devices.
- Annual cleaning of all sewage pumping stations if required.
- Marine inspection of effluent outfall and diffuser completed in 2017. (5-year cycle)

### Evaluation of the Need for Improvement Works

The treatment facility is operating at a plant capacity of 80% and is in compliance with specified effluent parameter criteria. In addition, there has been no significant treatment process upsets and plant bypasses. Planning work to convert the Mountview Clean Water Plant to a sewage pump

station continued in 2020. A request for proposal was issued and qualified consulting firm (Ainley Group) selected to commence the design of the replacement pump station and sewage forcemain to the Golden Pheasant Clean Water Plant. This conversion project is expected to be put out to tender in spring 2021 with expected completion of construction 2022.

### Evaluation Summary of Proposed Work Requiring Approval under OWRA

Mountview Clean Water Plant has long been planned for conversion to a pumping station which directs flow to the Golden Pheasant Clean Water Plant. This project will complete design and begin construction in 2021. These changes to the works will require approval under OWRA and pre-consultation is expected in early 2021 to address this requirement.

### Interpretation of Analytical Results

All sample results for Raw Sewage and Final Effluent are reported in this section. Other tables in this report include Chemical Usage, Biosolids Quality, and Biosolids Quantity.

### Raw Sewage

The information reported in the Raw Sewage sample results summary table consists of test results of analysis conducted on composite samples of the plant influent flow as required by the plant ECA. Samples are sent for analysis to Lakefield Research, as well as analysis conducted on site using Standard Methods or equivalent. Weekly analysis has been performed and reported as specified under the terms outline in the ECA.

### Influent Analysis

*Table 2 Influent Analysis*

Influent Parameter	Minimum	4 Week Average Maximum	Annual Average	Average Loading kg/day
BOD5 (mg/L)	65	327	176	496.3
Suspended Solids (mg/L)	35	928	244	688.1
Total Phosphorus (mg/L)	0.83	6.50	2.91	8.2
Total Ammonia Nitrogen (mg/L)	8.0	30.5	21.2	59.8

### Effluent Analysis

The information reported in the Final Effluent sample results summary table 3 consists of test results of analysis conducted on final effluent composite samples. Bacteriological samples, however, consisted of grab samples. Weekly analysis has been performed and reported as specified under the terms outlined in the ECA.

### Effluent Objective Analysis

The effluent concentration limits were met during all sample periods.

### Final Effluent Analysis Summary

All final effluent samples tested for CBOD5, suspended solids, ammonia, E. Coli, and total phosphorous were below non-compliance limits outlined in the ECA.

Table 3 Final Effluent Analysis Summary

Parameter	Minimum	4 Week Average Maximum	Annual Average	Average Loading kg/day
COBD5 (mg/L)	2	5	3	8.5
Suspended Solids (mg/L)	2	9.5	6.5	18.3
Ammonia (mg/L)	4.5	22.4	9.6	27.1
E. Coli (#/100 mL)	0	665	181.2	N/A
Total Phosphorus (mg/L)	0.06	0.32	0.19	0.54
pH	6.71	7.66	7.29	N/A

Average daily flow comparisons by day of week ensure ECA requirements for scheduled sampling are taken at a time, and in a location characteristic of the quality and quantity of the sewage stream over the time period being monitored. Average daily flow rates by day of the week compare the flow to the average daily flow for the entire year. This data is used to determine if a particular day of the week is best to ensure samples are taken to meet the requirements of scheduled monitoring sections of the ECA's. Sampling plans are reviewed and updated yearly based on the previous yearly flow data.

#### Final Effluent Sampling Summary

All samples were collected following the frequency and methods required by the facility approval. For the coming year, 2021, no changes to the sampling plan are being considered at this time.

#### Biosolids Generation

The quality and volume of biosolids hauled from the facility for disposal is outlined in the table provided. Thickened liquid sludge from the plant was hauled to Golden Pheasant Clean Water Plant by K&K Sanitation for further processing and will continue to do so in 2021. It is not anticipated that there will be a significant increase in the total volume of bio solids produced in 2021.

#### Summary of Complaints received throughout the reporting period

There were no complaints received in the reporting period.

#### Huntsville Mountview Wastewater Collection Summary

##### New Sewer Services:

A total of 75 customers connected to existing sewer laterals in 2020 as well as three (3) new laterals installed.

1. One 150 mm PVC sewer service installed by owner's contractor. This service is located at 10 Hilltop Dr.
2. One 125mm PVC sewer service installed by owner's contractor. This service is located at 19 Hodges Ln.
3. One 125mm PVC sewer service installed by owner's contractor. This service is located at 13 Florence St W

##### New Sewer Mains:

A total of 89 meters of 200 mm gravity sewer was installed in 2020 on Tristan Lane by owner's contractor.

##### Sewer Main Replacements:

A total of 277 meters of 250 mm gravity sewer was replaced in 2020 on Earls Rd as part of District of Muskoka capital projects. A total of 784 meters of 250 mm gravity sewer was replaced in 2020 on King William St as part of District of Muskoka capital projects.

#### Low Pressure Sewer Breaks:

There were no low pressure sewer breaks in 2020.

#### Sewer Force Main Breaks:

There were no sewer forcemain breaks in 2020.

#### Sewer Force Main Replacement

There were no sewer force mains replaced in 2020.

#### Main Line Sewer Blockage

District of Muskoka had one sewer main blockage in 2020. Re-coverable cost was \$4996.25 to clear and clean blockage.

#### Sewer Lateral Blockage

District of Muskoka had 1 sewer lateral blockage in 2020, Re-coverable cost was \$3692.09 to repair damaged sewer lateral. Interference by another utility caused this issue.

#### Service Low Pressure Sewer Blockages:

There were no low pressure sewer blockages in 2020.

#### Frozen Sewer Force Mains:

There were no frozen sewer force mains in 2020.

#### Frozen Sewer Service Laterals:

No sewer service laterals froze in 2020.

#### Frozen Low Pressure Sewer Services:

No low pressure sewer services froze in 2020.

#### Sewer Flushing/Video:

A total of 14824 meters of sewer main was flushed in 2020. A total of 3569 meters of sewer main was video inspected in 2020.

#### Sewer Locates:

There were 1101 sewer locate requests addressed in 2020.

Table 4 Effluent Flow Summary - 2020

<b>Month</b>	<b>Plant Total Monthly (m<sup>3</sup>)</b>	<b>Average Day Flow (m<sup>3</sup>/d)</b>	<b>Maximum Day Flow (m<sup>3</sup>/d)</b>	<b>Minimum Day Flow (m<sup>3</sup>/d)</b>	<b>Lagoons Monthly Flow (m<sup>3</sup>)</b>	<b>Facility Total Monthly Flow (m<sup>3</sup>)</b>
<b>January</b>	72,653	2,344	3,851	2,079	n/a	72,653
<b>February</b>	57,319	1,849	2,245	1,808	n/a	57,319
<b>March</b>	109,179	3,522	6,312	1,992	n/a	109,179
<b>April</b>	103,493	3,338	4,927	2,679	n/a	103,493
<b>May</b>	85,254	2,750	3,383	2,418	n/a	85,254
<b>June</b>	70,272	2,267	2,701	2,128	n/a	70,272
<b>July</b>	74,061	2,389	3,136	1,941	n/a	74,061
<b>August</b>	89,398	2,884	4,467	2,175	n/a	89,398
<b>September</b>	92,444	2,982	4,096	2,497	n/a	92,444
<b>October</b>	93,432	3,014	3,811	2,641	n/a	93,432
<b>November</b>	90,226	3,008	3,493	2,683	n/a	90,226
<b>December</b>	91,583	2,954	5,035	2,399	n/a	91,583

Total Flow: 1,029,313  
 Average Day: 2,820  
 Maximum Day: 6,312  
 Minimum Day: 1,808

Table 5 Influent Quarterly Analysis Summary – Weekly 24 Hour Composite Sample Part 1

Sample Date	Sample Identification Number	BOD5 mg/L	Phosphate	Total Phosphorus mg/L	Suspended Solids mg/L
Feb. 5, 2020	CA13142-FEB20	289	1.56	3.04	303
May-06-20	CA12161-MAY20	65	1.58	2.50	53
Aug. 5, 2020	CA13187-AUG20	117	1.92	2.96	148
Nov. 11, 2020	CA12371-NOV20	126	1.76	2.38	67
<b>Yearly Average</b>		149.3	1.71	2.72	142.8
<b>Maximum</b>		289	1.92	3.04	303
<b>Minimum</b>		65	1.56	2.38	53



Table 6 Influent Quarterly Analysis Summary – Weekly 24 Hour Composite Sample Part 2

Sample Date	Sample Identification Number	Total Kjeldahl Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Total Ammonia Nitrogen mg/L
Feb. 5, 2020	CA13142-FEB20	30.4	<0.06	<0.03	24.3
May-06-20	CA12161-MAY20	26.6	<0.06	<0.03	19.6
Aug. 5, 2020	CA13187-AUG20	27.6	<0.06	<0.03	23.2
Nov. 11, 2020	CA12371-NOV20	27.3	<0.06	<0.03	22.7
<b>Yearly Average</b>		28.0	0.06	<0.03	22.5
<b>Maximum</b>		30.4	0.06	<0.03	24.3
<b>Minimum</b>		26.6	0.06	<0.03	19.6

Table 7 Chemical Usage Summary: Clarion A405P

Month	Average Dosage mg/L	Total kg (dry)
January	57.3	4,099.3
February	67.4	3,852.3
March	41.2	4,029.7
April	38.2	3,877.6
May	47.4	3,890.3
June	55.7	3,890.3
July	54.3	3,826.9
August	46.2	3,865.0
September	43.3	3,909.3
October	48.0	4,295.8
November	47.9	4,308.5
December	48.3	4,333.8
Average	49.6	4014.9

Total Yearly Kilograms: 48,179

Table 8 Chemical Usage Summary: Chlorine Gas

<b>Month</b>	<b>Average Dosage mg/L</b>	<b>Total kg (dry)</b>
January	1.0	72.2
February	0.9	52.7
March	1.2	142.3
April	1.0	109.6
May	1.0	83.7
June	1.4	98.7
July	1.7	122.7
August	1.7	144.7
September	1.7	160.9
October	1.7	151.4
November	1.7	147.5
December	1.8	163.9
Average	1.4	120.9

Total Yearly Kilograms: 1,450.3

Table 9 Effluent Quarterly Analysis Summary – Weekly 24 Hour Composite Sample Part 1

Sample Date	Sample Identification Number	CBOD5 mg/L	pH	Phosphate	Total Phosphorus mg/L	Suspended Solids mg/L
Feb. 5, 2020	CA13142-FEB20	6	7.48	<0.03	0.17	9
May-06-20	CA12161-MAY20	2	7.48	<0.03	0.12	4
Aug. 5, 2020	CA13187-AUG20	3	7.48	0.10	0.30	6
Nov. 11, 2020	CA12371-NOV20	<2	7.22	<0.03	0.13	5
<b>Yearly Average</b>		3.3	7.42	0.05	0.18	6
<b>Maximum</b>		6	7.48	0.10	0.30	9
<b>Minimum</b>		2	7.22	0.03	0.12	4

Table 10 Effluent Quarterly Analysis Summary – Weekly 24 Hour Composite Sample Part 2

Sample Date	Sample Identification Number	Total Kjeldahl Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Total Ammonia Nitrogen mg/L
Feb. 5, 2020	CA13142-FEB20	20.4	7.2	0.20	19.6
May-06-20	CA12161-MAY20	11.9	10.0	0.30	9.5
Aug. 5, 2020	CA13187-AUG20	11.6	5.1	0.21	10.4
Nov. 11, 2020	CA12371-NOV20	7.4	13.7	0.64	5.6
<b>Yearly Average</b>		12.8	9.0	0.34	11.3
<b>Maximum</b>		20.4	13.7	0.64	19.6
<b>Minimum</b>		7.4	5.1	0.20	5.6

Table 11 Effluent Loading and Concentration Summary 2020: CBOD5

<b>Month</b>	<b>Average mg/L</b>	<b>Average kg/day</b>	<b>Maximum Daily kg/day</b>
<b>January</b>	3.25	7.62	12.52
<b>February</b>	4.75	8.78	10.66
<b>March</b>	2.75	9.69	17.36
<b>April</b>	2.00	6.68	9.85
<b>May</b>	2.00	5.50	6.77
<b>June</b>	3.00	6.80	8.10
<b>July</b>	3.25	7.76	10.19
<b>August</b>	2.50	7.21	11.17
<b>September</b>	2.20	6.56	9.01
<b>October</b>	2.00	6.03	7.62
<b>November</b>	2.25	6.77	7.86
<b>December</b>	2.40	7.09	12.08
<b>Average Monthly</b>	2.70	7.21	10.27
<b>Effluent Objective</b>	N/A	N/A	N/A
<b>Non-Compliance</b>	15.0	46.07	46.07

Table 12 Effluent Loading and Concentration Summary 2020: Suspended Solids

<b>Month</b>	<b>Average mg/L</b>	<b>Average kg/day</b>	<b>Maximum Daily kg/day</b>
<b>January</b>	6.25	14.65	24.07
<b>February</b>	8.50	15.72	19.08
<b>March</b>	8.25	29.06	52.07
<b>April</b>	5.80	19.36	28.58
<b>May</b>	3.50	9.63	11.84
<b>June</b>	6.00	13.60	16.21
<b>July</b>	4.50	10.75	14.11
<b>August</b>	6.50	18.74	29.03
<b>September</b>	8.20	24.45	33.59
<b>October</b>	6.25	18.84	23.82
<b>November</b>	7.00	21.05	24.45
<b>December</b>	6.60	19.50	33.23
<b>Average Monthly</b>	6.45	17.95	25.84
<b>Effluent Objective</b>	N/A	N/A	N/A
<b>Non-Compliance</b>	15	46.07	46.07

Table 13 Effluent Loading and Concentration Summary 2020: Total Ammonia Nitrogen Summer

<b>Month</b>	<b>Average mg/L</b>	<b>Average kg/day</b>	<b>Maximum Daily kg/day</b>
<b>May</b>	7.48	20.57	25.31
<b>June</b>	6.64	15.05	17.94
<b>July</b>	5.33	12.73	16.72
<b>August</b>	11.05	31.87	49.36
<b>September</b>	6.36	18.97	26.05
<b>Average Monthly</b>	7.37	19.84	27.07
<b>Effluent Objective</b>	N/A	N/A	N/A
<b>Non-Compliance</b>	N/A	N/A	N/A



Table 14 Effluent Loading and Concentration Summary 2020: Total Ammonia Nitrogen Winter

<b>Month</b>	<b>Average mg/L</b>	<b>Average kg/day</b>	<b>Maximum Daily kg/day</b>
<b>January</b>	11.80	27.65	45.44
<b>February</b>	21.75	40.22	48.83
<b>March</b>	15.75	55.47	99.41
<b>April</b>	12.22	40.80	60.21
<b>October</b>	7.18	21.64	27.36
<b>November</b>	4.68	14.08	16.35
<b>December</b>	6.40	18.91	32.22
<b>Average Monthly</b>	11.40	31.3	47.1
<b>Effluent Objective</b>	N/A	N/A	N/A
<b>Non-Compliance</b>	N/A	N/A	N/A

Table 15 Effluent Loading and Concentration Summary 2020: Fecal Coliform

<b>Month</b>	<b>#/100mL</b>	<b>Maximum Daily (#/100mL)</b>
<b>January</b>	146.75	216.00
<b>February</b>	1094.00	3400.00
<b>March</b>	58.75	81.00
<b>April</b>	529.80	1300.00
<b>May</b>	112.00	300.00
<b>June</b>	45.80	112.00
<b>July</b>	47.50	107.00
<b>August</b>	2.75	5.00
<b>September</b>	84.20	380.00
<b>October</b>	11.50	15.00
<b>November</b>	9.00	29.00
<b>December</b>	2.80	14.00
<b>Average Monthly</b>	178.7	496.6
<b>Effluent Objective</b>	N/A	N/A
<b>Non-Compliance</b>	N/A	N/A

Table 16 Effluent Loading and Concentration Summary 2020: Total Phosphorus

<b>Month</b>	<b>Average mg/L</b>	<b>Average kg/day</b>	<b>Maximum Daily kg/day</b>
<b>January</b>	0.12	0.28	0.46
<b>February</b>	0.22	0.41	0.49
<b>March</b>	0.23	0.81	1.45
<b>April</b>	0.17	0.57	0.84
<b>May</b>	0.11	0.30	0.37
<b>June</b>	0.17	0.39	0.46
<b>July</b>	0.19	0.45	0.60
<b>August</b>	0.34	0.98	1.52
<b>September</b>	0.32	0.95	1.31
<b>October</b>	0.19	0.57	0.72
<b>November</b>	0.13	0.39	0.45
<b>December</b>	0.13	0.38	0.65
<b>Average Monthly</b>	0.19	0.54	0.78
<b>Effluent Objective</b>			
<b>Non-Compliance</b>	0.50	892 kg/year	892 kg/year

Table 17 Liquid Sludge Production Summary 2020

<b>Month</b>	<b>Hauler</b>	<b>Liquid Volume m<sup>3</sup></b>	<b>Destination</b>
<b>January</b>	K&K	634.56	Golden Pheasant CWP
<b>February</b>	K&K	456.14	Golden Pheasant CWP
<b>March</b>	K&K	489.9	Golden Pheasant CWP
<b>April</b>	K&K	458.02	Golden Pheasant CWP
<b>May</b>	K&K	533.86	Golden Pheasant CWP
<b>June</b>	K&K	573.28	Golden Pheasant CWP
<b>July</b>	K&K	610.48	Golden Pheasant CWP
<b>August</b>	K&K	559.48	Golden Pheasant CWP
<b>September</b>	K&K	510.36	Golden Pheasant CWP
<b>October</b>	K&K	515.13	Golden Pheasant CWP
<b>November</b>	K&K	575.62	Golden Pheasant CWP
<b>December</b>	K&K	551.64	Golden Pheasant CWP

Yearly Total Volume: 6,468.5  
 Yearly Average Volume: 539.0  
 Maximum Volume: 634.6  
 Minimum Volume: 456.1

Table 18 Sludge Quality Analysis 2020

<b>Parameter Sampled (mg/L)</b>	<b>First Quarter</b>	<b>Second Quarter</b>	<b>Third Quarter</b>	<b>Fourth Quarter</b>
Date	Feb. 5/20	May 6/20	Aug. 5/20	Nov. 11/20
Sample ID	Digester Sludge	Digester Sludge	Digester Sludge	Digester Sludge
Nitrate	<0.3	<0.3	<0.3	<0.3
Mercury	0.005	0.004	0.006	0.005
Chromium	0.28	0.2	0.26	0.26
Cobalt	0.04	0.04	0.04	0.04
Copper	5.5	4.6	5.5	5.9
Lead	0.2	0.2	0.2	0.20
Molybdenum	0.10	0.07	0.09	0.11
Nickel	0.18	0.16	0.16	0.15
Selenium	<0.1	<0.1	<0.1	<0.1
Arsenic	<0.1	<0.1	<0.1	<0.1
Zinc	8.0	7	8	8
Cadmium	0.012	0.013	0.011	0.014
Ammonia+ Ammonium	554	482	465	481
Total Kjeldahl Nitrogen	1220	1080	1130	890
Total Phosphorus	410	320	380	370
Total Solids	13500	12200	14000	13200
Volatile Solids	<40	<40	112	<40
Nitrite	<0.2	<0.2	<0.2	<0.2

## Certification of Reports

I certify that the information in this document and all attachments are correct, accurate, and complete to the best of my knowledge

Marcus Firman, C.E.T.  
Director, Water and Wastewater Services

Mark Pringle, C.E.T.  
Manager of Water and Wastewater Operations