Owen Sound Drinking Water System
Annual Summary Report 2022

Richard H. Neath Water Treatment Plant

"Photo by Julia Wells, Owen Sound"

Prepared by:

Troy Pelletier- Water Treatment Superintendent
Mike Duncan- Water Distribution Superintendent

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1.0 Introduction

Purpose

The purpose of this report is to meet the Ministry of the Environment, Conservation and Parks (MECP) annual reporting requirements set out in the Safe Drinking Water Act, Ontario Regulation 170/03 Section 11, and Schedule 22.

Under Ontario Regulation 170/03, Section 11, the follow information is required;

- a brief description of the water system and a list of water treatment chemicals used;
- a summary of adverse test results and other issues associated reported to the Ministry that are non-adverse;
- a summary of corrective actions taken under Schedule 17 during the reporting period;
- a summary of test results required under this regulation, or other approvals or orders;
- provide any major expenses incurred which cover, installation, repair or replacement;
- the locations where a report is available;
- a copy of this report will be given to Meaford, as Owen Sound provides water to Leith residents.

The Section 11 requirements listed above are located in Appendix 2of this report.

Under Schedule 22, the Summary Report will include;

- List of the requirements of the Safe Drinking Water Act, Ontario water regulations, permits and licenses; and any deviations from them;
- Any requirements not met, the duration of the failure and the measures that were taken to correct the failure ;
- a summary of the quantities and flow rates including monthly average and maximum day flows;
- a comparison to the rate capacity and flow rates approved by the system's approval, drinking water works permit or municipal drinking water license;
- a copy of this report shall be given to Council by March 31.

2.0 Compliance

This section will reference the list of requirements by various Acts, regulations, and licenses and any non-compliance to report.

Municipal Drinking Water License (MDWL) 094-101

Schedule B (General Conditions)

1. This License (MDWL Issue 5) was current and active since it came into effect.
2. The owner will prepare an application for renewal by the requested due date. The next renewal application is due by April 1st, 2025.
3. The owner has ensured that any persons working or operating in the system is familiar with all applicable regulations and permits associated with this drinking water system.
4. A copy of the License and Drinking Water Works Permit (DWWP) is available to all persons involved in the operation of the drinking water system.
5. The owner is following the Permit to Take Water (PTTW), as identified in Schedule A of this License.
6. The owner is following the DWWP as identified in Schedule A of this License.
7. The City has complied with the requirement of having a financial plan, and was presented to Council in 2020.
8. There was no information request by a Director or provincial officer concerning the system or its operation.
9. Records are kept beyond the 5 year requirement.
10. All chemicals used in the system meet the ANSI NSF 60/61 and NSF 372 applicable standards, and are available.
11. Plant drawings are up to date. New drawings are available with updated information, if applicable.
12. An up-to-date operation and maintenance manual is available. A lot of the original equipment is stored using a large file system, and operation manuals for newer projects are stored in project binders.
13. Copies of the CT calculations, UV validation certificate and UV validated operating conditions documentation are available in the Operations manual.
14. There are procedures to deal emergencies, upset conditions and equipment breakdowns.
15. There are procedures for dealing with water complaints.

Schedule C (System-Specific Conditions)

1. The treatment subsystem did not exceed the rated capacity of the water plant of 27,300 m3/day.
2. For Residue Management, the annual average concentration did not exceed 25 mg/L for Total Suspended Solids, and no samples exceeded the chlorine residual of 0.00 mg/L of Free Chlorine.
3. The continuous pass-through UV dose met the required 40 mJ/cm^2 on all filters. The UV system maintains 45 mJ/cm2 as a minimum requirement to help maintain any drops in UV dosage. There were a number of intermittent drops in UV dose on various filters, that are linked to a calculation issue with the reactors, the UV's were working normally during these events, and our Vendor is continually working on remediating the issue.
4. The UVT monitor met the required testing frequency.
5. There were no monthly reports required to report UV alarms as per the MDWL. Critical alarms that are detected by the monitoring equipment are programmed to shut down the filter by closing the effluent valves to prevent water entering the clearwells without UV disinfection.
6. Continuous flow measurements were recorded for flow rate and daily volume on water flowing into the treatment system and water entering the distribution system.
7. Flow measuring devices were checked and calibrated. This was completed November 2022.
8. Calibration of CT Monitoring equipment is completed by staff, and a third party company for flow meter and temperature calibrations.
9. Additional sampling identified for Aluminum was checked within the stated time frame.
10. Testing of Total Suspended Solids (TSS) was conducted as per the requirements of the MDWL.
11. Harmful algal blooms have not been detected at any time at this facility and testing has not been implemented.
12. The Owner has developed a Harmful Algal Bloom monitoring, reporting and sampling plan, and was implemented by April 5th, 2021.

Schedule D (Conditions for Relief From Regulatory Requirements)

1. As per the updated MDWL issued October 20th, this section has no requirements.

Schedule E (Pathogen Log Removal / Inactivation Credits)

1. The log removal for Cryptosporidium (2), Giardia (3), and Viruses (4) was met throughout the reporting period.

2. Chemical coagulant was used at all times during this reporting period, except for one issue with the coagulant tubing (AWQI# 158096). This was rectified quickly with little impact to the drinking water system.
3. Duty UV sensors were being checked on a monthly basis as per the MDWL requirements. The master reference sensor is required to be calibrated by TrojanUV, the manufacturer, every 3 years. The last calibration was within the current 3 year period. The UV system has built-in features that if a UV reactor fails, all flow through the filter stops. Also, UV lamp status is available and all UV sensors are operating within their calibration specifications.
4. All UV system components were purchased from the UV manufacturer.
5. Sampling and testing of free chlorine was carried out by continuous monitoring equipment, and CT provided was greater than the CT required.

Drinking Water Works Permit 092-202

Requirements set out in this Permit have been complied with.

Ontario Regulation 170/03

1. Section 11 (as noted in the introduction) requires various components that are detailed in Appendix 2.
2. Schedule 22 (as noted in the introduction) is prepared within this report.

Safe Drinking Water Act, 2002

Requirements set out in this Act have been complied with.

Technical Support Document for Ontario Drinking Water Standards, Objectives and Guideline, 2006

The Operation guideline for aluminum is 0.100 mg/L, out of 52 samples checked, 9 samples exceeded this guideline, with a maximum value at 0.185 mg/L. As this technical document states; *"Medical studies have not provided clear evidence that residual aluminum has any effect on health."*

3.0 Uncommitted Hydraulic Reserve Calculation

The need to perform Water and Wastewater Uncommitted Hydraulic Reserve Calculations was identified in a February 16, 2022, Management Review meeting of the City's Drinking Water Quality Management System. The need was in light of a development freeze imposed on a neighbouring municipality.

Staff Report OP-22-050, Water and Wastewater Uncommitted Reserve Capacity Calculations was presented to the City's Operations Advisory Committee on November 8th, 2022.

The MECP D-5-1 Guideline- Calculating and Reporting Uncommitted Reserve Capacity at Sewage and Water Treatment Plants was used as a reference document to prepare the Calculations.

The Calculations provide an approximation of the uncommitted or residual capacity remaining for the City's Water and Wastewater Treatment Plants after factoring in the following information:

- Wastewater Treatment Plant's average daily flow for the previous three years
- Water Treatment Plant average day peak daily flows for the previous three years
- Planned residential, commercial, and industrial developments
- Vacant residential, commercial, and industrial lands
- A population density per residential unit based on the City's and County's planning documents
- Residential flow rate based on an assumed per capita flow rate
- Commercial and vacant industrial lands flow rate based on an assumed per-hectare flow rate
- Lands zoned Rural are excluded.

Based on the 2021 Water and Wastewater Treatment Plant flows and the factors included in the Background information:

The Water Treatment Plant has an excess capacity of 2,510 m3 per day.

- This represents approximately 9.2% of treatment capacity and is a population of 6,275 people.
- Care must be taken to preserve water treatment capacity for future development opportunities within the City.

The City currently has adequate Water and Wastewater Treatment capacity for the current identified development and in the longer term.

4.0 Water Distribution Activity Summary

During 2022, the following water distribution activities occurred:

Main Breaks

- 25 main breaks
- Private Property Main Breaks –
    - Assisted with Broken main at Tenneco 1800 17th St E Fireline in Bunker House to pipe gallery.
    - Hobarts 4" domestic line broken

Hydrants

- 4 hydrants replaced by contractor
- 10 new city hydrants installed by contractor
- 3 new private hydrants installed by contractor
- 3 flush hydrant replaced by water staff
- 4 City fire hydrants rebuilt by water staff, 10 hydrants plugged by City Staff, 1 raised by city staff

Services

- 6 new water services installed in fill lot
- 148 services running to prevent freezing of water mains
- 28 service box and rod corrosion replacements by city water staff, 15 by contractor
- 5 service leaks repaired and fixed 4 services due to contractor damage
- 5 frozen services (all internal on private property)
- 6 service box repairs (new tops, lower, raise, bent)
- 10 water taps done for contractors
- 5 water service disconnected

Valves

- 5 line valves rebuilt by water staff
- 1 new water valve installed by city (not including new construction)
- 6 valve box only repaired/replaced by city water staff
- 1 line valve replaced by city (not including new construction/capital work)
- 2 line valves cutout/killed by city (leaking not needed)

New Development Involvement Commissioning/Tapping

- 17th St E/27th Ave E Development – VanDolders
- New McDonalds Development
- New Hospital Parking Lot – Watermain Relocation
- Hedera Development – 2261 9th Ave E
- 1685 9th Ave E – Development
- 2347 3rd Ave W Development – Graham Construction
- 530 28th St W Development – Barry's Construction

- 396 14th St W Development – County of Grey

Capital Construction 2022 / Projects

- New 10" watermain installed by Macdonnell Construction 16th St E from 16th Ave E to 18 Ave E
- Bayshore Road project, 3 new hydrants, 2 replaced, 5 new water services – MacDonnell Excavating
- Cathodic Protection on the following roads;
    - 6th Ave W from 10th St W Island area – 16" DI
    - 7th Ave E from 8th St E to 6th St E – 10" DI
    - 16th Ave E from 10th St E to 17th St E – 10" DI
    - 19th St W from 3rd Ave W to 6th Ave W – 12" DI
- Special locate program for 2022 Bell/Rogers Fibre
    - Bell Fibre project 2,987 man hours ± for 8 months work

Water Coordinator Call Outs

There were 190 call outs, up 39 from 2021, consisting of customer complaints, leaks, and noisy meters. Contractor requests consist of swab blowing, pressure testing, sampling, information and requests, re-locating, site meets (39), broken water mains, frozen services, plumbing inspections, and assisting distribution staff, and all other City employees etc.

Meter Readings

There were 420, up 130 from 2021 meter readings, some of these readings include customers the City had asked to run water during winter periods to prevent freezing, or a request from the utility's administrator.

Water Pressure Complaints

- There were 9 water pressure complaints, two more than 2021.

Meter Work

- 195 water meters replaced, 73 more than 2021
- 3 frozen meters changed out
- 28 new houses or businesses
- 9 touchpad repairs
- 2 removed from closed or demolished buildings
- 28 upgrades to radio-read device
- 16 meters tested by Evans Supply (3rd Party)

Hydro and Water Locates

- 2107 water and 416 street lighting locates, 906 more water locates, 309 more street light locates

NOTE: Some individual locates were an entire City block.

- 44 Traffic light locates, 29 more than 2021
- 68 emergency locates
- 4 fibre optic locates

Valve Turnings

309 turnings. Turnings of valve and curb stops are done for contractors, plumbers, customers going on vacation, non-payment, emergency leaks, etc, these turnings were 104 more than 2021.

Report Request

Copies of this Report can be found at;

- City Hall Clerk's Office – located temporarily at 945 3rd Avenue East
- City's website - https://www.owensound.ca/en/city-hall/waterwastewater.aspx
- Public Works office – 1900 20th Street East
- Water Treatment Plant – 2600 3rd Avenue East
- Owen Sound & North Grey Union Public Library – 824 1st Avenue West

APPENDIX 1 - WATER TREATMENT DATA

FLOW/CHEMICAL USAGE

Date	Municipal Highlift Flow *m3*	Industrial Highlift Flow *m3*	Total High Lift Flow *m3*	Total Raw Water Flow *m3*
January	191,478.26	28,867.82	220,346.08	239,624.99
February	183,003.16	26,227.11	209,230.27	227,826.00
March	206,221.13	31,145.50	237,366.63	255,379.09
April	185,676.78	30,019.61	215,696.39	237,310.00
May	201,070.24	32,947.69	234,017.93	264,092.18
June	201,391.21	33,985.00	235,376.21	267,778.79
July	209,024.11	38,652.23	247,676.34	282,156.80
August	209,168.86	37,034.92	246,203.78	277,759.91
September	195,562.01	32,326.56	227,888.57	254,313.24
October	200,263.88	31,539.94	231,803.82	261,741.75
November	194,535.06	31,706.13	226,241.19	243,912.15
December	190,112.75	31,015.92	221,128.67	239,227.13
AVERAGE	197,292.29	32,122.37	229,414.66	254,260.17
MIN	183,003.16	26,227.11	209,230.27	227,826.00
MAX	209,168.86	38,652.23	247,676.34	282,156.80
TOTAL M^3	**2,367,507.45**	**385,468.43**	**2,752,975.88**	**3,051,122.03**

CHEMICAL USAGE

Chemical Usage	Dates Used	Amount Used *kgs*	Avg Dose *mg/L*
PAX XL-6	Jan 1 - Jul 19, Oct 25 - Dec 31 (267 days)	24,194.40	3.66
PAX XL-1900	Jul 19 - Oct 25 (98 days)	2,882.00	1.70
Chlorine - Pre	Year-round	1,740.60	0.57
Chlorine - Post	Year-round	6,048.50	2.09
HFS	Year-round	8,125.20	0.57

NOTES:

- PAX XL-6 and PAX XL1900 are chemicals used during the coagulation stage.
- HFS = HydroFluorosilicic Acid – chemical used to add Fluoride to the water.
  - Average raw water Fluoride residual was 0.08 mg/L
- Pre-Chlorine – refers to water that is chlorinating before filtration
- Post Chlorine – refers to chlorination after the filtration process
  - Average dosage for Cl2 is measured as Total Chlorine.

TREATED MONTHLY FLOW – MIN, MAX, and AVERAGE

Month	Treated Water Flow (m3/day)			% of Design Flow
	Average	Min	Max	
January	7,099.17	6,494.19	7,672.86	
February	7,484.20	6,830.10	8,274.39	
March	7,660.59	7,066.42	8,741.84	
April	7,224.41	6,742.26	7,854.65	
May	7,593.23	6,941.13	8,817.65	
June	7,853.09	7,044.01	9,054.69	
July	8,046.55	7,370.90	8,854.28	
August	7,959.91	7,282.81	9,306.98	
September	7,593.09	7,004.12	8,207.80	
October	7,515.20	6,827.61	8,366.34	
November	7,550.03	6,504.97	10,725.96	
December	7,129.72	6,571.28	7,801.65	
Average	7,559.1			**27.7%**
Min		6,494.2		**23.8%**
Max			10,726.0	**39.3%**

NOTE: Current Design Capacity (27,300 m3/day)

2021 Annual Flow Data

	Average	Min	Max	% of Design Flow
Average	7,442.4			**27.3%**
Min		3,808.9		**14.0%**
Max			10,971.7	**40.2%**

2020 Annual Flow Data

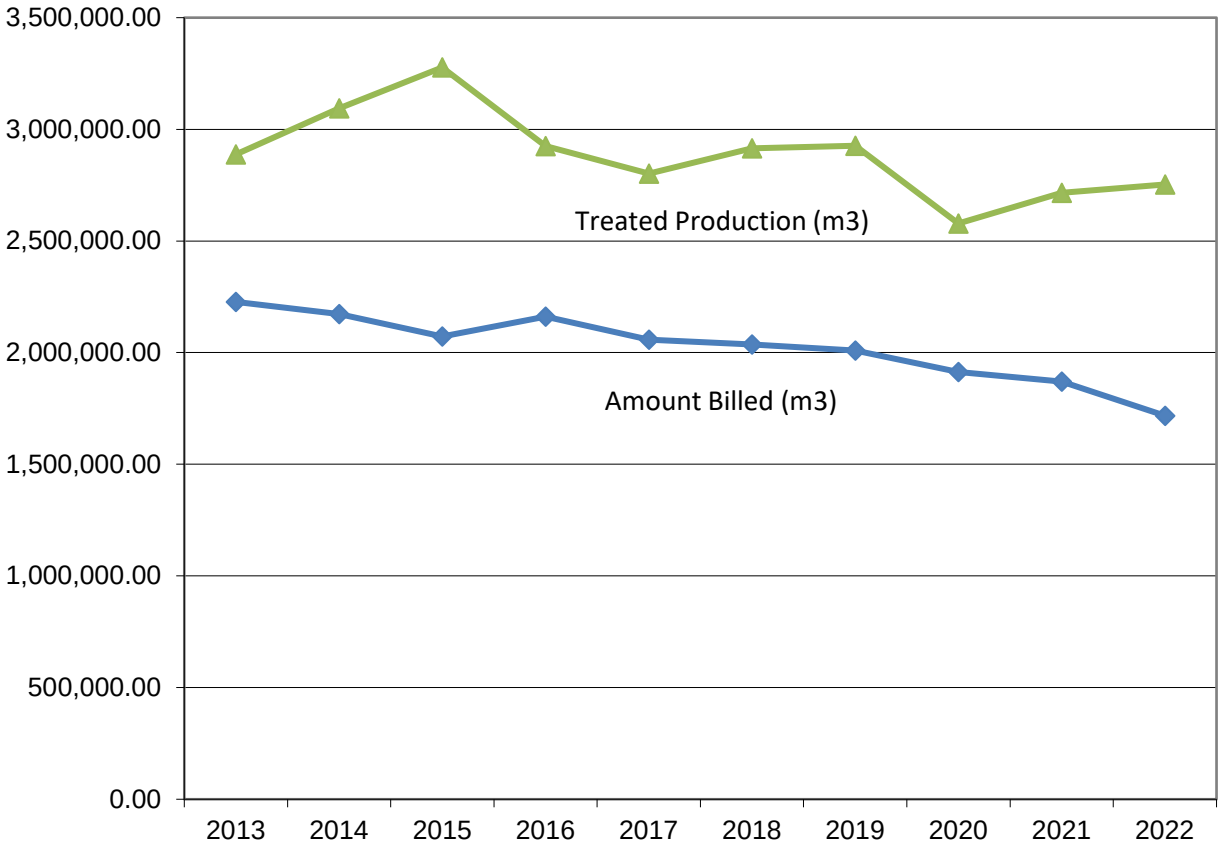
	Average	Min	Max	% of Design Flow
Average	7,045.6			**25.8%**
Min		5,385.9		**19.7%**
Max			10,371.2	**38.0%**

DAILY INSTANTANEOUS PEAK TREATED FLOW RATES (L/s)

Day	January	February	March	April	May	June	July	August	September	October	November	December
1	139.8	147.0	148.4	137.9	140.5	158.0	146.9	133.7	142.5	148.3	153.9	143.5
2	139.7	133.3	147.2	147.1	147.1	159.8	147.2	151.1	149.0	141.2	150.1	149.3
3	145.1	146.2	145.8	136.5	147.4	158.6	144.4	136.2	134.9	145.4	141.9	145.5
4	139.6	148.3	150.3	153.0	144.6	137.4	145.8	197.5	141.3	151.6	147.8	150.0
5	150.4	138.3	150.3	144.7	142.9	145.9	149.8	147.1	138.1	141.6	174.4	149.0
6	132.7	146.7	148.0	143.4	148.9	143.3	148.2	139.2	145.7	151.4	141.5	145.2
7	145.1	151.4	141.0	142.4	148.0	148.6	197.1	139.0	147.8	145.7	148.8	142.0
8	143.0	142.9	144.4	139.3	148.8	155.0	150.8	142.4	142.2	142.7	141.0	151.5
9	143.3	153.0	154.0	145.1	154.9	146.2	141.3	149.4	158.4	142.9	146.9	138.8
10	142.6	147.9	143.7	136.0	159.3	151.2	145.9	147.5	149.6	138.4	155.0	147.3
11	143.9	138.1	144.1	148.5	186.1	135.6	143.6	191.6	140.2	173.9	151.2	139.4
12	148.4	142.3	144.5	147.2	154.9	145.6	152.8	186.4	148.9	136.5	143.6	148.2
13	142.5	144.9	145.7	136.4	164.5	151.5	195.8	135.2	150.5	147.4	141.8	144.1
14	144.2	154.5	152.7	146.8	149.0	152.9	150.7	142.4	145.3	153.1	173.5	153.9
15	146.0	140.4	144.1	133.8	139.3	146.9	141.7	186.5	148.4	142.3	141.7	138.9
16	137.1	152.1	140.3	145.4	153.6	158.5	146.4	169.9	143.8	134.9	143.0	149.5
17	147.2	141.9	154.0	135.7	161.2	143.8	144.9	190.1	146.5	149.8	144.4	143.0
18	151.8	148.8	144.5	146.7	159.9	148.3	152.3	178.0	135.6	149.2	133.9	147.7
19	144.5	139.5	149.4	133.8	155.5	144.2	152.7	189.1	152.3	148.1	144.1	141.0
20	150.2	134.2	146.6	148.9	143.2	167.4	140.4	138.2	152.5	145.6	135.4	149.4
21	143.8	141.4	142.2	145.6	146.7	153.9	146.8	143.8	149.3	144.2	136.8	138.5
22	137.4	140.1	148.5	154.7	147.0	139.3	152.7	137.3	143.4	150.5	143.0	153.7
23	143.8	146.6	146.7	142.9	143.9	149.9	142.2	148.9	138.5	146.8	136.9	141.1
24	143.7	145.2	140.5	154.3	157.6	146.4	145.5	152.7	141.8	155.3	153.8	140.5
25	143.3	135.1	145.9	144.5	150.4	146.3	151.7	143.5	133.6	140.3	136.6	131.5
26	143.9	145.8	147.9	139.9	156.9	148.1	180.0	143.2	146.2	155.9	147.5	141.9
27	136.6	145.7	141.3	149.0	148.7	147.9	151.1	135.2	150.7	148.1	143.8	132.5
28	143.6	145.0	140.7	145.5	137.2	174.5	139.4	141.6	152.7	152.8	152.1	146.9
29	135.5		145.1	144.2	148.0	148.5	145.9	136.4	148.2	149.1	145.8	138.1
30	143.4		146.4	152.1	158.4	150.1	139.6	155.0	140.1	148.6	138.0	147.4
31	146.3		140.1		158.2		140.1	149.6		143.2		133.8
Max Day	**151.8**	**154.5**	**154.0**	**154.7**	**186.1**	**174.5**	**197.1**	**197.5**	**158.4**	**173.9**	**174.4**	**153.9**

10YR. TREATED WATER PRODUCTION vs. AMOUNT BILLED

2013– 2022



YEAR	m3 Produced	% Difference from previous yr	Amount Billed (m3)	% Difference from previous yr
2013	2,888,422	(8.47)	2,227,128	(5.59)
2014	3,093,427	6.63	2,173,331	(2.48)
2015	3,277,042	5.60	2,071,639	(4.91)
2016	2,924,898	(12.04)	2,160,640	4.12
2017	2,801,956	(4.39)	2,057,834	(5.00)
2018	2,915,204	3.88	2,036,471	(1.05)
2019	2,926,533	0.39	2,009,746	(1.33)
2020	2,578,421	(13.50)	1,912,633	(5.08)
2021	2,716,126	5.07	1,869,760	(2.29)
2022	2,752,976	1.34	1,717,658	(8.86)

WATER QUALITY COMPLAINTS

MONTH	#
January	1
February	2
March	1
April	0
May	1
June	2
July	2
August	8
September	2
October	5
November	3
December	3
Total - 2022	**30**

SPECIFIC COMPLAINTS

PROBLEM	COMPLAINT REPORTED
Taste/Odour	1
Petroleum smell	1
Sediment in water	2
Chlorine Smell/Taste	1
General concern	1
Discoloured water (Dark, brown, yellow)	22
Particles- clay	1
Sewer smell	1
Grand Total	**30**

UNACCOUNTED FOR WATER

IN PLANT	m3/yr
Raw Water metered	**3,051,122.03**
Online Instruments	7,696.90
In Plant Service Water	44,397.00
Ripening Water	13,100.00
Backwash Water Used	100,087.87
Treated pH Flow	2,628.00
Total Plant Water Usage	**2,883,212.26**
Treated Water Metered	**2,752,975.88**
Plant Water Usage	**4.52%**

(this can be caused by inaccuracies in the flow metering equipment, draining of the filters for a backwash, and/or leaking valves.)

DISTRIBUTION SYSTEM	m3/yr
Raw water bar screen cleaning	13,096.20
Running Services - Winter	32,888.00
Annual Flushing Program	13,854.00
Dead-End Flushing Units	401,182.14
Watermain Breaks identified	8,380.00
Treated Billed + Accounted For	**2,187,058.34**
Total billed 2022	**1,717,658**
Accounted For - (calculated)	**2,187,058.34**
Unaccounted For - Distribution	**20.56%**

Notes: This can be caused by a variety of issues, meter read cycles, main breaks, service leaks, which probably cause the majority of the loss, inaccurate residential, commercial water meters, dead end flushing program, Fire Dept. training, fire fighting, construction site flushing.

NOTE: In 2022, 147 locations were running water during the winter to prevent water lines from freezing.

APPENDIX 2

ANNUAL REPORT – Required under Ontario Regulation 170/03, Section 11

(Insert Annual Report Here)