

2020 Year End Report: Port Sydney Clarke Crescent Well



Drinking Water Works Permit: 143-204

Municipal Drinking Water License: 143-104

Ministry of Environment, Conservation and Parks Waterworks #: 220005688

Engineering and Public Works Department

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Introduction

The Clarke Crescent Well serving the community of Port Sydney is owned and operated by the District Municipality of Muskoka.

It constructed in 1984 and has an initial design capacity of 90 m³/day. The water system currently serves a population of approximately 91 people.

The plant operates under license 143-204 and permit 143-104, issued in September 2020 under the Municipal Drinking Water Licensing Program. Groundwater takings from Well 2, the Clarke Well, are permitted in accordance with Permit to Take Water #5134-8FNR64 (which is currently in the 10 year renewal process), which permits the operation at a rate not exceeding 205 Litres per minute to a maximum of 91m³/ day.

The water source is ground water from a drilled well considered to be under the direct influence of surface conditions due to the potential for the incomplete subsurface filtration of surface water entering the groundwater aquifer. In order to address his potential issue, the treatment system had significant improvements take place in 2004/2005. These upgrades include a filtration system and primary disinfection by Ultraviolet (UV) light. Secondary disinfection continues to be maintained by chlorination. Currently, a study is underway to determine what, if any, the influence is of the surface conditions.

All treatment control systems use a Supervisory Control and Data Acquisition (SCADA) system for process control and monitoring.

Legislation Requirements

Safe Drinking Water Act

In the Part Two Report of the Walkerton Inquiry, Commissioner Dennis O'Connor recommended that the Ontario Government enact a Safe Drinking Water Act to deal with matters related to treatment and distribution of drinking water. The Safe Drinking Water Act (SDWA) received royal assent in December, 2002.

The purpose of the Act is to gather in one place all legislation and regulations relating to the treatment and distribution of drinking water. The Act serves to protect human health through the control and regulation of drinking water systems and drinking water testing.

The foundation provisions of the Safe Drinking Water Act include:

- Purpose of the Act
- Definitions
- Minister's Powers and Duties
- Inspections
- Compliance and Enforcement
- Appeals and Offences

Ontario Regulations

The Ontario Government has enacted several supporting regulations under the SDWA (2002). These regulations combine previous requirements under the Ontario Water Resources Act and the new

requirements under the SDWA. Key components of the regulations include:

- System Categories
- Groundwater Under Direct Influence Of Surface Water (GUDI)
- Exemptions
- Approval of Systems
- Treatment
- Testing and Operational Checks (General Rules)
- Operational Checks
- Microbiological Testing
- Chemical Testing
- Adverse Conditions
- Corrective Action
- Engineer's and Summary Reports

[Municipal Drinking Water Licenses / Certificates of Approval](#)

The Municipal Drinking Water Licensing Program has replaced the Certificate of Approval program for municipal residential drinking water systems. The Ontario Government has implemented the Municipal Drinking Water Licensing Program (MDWLP) as recommended by Justice O'Connor in the Part II Report of the Walkerton Inquiry. Justice O'Connor recommended a new approvals framework for municipal drinking water systems, which would require owners to obtain a license to operate their systems as well as incorporate the concept of quality management into their operations.

A municipal drinking water license is an approval that is issued by the MOECC to owners under the Safe Drinking Water Act, 2002 for the operation of municipal residential drinking water systems. The District of Muskoka operated under various Certificates of Approval until October 2010 when the operating licenses were issued.

Previous Certificates of Approval were required for the establishment, replacement or alteration of all municipal drinking water systems. The MOECC issued Certificates of Approval to ensure that all undertakings comply with the legislation (i.e. Acts and Regulations) and the Ministry's Environmental Guidelines and Procedures developed to provide consistency of approach to various aspects of environmental protection throughout the province. Municipal Drinking Water Licenses and Permits similar to previous Certificates of Approval provide specific details about the drinking water system including:

- Drinking Water System Description
- Definitions and Information
- General Information – Compliance, Other Legal Requirements, Adverse Effects, Inspections
- Performance – Rated Capacity, Management of Residue

- Monitoring and Recording – Flow Measuring Devices, Sampling
- Operations and Maintenance

Comparison to Rated Capacity and Flow Rates

The Clarke Crescent Well has a rated capacity of 91m³/day. In 2020, the total monthly average flow for the year was 1,327.3 m³/day. The maximum day flow for the year was 64.7 m³/day, however the 3-year average for maximum day flow is 66.6 m³/day. This represents 73.2% of the plant design capacity. This value exaggerates the amount of plant capacity available as the cause for the high peak day flow values were found to be caused by unplanned issues with customers plumbing resulting in short lived high daily flows. When examined using annual peak flow averages over 3 years, peak flow average becomes 49.6 m³/day which represents 54.5% of the plant design capacity. No problems have been associated with this flow.

Monthly flows are shown in the attached table.

The Permit to Take Water (PTTW #5134-8FNR64) permits 91 m³/day; therefore there were no exceedances of this permit.

Summary of Analytical Results

A total of 416 microbiological regulatory tests were performed in 2020 and compliance with Provincial standards was achieved throughout the entire year.

There were 104 free chlorine residual tests performed in the distribution system and all results were satisfactory. Staff continue to routinely sample all areas of the system to ensure adequate free chlorine residuals are available throughout the distribution system.

A summary of other analytical results is also shown in this report.

Summary of Treatment Chemicals

The following chemicals are used for the treatment of drinking water at the Clarke Crescent Well:

- Sodium Hypochlorite: Secondary disinfection

A table summarizing the chemical use and average dosages is included in this report.

Documentation of System Repairs and Upgrades

No significant capital expenses were incurred to conduct system repairs or upgrades in 2020.

External Audits

MOE Inspection

A MOE inspection was completed on July 29, 2020 and is attached to this report. The overall rating was 100%.

DWQMS Audit

In 2020, all drinking water systems within the District had an external on-site recertification audit performed. There were two (2) minor non-conformances which have subsequently been addressed. As a result, all systems have been recertified. Overall, all drinking water systems are performing satisfactorily.

Port Sydney Clarke Well Water Distribution Summary 2020

New Services:

There were no new water services installed in 2020.

Broken Watermains:

There were no broken water mains to report in 2020.

Service Leaks:

There were no service leaks to report in 2020.

Service Relocation:

There were no service relocations to report in 2020.

Frozen Services:

No municipal water services were frozen in 2020.

Replacement Watermains:

No watermain replacement occurred in 2020.

New Watermains:

There were no new watermains installed in 2020.

Valve Replacement:

No mainline valve replacement took place in 2020.

Fire Hydrants:

There are no fire hydrants in Port Sydney. There exists one dry hydrant connection provided for fire department use. This equipment exists at the Clarke Well site and is tested for functionality annually.

Meter Installations:

No water meters required replacement in Port Sydney in 2020.

Service Box Maintenance:

No Service boxes required maintenance in Port Sydney in 2020.

Air-Vacuum Release Valves:

There are no air release valves in Port Sydney.

Locates:

There were no requests for locates in Port Sydney in 2020.

Table 1 Water Flow Summary - 2020

Month	Total Monthly (m³)	Average Day Flow (m³/d)	Maximum Day Flow (m³/d)	Minimum Day Flow (m³/d)
January	1,267.3	40.9	48.9	38.0
February	1,136.5	39.2	42.5	37.2
March	1,284.6	41.4	52.8	36.0
April	1,277.5	42.6	48.7	39.6
May	1,426.4	46.0	58.1	39.4
June	1,454.6	48.5	62.9	40.4
July	1,516.2	48.9	64.7	40.0
August	1,328.8	42.9	48.2	39.3
September	1,353.2	45.1	53.0	40.2
October	1,310.9	42.3	46.9	39.6
November	1,278.0	42.6	56.0	31.0
December	1,293.4	43.1	46.8	39.7

Total Flow: 15,927.4 m³
 Average Day: 43.6 m³
 Maximum Day: 52.5 m³
 Minimum Day: 38.4 m³

Table 2 Raw Water Monthly Analysis Summary 2020 Part 1

Month	Alkalinity (mg/L)	Hardness (mg/L)	pH	Turbidity (ntu)	True Colour (tcu)	Temperature (Celsius)
January	35	45	6.43	0.14	0	7.7
February	34	44	6.40	0.09	0	7.9
March	32	46	6.35	0.08	0	8.0
April	34	44	6.37	0.08	0	8.4
May	41	43	6.53	0.10	1	11.0
June	32	45	6.45	0.11	1	16.4
July	30	46	6.37	0.11	1	16.9
August	35	50	6.39	0.18	1	14.8
September	25	54	6.17	0.24	0	18.7
October	26	51	6.36	0.19	0	14.7
November	27	51	6.26	0.25	3	15.4
December	25	45	6.27	0.20	0	11.6
Average	31	47	6.36	0.15	0.5	12.6

Table 3 Raw Water Monthly Analysis Summary 2020 Part 2

Month	Microcystin (ug/L)	TDS (mg/L)	Langliers Saturation Index	Total Coliforms (CFU/100mL)	E. Coli (CFU/100mL)	Total Number of Samples
January	Not Collected		-2.3	0	0	8
February	Not Collected		-2.4	0	0	8
March	Not Collected		-2.4	0	0	10
April	Not Collected		-2.4	0	0	8
May	Not Collected		-2.2	0	0	8
June	Not Collected		-2.3	2	0	10
July	Not Collected		-2.2	0	0	8
August	Not Collected		-2.3	0	0	10
September	Not Collected		-2.3	0	0	8
October	Not Collected		-2.6	0	0	8
November	Not Collected		-2.5	0	0	10
December	Not Collected		-2.2	0	0	8
Average	N/A		-2.3	0	0	9

Table 4 Chemical Usage Summary: Sodium Hypochlorite

Month	Average Dosage mg/L	Total kg
January	3.0	33.7
February	3.0	30.1
March	2.9	33.0
April	2.8	31.1
May	2.9	37.0
June	3.0	39.1
July	3.0	39.4
August	2.8	39.1
September	2.9	35.1
October	2.9	34.6
November	2.9	34.0
December	3.1	38.1
Average	2.9	35.4

Port Sydney 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

Michael Currie
Manager of Water and Wastewater Operations



OPTIONAL ANNUAL REPORT TEMPLATE

Drinking-Water System Number:	220005688
Drinking-Water System Name:	Clarke Crescent Well Water Treatment System
Drinking-Water System Owner:	District Municipality of Muskoka
Drinking-Water System Category:	Small Municipal Residential
Period being reported:	January 01 to December 31, 2020

<p><u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u></p> <p>Does your Drinking-Water System serve more than 10,000 people? Yes [] No [X]</p> <p>Is your annual report available to the public at no charge on a web site on the Internet? Yes [X] No []</p> <p>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.</p> <div style="border: 1px solid black; padding: 5px;"> <p>District Municipality of Muskoka 70 Pine Street Bracebridge, Ontario P1L 1N3 www.muskoka.on.ca</p> </div>	<p><u>Complete for all other Categories.</u></p> <p>Number of Designated Facilities served:</p> <div style="border: 1px solid black; padding: 2px; width: 100px; text-align: center;">N.A.</div> <p>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [] No []</p> <p>Number of Interested Authorities you report to: <div style="border: 1px solid black; width: 100px; height: 20px; display: inline-block;"></div></p> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [] No []</p>
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Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report

List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:

Drinking Water System Name	Drinking Water System Number
N.A.	

Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water? Yes [] No [X]



Indicate how you notified system users that your annual report is available, and is free of charge.

- Public access/notice via the web
- Public access/notice via Government Office
- Public access/notice via a newspaper
- Public access/notice via Public Request
- Public access/notice via a Public Library
- Public access/notice via other method _____

Describe your Drinking-Water System

The Clarke well system services one subdivision consisting of 34 homes. The system was constructed in 1984. The system had significant upgrades in 2004/2005. The treatment process consists of disinfection by UV, chlorination and filtration. The rated water production capacity of this facility is 90 cubic meters per day. The water is obtained from a drilled well located at 46 Clarke Crescent.

List all water treatment chemicals used over this reporting period

Sodium Hypochlorite

Were any significant expenses incurred to?

- Install required equipment
- Repair required equipment
- Replace required equipment

Please provide a brief description and a breakdown of monetary expenses incurred

Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
May 04, 2020	Sodium	33.7	Mg/L	Annual Sampling	N/A



Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period.

	Number of Samples	Range of E.Coli Or Fecal Results (min #)-(max #) cfu/100 mL	Range of Total Coliform Results (min #)-(max #) cfu/100 mL	Number of HPC Samples	Range of HPC Results (min #)-(max #) cfu/100 mL
Raw	52	0	0-1	0	0
Treated	52	0-0	0-0	52	0-1
Distribution	52	0-0	0-0	52	0-1

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report.

	Number of Grab Samples	Range of Results (min #)-(max #)	Geometric Mean
Turbidity	8760	0.049-0.130	0.07
Chlorine	8760	1.33-1.90	1.59
Fluoride (If the DWS provides fluoridation)	N/A	N/A	N/A

NOTE: For continuous monitors use 8760 as the number of samples.

*NOTE: Record the unit of measure if it is **not** milligrams per litre.
MDL = Method Detection Limit*

Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure

Summary of Inorganic parameters tested during this reporting period or the most recent sample results

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	May 4/20	0.09<MDL	ug/L	No
Arsenic	May 4/20	0.2<MDL	ug/L	No
Barium	May 4/20	21.6	ug/L	No
Boron	May 4/20	14	ug/L	No
Cadmium	May 4/20	0.009	ug/L	No
Chromium	May 4/20	0.20	ug/L	No
*Lead	May 4/20	--	ug/L	No
Mercury	May 4/20	0.01<MDL	ug/L	No
Selenium	May 4/20	0.09	ug/L	No
Sodium	May 4/20	33.7	mg/L	Yes
Uranium	May 4/20	0.064	ug/L	No
Fluoride	May 4/20	0.06<MDL	mg/L	No



Nitrite	Feb 3/20	0.003<MDL	mg/L	No
Nitrate	Feb 3/20	1.17	mg/L	No
Nitrite	May 4/20	0.003<MDL	mg/L	No
Nitrate	May 4/20	1.13	mg/L	No
Nitrite	Aug 4/20	0.003<MDL	mg/L	No
Nitrate	Aug 4/20	1.12	mg/L	No
Nitrite	Nov 2/20	0.003<MDL	mg/L	No
Nitrate	Nov 2/20	1.11	mg/L	No

*only for drinking water systems testing under Schedule 15.2; this includes large municipal non-residential systems, small municipal non-residential systems, non-municipal seasonal residential systems, large non-municipal non-residential systems, and small non-municipal non-residential systems

Summary of lead testing under Schedule 15.1 during this reporting period

(applicable to the following drinking water systems; large municipal residential systems, small municipal residential systems, and non-municipal year-round residential systems)

Location Type	Number of Samples	Range of Lead Results (min#) – (max #)	Number of Exceedances
Plumbing	0	N/A	N/A
Distribution	2	0.23-0.43 ug/L	0

Summary of Organic parameters sampled during this reporting period or the most recent sample results

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	May 4/20	0.02<MDL	ug/L	No
Atrazine+N-dealkylated Metabolites	May 4/20	0.01<MDL	ug/L	No
Azinphos-methyl	May 4/20	0.05<MDL	ug/L	No
Benzene	May 4/20	0.32<MDL	ug/L	No
Benzo(a)pyrene	May 4/20	0.004<MDL	ug/L	No
Bromoxynil	May 4/20	0.33<MDL	ug/L	No
Carbaryl	May 4/20	0.05<MDL	ug/L	No
Carbofuran	May 4/20	0.01<MDL	ug/L	No
Carbon Tetrachloride	May 4/20	0.17<MDL	ug/L	No
Chorpyrifos	May 4/20	0.02<MDL	ug/L	No
Diazinon	May 4/20	0.02<MDL	ug/L	No
Dicamba	May 4/20	0.20<MDL	ug/L	No
1,2 Dichlorobenzene	May 4/20	0.41<MDL	ug/L	No
1,4 Dichlorobenzene	May 4/20	0.36<MDL	ug/L	No
1,2 Dichloroethane	May 4/20	0.35<MDL	ug/L	No
1,1 Dichloroethylene	May 4/20	0.33<MDL	ug/L	No
Dichloromethane	May 4/20	0.35<MDL	ug/L	No
2,4 Dichlorophenol	May 4/20	0.15<MDL	ug/L	No
2,4-D	May 4/20	0.19<MDL	ug/L	No
Diclofop-Methyl	May 4/20	0.40<MDL	ug/L	No
Dimethoate	May 4/20	0.06<MDL	ug/L	No
Diquat	May 4/20	1<MDL	ug/L	No
Diuron	May 4/20	0.03<MDL	ug/L	No
Glyphosate	May 4/20	1<MDL	ug/L	No



Malathion	May 4/20	0.02<MDL	ug/L	No
MCPA	May 4/20	0.00012<MDL	ug/L	No
Metolachor	May 4/20	0.01<MDL	ug/L	No
Metribuzin	May 4/20	0.02<MDL	ug/L	No
Monochlorobenzene	May 4/20	0.30<MDL	ug/L	No
Paraquat	May 4/20	1<MDL	ug/L	No
Pentachlorophenol	May 4/20	0.15<MDL	ug/L	No
Phorate	May 4/20	0.01<MDL	ug/L	No
Picloram	May 4/20	1<MDL	ug/L	No
PCB	May 4/20	0.04<MDL	ug/L	No
Prometryne	May 4/20	0.03<MDL	ug/L	No
Simazine	May 4/20	0.01<MDL	ug/L	No
THM (NOTE: annual average from Distribution – 4 samples)	Samples Taken: Feb.3/20 May 04/20 Aug. 4/20 Nov 2/20	3.7	µg/L	No
Terbufos	May 5/20	0.01<MDL	µg/L	No
Tetrachloroethylene	May 5/20	0.35<MDL	µg/L	No
2,3,4,6-Tetrachlorophenol	May 5/20	0.20<MDL	µg/L	No
Triallate	May 5/20	0.01<MDL	µg/L	No
Trichloroethylene	May 5/20	0.44<MDL	µg/L	No
2,4,6-Trichlorophenol	May 5/20	0.25<MDL	µg/L	No
Trifluralin	May 5/20	0.02<MDL	µg/L	No
Vinyl Chloride	May 5/20	0.17<MDL	µg/L	No
HAA5 (Distribution Water)	Samples Taken:			
	Feb.03/20	5.3<MDL	µg/L	No
	May 05/20	5.3<MDL	µg/L	No
	Aug.4/20	5.3<MDL	µg/L	No
	Nov 02/20	5.3<MDL	µg/L	No
	RAA	5.3<MDL	µg/L	No

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

Parameter	Result Value	Unit of Measure	Date of Sample