

Belgrave Well Supply
2022 Operation and Maintenance
Annual Report

PTTW # 4313-C7ARBA, dated September 30, 2031
MDWL # 247-101 issue #3, Exp March 2022
(renewal application and amendment to MDWL sent Nov. 2, 2021, prepared by Burnside & Assoc.)

PREPARED BY

Veolia Water
100 Cove Rd.
Goderich, ON
N7A 3Z2

TO

Municipality of Morris Turnberry,
% Mike Alcock
RR#4, 41342 Morris Road,
Brussels, ON
N0G 1H0

Table of Contents

1.0 INTRODUCTION AND BACKGROUND	4
2.0 DESCRIPTION OF WATER SYSTEM	4
3.0 SUMMARY OF WATER QUALITY MONITORING	6
3.1 Water Treatment Equipment Operation and Monitoring as Per Schedule 7, O. Reg 170/03.....	6
3.1.1 Point of Entry Chlorine Residual	6
3.1.2 Distribution Chlorine Residual	6
3.1.3 Turbidity	7
3.2 Microbiological Sampling as per Schedule 10, O. Reg.170/03	8
3.2.1 Raw Water Samples	8
3.2.2 Treated Water (Point of Entry)Samples	10
3.2.3 Distribution Samples	11
3.3 Chemical Sampling & Testing as per Schedule 13, O. Reg.170/03	12
3.3.1 Inorganics	12
3.3.2 Lead	13
3.3.3 Organics	14/15
3.3.4 Trihalomethanes and Haloacetic Acids.....	16
3.3.5 Nitrate & Nitrite	16
3.3.6 Sodium	17
3.3.7 Fluoride	17
4.0 WATER AND CHEMICAL USAGE	18
4.1 Chemical Usage.....	18
4.2 Annual Flows	19
5.0 MINISTRY OF THE ENVIRONMENT INSPECTIONS AND REGULATORY ISSUES	20-22
7.0 MECP Regulatory Changes.....	22

List of Tables

Table 1 – Treated and Distribution Chlorine Residuals for Belgrave Drinking Water System

Table 2 – Raw Water Turbidities for Belgrave Drinking Water System

Table 3a – Microbiological Results for Raw Water at Belgrave Drinking Water System Jane Well

Table 3b – Microbiological Results for Raw Water at Belgrave Drinking Water System McCrea Well

Table 4 – Microbiological Results for Point of Entry at Belgrave Drinking Water System

Table 5 – Microbiological Results for Belgrave Distribution System

Table 6 – Schedule 23 Results for Belgrave Drinking Water System

Table 7 – Lead Sampling Program Results for Belgrave Drinking Water System

Table 8 – Schedule 24 Results for Belgrave Drinking Water System

Table 9 – Nitrate, Nitrite, THM and HAA Results at Belgrave Drinking Water System

Table 10 – Chemical Usage at the Belgrave Drinking Water System

Table 11 – Treated Water Flows for Belgrave Drinking Water System

1.0 INTRODUCTION AND BACKGROUND

The purpose of the 2022 Annual Report is to document the operation and maintenance data for the Belgrave Well Supply for review by The Ministry of Environment, Conservation and Parks in accordance with O. Reg. 170/03. This report covers January 1, 2022 to December 31, 2022. A copy of this report will be submitted to the owner to be uploaded to the municipality's website and can be provided to interested parties upon request.

2.0 DESCRIPTION OF WATER SYSTEM

The Belgrave Well Supply (DWS #220008257), is characterized as a groundwater system and is classified as a large municipal residential system. The system consists of two wells, with a maximum capacity of 501 m³/day. The treatment building houses the controls for the system, chlorination and iron removal treatment, in-ground storage reservoirs and pressure system including pumps for the distribution system.

One production well is located at 32 Hamilton Street (near the intersection of Jane St and referred to as the Jane Street Well), and the other at 23 McCrea Street, with both wells connected to the treatment plant at 28 McCrea Street via dedicated raw water mains. The distribution system serves the community of Belgrave with a connection to the Humphrey Subdivision (North Huron).

The system serves a population of approximately 300 residents, with approximately 113 customer services in use (and 223 service connections total).

The system consists of a Class 2 Treatment and Class 1 Distribution and Supply, which is owned by the Municipality of Morris-Turnberry and operated by Veolia Water Canada, the Operating Authority.

The Jane Street well is 42.4 meters deep, equipped with a submersible pump with a rated capacity of 1.6 Litres/second, with instrumentation and control equipment, and discharges to a combined header.

The McCrea Street Well is 38.1 meters deep equipped with a submersible pump with a rated capacity of 4.2 Litres/second, with instrumentation and control equipment and discharges to a combined header.

Flow from each well is combined in a common filter influent header at the treatment plant where the flow is then split equally through three green sand filters, treated with sodium hypochlorite and then to an in-ground reservoir and a high lift pumping station.

The Jane Street well was drilled in October 1983 and The McCrea Street Well drilled in June 1976. Modifications and updates were made to the Jane Street and McCrea Street well systems in 2007 to form the new Belgrave Water Treatment System with a new treatment building.

Raw water is pumped from each well. Potassium permanganate is injected as part of the iron removal system. The filtered water is treated with 6% sodium hypochlorite and then flows to an in-ground two cell storage and chlorine contact reservoir located below the treatment building. The treatment building has three (3) high lift submersible pumps and six (6) hydro pneumatic pressure tanks that supply and maintain the water pressure to the distribution system. The system is monitored and controlled by an onsite Programmable Logic Controller (PLC).

Back-up power is supplied by one 60 KW diesel standby generator with an automatic transfer switch located in the pump house.

There is no elevated storage tank. The system pressure is maintained using pressure tanks and the high lift pumps.

The system has no hydrants and capacity for fire protection is not provided. Blow-offs are used for flushing purposes

The current water source is from two secure deep bedrock wells. Land use in the vicinity of the wells is a mixture of residential and institutional. There is no Municipal sanitary sewer system so the area is served by individual septic systems.

Disinfection is achieved on the Belgrave well supply through the use of 6 % sodium hypochlorite. This chemical is injected prior to the water entering the chlorine contact reservoir at a sufficient dosage to achieve both primary and secondary disinfection objectives.

The primary disinfection system consists of a 200 L solution tank, with one duty and one standby chemical metering pump with automatic switch-over capability. An on-line free chlorine residual analyzer ensures continuous disinfection with high and low level parameter set points and alarms.

Primary disinfection is provided via Chlorine Contact Time within the reservoir. The Chlorine Contact provided is based on the provision of a minimum regulatory CT of 4.0, to provide 99% (2-log) inactivation of viruses. The design Chlorine Contact Time is based on 2-log inactivation of viruses at a minimum free chlorine residual of 0.2 mg/L (after contact time), raw water pH of 6-9 and a minimum water temperature of 5°C.

The chlorine dosage range varies with the chlorine demand of the raw water. The free chlorine residual is monitored at the point of entry to the distribution system, by an on-line chlorine analyzer, with a target residual of > 0.1.00 mg/l and < 2.00 mg/l.

The raw water from the wells at Belgrave has iron levels higher than what is considered aesthetically acceptable. Through the First Engineers report it was determined that the iron oxidized in the treated water and resulted in higher than acceptable turbidity levels within the distribution system. The treatment building provides iron removal through greensand filters. Potassium permanganate is injected into the water to oxidize the iron and to regenerate the greensand filters. This chemical is injected into the raw water upstream of the filters.

The treated water is monitored and controlled by an on-site PLC. A PC at the site records the data generated by the PLC at the wells and treatment building.

Distribution piping typically ranges in size from 50 mm to 150 mm in diameter, and consists of PVC Polyethylene and High Density Polyethylene Piping.

Typical system pressure ranges from 40 P.S.I to 60 P.S.I.

3.0 SUMMARY OF WATER QUALITY MONITORING

3.1 Water Treatment Equipment Operation and Monitoring as Per Schedule 7, O. Reg 170/03

3.1.1 Point of Entry Chlorine Residual

Chlorine residuals are continuously measured using a HACH CL17 online chlorine analyzer and verified for accuracy using hand-held HACH pocket colorimeters.

Table 1 shows the monthly average of free chlorine residual values on the treated water at the point of entry.

3.1.2 Distribution Chlorine Residual

Chlorine residuals in the distribution system are continuously monitored at the Humphrey sample station using a HACH CL17 online chlorine analyzer and recorded on the SCADA system. They are also verified using a HACH pocket colorimeter.

Table 1 – Treated and Distribution Chlorine Residuals for Belgrave Drinking Water System

Date	Avg. Treated Chlorine Residuals (mg/L)	Avg. Distribution Chlorine Residuals (mg/L)
January	1.64	1.45
February	1.54	1.34
March	1.41	1.21
April	1.40	1.24
May	1.41	1.23
June	1.37	1.19
July	1.45	1.26
August	1.61	1.29
September	1.53	1.25
October	1.49	1.26
November	1.56	1.33
December	1.64	1.47
Average	1.50	1.29
Minimum	0.99	0.81
Maximum	2.20	1.86

3.1.3 Turbidity

The maximum raw turbidity (NTU) measured at the Jane Well was 0.70 NTU and at the McCrae well the maximum raw turbidity(NTU) was 0.60 NTU.

Table 2 provides a summary of raw turbidity results.

Table 2. – Raw Water Turbidities (NTU) for Belgrave Well Supply

Date	Avg Jane Well Raw NTU	Avg McCrae Well Raw NTU
January	0.19	0.15
February	0.15	0.10
March	0.17	0.13
April	0.16	0.12
May	0.14	0.15
June	0.18	0.17
July	0.14	0.20
August	0.24	0.23
September	0.70	0.60
October	0.18	0.17
November	0.20	0.17
December	0.17	0.22
Minimum	0.14	0.10
Maximum	0.70	0.60
# samples	31	30

3.2 Microbiological Sampling as Per Schedule 10, O. Reg 170/03

3.2.1 Raw Water Samples

Raw water samples are taken every week. A total of 53 samples from Jane Well and 54 samples from McCrea Well were collected and analyzed for E. Coli and Total Coliforms. Each Total Coliform and E. Coli result obtained was 0 cfu/100 ml.

Table 3a and Table 3b provide a summary of bacteriological results performed on the raw water.

Table 3a – Microbiological Results for Raw Water at the *Jane Well*

Date	# Samples	E. Coli		Total Coliform		
		# Samples 0	# Samples ≥1	# Samples	# Samples 0	# Samples ≥1
Jan	4	4	0	4	4	0
Feb	4	4	0	4	4	0
Mar	5	5	0	5	5	0
Apr	4	4	0	4	4	0
May	5	5	0	5	5	0
Jun	4	4	0	4	4	0
Jul	4	4	0	4	4	0
Aug	6	6	0	6	6	0
Sep	4	4	0	4	4	0
Oct	4	4	0	4	4	0
Nov	5	5	0	5	5	0
Dec	4	4	0	4	4	0
Total	53	53	0	53	53	0

Table 3b. Microbiological Results for Raw Water at the *McCrea Well*

Date	E. Coli			Total Coliform		
	# Samples	# Samples 0	# Samples ≥1	# Samples	# Samples 0	# Samples ≥1
Jan	4	4	0	4	4	0
Feb	4	4	0	4	4	0
Mar	5	5	0	5	5	0
Apr	4	4	0	4	4	0
May	5	5	0	5	5	0
Jun	4	4	0	4	4	0
Jul	4	4	0	4	4	0
Aug	6	6	0	6	6	0
Sep	4	4	0	4	4	0
Oct	4	4	0	4	4	0
Nov	5	5	0	5	5	0
Dec	4	4	0	4	4	0
Total	53	53	0	53	53	0

3.2.2 Treated Water (Point of Entry) Samples

One treated water sample from the point of entry is taken every week and analyzed for E.Coli, Total Coliforms and for Heterotrophic Plate Count (HPC). A total of 53 treated water samples were collected and analyzed for the above parameters. All E. Coli and Total Coliform samples were found to be safe. The range of HPC results were <10 – 20 cfu/100 ml.

Table 4 provides a summary of all bacteriological results performed on the treated water.

Table 4. – Microbiological Results for Point of Entry

Date	E. Coli			Total Coliform			HPC		
	# Samples	# Samples 0	# Samples ≥1	# Samples	# Samples 0	# Samples ≥1	# Samples	# Safe	Deteriorating
Jan	4	4	0	4	4	0	4	4	0
Feb	4	4	0	4	4	0	4	4	0
Mar	5	5	0	5	5	0	5	5	0
Apr	4	4	0	4	4	0	4	4	0
May	5	5	0	5	5	0	5	5	0
Jun	4	4	0	4	4	0	5	4	0
Jul	4	4	0	4	4	0	4	4	0
Aug	6	6	0	6	6	0	6	6	0
Sep	4	4	0	4	4	0	4	4	0
Oct	4	4	0	4	4	0	4	4	0
Nov	5	5	0	5	5	0	5	5	0
Dec	4	4	0	4	4	0	4	4	0
Total	53	53	0	53	53	0	53	53	0

3.2.3 Distribution Samples

Distribution samples are collected every week and tested for E.Coli, Total Coliforms and for Heterotrophic Plate Count (HPC). A total of 104 distribution samples were collected and analyzed for the above parameters. All E. Coli results from the treated water were 0 cfu/100 ml. The range of HPC results were 10 - <10 cfu/100 ml.

Table 5 provides a summary of all bacteriological samples taken in the distribution system.

Table 5 – Microbiological Results

Date	E. Coli			Total Coliform			HPC		
	# Samples	# Samples 0	# Samples ≥1	# Samples	# Samples 0	# Samples ≥1	# Samples	Safe	Deteriorating
Jan	7	7	0	7	7	0	4	4	0
Feb	7	7	0	7	7	0	4	4	0
Mar	10	10	0	10	10	0	5	5	0
Apr	8	8	0	8	8	0	4	4	0
May	10	10	0	10	10	0	5	5	0
Jun	8	8	0	8	8	0	4	4	0
Jul	8	8	0	8	8	0	4	4	0
Aug	12	12	0	12	12	0	6	6	0
Sep	8	8	0	8	8	0	4	4	0
Oct	8	8	0	8	8	0	4	4	0
Nov	10	10	0	10	10	0	5	5	0
Dec	8	8	0	8	8	0	4	4	0
Total	104	104	0	104	104	0	53	53	0

3.3 Chemical Sampling & Testing as Per Schedule 13, O. Reg 170/03

3.3.1 Inorganics

One treated water sample is taken every 36 months and tested for inorganics. The most recent samples for the Belgrave Drinking Water System were collected on January 27, 2020 and submitted to the laboratory for analysis of inorganics as listed in Schedule 23. All parameters were found to be within compliance. Inorganics will be sampled and analyzed again on or before **January 27, 2023**.

Results from March 1, 2017 and January 27, 2020 can be found in **Table 6**.

Table 6. – Schedule 23 Results for Belgrave Well Supply

Parameter	Result (µg/L) 2017	Results (µg/L) 2020	Maximum Allowable Concentration µg/L
Antimony	<0.02	<0.09	6
Arsenic	0.80	0.6	10
Barium	146	153	1000
Boron	21	<2	5000
Cadmium	<0.003	0.003	5
Chromium	0.48	<0.08	50
Mercury	<0.01	0.01	1
Selenium	<.04	<0.04	10
Uranium	0.802	0.854	20

3.3.2 Lead

Schedule 15.1 of Ontario Regulation 170/03 requires that samples be taken during two seasons: once between December 15 and April 15 and once between June 15 and October 15. The Maximum Allowable Concentration for Lead is 10µg/L. Lead, pH and Alkalinity samples were taken on February 17th and again on July 4th, 2022.

2022 results can be found in **Table 7**.

Table 7. – Lead Sampling Program Results for Belgrave Drinking Water System

DATE	pH	Alkalinity (mg/L)	Lead(µg/L)
Dec-Apr	8.35	250	0.04
Jun-Oct	8.15	234	0.02

3.3.3 Organics

One treated water sample is taken every 36 months and tested for schedule 24 organic parameters. The most recent samples were collected on January 27, 2020. All parameters were found to be within compliance. Organics will be sampled and analyzed again on or before **January 27, 2023**.

2020 sample results can be found in **Table 8**.

Table 8. – Schedule 24 Results for Belgrave Drinking Water System

Parameter	Result (µg/L)	Maximum Allowable Concentration (µg/L)
Benzene	<0.32	1
Carbon Tetrachloride	<0.17	2
1,2-Dichlorobenzene	<0.41	200
1,4-Dichlorobenzene	<0.36	5
1,1-Dichloroethylene	<0.33	14
1,2-Dichloroethane	<0.35	5
Dichloromethane	<0.35	50
Monochlorobenzene	<0.3	80
Tetrachloroethylene	<0.35	10
Trichloroethylene	<0.44	5
Vinyl Chloride	<0.17	1
Diquat	<1	70
Paraquat	<1	10
Glyphosate	<1	280
Polychlorinated Biphenyls	<0.04	3
Benzo(a)pyrene	<0.004	0.01
2,4-dichlorophenol	<0.15	900
2,4,6-trichlorophenol	<0.25	5
2,3,4,6-tetrachlorophenol	<0.20	100
Pentachlorophenol	<0.15	60
Alachlor	<0.02	5
Atrazine+N-dealkylated metabolites	<0.01	5
Atrazine	<0.01	-
Desethyl atrazine	<0.01	-
Azinphos-methyl	<0.05	20
Carbaryl	<0.05	90
Carbofuran	<0.01	90
Chlorpyrifos	<0.02	90
Diazinon	<0.02	20

Table 8 Con't

Parameter	Result (µg/L)	Maximum Allowable Concentration (µg/L)
Dimethoate	<0.06	20
Diuron	<0.03	150
Malathion	<0.02	190
Metolachlor	<0.01	50
Metribuzin	<0.02	80
Phorate	<0.01	2
Prometryne	<0.03	1
Simazine	<0.01	10
Terbufos	<0.01	1
Triallate	<0.01	230
Trifluralin	<0.02	45
2,4-dichlorophenoxyacetic acid	<0.19	100
Bromoxynil	<0.33	5
Dicamba	<0.20	120
Diclofop-methyl	<0.40	9
MCPA	<0.00012	.1
Picloram	<1	190

3.3.4 Trihalomethanes and Haloacetic Acid

One distribution sample is taken every three months from a point in the distribution system and tested for Trihalomethanes (THMs) and Haloacetic Acids (HAAs). Samples were collected during the months of February, May, August and November. The Ontario Drinking Water Quality Standard (ODWQS) has set a Maximum Allowable Concentration (MAC) of 100 µg/L for THMs and it is expressed as a running annual average(RAA). The RRA for THMs was found to be 13 µg/L, which is within compliance. The HAA MAC is 80 µg/L the results were found to be within compliance.

Refer to **Table 9** for the summary of trihalomethane and haloacetic acids results.

3.3.5 Nitrate & Nitrite

One treated water sample is taken every three months and tested for nitrate and nitrite. Samples were collected during the months of February, May, August and November. The Ontario Drinking Water Quality Standard (ODWQS) has a set Maximum Allowable Concentration (MAC) of 1 mg/L for nitrites and 10 mg/L for nitrates. The results were found to be within compliance.

Refer to **Table 9**.

Table 9. – Nitrate, Nitrite ,THM and HAAs Results at Belgrave Drinking Water System

Date	Nitrate		Nitrite		THMs		HAAs	
	# Samples	Result (mg/L)	# Samples	Result (mg/L)	# Samples	Results (µg/L)	# Samples	Result (µg/L)
Feb	1	0.017	1	<0.003	1	12	1	<5.3
May	1	0.018	1	<0.003	1	11	1	<5.3
Aug	1	0.015	1	<0.003	1	14	1	<5.3
Nov	1	0.017	1	<0.003	1	15	1	<5.3
Total	4		4		4		4	
Avg.		0.017		<0.003		RAA 13		<5.3
Max		0.018		<0.003		15		<5.3

3.3.6 Sodium

One water sample is collected every 60 months and tested for Sodium. The Ontario Drinking Water Standards (ODWQS) have set a Maximum Acceptable concentration (MAC) of 200 mg/L for Sodium and requires the Medical Office of Health be notified if the concentration exceeds 20 mg/L. These samples were last collected on March 5, 2018 and were found to be 16.6 mg/L, which is in compliance. The next water sample for Sodium will be collected and analyzed on or before **March 5, 2023**.

3.3.7 Fluoride

One water sample is collected at least once in every 60 months and tested for Fluoride. The Ontario Drinking Water Quality Standards (ODWQS) have set a MAC of 1.5 mg/L. On May 11, 2020 a sample was collected for this analysis. The sample was found to have a concentration of 1.49 mg/L, which is in compliance. The next water sample for Fluoride will be collected and analyzed on or before May 5, 2025.

4.0 WATER AND CHEMICAL USAGE

4.1 Chemical Usage

96.67 kg of sodium hypochlorite and 30.55 kg of Potassium Permanganate was used to ensure proper disinfection. Refer to **Table 10**

Table 10. – Chemical Usage at Belgrave Drinking Water System

Date	Sodium Hypochlorite		Potassium Permanganate
	Usage (kg)	Average Dosage (mg/L)	Total Usage (kg)
Jan	7.75	5.48	2.52
Feb	6.33	5.30	2.79
Mar	6.84	5.77	2.2
Apr	7.13	5.03	2.46
May	8.28	5.31	2.31
Jun	8.63	5.37	2.56
Jul	11.75	6.12	2.62
Aug	9.12	5.81	2.45
Sep	7.80	5.83	2.49
Oct	7.11	4.73	2.48
Nov	7.64	5.37	2.52
Dec	7.96	4.90	2.93
Total	96.67		30.55
Average		5.42	

4.2 Annual Flows

A summary of the water supplied to the distribution system is provided in **Table 11**. This Table provides a breakdown of the monthly flow provided to the distribution system.

Flow meters were not calibrated in 2022.

Table 11. – Treated Water Flows for Belgrave Drinking Water System

Date	Avg.Daily Flow (m3)	Max Daily Flow (m3)	Total Daily Flow (m3)
Jan	77	96	2373
Feb	71	93	1978
March	70	81	2156
April	73	88	2179
May	99	140	2965
June	122	212	3663
July	155	261	4806
Aug.	100	196	3103
Sept.	91	113	2743
Oct.	92	108	2854
Nov.	71	97	2118
Dec.	66	94	2033
Avg	90		
Max		261	
Total			32971

5.0 MINISTRY OF ENVIRONMENT INSPECTIONS AND REGULATORY ISSUES

SAI Global conducted a Surveillance System Audit on July 25, 2022. There were no nonconformances, there were five opportunity for Improvement to be considered.

The following opportunities for improvement have been identified.

- Element 1: Consider describing how the Operational Plan is made available for viewing by the public (as required by the Ministry Director's Directions), as it does not appear to be available online.
- Element 2: Consider including the text of the QMS Policy commitments on the Belgrave Water - Municipality of Morris-Turnberry (morristorynberry.ca) webpage – as this would support achievement of DWQMS Element 2 PLAN d).
- Element 11: Consider referencing in OP El. 11 Personnel Coverage to O. Reg. 128/04's new provisions (enacted Dec. 2021) and regulatory requirements regarding the use of emergency substitute operators, their required competencies, training, records to be retained and reports to be made to the MECP.
- Element 17: Consider cross-referencing the list of equipment included in OP El. 17s.17.4, ensuring it includes all measurement instrumentation that forms part of the monitoring system for CT. This requirement is included in the latest version of the Municipal Drinking Water Licence's Schedule C Section 4.0 Calibration of CT Monitoring System – and therefore, an opportunity exists to also reference this section of the MDWL in Morris-Turnberry's OP Element 17.
- Element 19: Consider adding External Audit records to the list of "Documents Reviewed" for each internal audit conducted to document the status of findings identified in audit reports.

It is suggested that the opportunities for improvement be considered by management to further enhance the Operating Authority's Quality Management System and performance.

The Ministry of the Environment, Conservation and Parks last inspection on the Belgrave Drinking Water System was January 31, 2023 (for the 2022 year). there were several non compliance/non conformances noted:

The owner did not have a program or maintained a schedule for routine cleanout, inspection and maintenance of reservoirs and elevated storage tanks within the distribution system.

The last Ministry detailed inspection report identified that a reservoir and pump well video inspection last occurred in June 2015. The operator was not aware of any inspections or cleanouts completed. Maintenance inspection and cleanout of the reservoir / high lift well also do not appear to be included in the municipal 2022 Asset Management Plan life cycle assessments for the Belgrave water system.

Recommendation:

The owner is encouraged to assess the information on the last inspection of the reservoir and pump well, and plan for a subsequent routine cleanout, inspection and maintenance of these storage structures as necessary.

Logbooks were not properly maintained and/or did not contain the required information.

Logs and records kept largely met the requirements under section 27 of O.Reg. 128/04. However, there were two exceptions noted where the date was not recorded; pages 67 checks but also noted operational alarm conditions. The operating authority's standard operating procedure: "MT-OM-12 Belgrave Operations Manual - Daily Checks" identifies

the provisions of section 27 of O.Reg. 128/04 which must be adhered to.

Required Actions:

Within 30 days of the issuance of the inspection report:

- I. Ensure that all operators, responsible for operation of the Belgrave DWS, review standard operating procedure "MT-OM-12 Belgrave Operations Manual - Daily Checks".
- II. Document this review in the training records for each of the operators and submit a copy of this document to the issuing officer.

The following issues were also noted during the inspection:

These issues were brought to the attention of the operator immediately after the inspection due to the potential for contamination and/or ensuring the reliability of the drinking water system:

- A. Concerns were identified with the greensand filter backwash decant tank, from which the decant is combined with the raw water fed into the treatment process:
 - i. Although it was designed in this manner, the treated water (CT) free chlorine analyser waste stream (which is an older Hach 1720 unit which utilizes DPD solution) flows into this decant tank.
 - ii. The greensand filter rinse effluent is directed back into the decant tank via a floor drain which is not sufficiently protected against other contaminants on the floor gaining access to the tank via this drain. The potential for contaminants gaining access is increased due to the ongoing leaking from backwash piping caused by the backwash pump start-up and valve issues.
- B. Low-low free chlorine set point alarm on the CT free chlorine analyser may default to 0.0 mg/L after a power outage and must be manually reset by the operator. If this is the case, the default setting should be revised appropriately.
- C. McCrae well shuts down and alarms on flow signal in excess of 4.20 L/s set point (4.18 L/s shown in trending) to ensure PTTW taking limits compliance. Valve throttling at the McCrae flow control valve or PLC adjustments may be needed. False flow readings caused by pump surges/aeration on start-up are not considered PTTW exceedances.

Recommendations:

 - A i. The analyser waste stream was subsequently directed away from the decant and directed to the sludge waste tank temporarily. Due to the volume generated for off-site disposal, an alternative is being sought, including consideration for a switch to a reagent free model. No further recommendations are offered at this time.
 - A ii. The floor drain receiving rinse effluent from the greensand filter backwash process should be protected to ensure that contaminated waters or other fluids, generated from maintenance, operational activities or leaks, are not allowed to enter the drain.
- B. If it is found that the low-low free chlorine set point alarm on the CT free chlorine analyser defaults to 0.0 mg/L after a power outage, the default setting should be revised appropriately so it doesn't require manual reset by the operator.
- C. Investigate and correct any control adjustments (flow control valve or PLC) which may be needed to ensure that the McCrae well doesn't lock out and alarm on erroneous flow signals.

The 2021 Summary Report for municipal council was completed on time and distributed in accordance with the regulatory requirements, but did not include all the required content.

However, the report failed to include a statement of the specific legislative requirements which were not met during the period covered by the report. Specifically, the Ministry's inspection report identified non-compliance with flow monitoring provisions of the drinking water system licence.

The next Summary Report to council, for 2022, under Schedule 11 of O. Reg. 170/03, will be required by March 31, 2023.

Required Action:

By March 31, 2023,

- I. Correct the 2021 Summary Report to council, ensuring it complies with paragraph (a) of sub-section 22-2 (2) under of O. Reg. 170/03, and lists the requirements of the Act, the regulations, the system's approval, drinking water works permit, municipal drinking water licence, and any orders applicable to the system that were not met at any time during the

period covered by the report.

II. Provide the corrected 2021 Summary Report to the Morris-Turnberry municipal council.

III. Ensure that the 2022 Summary Report prepared is also consistent with the provisions of O. Reg. 170/03 Schedule 22-2.

All required Director Notifications under Condition 2.4 of Schedule B of the Drinking Water Works Permit were not made to the Ministry during the inspection period.

The new McCrea well was authorized through a Schedule C approved by the Director, issued March 18, 2022. Logbook records show that the well was commissioned and placed into service the week of August 15, 2022. No Director notification was submitted within 30 days of placing the well into service, contrary to condition 2.4.2 under Schedule B of Drinking Water Works Permit 247-201.

Required Action:

Within 30 days of the issuance of the inspection report:

I. Prepare a "Director Notification Form - Alterations to a Drinking Water System" for the placing of the new well, authorized by Schedule C, issued March 19, 2022, into service.

II. Submit the Director Notification Form to the email address MDWLP@ontario.ca, with a copy of the email addressed to the issuing officer.

There were no adverse water events in 2022.

7.0 MECP Regulatory Changes

- Proposed amendments to drinking water operator and water quality analyst certification regulations have been issued to address the impacts of emergencies. These include:
 - allowing the Ministry to act quickly to ensure the Province's drinking water is protected during an emergency
 - extending Operator certificates and allowing certain qualified but non-certified staff to temporarily maintain system operations, and would only be enacted during an emergency
 - allowing temporary relief from training and certification requirements

This proposal has been registered with the Environmental Registry of Ontario and the consultation process was closed on July 2, 2021. The outcome of this proposal is expected to be published in 2022.
- Proposed updates to the Director's Directions - Minimum Requirements for Operational Plans - May 2021. The Director's Directions have updated the following:
 - Content Requirements - all referenced documents will be considered part of the Operational Plan.
 - Procedures for version control - version number and revision date is to be embedded in every electronic copy, and recorded on every page of any physical copy
 - Completed copy of Subject System Description Form in Schedule "C" of the Director's Directions
 - Operational Plans are to be submitted to the Director electronically
 - Retention of Operational Plans - Operational Plans that were the subject of an audit by an auditor for the accreditation body shall be retained for a minimum of 10 years
 - Public Disclosure of Operational Plans - shall be made available for viewing by the public either electronically (website) or at the principal place of business, but not in a manner that would threaten the safety, health or quality of the drinking water, or create significant prejudice with the contractual obligations of the Operating Authority or other organization.
 - Operational Plans shall be updated to meet the requirements of the Director's Directions no later than April 1, 2022.

The Municipality will provide A copy of the Operational Plan by request