Annual Report
For the 2022 Operating Year

Blyth Drinking Water System
2022 Operation and Maintenance
Annual Report

PREPARED BY

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TO

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1.0 INTRODUCTION AND BACKGROUND

The purpose of the 2022 Annual Report is to document the operation and maintenance data for the Blyth Drinking Water System for review by the Ministry of the 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 Township's website and can be supplied, free of charge, to interested parties upon request.

2.0 DESCRIPTION OF WATER SYSTEM

The Blyth Drinking Water System (DWS # **220001496**), is characterized as a "secure ground water" system and is classified as a large municipal residential system. The system consists of three wells (1, 2 and 5) with a rated capacity of 2877 m3/day with the inclusion of Well 5 (1728 m3/d), put in operation December 21, 2016. Treatment consists of chlorination (sodium hypochlorite) and iron sequestration (sodium silicate) treatment. The Well 1 and 2 system is located at 201 Thuell St. Well #5 is located in the north east corner of 377 Gypsy Lane. The distribution system serves the community of Blyth with a population of approximately 1000 residents, 450 customer services, with 12.7 km of various size and material water main.

The system is owned by the Corporation of the Township of North Huron and operated by Veolia Water Canada, the Operating Authority.

The Wells 1 and 2 water supply system consists of two drilled wells fitted with pumps capable of pumping the volume specified in the Permit to Take Water. The raw water consistently has substantial naturally occurring hardness and relatively high iron content that requires sequestering to prevent discoloration in the distribution system which is typical of all drilled wells in the area. The raw water also has fluoride concentrations that hover at or just above the maximum allowable concentration in O.Reg 169/03 which is typical of the drilled wells in the area. Chlorine, (a critical process) and an iron sequestering agent are added to the raw water prior to entry into a baffled contact tank that satisfies the chlorine contact time required with adequate chlorine residual to disinfect.

From the contact tank/reservoir the water flows to the high lift building that houses two electrically driven high lift pumps, as well as a diesel engine driven fire pump, that are capable of maintaining adequate system pressure. The water level in the reservoir is maintained by a level controller that starts and stops the well pumps. Also housed in the building is a manually operated standby emergency generator that allows operation of the equipment during extended power interruptions. The building contains cushion tanks that absorb hydraulic shocks and maintain pressure during brief power interruptions. The treated drinking water is monitored for chlorine residual and turbidity by on-line equipment connected to an auto dialer. The monitoring system will alert the on-call operator to respond if the set points are breached. The chlorine and turbidity analysis data levels are stored on a data logger.

The distribution system has no elevated storage and relies on the pumps and cushion tanks to maintain pressure. Critical processes to ensure safe water are adequate chlorination and maintenance of system pressure. The monitors activate an alarm through the auto dialer if the set points are breached.

The raw water has abnormally high chlorine demand, coupled with sequestering agent and high background sodium levels that result in elevated sodium in the treated water just above the maximum allowable concentrations in O.Reg 169/03.

Well # 5 was put into service in December 21, 2016, as a second isolated source. It is a 175 mm drilled well, 83.5 m deep. Well # 5 is equipped with a submersible vertical turbine pump, well level sensor to measure static level and provide well level monitoring. At this stage of development of the system (phase 1 of 3), Well 5 has been designed to operate on a time-of-day basis to run twice per day during peak demand times and controlled with a variable speed drive to maintain the desired pressure set point in the distribution system as well as to provide additional volume of water during periods of high-water demand such as fire protection.

Although the well has not been in service long average quality appears to be similar to the Well 1 & 2 quality with fluoride & sodium siting at or above the limits, chlorine demand with similar hardness and alkalinities.

The well house is equipped with back-up diesel generator, complete with auto transfer, sodium hypochlorite (2) and sodium silicate (2) pumps, a chlorine contact loop, on-line monitoring, alarm generation and auto-dialer.

The well house and its equipment have a daily maximum capacity to deliver 1728 m3 per day to the Blyth community.

The water from Well 5 is pumped through a main header where sodium hypochlorite and sodium silicate are added and directed to a chlorine contact loop to provide adequate chlorine concentration/contact time at maximum flow and before the first consumer.

The water quality is monitored and data-logged by a programmable logic controller with breaches of set-points going to an alarm dialer.

Disinfection is achieved on the Blyth well supply through the use of 12% sodium hypochlorite. In the well houses this chemical is added prior to the water entering the chlorine contact reservoir at a suitable dose rate to achieve both primary and secondary disinfection objectives.

The attached distribution system is constructed with a combination of ductile iron, cast iron, PVC and high-density polyethylene piping with polyethylene, copper and galvanized steel services. There are no known lead services. There is no elevated storage to maintain pressure and the system pressure is maintained using pressure tanks, 3 high lift pumps (2 electric and a diesel) and 1 variable speed submersible (Well 5).

The system has approximately 45 fire hydrants that with the additional 20L/s flow from the new Well 5 will provide much improved sustained fire flows.

The chlorine dosages 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 > 1.00 mg/l and < 1.30 mg/l.

The Blyth well supply has 1 PTTW (Permit to Take Water) # 6057-A3SJAU with an expiry date of November 30, 2025, which allows 3504.960 cubic meters per day to be pumped from the combined wells.

The Blyth Drinking Water System has maximum flows as specified in the Municipal Drinking Water License (MDWL) 090-101, Issue 4 and Drinking Water Works Permit (DWWP) 090-201), Issue 5. The maximum rated capacity from the combined wells is 2877 cubic meters per day. Authorization to operate Well 5 is in a Form C addendum to the DWWP.

The pre-chlorine entering the contact facilities and treated water (point of entry to distribution) is monitored by on-line chlorine analyzers.

Typical system pressure ranges from 40 psi at the higher elevations to 85 psi at Wells 1 and 2 which is the lowest elevation of the system.

Well 5 system pressure ranges between 53psi to 65psi under normal operating conditions

3.0 SUMMARY OF WATER QUALITY MONITORING

3.1 Water Treatment Equipment Operation and Monitoring

3.1.1 Point of Entry Chlorine Residual

Chlorine residuals are continuously measured using an online chlorine analyzer and verified for accuracy using hand-held HACH pocket colourimeters which accuracies are verified using known standards. **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 checked daily using a HACH pocket colourimeter. In 2022, 468 distribution chlorine residuals were recorded the results can be found in Table 1

Table 1 – Treated and Distribution Chlorine Residuals for Blyth Drinking Water System [a]

Blyth 2022 Treated Water Monthly Average Point of Entry Chlorine Residuals			North Huron - Blyth Water - 2022 Distribution Residual Summary				
Month	**Well 1/2 POE**	**Well 5 POE**	**Month**	**Total Dist. Sample**	**Min FCR**	**Max FCR**	**Avg FCR**
Jan	1.10	1.34	**Jan**	39	0.79	1.24	1.04
Feb	1.07	1.48	**Feb**	36	0.83	1.25	1.04
Mar	1.23	1.58	**Mar**	41	0.87	1.42	1.12
Apr	1.24	1.52	**Apr**	38	0.98	1.41	1.18
May	1.15	1.32	**May**	41	0.74	1.46	1.11
Jun	1.17	1.39	**Jun**	38	0.82	1.35	1.08
Jul	1.09	1.13	**Jul**	39	0.73	1.31	1.06
Aug	1.28	1.35	**Aug**	40	0.79	1.81	1.10
Sept	1.17	1.68	**Sept**	38	0.77	1.59	1.12
Oct	1.39	1.72	**Oct**	39	0.95	1.83	1.32
Nov	1.50	2.03	**Nov**	40	0.97	1.92	1.39
Dec	1.44	1.86	**Dec**	39	1.03	1.78	1.34
Count	364	364	**Count**	468			
Min	0.81	0.85	**Min**		0.73		
Max	2.01	2.45	**Max**			1.92	
Ave	1.24	1.53	**Avg**				1.16

[a] – Results collected from January 1, 2022 – December 31, 2022

3.1.3 Turbidity

Treated Turbidity is measured daily using online turbidimeters at Wells 1&2 and weekly using a handheld at well 5, Operations had to get two new handheld turbidimeters in 2022 and there were some missed turbidity readings as a result and miscommunication between operators. Raw water Turbidites are collected weekly from each well using handheld turbidimeters. **Table 2** provides a summary of raw and treated turbidity results. The maximum turbidity measured in the treated water at wells1&2 was 0.28 NTU and 0.31 at well 5.

Table 2 – Raw and Treated Water Turbidities for Blyth Drinking Water System [a]

Monthly Ave Raw Water Turbidity's				Treated Water turbidity's Well 1/2					Treated Water turbidity's Well 5				
Month	**Well 1**	**Well 2**	**Well 5**	**Month**	**Min**	**Max**	**Average**	**Count**	**Month**	**Min**	**Max**	**Average**	**Count**
Jan	0.26	0.38	0.43	**Jan**	0.04	0.15	0.09	31.00	**Jan**	0.16	0.23	0.20	4.00
Feb	0.30	0.28	0.23	**Feb**	0.03	0.18	0.09	28.00	**Feb**	0.12	0.18	0.16	4.00
Mar	0.27	0.32	0.30	**Mar**	0.06	0.12	0.08	31.00	**Mar**	0.10	0.14	0.12	4.00
Apr	0.24	0.25	0.27	**Apr**	0.04	0.17	0.07	30.00	**Apr**	0.11	0.14	0.12	3.00
May	0.28	0.28	0.29	**May**	0.04	0.10	0.07	31.00	**May**	0.09	0.12	0.11	4.00
Jun	0.29	0.32	0.32	**Jun**	0.05	0.28	0.09	30.00	**Jun**	0.09	0.09	0.09	1.00
Jul	0.23	0.25	0.27	**Jul**	0.06	0.14	0.10	31.00	**Jul**	0.08	0.12	0.10	3.00
Aug	0.23	0.27	0.28	**Aug**	0.09	0.19	0.13	31.00	**Aug**	0.10	0.13	0.12	4.00
Sep	0.35	0.25	0.31	**Sep**	0.10	0.17	0.56	30.00	**Sep**	0.10	0.15	0.12	4.00
Oct	0.36	0.29	0.34	**Oct**	0.09	0.18	0.13	31.00	**Oct**	0.13	0.31	0.22	2.00
Nov	0.26	0.31	0.17	**Nov**	0.09	0.16	0.12	30.00	**Nov**	0.19	0.19	0.19	1.00
Dec	0.14	0.22	0.16	**Dec**	0.10	0.16	0.52	30.00	**Dec**	0.00	0.00	0.00	0.00
Min	0.10	0.18	0.08	**Min**	0.03		0.07		**Min**	0.08		0.09	
Max	0.39	0.57	0.57	**Max**		0.28	0.56		**Max**		0.31	0.22	
Average	0.27	0.28	0.28	**Average**			0.17		**Average**			0.13	
Count	49	50	48	**Count**				364.00	**Count**				34.00

[a] – Results collected from January 1, 2022 – December 31, 2022

3.2 Microbiological Sampling

3.2.1 Raw Water Samples

Raw water samples are taken every week from each of Well 1, 2 and well 5. In 2022, a total of 156 samples were collected and analyzed for each E. Coli and Total Coliforms. All E. Coli and Total Coliform results obtained were 0 cfu/100 ml in the raw water.

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 Heterotrophic Plate Count (HPC) at Wells 1, 2 and Well 5. A total of 104
treated water samples were collected and analyzed for the above parameters. Each E. Coli result from the treated water was 0 cfu/100 ml. There was 1 sample result that resulted with an adverse result for total Coliforms in May of 2022, the results was a 1cfu/100ml when the MAC is 0cfu/100ml, resamples were collected and the results came back clear. Currently, there is no limit on HPC. 104 samples were found to be safe, with 0 deteriorating >50. The range of HPC results were <10 - 20 cfu/1 ml.

3.2.3 Distribution System

Distribution samples are collected every week and tested for E.Coli, Total Coliform and for Heterotrophic Plate Count (HPC) in at least 25% of the samples. In 2022, a total of 386 distribution samples were collected and analyzed for the above parameters and all samples were found to be safe. The range of HPC results were <10 - 30 cfu/1ml with 56 samples being analyzed.

Table 3 Summary of Microbiological results 2022

Annual Summary of samples								
Location	**TC Count**	**TC Adverse**	**EC Count**	**EC Adverse**	**HPC count**	**HPC >50**	**Total # samples**	**Total non compliant**
Raw water	156	0	156	0	N/A	N/A	312	0
Treated Water	104	1	104	0	104	0	312	1
Distribution	165	0	165	0	56	0	386	0
							1010	**1**

3.3 Chemical Sampling & Testing

3.3.1 Haloacetic Acids

In 2022 Samples for HAA5's were collected at the beginning of every quarter, Maximum acceptable concentration for HAA5's is 80 ug/L all samples were compliant to the limit in 2022

- 2022 HAA5 Sample results can be found in Table 4.

Table 4- Haloacetic Acids

HAA5 ug/L								
Date	**Location**	**Total HAA5**	**Chloroacetic Acid**	**Bromoacetic Acid**	**Dichloroacetic Acid**	**Dibromoacetic Acid**	**Trichloroacetic Acid**	**Average**
Jan 19-22	148 Dinsley St.	10.3	4.7	2.9	3.8	2	6.6	5.1
	182 Thuell St.	12	4.7	2.9	4.3	2	7.8	2.9
Apr 5-22	166 Dinsley St.	5.3	4.7	2.9	2.6	2	5.3	3.8
	182 Thuell St.	5.3	4.7	2.9	4.2	2	5.3	4.1
July 5-22	166 Dinsley St.	5.3	4.7	2.9	2.6	2	5.3	3.8
	182 Thuell St.	5.3	4.7	2.9	3	2	5.3	3.9
Jan 25-22	166 Dinsley st	5.3	4.7	2.9	2.6	2	5.3	3.8
	182 Thuell ST	10.4	4.7	2.9	3.9	2	6.5	5.1
MIN		5.3	4.7	2.9	2.6	2	5.3	2.9
MAX		12	4.7	2.9	4.3	2	7.8	5.1
AVERAGE		**7.4**	**4.7**	**2.9**	**3.4**	**2.0**	**5.9**	**4.0**

3.3.2 **Strontium and Calcium**

Strontium and calcium monitoring is on-going in the Blyth Drinking Water System, in 2021 quarterly samples were collected and the Huron Perth Public Health unit distributed notices of the elevated levels to the Township for the Blyth Drinking water system users. Since that one-year program we are required going further to sample once annually to continue to monitor the levels the results from samples collected on July 5, 2022 can be found in table 5 Below.

Table 5 - Strontium and Calcium

Strontium and Calcium			
Date	**Location**	**Calcium**	**Strontium ug/L**
July 5-22	Well 1 RW	168	42600
	Well 2 RW	198	53100
	Well 5 RW	166	42200
	Well 1&2 POE	41.6	49400
	298 Hamilton	46.2	41500
	Well 5 POE	45.1	39400
Total Strontium Health basis MAC 7000ug/L			
	MIN	**41.6**	**39400**
	MAX	**198**	**53100**
	AVERAGE	**110.8**	**44700.0**

*Samples Collected July 5, 2022

The total strontium has a health Mac of 7000ug/L, currently there is not a regulatory limit for Strontium in Ontario, however the Health Unit recommends a Mac of 7000ug/L

3.3.3 Inorganics

One treated water sample is taken every 36 months and tested for inorganics. The most recent sample for the Blyth Drinking Water System was collected on May 11, 2021. Schedule 23 will be collected and analyzed next in May 2023. All parameters were found to be within compliance. Results from 2021 can be found in **Table 6.**

Table 6 – Schedule 23 Results for Blyth Drinking Water System – [a]

Water Works Name:			Blyth Drinking Water System		
Well No. (if applicable):			Well # 1 # 2 & #5		
Year:			**2021**		
Serviced Population			1000		
Laboratories Which Performer Analyses:			SGS Lakefield Research		
Water Works #			220001496		
	Analysis			1/2 MAC	Maximum
	Date	Well #1&2	Well # 5		Allowable Level
Parameter	(MM/DD/YY)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Schedule 23					
Antimony	May 11-21	9	9	3	6
Arsenic	May 11-21	1.3	2.9	5	10
Barium	May 11-21	140	249	500	1000
Boron	May 11-21	63	61	2500	5000
Cadmium	May 11-21	0.004	0.003	2.5	5
Chromium	May 11-21	0.14	0.4	25	50
Mercury	May 11-21	0.01	0.01	0.5	1
Selenium	May 11-21	0.04	0.04	25	50
Uranium	May 11-21	0.11	0.184	10	20

[a] – Samples collected on May 11, 2021.

3.3.4 Lead

1. 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 10 ug/L. In 2022 Samples were collected on March 15, 2022 and Sept 20, 2022 all samples were below the MAC. 2022 results can be found in **Table 7.**

Table 7 – Lead Sampling Program Distribution Results for Blyth Drinking Water System [a]

Lead Blyth Water 2022				
	MAC	30-500caco3	10ug/L	6.5-8.5
Date	**Location**	**Alk mg/L**	**Lead ug/L**	**Field pH**
Mar 15-22	Hydrant - Behind post office 1st		0.08	7.83
	Hydrant - Behind post office 2nd		0.05	7.83
	Hydrant - 255 Dinsley St. 1st		0.87	7.81
	Hydrant - 255 Dinsley St. 2st		0.23	7.81
Mar 17-22	Hydrant - 255 Dinsley St.	217		8.48
	Hydrant - Behind Post Office	215		8.4
Sept 20-22	Hydrant McConnell & Morris1st		0.09	7.71
	Hydrant McConnell & Morris2nd		0.08	
	Hydrant McConnell & Morris 3rd	206		
	Hydrant king & Gypsy 1st		0.2	7.78
	Hydrant King & Gypsy 2nd		0.14	
	Hydrant King & Gypsy 3rd	207		
	Min	**206**	**0.05**	**7.71**
	Max	**217**	**0.87**	**8.48**
	Average	**211**	**0.22**	**7.96**

[a] – Samples collected on March 15 & 17, 2022 and Sept 20, 2022 respectively.

3.3.5 Organics

One treated water sample is taken every 36 months and tested for organics. The sample for the Blyth Drinking Water System was collected on May 11, 2021 for analysis of organics as listed in Schedule 24. Schedule 24 samples will be collected and analyzed for next in 2023 All parameters were found to be within compliance. 2021 sample results can be found in **Table 8.**

Table 8 – Schedule 24 Results for Blyth Drinking Water System [a]

Water Works Name:			Blyth Drinking Water System		
Well No. (if applicable):			Well # 1, # 2 & #5		
Year:			**2021**		
Serviced Population			1000		
Laboratories Which Performer Analyses:			SGS Lakefield Research		
Water Works #			220001496		
	Analysis				Maximum
	Date	Well #1&2	Well # 5		Allowable Level
Parameter	(MM/DD/YY)	(ug/L)	(ug/L)		(ug/L)
Schedule 23 & 24					
Benzene	May 11-21	0.32	0.32	<MDL	1
Carbon Tetrachloride	May 11-21	0.17	0.17	<MDL	2
1,2-Dichlorobenzene	May 11-21	0.41	0.41	<MDL	200
1,4-Dichlorobenzene	May 11-21	0.36	0.36	<MDL	5
1,1-Dichloroethylene	May 11-21	0.33	0.33	<MDL	14
1,2-Dichloroethane	May 11-21	0.35	0.35	<MDL	5
Dichloromethane	May 11-21	0.35	0.35	<MDL	50
Monochlorobenzene	May 11-21	0.3	0.3	<MDL	80
Tetrachloroethylene	May 11-21	0.35	0.35	<MDL	10
Trichloroethylene	May 11-21	0.44	0.44	<MDL	5
Vinyl Chloride	May 11-21	0.17	0.17	<MDL	1
Diquat	May 11-21	1	1	<MDL	70
Paraquat	May 11-21	1	1	<MDL	10
Glyphosate	May 11-21	1	1	<MDL	280
Polychlorinated Biphenyls	May 11-21	0.04	0.04	<MDL	3
Benzo(a)pyrene	May 11-21	0.004	0.004	<MDL	0.01

Alachlor	May 11-21	0.02	0.02	<MDL	5
Atrazine+N-dealkylated metabolites	May 11-21	0.01	0.01	<MDL	5
Atrazine	May 11-21	0.01	0.01	<MDL	
De-ethylated atrazine	May 11-21	0.01	0.01	<MDL	
Azinphos-methyl	May 11-21	0.05	0.05	<MDL	20
Carbaryl	May 11-21	0.05	0.05	<MDL	90
Carbofuran	May 11-21	0.01	0.01	<MDL	90
Chlorpyrifos	May 11-21	0.02	0.02	<MDL	90
Diazinon	May 11-21	0.02	0.02	<MDL	20
Dimethoate	May 11-21	0.06	0.06	<MDL	20
Diuron	May 11-21	0.03	0.03	<MDL	150
Malathion	May 11-21	0.02	0.02	<MDL	190
Metolachlor	May 11-21	0.01	0.01	<MDL	50
Metribuzin	May 11-21	0.02	0.02	<MDL	80
Phorate	May 11-21	0.01	0.01	<MDL	2
Prometryne	May 11-21	0.03	0.03	<MDL	1
Simazine	May 11-21	0.01	0.01	<MDL	10
Terbufos	May 11-21	0.01	0.01	<MDL	1
Triallate	May 11-21	0.01	0.01	<MDL	230
Trifluralin	May 11-21	0.02	0.02	<MDL	45
2,4-dichlorophenoxyacetic acid	May 11-21	0.19	0.19	<MDL	100
Bromoxynil	May 11-21	0.33	0.33	<MDL	5
Dicamba	May 11-21	0.2	0.2	<MDL	120
Diclofop-methyl	May 11-21	0.4	0.4	<MDL	9
MCPA	May 11-21	0.00012	0.00012	<MDL	0.1
Picloram	May 11-21	1	1	<MDL	190
2,4-dichlorophenol	May 11-21	0.15	0.15	<MDL	900
2,4,6-trichlorophenol	May 11-21	0.25	0.25	<MDL	5
2,3,4,6-tetrachlorophenol	May 11-21	0.2	0.2	<MDL	100
Pentachlorophenol	May 11-21	0.15	0.15	<MDL	60

[a] – Samples collected on May 1, 2021.

3.3.6 Trihalomethanes

One distribution sample is taken every three months from a point in the distribution system and tested for Trihalomethanes (THMs). In 2022, samples were collected during the months of January, April, July and October. The Ontario Drinking Water Quality Standard (ODWQS) have set a Maximum Allowable Concentration (MAC) of 100 µg/L for this parameter and it is expressed as a running annual average. In 2022, the average THM was found to be 16.5 µg/L, which is within compliance. Refer to **Table 9** for the summary of trihalomethane results.

3.3.7 Nitrate & Nitrite

One treated water sample is taken every three months and tested for nitrate and nitrite. In 2022, samples were collected during the months of January, April, July and October. The Ontario Drinking Water Quality Standard (ODWQS) have set a 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 and THM Results at Blyth Drinking Water System [a]

Treated Drinking Water - Nitrites and Nitrates POE Well 1 & 2														
													O.Reg 169	
Date		**Jan 11-22**		**Apr 5-22**		**Jul 5-22**		**Oct 25-22**	**Min**	**Max**	**Avg**	**MAC**	**1/2 MAC**
NO2	<	0.003	<	0.003	<	0.003	<	0.003	**0.003**	**0.003**	**0.003**	**1**	**0.5**
NO3		0.01		0.008		0.007	<	0.011	**0.007**	**0.011**	**0.009**	**10**	**5**
NO2+NO3		0.01		0.008		0.007	<	0.011	**0.007**	**0.011**	**0.009**	**10**	**5**

Treated Drinking Water - Nitrites and Nitrates POE Well 5													
												O.Reg 169	
Date		**Jan 11-22**		**Apr 5-22**		**Jul 5-22**		**Oct 25-22**	**Min**	**Max**	**Avg**	**MAC**	**1/2 MAC**
NO2	<	0.003	<	0.003	<	0.003	<	0.003	**0.003**	**0.003**	**0.003**	**1**	**0.5**
NO3		0.01		0.008		0.006	<	0.010	**0.006**	**0.010**	**0.009**	**10**	**5**
NO2+NO3		0.01		0.008		0.006	<	0.010	**0.006**	**0.010**	**0.009**	**10**	**5**

Distribution Drinking Water - Trihalomethanes													
Date		**Jan 11-22**		**Apr 5-22**		**Jul 5-22**		**Oct 25-22**	**Min**	**Max**	**Average**	**MAC**	**1.2 MAC**
THMs (total)		17		14		18		17	**14.0**	**18.0**	**16.5**	**100**	**50**
Bromodichloromethane		3		2.3		2.9		2.9	**2.3**	**3.0**	**2.8**		
Bromoform	<	0.34	<	0.34	<	0.34		0.34	**0.340**	**0.340**	**0.340**		

Chloroform	13		11.0		14.0		14.0		**11.0**	**14.0**	**13.0**
Dibromochloromethane	0.65		0.54		0.64		0.63		**0.54**	**0.65**	**0.62**

[a] – Results collected from Jan 11, Apr 5, Jul 5 and Oct 25, 2022

3.3.8 Sodium

One water sample is collected annually for raw water at Wells 1, 2 and 5 and tested for Sodium due to naturally elevated levels. O. Reg 170/03 has set a Maximum Acceptable concentration (MAC) of 20 mg/L on the Treated Water for Sodium which requires the Medical Office of Health be notified if the concentration exceeds the MAC. The Raw water samples were collected on August 9, 2022 at Wells 1, 2 and 5 (Raw Water), results can be found below.

Treated water samples were collected on January 8, 2018 Well 1&2 POE 23.1mg/L, well 5 POE 22.2mg/L both exceeding the MAC, AWQI #138510 was issued and resamples were collected on January 9, 2018. The resample results were; Well 1&2 POE 22.3mg/L, Well 5 22.5mg/L both still exceeding the 20mg/L MAC. The Huron County Health Unit provided the Township of North Huron with a Notification to be distributed to all water system users.

3.3.9 Fluoride

One water sample is collected annually and tested for Fluoride from the raw water due to naturally elevated levels. The Ontario Drinking Water Quality Standards (ODWQS) have set a MAC of 1.5 mg/L on Treated Water.

On August 9, 2022, Raw water samples were collected for this analysis. The samples can be found below. Wells 2 & 5 raw water Fluoride analysis are greater than the treated water MAC 1.5 mg/L.

Treated Water samples were collected on January 8, 2018 Samples results were as follows: Well 1&2 POE 1.77mg/L, Well 5 1.46mg/L Well 1&2 POE results were in exceedance of the 1.5mg/ L MAC. AWQI # 1358514 was issued and resamples collected for Well 1&2, the resample result was 1.81mg/L still in exceedance of the 1.5mg/L MAC. The Huron County Health Unit provided the Township of North Huron a Notice to be Distributed to all Water system users.

Results for 2022 raw sodium & fluoride samples can be found in table 10 below along with 2018 treated water results. Sodium and Fluoride will be analyzed on the Treated water next in January of 2023.

Table 10 Sodium and Fluoride Raw and Treated

2022-Raw Water Sodium/Fluoride mg/L * not reportable- Monitoring				**2018-Treated Water POE Sodium/Fluoride mg/L**			
Date	**Location**	**Fluoride**	**Sodium**	**Date**	**Location**	**Fluoride**	**Sodium**
Aug 9-22	**Well1**	1.33	16.6	Jan 8-18	Well 1&2	1.77	23.1
	well2	1.77	14.7		Well 5	1.46	22.2
	well5	1.52	20.3	Jan 11-18	Well 1&2	1.81	22.3
Treated MAC		**1.5**	**20**		Well 5		22.5
	Min	**1.33**	**14.7**				
	Max	**1.77**	**20.3**	Resamples showed still above Mac- HCHU issued notice to be distributed to all rate payers notifying them of the high sodium and Fluoride results			
	Average	**1.5**	**17.2**				
					MAC	**1.5**	**20**
					Min	1.46	22.2
					Max	1.81	23.1
					Average	1.68	22.53

Results for raw water Aug 9, 2022, treated water results January 2018

4.0 WATER AND CHEMCIAL USAGE

4.1 Chemical Usage

Refer to **Table 11.** From January 1, 2022 to December 31, 2022, 936.4kg of chlorine (in 12% sodium hypochlorite) was used to ensure proper disinfection in the distribution system with an average dosage of 6.01 mg/L.
Refer to **Table 11** – due to elevated iron content, sodium silicate is used to maintain the iron in a non-oxidized state to prevent excessive discoloration. The average dose rate as active silicate was 3.8mg/L

Table 11– Chemical Usage at Blyth Drinking Water System [a]

Township of North Huron - Blyth Well Supply - 2022 Chemical Usage Summary														
Well 1					Well 2					Well 5				
Month	Chl'n used (Kg)	Cl Dose	Si (L)	Si Dose	Month	Chl'n used (Kg)	Cl Dose	Si (L)	Si Dose	Month	Chl'n used (Kg)	Cl Dose	Si (L)	Si Dose
January	21.5	5.28	43.05	4.1	January	20.9	5.80	36.29	4.0	January	21.0	5.12	43.92	5.4
February	17.8	5.03	36.29	4.0	February	21.1	5.81	47.49	5.1	February	20.5	4.76	42.94	3.9
March	21.9	5.47	41.00	4.0	March	22.4	5.80	24.42	2.5	March	22.7	4.86	45.63	3.8
April	20.1	5.45	35.26	3.6	April	21.3	6.15	22.40	2.5	April	21.6	7.25	44.65	3.9
May	22.8	5.31	43.26	4.0	May	26.8	5.90	15.84	2.8	May	27.6	4.77	58.32	3.9
June	27.9	5.57	40.18	3.0	June	28.8	5.79	35.62	2.8	June	32.6	4.70	69.78	3.9
July	23.4	5.61	56.17	5.7	July	30.3	6.21	36.96	3.0	July	35.3	4.94	68.56	3.7
August	24.9	6.24	44.49	4.4	August	26.2	6.61	28.90	2.8	August	32.4	5.18	48.56	3.2
September	23.3	6.04	45.51	4.6	September	24.7	6.36	28.67	2.8	September	34.5	5.91	52.46	3.5
October	25.8	6.21	48.18	4.7	October	48.8	14.87	29.57	2.8	October	33.0	5.56	49.04	3.3
November	22.1	6.15	44.69	5.0	November	23.1	6.18	28.22	3.0	November	31.0	5.66	51.73	3.7
December	19.2	5.76	45.10	5.8	December	22.5	6.02	162.85	2.9	December	36.9	8.18	60.76	4.7
Total	270.6	68.12	523.16	52.9	Total	316.9	81.51	497.22	37.1	Total	348.9	66.90	636.35	46.9
Min	17.8	5.03	35.26	3.0	Min	20.9	5.79	15.84	2.5	Min	20.5	4.70	42.94	3.2
Max	27.9	6.24	56.17	5.8	Max	48.8	14.87	162.85	5.1	Max	36.9	8.18	69.78	5.4
Avg	22.6	5.68	43.60	4.4	Avg	26.4	6.79	41.43	3.1	Avg	29.1	5.57	53.03	3.9

[a] – Results collected from January 1, 2022 – December 31, 2022

4.2 Annual Flows: Permit to Take Water/ Capacity Breakdown

Permit to Take Water 6057-A3SJAU Compliance Report					
3.2 -Maximum Amount of Taking Permitted					
	Max/Day on Permit		Peak Flow	% Of Limit	
Well #1 (in m3)	653	m3	313	47.9	%
Well #2 (in m3)	1123	m3	278	24.8	%
Well #5 (in M3)	1728	m3	461	26.7	%
3.2 - Average Annual Amount of Taking Permitted					
	m3/year		m3/year		
Well #1 (in m3)	238345		47610	20.0	%
Well #2 (in m3)	409968		48071	11.7	%
Well #5 (in M3)	630720		66017	10.5	%

Capacity Report				
Total Peak Flow and average daily flow of all wells combined				
	Maximum		Actual	% Of Cap	
Capacity (m3/d)	3504		839	23.9	%
Average Daily flow (m3/Day)	3504		443	12.6	%

A summary of the water supplied to the distribution system in 2022 is provided in **Table 12.** This Table provides a breakdown of the monthly flow provided to the distribution system. Flow meters were calibrated in June 2022 by Iconix and were found to be acceptable.

Table 12 – Treated Water Flows for Blyth Drinking Water System

Blyth Water 3 wells combined totals			Blyth Water - Max Flow Summary		
Month	Total Flow m3	Max Daily Flow	Well 1	Well 2	Well 5
January	11965	514	183	187	195
February	11312	518	174	193	199
March	12446	556	203	180	220
April	11585	479	179	181	234
May	14479	764	229	278	317
June	16813	755	313	265	461
July	16281	823	227	221	397
August	14209	616	203	211	318
September	13535	553	197	184	290
October	14133	839	234	235	421
November	12734	604	188	169	276
December	12206	517	165	161	246
Total	161698	7538			
Min	11312	479			
Max	16813	839			
Avg	13475	628			

5.0 IMPROVEMENTS TO SYSTEM AND ROUTINE AND PREVENTATIVE MAINTENANCE

The following summarizes water system improvements and routine and preventative maintenance for the Blyth Drinking Water System:

- Preventative maintenance performed as per the computerized maintenance program
- Fuel Tank replacement for all Generators

6.0 MINISTRY OF THE ENVIRONMENT INSPECTIONS AND REGULATORY ISSUES

The most recent Ministry of Environment inspection was completed by Shayne Finlay on Jun 21m 2022.

There were no non compliances noted and the final Inspection Rating was 100%

7.0 Emergent Issues

7.1.0 EMERGENT ISSUES SUMMARY

No emergency issues to report at this time

Report Completed by: Veolia Water
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