



Wingham Drinking Water System  
2021 Operation and Maintenance  
Annual Report

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## **1.0 INTRODUCTION AND BACKGROUND**

The purpose of the 2021 Annual Report is to document the operation and maintenance data for the Wingham 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, 2021 to December 31, 2021. 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 Wingham Drinking Water System (DWS # **220001502**), is characterized as a "secure ground water" system and is classified as a large municipal residential system. The system consists of two wells – Well 3 with a rated capacity of 6537 m<sup>3</sup>/day and Well 4 with a rated capacity of 5270 m<sup>3</sup>/d. Treatment at both sites consists of chlorination (sodium hypochlorite) and iron sequestration (sodium silicate) treatment. The Well 3 system is located at 200 Water St. Well #4 is located at 23 Albert St. The distribution system serves the community of Wingham with a population of approximately 2950 residents, 1150 customer services and 29 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 Well 3 supply system consists of a 323 mm well drilled to a depth of 102.1m fitted with a variable speed pump capable of pumping the volume specified in the MECP 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. 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 distribution/standpipe that maintains adequate system pressure. The well is cycled by a level controller that starts and stops the well 3/high lift pumps. Emergency power is supplied by a portable diesel generator that allows operation of the equipment during extended power interruptions. The treated drinking water is monitored for chlorine residual and turbidity by on-line equipment connected to SCADA/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 elevated storage 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, as a critical feature well 3, high-lift 2 and well 4 are equipped with variable frequency drives that can be set to maintain system pressure setpoint in the event the standpipe is not in service.

Well #4 is a 356 mm drilled well, 98.65 m deep, complete with a stainless steel liner and equipped with a submersible vertical turbine pump, well level sensor to measure static level and provide well level monitoring. The system has been designed to operate to alternate the duty wells between well 3 and 4.

The #4 well house is equipped with a back-up diesel generator, sodium hypochlorite (2) and sodium silicate pump, a baffled chlorine contact tank equipped with 3 high lift pumps, on-line monitoring, alarm generation and auto-dialer.

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Back-up power is supplied by one diesel standby generator with automatic transfer switch and double wall fuel tank.

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

Disinfection is achieved on the Wingham 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 facilities at dosages high enough to achieve both primary and secondary disinfection objectives.

The 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 known lead services, of which have been sampled at the initial plumbing sampling program, where no elevated levels were found due to the service material. The iron sequestering also has the dual purpose of corrosion control, coupled with very stable pH and substantial alkalinity and hardness that inhibits corrosion that controls lead corrosion. These services will be replaced when street reconstruction takes place.

The system has approximately 135 fire hydrants.

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 Wingham well supply Operates on PTTW # 1450-B38HKS which expires on August 1, 2028 which allows 11,807 cubic meters per day to be pumped from the combined wells.

The Wingham Drinking Water System (treatment Subsystem) has maximum flows as specified in the Municipal Drinking Water License (MDWL) 090-102, Issue 4 and Drinking Water Works Permit (DWWP) 090-202, Issue 4. The maximum total daily flow is 11,807 cubic meters per day.

The treated water is monitored by an on-line chlorine analyzer.

Typical system pressure ranges from 40 psi to 85 psi.

### 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. **Table 1** shows the monthly average of the daily free chlorine residual value 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 2021, 470 distribution chlorine residuals were recorded.

**Table 1.** – Treated and Distribution Chlorine Residuals for Wingham Drinking Water System – Distribution Min/Max/Average was based on all samples not the monthly averages

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Min	Max	# Samples
<b>Avg W3 Treated Chlorine Residual (mg/L)</b>	1.27	1.20	1.30	1.28	1.27	1.27	1.23	1.21	1.23	1.30	1.29	1.31	1.26	0.86	1.55	366
<b>Avg W4 Treated Chlorine Residual (mg/L)</b>	1.22	1.24	1.19	1.21	1.21	1.14	1.11	1.21	1.24	1.26	1.21	1.25	1.21	0.97	1.49	365
<b>Average Distribution Chlorine Residual (mg/L)</b>	1.01	1.06	1.03	0.99	0.97	0.96	0.97	0.94	1.01	1.02	1.01	1.04.	1.00	0.59	1.47	470

<sup>a</sup> – Results collected from January 1, 2021 – December 31, 2021

### 3.1.3 Turbidity

Treated Turbidity is measured daily using an online analyzer and raw water samples are analyzed using portable turbidimeters. **Table 2**, provides a summary of raw and treated turbidity results. The maximum turbidity measured in the treated water was 0.36 NTU.

**Table 2 – Raw and Treated Water Turbidities for Wingham Drinking Water System<sup>a</sup>**

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Min	Max	# Samples
<b>Avg W3 Raw Turbidity</b>	0.30	0.30	0.30	0.34	0.28	0.31	0.30	0.31	0.38	0.37	0.30	0.31	<b>0.32</b>	<b>0.28</b>	<b>0.38</b>	46
<b>Avg W3 Treated Turbidity</b>	0.10	0.10	0.10	0.12	0.14	0.12	0.12	0.12	0.12	0.12	0.15	0.13	<b>0.12</b>	<b>0.10</b>	<b>0.15</b>	366
<b>Avg W4 Raw Turbidity</b>	0.30	0.32	0.30	0.29	0.22	0.32	0.34	0.27	0.30	0.17	0.26	0.19	<b>0.27</b>	<b>0.17</b>	<b>0.34</b>	50
<b>Avg W4 Treated Turbidity</b>	0.07	0.06	0.06	0.06	0.06	0.07	0.05	0.05	0.06	0.05	0.07	0.06	<b>0.06</b>	<b>0.05</b>	<b>0.07</b>	365

<sup>a</sup> – Results collected from January 1, 2021 – December 31, 2021

### 3.2 Microbiological Sampling

#### 3.2.1 Raw Water Samples

Raw water samples are taken every week. In 2021, a total of 50 samples were collected and analyzed for E.coli and Total Coliforms from Well 3 and 50 samples from Well 4. Each E. coli and Total Coliform result obtained was 0 cfu/100 ml in the raw water. **Table 3 and Table 3.1** provides a summary of bacteriological results performed on the raw water.

**Table 3 – Microbiological Results for Raw Water Well 3 at Wingham Drinking Water System <sup>a</sup>**

Date	Total Coliform		E. Coli	
	# Samples	# Samples ≥1	# Samples	# Samples ≥1
Jan	4	0	4	0
Feb	4	0	4	0
Mar	4	0	4	0
Apr	4	0	4	0
May	4	0	4	0
Jun	5	0	5	0
Jul	4	0	4	0
Aug	5	0	5	0
Sep	4	0	5	0
Oct	4	0	4	0
Nov	4	0	4	0
Dec	4	0	4	0
<b>Total</b>	<b>50</b>	<b>0</b>	<b>50</b>	<b>0</b>

<sup>a</sup> – Results collected from January 1, 2021 – December 31, 2021

**Table 3.1 – Microbiological Results for Raw Water Well 4 at Wingham Drinking Water System <sup>a</sup>**

Date	Total Coliform		E. Coli	
	# Samples	# Samples ≥1	# Samples	# Samples ≥1
Jan	4	0	4	0
Feb	4	0	4	0
Mar	4	0	4	0
Apr	4	0	4	0
May	4	0	4	0
Jun	5	0	5	0
Jul	4	0	4	0
Aug	5	0	5	0
Sep	4	0	4	0
Oct	4	0	4	0
Nov	4	0	4	0
Dec	4	0	4	0
<b>Total</b>	<b>50</b>	<b>0</b>	<b>50</b>	<b>0</b>

<sup>a</sup> – Results collected from January 1, 2021 – December 31, 2021



### 3.2.2 Treated Water (Point of Entry) Samples

One treated water sample from the point of entry from Well 3 and Well 4 is taken every week and analyzed for E. Coli, Total Coliforms and for Heterotrophic Plate Count (HPC). A total of 100 treated water samples were collected and analyzed at Wells 3 and 4 for each of the above parameters, all samples were found to be safe. Each E. Coli and total coliform result from the treated water was 0 cfu/100 ml. Currently, there is no limit on HPC samples, HPC samples can be used as an indication of interior pipe conditions where flushing is required when there are positive results. All (106) samples were found to be safe, with 0 result >50cfu/100ml. The range of HPC results were <10 -40 cfu/100 ml. **Table 4** provides a summary of all bacteriological results performed on treated water.

**Table 4 – Microbiological Results for Point of Entry at Wingham Drinking Water System <sup>a</sup>**

Date	#TC Samples	# Samples $\geq 1$	#EC Samples	# Samples $\geq 1$	#HPC Samples	Safe	Deteriorating $\neq >50$
Jan	8	0	8	0	8	8	0
Feb	8	0	8	0	8	8	0
Mar	8	0	8	0	8	8	0
Apr	8	0	8	0	8	8	0
May	8	0	8	0	8	8	0
Jun	10	0	10	0	10	10	0
Jul	8	0	8	0	8	8	0
Aug	10	0	10	0	10	10	0
Sep	8	0	8	0	8	8	0
Oct	8	0	8	0	8	8	0
Nov	8	0	8	0	8	8	0
Dec	8	0	8	0	8	8	0
<b>Total</b>	<b>100</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>100</b>	<b>100</b>	<b>0</b>

<sup>a</sup> – Results collected from January 1, 2021 – December 31, 2021

### 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 addition to regular samples, we collected samples from Carling Terrace reconstruction. In 2021, a total of 150 distribution samples were collected and analyzed for Total Coliforms and E. Coli and all samples were found to be safe. All E. Coli and total coliform results from the treated water were 0 cfu/100 ml. There were a total of 50 HPC samples with ranges between <10-30 cfu/100 ml. **Table 5** provides a summary of all bacteriological samples taken in the distribution system.

Table 5 – Microbiological Results for Wingham Distribution System<sup>a</sup>

Date	# Samples TC	# Samples ≥1	# Samples EC	# Samples ≥1	# Samples HPC	Safe	Deteriorating = />50
Jan	12	0	12	0	4	4	0
Feb	12	0	12	0	4	4	0
Mar	12	0	12	0	4	4	0
Apr	12	0	12	0	4	4	0
May	12	0	12	0	4	4	0
Jun	15	0	15	0	5	5	0
Jul	12	0	12	0	4	4	0
Aug	15	0	15	0	5	5	0
Sep	12	0	12	0	4	4	0
Oct	12	0	12	0	4	4	0
Nov	12	0	12	0	4	4	0
Dec	12	0	12	0	4	4	0
<b>Total</b>	<b>150</b>	<b>0</b>	<b>150</b>	<b>0</b>	<b>50</b>	<b>50</b>	<b>0</b>

<sup>a</sup> – Results collected from January 1, 2021 – December 31, 2021

### 3.3 Chemical Sampling & Testing

#### 3.3.1 Inorganics

One treated water sample is taken every 36 months and tested for inorganics. The most recent samples for the Wingham Drinking Water System were collected on May 11, 2021 and submitted to the laboratory for analysis of inorganics as listed in Schedule 23. All parameters were found to be within compliance. Results from 2021 can be found in **Table 6**.

**Table 6** – Schedule 23 Results for Wingham Drinking Water System <sup>a</sup>

<b>Water Works Name:</b>					Wingham Well Supply	
<b>Well No. (if applicable):</b>					Well # 4 & # 3	
<b>Year:</b>					2021	
<b>Serviced Population</b>					2845	
<b>Laboratories Which Performer Analyses:</b>					SGS Lakefield Research	
<b>Water Works #</b>					220001502	
		Analysis			Analysis	Maximum
<b>Parameter</b>	<b>Date</b> (MM/DD/YY)		<b>Well 3</b> (ug/L)	<b>Well 4</b> (ug/L)		<b>Allowable Level</b> (ug/L)
<b>Schedule 23</b>			<b>May 11-21</b>	<b>May 11-21</b>		
Antimony	May 11-21		0.9	0.9	<MDL	6
Arsenic	May 11-21		1.7	3.1		25
Barium	May 11-21		156	49.1		1000
Boron	May 11-21		27	34		5000
Cadmium	May 11-21		0.003	0.003	<MDL	5
Chromium	May 11-21		0.17	0.23		50
Mercury	May 11-21		0.01	0.01	<MDL	1
Selenium	May 11-21		0.08	0.04		10
Uranium	May 11-21		0.996	0.864		20

<sup>a</sup> – Results collected May 11, 2021

### 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 0.01 mg/L or 10 ug/L. 2021 Results can be found in **Table 7**.

**Table 7 – Lead Sampling Program Results for Wingham Drinking Water System <sup>a</sup>**

<b>Lead Wingham Water 2021 DW- Hydrants</b>				
<b>Date</b>	<b>Location</b>	<b>Alk mg/L</b>	<b>Lead ug/L</b>	<b>Field pH</b>
Mar 23-21	Yard Hydrant 435 Minnie St.		0.04	7.11
	Yard Hydrant 435 Minnie St.	219		
	Yard Hydrant 99 David St.		0.08	7.21
	Yard Hydrant 99 David St.	217		
Oct 4-21	Yard Hydrant 295 William St.		0.04	7.38
	Yard Hydrant 295 William St.	234		
	Yard Hydrant Shutter & Alfred St.		0.05	7.82
	Yard Hydrant Shutter & Alfred St	231		
<b>Alkalinity AO/OG 30-500</b>	<b>Min</b>	<b>217</b>	<b>0.04</b>	<b>7.11</b>
<b>Lead MAC 10</b>	<b>Max</b>	<b>231</b>	<b>0.08</b>	<b>7.82</b>
	<b>Average</b>	<b>224</b>	<b>0.05</b>	<b>7.38</b>

<sup>a</sup> – Samples collected on March 23, 2021 and October, 2021 respectively.

### 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 May 11, 2021. All parameters were found to be within compliance. 2021 sample results can be found in **Table 8**.

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**Table 8 – Schedule 24 Results for Wingham Drinking Water System**

Water Works Name:	Wingham Well Supply			
Well No. (if applicable):	Well # 4 & # 3			
Year:	2021			
Serviced Population	2845			
Laboratories Which Performer Analyses:	SGS Lakefield Research			
Water Works #	220001502			
	Well # 3		Well #4	Maximum Allowable Level
Parameter	(ug/L)		(ug/L)	(ug/L)
Schedule 23 & 24	May 11-21		May 11-21	
Benzene	0.32	<MDL	0.32	<MDL
Carbon Tetrachloride	0.17	<MDL	0.17	<MDL
1,2-Dichlorobenzene	0.41	<MDL	0.41	<MDL
1,4-Dichlorobenzene	0.38	<MDL	0.38	<MDL
1,1-Dichloroethylene	0.33	<MDL	0.33	<MDL
1,2-Dichloroethane	0.35	<MDL	0.35	<MDL
Dichloromethane	0.35	<MDL	0.35	<MDL
Monochlorobenzene	0.3	<MDL	0.3	<MDL
Tetrachloroethylene	0.35	<MDL	0.35	<MDL
Trichloroethylene	0.44	<MDL	0.44	<MDL
Vinyl Chloride	0.17	<MDL	0.17	<MDL
Diquat	1	<MDL	1	<MDL
Paraquat	1	<MDL	1	<MDL
Glyphosate	1	<MDL	1	<MDL
Polychlorinated Biphenyls	0.04	<MDL	0.04	<MDL
Benzo(a)pyrene	0.004	<MDL	0.004	<MDL
Alachlor	0.02	<MDL	0.02	<MDL
Atrazine+N-dealkylated metabolites	0.01	<MDL	0.01	<MDL
Atrazine	0.01	<MDL	0.01	<MDL
De-ethylated atrazine	0.01	<MDL	0.01	<MDL
Azinphos-methyl	0.05	<MDL	0.05	<MDL
	Well #3		Well #4	Maximum Allowable Level
Parameter	(ug/L)		(ug/L)	(ug/L)
Carbaryl	0.05	<MDL	0.05	<MDL
carbofuran	0.01	<MDL	0.01	<MDL
Chlorpyrifos	0.02	<MDL	0.02	<MDL
Diazinon	0.02	<MDL	0.02	<MDL
Dimethoate	0.06	<MDL	0.06	<MDL
Diuron	0.03	<MDL	0.03	<MDL
Malathion	0.02	<MDL	0.02	<MDL
Metolachlor	0.01	<MDL	0.01	<MDL
Metribuzin	0.02	<MDL	0.02	<MDL
Phorate	0.01	<MDL	0.01	<MDL
Prometryne	0.03	<MDL	0.03	<MDL
Simazine	0.01	<MDL	0.01	<MDL
Terbufos	0.01	<MDL	0.01	<MDL
Triallate	0.01	<MDL	0.01	<MDL
Trifluralin	0.02	<MDL	0.02	<MDL
2,4-dichlorophenoxyacetic acid	0.19	<MDL	0.19	<MDL
Bromoxynil	0.33	<MDL	0.33	<MDL
Dicamba	0.2	<MDL	0.2	<MDL
Diclofop-methyl	0.4	<MDL	0.4	<MDL
MCPA (mg/L)	0.00012	<MDL	0.00012	<MDL
Picloram	1	<MDL	1	<MDL
2,4-dichlorophenol	0.15	<MDL	0.15	<MDL
2,4,6-trichlorophenol	0.25	<MDL	0.25	<MDL
2,3,4,6-tetrachlorophenol	0.2	<MDL	0.2	<MDL
Pentachlorophenol	0.15	<MDL	0.15	<MDL

### 3.3.4 Trihalomethanes

One distribution sample is taken every three months from a point in the distribution system and tested for Trihalomethanes (THMs). The Ontario Drinking Water Quality Standard (ODWQS) have set a Maximum Allowable Concentration (MAC) of 100µg/L for this parameter and it's expressed as a running annual average. In 2021, the average THM was found to be 6.6µg/L, which is well below the MAC. Refer to **Table 9** for the summary of Trihalomethane results.

### 3.3.5 Nitrate & Nitrite

One treated water sample is taken every three months and tested for nitrate and nitrite. 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 Wingham Drinking Water System**

Township of North Huron - 2021 Quarterly Sampling Summary									
Treated Drinking Water - Nitrites and Nitrates					Well #3				
Date	Jan 19-21	Apr 13-21	Jul 6-21	Oct 5-21	Min	Max	Avg	O.Reg 169	
								MAC	1/2 MAC
NO2	0.003	0.003	0.003	0.003	0.003	0.003	0.003	1	0.5
NO3	0.006	0.009	0.011	0.011	0.006	0.011	0.009	10	5
NO2+NO3	0.006	0.009	0.011	0.011	0.006	0.011	0.009	10	5
Treated Drinking Water - Nitrites and Nitrates					Well #4				
Date	Jan 19-21	Apr 13-21	Jul 6-21	Oct 5-21	Min	Max	Avg	O.Reg 169	
								MAC	1/2 MAC
NO2	0.003	0.003	0.003	0.003	0.003	0.003	0.003	1	0.5
NO3	0.006	0.006	0.006	0.006	0.006	0.006	0.006	10	5
NO2+NO3	0.006	0.006	0.006	0.006	0.006	0.006	0.006	10	5
Distribution Drinking Water - Trihalomethanes									
	Jan 19-21	Apr 13-21	Jul 6-21	Oct 5-21					
THMs (total)	4.6	4.9	11	5.9	4.6	11.0	6.6	100	50
Bromodichloromethane	1.2	1.2	2.3	1.1	1.1	2.3	1.5		
Bromoform	0.34	0.34	0.34	0.34	0.340	0.340	0.340		
Chloroform	3	3.2	7.9	4.8	3.0	7.9	4.7		
Dibromochloromethane	0.45	0.46	0.74	0.37	0.37	0.74	0.51		

<sup>a</sup> – Samples collected on January 19<sup>th</sup>, April 13<sup>th</sup>, July 6<sup>th</sup> and October 5<sup>th</sup> 2021 respectively.

### **3.3.6 Sodium**

One water sample is collected every 60 months and tested for Sodium. O. Reg 170/03 has set a Maximum Acceptable concentration (MAC) of 20 mg/L for Sodium which requires the Medical Office of Health be notified if the concentration exceeds the MAC. These samples were collected on January 2, 2018 and were found to be 11.5 mg/L at Well 3 and 15.7 mg/L at Well 4.

### **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. These samples were collected on January 2, 2018 and were found to be 1.0 mg/L at Well 3 and 1.02 mg/L at Well 4, which is within compliance.

## 4.0 WATER AND CHEMICAL USAGE

### 4.1 Chemical Usage

Refer to **Table 10**. From January 1, 2021 to December 31, 2021, 930.0 kg of sodium hypochlorite was used to ensure proper disinfection in the distribution system with an average dosage of 2.32 mg/L between the two wells.

**Table 10 – Chemical Usage at Wingham Drinking Water System**

Township of North Huron - Wingham Well Supply - 2021 Summary						Township of North Huron - Wingham Well Supply - 2021 Summary					
Well #3						Well #4					
Month	Chlorine used (Kg)	Cl Dosage	TDW Cl Free Res	Silicate (L)	Silicate Dosage	Month	Chlorine used (Kg)	Cl Dosage	TDW Cl Free Res	Silicate (L)	Silicate Dosage
January	43.5	2.60	1.27	242.3	5.20	January	24.0	2.45	1.22	126.6	5.05
February	41.8	2.16	1.20	232.3	4.69	February	26.8	2.34	1.24	134.9	4.61
March	44.9	1.94	1.30	239.6	4.64	March	29.6	2.32	1.19	154.2	4.75
April	41.5	2.15	1.28	232.0	4.69	April	28.8	2.53	1.21	143.2	4.89
May	53.1	2.18	1.27	289.4	4.60	May	35.0	2.38	1.21	167.6	4.42
June	60.9	2.19	1.27	328.7	4.67	June	27.9	2.32	1.14	129.1	4.22
July	50.7	2.07	1.23	297.9	4.66	July	37.1	2.40	1.11	167.4	4.22
August	52.0	2.14	1.21	277.9	4.54	August	39.8	2.60	1.21	136.4	3.54
September	46.8	2.22	1.23	243.8	4.53	September	34.8	2.60	1.24	153.2	4.50
October	43.3	2.22	1.30	225.7	4.52	October	30.3	2.45	1.26	143.7	4.50
November	44.8	2.38	1.29	217.6	4.50	November	27.0	2.47	1.21	128.8	4.60
December	40.6	2.21	1.31	205.9	4.39	December	24.8	2.36	1.25	85.4	3.12
<b>Total</b>	563.9	26.46	15.15	3033.2	55.63	<b>Total</b>	366.1	29.23	14.50	1670.7	52.43
<b>Min</b>	40.6	1.94	1.20	205.9	4.39	<b>Min</b>	24.0	2.32	1.11	85.4	3.12
<b>Max</b>	60.9	2.60	1.31	328.7	5.20	<b>Max</b>	39.8	2.60	1.26	167.6	5.05
<b>Avg</b>	47.0	2.20	1.26	252.8	4.64	<b>Avg</b>	30.5	2.44	1.21	139.2	4.37

<sup>a</sup> – Results collected from January 1, 2021 – December 31, 2021



**4.2 Annual Flows**

A summary of the water supplied to the distribution system in 2021 is provided in **Table 11**. This Table provides a breakdown of the flow provided to the distribution system. Flow meters were calibrated in 2021 by Iconix Waterworks and were found to be acceptable. The Flow meters will be calibrated again 2022.

**Table 11 – Treated Water Flows for Wingham Drinking Water System**

<b>Permit to Take Water 1450-B38HKS Compliance Report - 2021</b>						
<b>3.2 -Maximum Amount of Taking Permitted</b>						
		Max/Day on Permit		Peak Flow	%of Limit	
Well #3 (in m3)		6537	m3	1389	21.2	%
Well #4 (in m3)		5270	m3	955	18.1	%
<b>3.2 - Average Annual Amount of Taking Permitted</b>						
Well #3 (in m3)		6537	m3	702	10.7	%
Well #4 (in m3)		5270	m3	391	7.4	%
<b>Municipal Drinking Water License 090-102 Issue 5 - Capacity Report</b>						
		Total Peak Flow				
		Maximum		Actual	%of Cap	
Capacity (m3/d)		11808	m3	2029	17.2	%
Total Average Flow						
Capacity (m3/d)		4309774	m3	398755	9.3	%
Average Daily flow (m3/Day)		11808	m3	1092	9.3	%

## **5.0 IMPROVEMENTS TO SYSTEM AND ROUTINE AND PREVENTATIVE MAINTENANCE**

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

- Hydrant flushing completed
- One water main break repair

## **6.0 MINISTRY OF THE ENVIRONMENT INSPECTIONS AND REGULATORY ISSUES**

The Ministry of Environment inspection was completed by Rhonda Shannon on November 17, 2020. The report was issued on January 25, 2021.

There was one non-compliance noted due to operations and maintenance manuals not meeting the requirements of the Drinking Water Works Permit. The action that is required is that the operating authority reviews, updates and ensures all the requirements are included in this draft procedure. The finalized SOP was to be submitted by February 15, 2021 and added to the existing Operations Manual. No further actions were required.

The Inspection Report got a 97.78% rating.

## **7.0 Haloacetic Acids (HAA5)**

It should be noted that there will be some upcoming changes to Ontario Regulation 170/03 and Ontario Regulation 169/03 that strengthen standards and clarify testing requirements as follows:

- January 1, 2020: New standards for HAA5s and HAA5s testing optimization rules for smaller systems will come into effect / require reporting.
- In 2021 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 2021

Table 12 – Total Haloacetic Acids

HAA5 DW 2021 ug/L								
Date	Location	Total HAA5	Chloroacetic Acid	Bromoacetic Acid	Dichloroacetic Acid	Dibromoacetic Acid	Trichloroacetic Acid	Ave ug/L
<b>Jan 19-21</b>	Royal Homes	5.3	4.7	2.9	2.6	2	5.3	3.8
	435 Minnie St.	5.3	4.7	2.9	2.6	2	5.3	3.8
<b>Apr 13-21</b>	435 Minnie St.	5.3	4.7	2.9	2.6	2	5.3	3.8
	Royal Homes	5.3	4.7	2.9	2.6	2	5.3	3.8
<b>July 6-21</b>	435 Minnie St	5.3	4.7	2.9	2.6	2	5.3	3.8
	Royal Homes	5.3	4.7	2.9	2.6	2	5.3	3.8
<b>Oct 6-20</b>	Royal Homes	5.3	4.7	2.9	2.6	2	5.3	3.8
	435 Minnie St	5.3	4.7	2.9	2.6	2	5.3	3.8
	<b>Min</b>	<b>5.3</b>	<b>4.7</b>	<b>2.9</b>	<b>2.6</b>	<b>2</b>	<b>5.3</b>	<b>3.8</b>
	<b>Max</b>	<b>5.3</b>	<b>4.7</b>	<b>2.9</b>	<b>2.6</b>	<b>2</b>	<b>5.3</b>	<b>3.8</b>
	<b>Ave</b>	<b>5.3</b>	<b>4.7</b>	<b>2.9</b>	<b>2.6</b>	<b>2</b>	<b>5.3</b>	<b>3.8</b>

*Annual Report*  
*For the 2021 Operating Year*

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*Report Completed by: Veolia Water*

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