

# Annual Report

## *For the 2016 Operating Year*

### Ripley Drinking Water System 2016 Operation and Maintenance Annual Report

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## **1.0 INTRODUCTION AND BACKGROUND**

The purpose of the 2016 Annual Report is to document the operation and maintenance data for the Ripley Drinking Water System for review by the Ministry of the Environment in accordance with O. Reg. 170/03. This report covers January 1, 2016 to December 31, 2016. A copy of this report will be submitted to the owner to be displayed to the residents.

## **2.0 DESCRIPTION OF WATER SYSTEM**

The Ripley Drinking Water System (DWS # **2200002636**) is comprised of two (2) wells located within the Municipality of Huron-Kinloss in the Village of Ripley. The system serves an estimated population of approximately 918 people and 355 connections. Both wells are located at the Ripley Pumphouse, which is equipped with an on-line chlorine analyzer and is monitored through a SCADA system based out of the Ripley Municipal office. As a redundancy, the pumphouse is also equipped with an auto-dialer that is independent of the SCADA system, to call out alarms in the event of communications/SCADA failure.

The Ripley Drinking Water System is characterized as a “secure groundwater system” and categorized as a Class 2 Distribution and Supply Large Municipal Residential drinking water system as per O.Reg 170/03. The system has a daily maximum capacity to deliver 864 cubic metres of potable water to the Village of Ripley.

The two (2) wells are described as follows:

Well #1 (RP-W1) is a 203 mm diameter, 84.4 m deep drilled groundwater well, located within the existing pumphouse at 74 Huron Street. A pitless adapter connects the well pump to an underground discharge line which empties into the water storage reservoir. The discharge line is equipped with a check valve and an isolation valve. Well # 1 was drilled in 1947, with the well pump and associated equipment replaced in 2007.

Well #2 (RP-W2) is a 203 mm diameter 85.3 m deep drilled groundwater well located approximately 60 m east of the existing pumphouse. Well # 2 is equipped with a submersible well pump. A pitless adapter connects the well pump to an underground discharge line which empties into the water storage reservoir. The discharge line is equipped with a check valve and an isolation valve. Well # 2 was drilled in 1994, with the well pump and associated equipment replaced in June 2013.

From the water storage reservoir, the water is pumped via two (2) high lift pumps, to the chlorine contact watermain (55 m x 582 mm ID = 14,632 L).

Both Ripley wells are secure deep bedrock wells, not under the influence of surface water. The wells penetrate limestone aquifers. Due to the depth and structure of the aquifers, the water temperature is relatively constant (<10°), turbidity is low, and the water is relatively hard. The raw water is also relatively high in sodium and fluoride, but the lead content of the raw water is well below the half-MAC (Maximum Allowable Concentration). Those who are supplied water from the Ripley Drinking Water System are made aware of the various concentrations in their drinking water by numerous means of communication with the Township of Huron-Kinloss.

The Ripley Drinking Water System is equipped with a Supervisory Control and Data Acquisition system (SCADA) allowing for remote control, monitoring and record keeping of the system. This provides the operator with the current operating status of the supply and treatment equipment throughout the system at any given time via remote access by computer or iPhone.

A 250 kW stand-by diesel generator and fuel storage tank are located in the Fire Hall adjacent to the pumphouse. The diesel generator provides emergency backup power for the water system in the event of a power failure. A stand-by propane generator is also located at the Ripley Municipal office for back-up power requirements for the office and SCADA systems.

The raw water is disinfected using sodium hypochlorite (12%) and serves primarily as a measure to prevent microbiological growth within the raw water pipeline, reservoir, and distribution system. The Ripley Drinking Water System achieves a minimum of 2-log removal or inactivation of viruses as outlined in the MOECC *Procedure for Disinfection of Drinking Water in Ontario* with a chlorine contact watermain.

### 3.0 SUMMARY OF WATER QUALITY MONITORING

#### 3.1 Water Treatment Equipment Operation and Monitoring

##### 3.1.1 Point of Entry Chlorine Residual

In 2016, a total of 366 samples were collected and analyzed for Free Chlorine Residual at the Point of Entry (POE) for treated water using a HACH pocket chlorine colorimeter. **Table 1** shows the monthly average of free chlorine residual grab sample values.

##### 3.1.2 Distribution Chlorine Residual

In 2016, a Total of 366 samples were collected in the Ripley Distribution System.

**Table 1** -Treated and Distribution Grab Sample Chlorine Residuals for Ripley Drinking Water System

Month	Ripley Treated Water	Ripley Distribution
Jan	1.61	1.48
Feb	1.75	1.57
Mar	1.69	1.58
Apr	1.67	1.48
May	1.71	1.49
Jun	1.67	1.48
Jul	1.63	.55
Aug	1.59	1.45
Sep	1.69	1.53
Oct	1.68	1.43
Nov	1.74	1.47
Dec	1.78	1.61
Annual Min	1.34	0.89
Annual Max	1.95	1.97
Annual Avg	1.68	1.51
# Samples	366	366

##### 3.1.3 Turbidity

Drinking water turbidity was measured by a portable turbidity analyzer. The raw and treated water grab samples were collected monthly and analyzed for turbidity. **Table 2** provides a summary of raw and treated turbidity results. The maximum turbidity measured in the raw water was 0.24 NTU and the maximum turbidity measured in the treated water was 0.52 NTU.

**Table 2 – Raw and Treated Water Turbidities for Ripley Drinking Water System**

Month	Ripley Well 1	Ripley Well 2	Ripley Treated
Jan	0.17	0.20	0.18
Feb	0.22	0.18	0.29
Mar	0.18	0.14	0.20
Apr	0.14	0.14	0.19
May	0.13	0.16	0.23
Jun	0.09	0.15	0.19
Jul	0.17	0.14	0.24
Aug	0.13	0.15	0.23
Sep	0.16	0.17	0.21
Oct	0.18	0.17	0.24
Nov	0.13	0.11	0.22
Dec	0.10	0.17	0.39
Annual Min	0.09	0.11	0.18
Annual Max	0.24	0.20	0.52
Annual Avg	0.15	0.16	0.23
# Samples	20	21	23

### 3.2 Microbiological Sampling

#### 3.2.1 Raw Water Samples

Raw water samples are taken every week. In 2016, a total of 104 samples were collected and analyzed for E. Coli and Total Coliform. All of the E. Coli results obtained were 0 cfu/100 mL. All of the Total Coliform results were 0 cfu/100 mL. **Table 3** provides a summary of bacteriological results performed on the raw water.

**Table 3 – Microbiological Results for Raw Water at Ripley Drinking Water System**

#### Ripley Well 1

Month	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	5	5	0	5	5	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	52	52	0	52	52	0

Ripley Well 2

Month	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	5	5	0	5	5	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
<b>Total</b>	52	52	0	52	52	0

3.2.2 Treated Water (Point of Entry) Samples

One (1) treated water sample is taken every week and analyzed for E. Coli, Total Coliform, and for Heterotrophic Plate Count (HPC). A total of 104 treated water samples were collected and analyzed for 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. The range of HPC results were 0 – 12 cfu/100 mL. **Table 4** provides a summary of all bacteriological results performed on treated water.

**Table 4** – Microbiological Results for Treated Water (Point of Entry) at Ripley Drinking Water System

Month	E. Coli			Total Coliform			HPC		
	# Samples	# Samples "0"	# Samples ≥1	# Samples	# Samples "0"	# Samples ≥1	# Samples	# Samples "0"	# Samples ≥1
Jan	4	4	0	4	4	0	4	3	1
Feb	4	4	0	4	4	0	4	2	2
Mar	5	5	0	5	5	0	5	1	4
Apr	4	4	0	4	4	0	4	4	0
May	5	5	0	5	5	0	5	4	1
Jun	4	4	0	4	4	0	4	3	1
Jul	4	4	0	4	4	0	4	3	1
Aug	5	5	0	5	5	0	5	2	3
Sep	4	4	0	4	4	0	4	1	3
Oct	4	4	0	4	4	0	4	1	3
Nov	5	5	0	5	5	0	5	5	0
Dec	4	4	0	4	4	0	4	3	1
<b>Total</b>	52	52	0	52	52	0	52	32	20

### 3.2.3 Distribution System

Typically, two (2) distribution samples are collected every week and tested for E. Coli, Total Coliform, and for Heterotrophic Plate Count (HPC). In 2016, a total of 104 distribution samples were collected and analyzed for the above parameters and all sampled were found to be safe. Each E. Coli result and Total Coliform result from the distribution samples was 0 cfu/100 mL. The range of HPC results were 0 – 7 cfu/100 mL. **Table 5** provides a summary of all bacteriological samples taken in the distribution system.

**Table 5 – Microbiological Results for Ripley Drinking Water Distribution System**

Month	E. Coli			Total Coliform			HPC		
	# Samples	# Samples "0"	# Samples ≥1	# Samples	# Samples "0"	# Samples ≥1	# Samples	# Samples "0"	# Samples ≥1
Jan	4	4	0	4	4	0	4	3	1
Feb	4	4	0	4	4	0	4	2	2
Mar	5	5	0	5	5	0	5	1	4
Apr	4	4	0	4	4	0	4	4	0
May	5	5	0	5	5	0	5	4	1
Jun	4	4	0	4	4	0	4	3	1
Jul	4	4	0	4	4	0	4	3	1
Aug	5	5	0	5	5	0	5	2	3
Sep	4	4	0	4	4	0	4	1	3
Oct	4	4	0	4	4	0	4	1	3
Nov	5	5	0	5	5	0	5	5	0
Dec	4	4	0	4	4	0	4	3	1
<b>Total</b>	52	52	0	52	52	0	52	32	20

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

#### 3.3.1 Inorganics

Treated water samples are collected every 36 months and tested for inorganics. The most recent samples for the Ripley Drinking Water System were collected on June 5, 2015 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 June 10, 2018. Results from the June 5, 2015 samples can be found in **Table 6**.

**Table 6 – Inorganics (Schedule 23) Results for Ripley Drinking Water System**

Parameter	Ripley Treated Water (µg/L)	Maximum Allowable Concentration (µg/L)
Antimony	0.10	6
Arsenic	4.4	25
Barium	66.9	1000
Boron	118	5000
Cadmium	0.021	5
Chromium	0.32	50
Mercury	0.01 <MDL	1
Selenium	1 <MDL	10
Uranium	5.28	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 Ripley Drinking Water System is currently under a reduced sampling program for lead where lead, pH and alkalinity are sampled in each season every 3 years. In the interim, pH and alkalinity are tested during each sampling season. Two pH and alkalinity samples were collected on March 22, 2016, and again on September 27, 2016. These parameters are required to be sampled and analyzed again between the months of December 2016 and April 2017 and again between June and October 2017. Lead samples are also required in the 2017 sampling season. 2016 results can be found in **Table 7**.

**Table 7 – Lead Sampling Program Results for Ripley Drinking Water System**

Sampling Season	pH	Alkalinity (mg/L)
Dec – Apr	7.43	206
	7.41	207
Jun - Oct	7.47	203
	7.65	201

### 3.3.3 Organics

Treated water samples are collected every 36 months and tested for schedule 24 organic parameters. The most recent samples were collected on June 10, 2015. All parameters were found to be within compliance. Organics will be sampled and analyzed again on or before June 10, 2018. June 10, 2015 sample results can be found in **Table 8**.

**Table 8 – Organics (Schedule 24) Results for Ripley Drinking Water System**

Parameter	Ripley Treated Water	Maximum Allowable Concentration (µg/L)
Benzene	0.32 <MDL	5
Carbon Tetrachloride	0.16 <MDL	5
1,2-Dichlorobenzene	0.41 <MDL	200
1,4-Dichlorobenzene	0.36 <MDL	5
1,1-Dichloroethylene	0.33 <MDL	14
1,2-Dichloroethane	0.35 <MDL	5
Dichloromethane	0.35 <MDL	50
Monochlorobenzene	0.3 <MDL	80
Tetrachloroethylene	0.35 <MDL	30
Trichloroethylene	0.44 <MDL	50
Vinyl Chloride	0.17 <MDL	2
Diquat	1 <MDL	70
Paraquat	1 <MDL	10
Glyphosate	1 <MDL	280
Polychlorinated Biphenyls	0.04 <MDL	3
Benzo(a)pyrene	0.004 <MDL	0.01
2,4-dichlorophenol	0.15 <MDL	900
2,4,6-trichlorophenol	0.25 <MDL	5
2,3,4,5-tetrachlorophenol	0.20 <MDL	100
Pentachlorophenol	0.15 <MDL	60

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Alachlor	0.02 <MDL	5
Aldicarb	0.01 <MDL	9
Aldrin+Dieldrin	0.01 <MDL	0.7
Aldrin	0.01 <MDL	-
Dieldrin	0.01 <MDL	-
Atrazine+N-dealkylated metabolites	0.01 <MDL	5
Atrazine	0.01 <MDL	-
De-ethylated atrazine	0.01 <MDL	-
Azinphos-methyl	0.05 <MDL	20
Bendiocarb	0.01 <MDL	40
Carbaryl	0.05 <MDL	90
Carbofuran	0.01 <MDL	90
Chlordane	0.01 <MDL	7
α-chlordane	0.01 <MDL	-
γ-chlordane	0.01 <MDL	-
Oxychlordane	0.01 <MDL	-
Chlorpyrifos	0.02 <MDL	90
Cyanazine	0.03 <MDL	10
Diazinon	0.02 <MDL	20
(DDT)+Metabolites	0.01 <MDL	30
op-DDT	0.01 <MDL	-
pp-DDD	0.01 <MDL	-
pp-DDE	0.01 <MDL	-
pp-DDT	0.01 <MDL	-
Dimethoate	0.03 <MDL	20
Diuron	0.03 <MDL	150
Heptachlor-Heptachlor Epoxide	0.01 <MDL	3
Heptachlor	0.01 <MDL	-
Heptachlor epoxide	0.01 <MDL	-
Lindane	0.01 <MDL	4
Malathion	0.02 <MDL	190
Metolachlor	0.01 <MDL	900
Metribuzin	0.02 <MDL	50
Parathion	0.02 <MDL	80
Phorate	0.01 <MDL	50
Prometryne	0.03 <MDL	2
Simazine	0.01 <MDL	1
Temephos	0.01 <MDL	10
Terbufos	0.01 <MDL	280
Triallate	0.01 <MDL	1
Trifluralin	0.02 <MDL	230
2,4-dichlorophenoxyacetic acid	0.19 <MDL	45
2,4,5-trichlorophenoxyacetic acid	0.22 <MDL	100

Parameter	Ripley Treated Water	Maximum Allowable Concentration (µg/L)
Bromoxynil	0.33 <MDL	280
Dicamba	0.20 <MDL	5
Diclofop-methyl	0.40 <MDL	120
Dinoseb	0.36 <MDL	9
Picloram	1 <MDL	10

### 3.3.4 Trihalomethanes

Distribution samples are taken every three months from representative points in the distribution system and tested for Trihalomethanes (THMs). In 2016, samples were collected during the months of February, May, August, and November. 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 2016, the average THM was found to be 5.9 µg/L, which is within compliance. Refer to **Table 9** for the summary of trihalomethane results. In 2017, samples will be collected in February, May, August, and November.

### 3.3.5 Nitrate & Nitrite

Four treated water samples are taken every three months and tested for nitrate and nitrite. In 2016, samples were collected during the months of February, May, August, and November. 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 analytical results were found to be within compliance. Refer to **Table 9**. In 2017, samples will be collected in February, May, August, and November.

**Table 9 – Nitrate, Nitrite and THM Results at Ripley Drinking Water System**

Date	Nitrite		Nitrate		THM	
	# Samples	Result	# Samples	Result	# Samples	Result
Feb	1	0.003	1	0.100	1	4.7
May	1	0.003	1	0.131	1	4.3
Aug	1	0.003	1	0.114	1	9.6
Nov	1	0.003	1	0.086	1	5.1
Total	4		4		4	
Avg		0.003		0.108		5.9
Max		0.003		0.131		9.6

### 3.3.6 Sodium

One water sample is collected from point of entry 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 June 21, 2016. Refer to **Table 10**. The next water sample for Sodium will be collected and analyzed on or before June 21, 2021.

### 3.3.7 Fluoride

One water sample is collected from point of entry 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 12, 2015, a sample was collected for this analysis. The sample collected exceeded the Maximum Allowable Concentration (MAC). This is due to naturally occurring fluoride in the aquifer. The next water samples for Fluoride will be collected and analyzed on or before May 12, 2021. Refer to **Table 10**.

**Table 10** – Sodium and Fluoride Results at Ripley Drinking Water System

Location	Sodium	Fluoride
Ripley Treated Water	30.8	2.03
Max Allowable Concentration (mg/L)	20.0	1.50

### 3.3.8 Non-Regulatory Testing – Aesthetic Objectives and Operational Guidelines

Samples were collected on November 21, 2016 and tested for parameters listed in the MOECC Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines, June 2006, PIBS 4449e01. Refer to **Table 11** for Aesthetic Objective/Operational Guideline results.

**Table 11** - Aesthetic Objectives and Operational Guidelines

Parameter	AO/OG	Ripley Treated Water
pH	6.5 – 8.5	7.86
Alkalinity (mg/L as CaCO <sub>3</sub> )	30 – 500	204
Colour (TCU)	5	3<MDL
Total Dissolved Solids (mg/L)	500	377
Organic Nitrogen (mg/L)	0.15	0.05<MDL
Total Kjeldahl Nitrogen (mg/L)	---	0.05<MDL
Ammonia + Ammonium (mg/L)	---	0.07
Hydrogen Sulphide (mg/L)	0.05	0.006<MDL
Sulphide (mg/L)	0.05	0.006<MDL
Chloride (mg/L)	250	21
Sulphate (mg/L)	500	83
Hardness (mg/L as CaCO <sub>3</sub> )	80 – 100	212
Aluminum (µg/L)	100	1.3
Copper (µg/L)	1000	1.65
Iron (µg/L)	300	197
Manganese (µg/L)	50	16.3
Zinc (µg/L)	5000	34
Dissolved Organic Carbon (mg/L)	5	1<MDL
Methane (L/m <sup>3</sup> )	3	0.02<MDL
Ethylbenzene (µg/L)	2.4	0.33<MDL
Toluene (µg/L)	24	0.36<MDL
Xylene (µg/L)	300	0.43<MDL
m/p-xylene (µg/L)	---	0.43<MDL
o-xylene (µg/L)	---	0.17<MDL

AO/OG – Aesthetic Objective / Operational Guideline

MDL – Laboratory Method Detection Limit

#### 4.0 WATER AND CHEMICAL USAGE

##### 4.1 Chemical Usage

Refer to **Table 12**. From January 1, 2016 to December 31, 2016, 289.66 kg of sodium hypochlorite (NaOCl) was used to treat the water that was provided to the distribution system with an average dosage of 2.91 mg/L.

**Table 12** – Sodium Hypochlorite Usage at Ripley Drinking Water System

Month	Usage (kg)	Avg Dosage (mg/L)
Jan	18.22	2.92
Feb	19.18	2.82
Mar	20.01	2.70
Apr	20.42	2.90
May	23.87	2.91
Jun	25.53	2.75
Jul	34.09	2.83
Aug	32.43	2.97
Sep	29.39	3.02
Oct	24.01	3.08
Nov	20.84	3.18
Dec	21.67	2.89
<b>Total</b>	<b>289.66</b>	
<b>Avg</b>		<b>2.91</b>

##### 4.2 Annual Volumes

A summary of the water supplied to the distribution system in 2015 is provided in **Table 13**. This Table provides a breakdown of the monthly volume provided to the distribution system.

Flow meter was sent to Coulter Water Meter Service for calibration and was found to be acceptable. The water meter will be calibrated again in April 2016.

**Table 13** – Treated Water Volumes for Ripley Drinking Water System

Month	Avg Daily Volume (m <sup>3</sup> )	Max Daily Volume (m <sup>3</sup> )	Total Monthly Volume (m <sup>3</sup> )
Jan	219.82	335.46	6,814.31
Feb	227.73	278.45	6,604.07
Mar	230.84	275.83	7,155.90
Apr	235.61	538.24	7,068.23
May	261.34	395.73	8,101.43
Jun	313.71	507.13	9,411.44
Jul	386.57	498.69	11,983.68
Aug	345.90	549.36	10,723.00
Sep	320.50	597.86	9,614.91
Oct	253.05	436.03	7,844.70
Nov	217.56	251.83	6,526.66
Dec	239.02	277.69	7,409.49
<b>Avg</b>	<b>270.97</b>		
<b>Max</b>		<b>597.86</b>	
<b>Total</b>			<b>99,257.92</b>

## 5.0 IMPROVEMENTS TO SYSTEM AND ROUTINE AND PREVENTATIVE MAINTENANCE

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

- Watermain break repair on January 27, 2016 on Gladstone Street.
- SCADA control board was replaced at the Ripley pumphouse on May 18, 2016.
- Semi-annual flushing was performed in April and September, 2016, in conjunction with valve turning.

## 6.0 MINISTRY OF THE ENVIRONMENT INSPECTIONS AND REGULATORY ISSUES

- Flow meter change-out was conducted on May 6, 2016.
- The Ministry of the Environment and Climate Change conducted an inspection on Ripley Drinking Water System Supply between July 26, 2016 and October 5, 2016. The Operating Authority achieved a rating of 97.44% on the 2016 Ripley Inspection Report – an improvement from the 2015 Ripley Inspection Report (86.85%).
- DWQMS Audit was conducted on November 24, 2016.

## 7.0 EMERGENT ISSUES

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:

- Strengthen standards for Arsenic, Carbon Tetrachloride, Benzene, and Vinyl Chloride;
- Adopt new standards for Chlorate, Chlorite, 1-Methyl-4-Chlorophenoxyacetic acid (MCPA) and Haloacetic Acids (HAAs); (NOTE: Chlorate and Chlorite testing is only required for Municipal Drinking Water Systems using Chlorine Dioxide treatment equipment.)
- Clarify/optimize testing, sampling and reporting requirements for Trihalomethanes (THMs) and HAAs; and
- Remove 13 pesticides from testing requirements.

The aforementioned amendments will be phased in over the next four years to allow system owners and/or operators the opportunity to collect baseline information and complete required system upgrades. Currently, the new sampling, testing, reporting and re-sampling requirements, and the removal of 13 pesticides came into effect January 1, 2016. Refer to **Table 14** for the new Regulatory Requirements. Subsequent phase-in dates are:

- January 1, 2017: Testing requirements for HAAs and updates to standards for Carbon Tetrachloride, Benzene, Vinyl Chloride, Chlorate, Chlorite, and MCPA come into effect / require reporting
- January 1, 2018: Updates to standards for Arsenic come into effect / require reporting
- January 1, 2020: New standards for HAAs and HAAs testing optimization rule for smaller systems will come into effect / require reporting.

**Table 14 – Regulatory Requirements**

Parameter	Current Requirement		Amended Requirement	
	MAC	½ MAC	MAC	½ MAC
Arsenic	25 µg/L	12.5 µg/L	10 µg/L	5 µg/L
Benzene	5 µg/L	2.5 µg/L	1 µg/L	0.5 µg/L
Carbon Tetrachloride	5 µg/L	2.5 µg/L	2 µg/L	1 µg/L
Vinyl Chloride	2 µg/L	1 µg/L	1 µg/L	0.5 µg/L

**ARSENIC REVIEW**

Historic Arsenic values were reviewed from 2003 to 2015 and are shown in **Table 15**.

**Table 15 – Historic Arsenic Values**

Date	Ripley Treated Water (µg/L)
Feb 2003	4
Jun 2003	5
Jun 2006	6.5
Jan 2008	4.5
Jun 2009	5.7
Nov 2010	5
Dec 2010	4.8
Aug 2011	5
Nov 2011	4.9
Aug 2012	4.8
Nov 2012	5.1
Sep 2013	4.9
Nov 2013	4.5
Sep 2014	4.9
Dec 2014	5.5
Jun 2015	4.4

**EMERGENT ISSUES SUMMARY:**

A review of the sample results between 2003 and 2015 indicates that Arsenic may be in exceedance of the amended ½ MAC requirements in Ripley (highlighted in yellow). This would require quarterly sampling to be conducted (see note below).

Historic values of the other parameters (Benzene, Carbon Tetrachloride, and Vinyl Chloride), are all below the amended standards prescribed.

**NOTE:**

***O. Reg. 170/03, Schedule 13: Increased frequency under ss. 13-2 and 13-4***

13-5. (1) If a test result obtained under section 13-2 or 13-4 for a parameter **exceeds half of the standard prescribed** for the parameter in Schedule 2 to the Ontario Drinking Water Quality Standards, the frequency of sampling and testing for that parameter under that section shall be **increased** so that at least one water sample is taken and tested **every three months**.