

Ministry of the Environment,
Conservation & Parks

Ministère de l'Environnement, de la Protection de
la nature et des Parcs

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October 9, 2020

Sent by Email: edance@huronkinloss.com

The Corporation of the Township of Huron-Kinloss
21 Queen Street
P.O. Box 130
Ripley, Ontario
N0G 2R0

Attention: Emily Dance
Clerk

Dear Ms. Dance:

Re: 2020/2021 Inspection Report 1-NY0WH
Lucknow Drinking Water System
Drinking Water Licence 087-103, Issue #2
Drinking Water Works Permit 087-203, Issue #3

The enclosed report documents findings of the inspection that was performed on August 12, 2020.

Two sections of the report, namely "Actions Required" and "Recommended Actions", specify due dates for the submission of information or plans to my attention.

Please note that "Actions Required" are linked to incidents of non-compliance with regulatory requirements contained within an Act, a Regulation, or site-specific approvals, orders or instructions; "Recommended Actions" convey information that the owner or operating authority should consider implementing in order to conform with existing and emerging industry standards.

The report includes an Inspection Summary Rating Record as an appendix. This record forms part of the ministry's comprehensive, risk-based inspection process. The rating provides a quantitative measure of the inspection results for this specific drinking water system for the reporting year. An inspection rating that is less than 100 per cent does not mean that the drinking water from the system is unsafe. The primary goals of this assessment are to encourage ongoing improvement of drinking water systems and to measure this progress from year to year.

I would like to remind you that Section 19 of the Safe Drinking Water Act, 2002 (Standard of Care) creates a number of obligations for individuals who exercise decision-making authority over municipal drinking water systems, including members of municipal councils. The recently revised, "Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils", a publication found on the [Drinking Water Ontario website](http://www.ontario.ca/environment-and-energy/municipal-drinking-water-systems-licencing-registration-and-permits) (<http://www.ontario.ca/environment-and-energy/municipal-drinking-water-systems-licencing-registration-and-permits>), provides further information about these obligations.

Should you have any questions regarding the content of the enclosed report, please do not hesitate to contact me.

Yours truly,



Heather Lovely

Water Compliance Inspector

Phone: 519-374-0231

e-mail: heather.lovely@ontario.ca

Enclosure

- ec:
- Dr. Ian Arra, Medical Officer of Health, Grey-Bruce Health Unit
 - Andrew Barton, Environmental Health Manager, Grey-Bruce Health Unit
 - Phil Beard, General Manager, Maitland Valley Conservation Authority
 - Nancy Mayhew, Overall Responsible Operator, Veolia Water Canada
 - Mark Smith, Water Compliance Supervisor, Ministry of the Environment, Conservation & Parks
- c: File SI-BR-HK-HA-540 (2020)



Ministry of the Environment, Conservation and Parks

LUCKNOW DRINKING WATER SYSTEM

Inspection Report

Site Number:	220002663
Inspection Number:	1-NY0WH
Date of Inspection:	Aug 12, 2020
Inspected By:	Heather Lovely

OWNER INFORMATION:

Company Name:	HURON-KINLOSS, THE CORPORATION OF THE TOWNSHIP OF	Unit Identifier:	
Street Number:	21		
Street Name:	QUEEN St		
City:	HURON KINLOSS	Postal Code:	N0G 2R0
Province:	ON		

CONTACT INFORMATION

Type:	Operating Authority	Name:	Nancy Mayhew
Phone:	(519) 524-6583	Fax:	(519) 524-9358
Email:	nancy.mayhew@veolia.com		
Title:	Overall Responsible Operator, Veolia Water Canada - WWT Class 2		

Type:	Owner	Name:	Tracey Howe
Phone:	(519) 395-3735 xext133	Fax:	(519) 395-4107
Email:	thowe@huronkinloss.com		
Title:	Administrative Assistant, Public Works, Township of Huron-Kinloss		

Type:	Owner	Name:	John Yungblut
Phone:	(519) 395-3735	Fax:	(519) 395-4107
Email:	jyungblut@huronkinloss.com		
Title:	Director of Public Works.		

INSPECTION DETAILS:

Site Name:	LUCKNOW DRINKING WATER SYSTEM
Site Address:	WELL 4: 600 HAVELOCK ST / WELL 5: 381 SOUTH DELHI ST HURON-KINLOSS ON N0G 2R0
County/District:	HURON-KINLOSS
MECP District/Area Office:	Owen Sound Area Office
Health Unit:	GREY BRUCE HEALTH UNIT
Conservation Authority:	Maitland Valley Conservation Authority
MNR Office:	Owen Sound Regional Office
Category:	Large Municipal Residential
Site Number:	220002663
Inspection Type:	Unannounced
Inspection Number:	1-NY0WH
Date of Inspection:	Aug 12, 2020
Date of Previous Inspection:	Jun 13, 2019

COMPONENTS DESCRIPTION

Site (Name):	MOE DWS Mapping	Sub Type:	
Type:	DWS Mapping Point		

Site (Name): WELL #4 RAW
Type: Source **Sub Type:** Ground

- Comments:**
- The Lucknow Municipal Drinking Water Licence is # 087-103 Issue 2, expires May 19, 2021
 - The Lucknow Drinking Water Works Permit is # 087-203 Issue 3, issued May 20, 2016.
 - Schedule C: Authorization to Alter the Drinking Water System for DWWP Issued June 20, 2016
 - The Permit to Take Water #7631-AQYS3J, issued on July 11, 2017 expires September 30, 2027.
 - Operational Plan #: 087-403, Operating Authority#: 087-OA1

MDWL Schedule E: Pathogen Log Removal/Inactivation Credits

Well #4
 Minimum Disinfection Required: 2 log removal/inactivation of Viruses
 Disinfection Credits Assigned: 2+ log removal/ inactivation of Viruses via Chlorination (CT: watermain)

Well #5
 Minimum Disinfection Required: 2 log removal/inactivation of Viruses
 Disinfection Credits Assigned: 2+ log removal/ inactivation of Viruses via Chlorination (CT: watermain)

Lucknow Well No. 4, constructed in 1957 is drilled into the limestone-dolostone bedrock aquifer to a depth of 54.8 m. Well No.4 is used to supply water to the system when the output from primary production well No.5 proves insufficient to meet the demand of the system. The 200 mm diameter well is located inside a pumphouse, near the intersection of Hamilton and Havelock Streets in a community park. It is equipped with a vertical turbine pump rated at 9.5 L/s, with a 75 mm discharge line connected to the well pump header, with a 100 mm diameter turbine flow meter in the header.

Site (Name): WELL #5 RAW
Type: Source **Sub Type:** Ground

Comments:
 Constructed in 1967, Lucknow Well No.5 is the main production well for the system. The well is located inside a pumphouse adjacent to a senior's care facility at the intersection of Bob and Delhi Streets. The 203 mm diameter casing well is drilled to a depth of 58.8 m into the limestone-dolostone bedrock aquifer. According to the well record summary report the well takes water from within the bedrock at a depth of 47.5m. The well is equipped with a line-shaft turbine pump rated at 32.8 L/s at a TDH of 66.1 m with a 150 mm diameter discharge line connected to the well pump header, which contains a 150 mm diameter turbine flow meter.

The 2019 Annual and Summary report states:
 "Each well supply is located within its own pumphouse in the Village of Lucknow. Both sites are controlled, monitored, and alarmed through a Supervisory Control and Data Acquisition (SCADA) system which is connected to the main controller, autodialer, and server at the Ripley Municipal Office. The desktop computer used by the system's operators is located at the Ripley Township Shed and is connected remotely to the SCADA server. As a redundancy, each site is also equipped with an auto-dialer that is independent of the SCADA system, and is used to call out alarms in the event of communications/SCADA failure. This SCADA system provides the operator with the ability to monitor current operating status of the supply and treatment equipment throughout the water system at any given time via remote access by computer or Smartphone, and to have control over operations."

Site (Name): PUMPHOUSE #4 TREATED
Type: Treated Water POE **Sub Type:** Pumphouse

Comments:

The Well No.4 pumphouse is located in a community park near the intersection of Hamilton and Havelock Streets. The pumphouse contains supply, treatment and control facilities used in the production of drinking water. The disinfection system utilizes sodium hypochlorite and consists of a 230 L chemical storage tank, two chemical metering pumps (one duty, one spare), with a feed line connected to the well pump discharge line. Chlorine contact time at Well No. 4 is provided by a 90 m, 450 mm diameter contact water main. Chlorine residuals and turbidity levels are continuously monitored by on-line instrumentation to verify the pumphouse is supplying safe drinking water to the system.

The following was provided by the Overall Responsible Operator May 12, 2015.

As per the Procedure for Disinfection of Drinking Water in Ontario
 Inactivation Requirements: 2-log removal/inactivation of viruses
 Average pre-treatment water pH range: 7.5 - 8
 Average pre-treatment water temperature (oC): 7.5 - 8°C
 CT – Concentration * Time to meet inactivation requirements = CT 4
 (T10 is the length of time during which not more than 10% of the influent Water would pass through that process.)
 Baffle ratio - Baffle condition (poor, average, superior), T10/T Ratio = 1.0 BF

Contact Water Main: (DR18 PVC, 0.437 m ID x 90 m)
 Volume Capacity (m³): 13.499 m³
 Maximum permitted flow rate (m³/min) = 0.865 m³/min
 Effective contact time @ max flow (min) = 15.605 minutes
 Minimum Disinfection Residual Concentration (mg/L) = 0.26 mg/L

Therefore, a minimum free chlorine concentration of 0.26 mg/L is required to meet primary disinfection at maximum flow rate.

Site (Name): PUMPHOUSE #5 TREATED
Type: Treated Water POE **Sub Type:** Pumphouse

Comments:
 Well No.5 pumphouse is located at the intersection of Bob and Delhi Streets and contains supply, treatment and control facilities used in the production of drinking water. The disinfection system utilizes sodium hypochlorite. It consists of a 230 L chemical storage tank, two chemical metering pumps (one duty, one spare), and a feed line connected to the well pump discharge line. Chlorine contact time at Well No. 5 is provided by a 230 m, 450 mm diameter contact water main. Chlorine residuals and turbidity levels are continuously monitored by on-line instrumentation to verify the pumphouse is supplying safe drinking water to the system.

In September 2016, the Operating Authority installed a second chlorine analyzer prior to the contact watermain in order to give operators a more time to resolve an issue before a low chlorine event could create an adverse water quality incident.

Under the current Permit an amendment to Schedule A was not required and is therefore not listed in the Permit. The following was provided by the Overall Responsible Operator May 12, 2015.

As per the Procedure for Disinfection of Drinking Water in Ontario
 Inactivation Requirements: 2-log removal/inactivation of viruses
 Average pre-treatment water pH range: 7.5 - 8
 Average pre-treatment water temperature (oC): 7.5 - 8°C
 CT – Concentration * Time to meet inactivation requirements = CT 4
 (T10 is the length of time during which not more than 10% of the influent water would pass through that process.)

Baffle ratio - Baffle condition (poor, average, superior), T10/T Ratio = 1.0 BF

Contact Water Main: (DR18 PVC, 0.437 m ID x 230 m)
 Volume Capacity (m³): 34.497 m³
 Maximum permitted flow rate (m³/min) = 2.275 m³/min
 Effective contact time @ max flow (min) = 15.163 minutes
 Minimum Disinfection Residual Concentration (mg/L) = 0.27 mg/L

Therefore, a minimum free chlorine concentration of 0.27 mg/L is required to meet primary disinfection at maximum flow rate.

NOTE: During flushing, flows are sometimes just under 41 L/s (2.460 m³/min)... therefore, a minimum free chlorine concentration of 0.29 mg/L would be required to meet primary disinfection during flushing or elevated flow rates.

Site (Name): DISTRIBUTION SYSTEM
Type: Other **Sub Type:** Other

Comments:
 The distribution system serves the community of Lucknow with an estimated population of approximately 1,726 residents (based on most recent Canadian census results) with approximately 664 connections over 13.5 km. The distribution network has a combination of PVC, copper, ductile, and cast iron water mains, in sizes varying between 1-inch and 12-inch diameter. There are 65 hydrants and 4 blow-ffs connected to the distribution system.

The Lucknow water distribution system runs through a 260 meter water main extension, southward along Lucknow Line (Huron County Road No. 1), and supplies drinking water to 10 properties in the Municipality of Ashfield-Colborne-Wawanosh (ACW) in Huron County known as South Lucknow Distribution System (water works #260003123).

In 2005 the Township of Ashfield-Colborne-Wawanosh entered into a written agreement with the Township of Huron-Kinloss with the understanding that Huron-Kinloss will manage the South Lucknow DW as part of the Lucknow DWS. Under this O. Reg. 170/03 section 5(4) agreement, Huron-Kinloss will sample and test the water as well as ensure adequate disinfection throughout the South Lucknow distribution system.

Site (Name): STANDPIPE
Type: Other **Sub Type:** Reservoir

Comments:
 The 2019 Annual and Summary report states:
 "A Standpipe, located at 656 Wheeler Street, is 6.7 m in diameter, 27.5 m high and has a total volume of 996 m³. The well pumps at Well # 4 and Well # 5 are automatically controlled by the water level in the Standpipe via communications located at 482 Ross Street (former pumphouse). The Standpipe was built in 1930, making it approximately 90 years old. It consists of a riveted steel design (bolted steel top section), which includes a protective layer of 'shop coat' (lead and linseed oil), two (2) coats of 'anti aqua paint' (unknown), and a food grade grease paint on the interior that is intended to provide corrosion protection. The riveted steel design of Standpipes was phased out in the 1930s and is no longer used. The Standpipe is in a state of disrepair, but is currently in operable condition."

The interior paint is no longer acceptable to AWWA as a suitable coating material for finished water storage facilities. The standpipe was examined via a camera on June 21, 2007 by RTD Quality Services Inc, water samples were taken and the health unit had no concerns or recommendations.

On June 20, 2016 the owner received a Schedule C: Authorization to Alter the Drinking Water System for DWWP 087-203.

The proposed work is to include the construction, testing and commissioning of an elevated water storage tank having a capacity of 1,600m³ and a top water level of 317.6 masl including a 300 mm diameter combined inlet/outlet riser pipe on the elevated tank site and on the adjacent municipally owned properties (662 and 656 Wheeler Street), along with watermain and storm sewer upgrades on the elevated tank site, the former standpipe site and on the adjacent Wheeler Street and Victoria Street.

Site (Name): FIRE PUMPHOUSE

Type: Other

Sub Type: Other

Comments:

A third pumphouse, located near the intersection of Campbell Street and Ross Street, contains a diesel booster pump designed to increase water pressure in the event of a fire. To the operating authority's knowledge, this pump has not been needed for many years. Maintenance of the pump is carried out by the fire department. The pumphouse did contain an old well, which was not used and was disconnected from the system. The well was properly abandoned as per O. Reg. 903 on June 29, 2004.

INSPECTION SUMMARY:

Introduction

- **The primary focus of this inspection is to confirm compliance with Ministry of the Environment, Conservation and Parks (MECP) legislation as well as evaluating conformance with ministry drinking water policies and guidelines during the inspection period. The ministry utilizes a comprehensive, multi-barrier approach in the inspection of water systems that focuses on the source, treatment, and distribution components as well as management practices.**

This drinking water system is subject to the legislative requirements of the Safe Drinking Water Act, 2002 (SDWA) and regulations made therein, including Ontario Regulation 170/03, "Drinking Water Systems" (O.Reg. 170/03). This inspection has been conducted pursuant to Section 81 of the SDWA.

This inspection report does not suggest that all applicable legislation and regulations were evaluated. It remains the responsibility of the owner to ensure compliance with all applicable legislative and regulatory requirements.

On August 12, 2020 Water Inspector, Heather Lovely, met with ORO, Nancy Mayhew, to inspect the Lucknow Drinking Water System (DWS) concurrently with South Lucknow Distribution System (DS). The site inspection included both pump houses, herein referred to as "Lucknow 4" and "Lucknow 5", as well as the standpipe.

The Lucknow DWS is located in the Municipality of Huron-Kinloss and Veolia Water Canada is the Operating Authority of the drinking water system on behalf of the municipality (owner).

The inspection period for this report is from the date of the last inspection, June 13, 2019 to the date of the current inspection, August 12, 2020.

Source

- **The owner was maintaining the production well(s) in a manner sufficient to prevent entry into the well of surface water and other foreign materials.**

The Lucknow DWS source wells (4 and 5) are located within the respective pump houses. Although Water Well Records (Well #4 - 1401878, and Well #5 - 1401880) do not include documentation on the annular seal, a review of over 10 years (January 2010 to August 2020) of raw water test results does not indicate these wells are under influence from surface water. Of the 2218 samples taken during that time frame, there were only three (3) instances of the presence of total coliform detected in October 2011 and September and October 2017. In all instances the result was 1 cfu/100 mL for total coliforms and there were no instances of E. coli detected in the raw water of the production wells.

- **Measures were in place to protect the groundwater and/or GUDI source in accordance with any the Municipal Drinking Water Licence and Drinking Water Works Permit issued under Part V of the SDWA.**

Conditions 16.2.8, 16.2.9 and 16.2.10 of Schedule B of Municipal Drinking Water Licence 087-103, Issue 2 prescribe that the Lucknow DWS Operations and Maintenance Manual must include a well inspection and maintenance program that includes the following:

- An inspection schedule for all wells associated with the drinking water system, including all production wells, stand-by wells, test wells and monitoring wells;
- Well inspection and maintenance procedures for the entire well structure of each well including all above and below grade well components; and
- Remedial action plans for situations where an inspection indicates non-compliance with respect to regulatory requirements and/or risk to raw well water quality.

Source

These requirements are met within section L-OM-18 "Well Inspection and Maintenance Plan" of the Lucknow DWS Operations and Maintenance Manual. This procedure specifies the following:

Above Ground

A quick visual inspection of the area around all the wells should be conducted at every visit. This includes making sure the area around the well casings is sanitary, that the well caps/well heads are securely in place, and ensuring that all potential contamination sources are kept away from the wells.

Below Ground

A formal inspection of the production wells should occur every time a pump is to be pulled from the well." [Summary report criteria specified.]

In addition, the procedure stipulates remedial action plans. The raw water (quality and quantity) trend data and well pump performance will be reviewed each year and a Licenced Well Contractor will be contacted to examine the well if a deterioration is noted (>25% compared to the historic average). This data was included in the "Lucknow Annual and Summary Report – For the 2019 Operating Year", that was prepared by the ORO and presented to the owner.

- **Trends in source water quality were being monitored.**

ORO email response:

"The source water quality lab results are received via email and added to a spreadsheet maintained by the ORO/QACS. This spreadsheet is used to generate monthly and annual summaries. Any changes or trends are reported to operators, the owner and project manager."

Permit To Take Water

- **The owner was in compliance with all conditions of the PTTW.**

The Lucknow DWS operates under Permit to Take Water (PTTW) #7631-AQYS3J. This PTTW applies to both Well 4 and Well 5 production wells and stipulates the following:

Well 4

- Maximum allowable flow is 865 L/minute or 14.4 L/s
- Maximum volume taken per day is 935,000 L/day or 935 m3/day

Well 5

- Maximum allowable flow is 2,275 L/minute or 37.9 L/s
- Maximum volume taken per day is 1,500,000 L/day or 1,500 m3/day

Wells 4 and 5

- Maximum volume taken per day is 1,500,000 L/day or 1,500 m3/day

There were no exceedances of the PTTW conditions related to maximum volume of water taken per day during the inspection time frame. The maximum volume taken at pump house 4 was 806.08 m3/day on November 4, 2019 and at pump house 5 was 997.72 m3/day during the inspection time frame. The maximum daily volume of water taken from Lucknow 4 and 5 combined was 1080.70 m3 during the inspection time frame.

There were five instances when the recorded maximum daily flow rate exceeded the maximum allowable flow stipulated on the PTTW, but in each instance the flow exceedance was less than 5 minutes or was inaccurate, i.e. due to maintenance.

Permit To Take Water

Condition 4.2 of the PTTW also stipulates the Permit Holder shall measure and record static water levels in each production well on a weekly basis. Operating Authority staff measured and recorded the static water levels in each production well on a weekly basis throughout the inspection period.

Capacity Assessment

- **There was sufficient monitoring of flow as required by the Municipal Drinking Water Licence or Drinking Water Works Permit issued under Part V of the SDWA.**

Flow measurement conditions 2.1.1 and 2.1.2 (Schedule C) of the MDWL (087-103) state flow rate and volume of water into the treatment subsystem and the distribution subsystem must be recorded daily. Each pump house has one flow meter to measure the flow rate of raw water into the treatment system from each of the production wells. There is no treated water flow meter, however, the raw water flow meters reflect the amount of water entering the distribution system.

- **The flow measuring devices were not calibrated or verified in accordance with the requirements of the MDWL issued under Part V of the SDWA.**

Corix Water Products conducted verification of the Lucknow flow meters on June 18, 2019 and Indus Control on June 30, 2020, therefore, within 1 year +/- 30 days. The flow meters in this DWS are a Sensus 3" W-350 and a Sensus 6" W-2000 at Lucknow 4 and Lucknow 5 respectively.

As per MDWL 087-103 Issue 2, Schedule C condition 3.1:

"All flow measuring devices that are required by regulation, by a condition in the Drinking Water Works Permit, or by a condition otherwise imposed by the Ministry of the Environment and Climate Change, shall be checked and calibrated in accordance with the manufacturer's instructions."

On June 30, 2020 Indus Control conducted on-site verifications of the Lucknow flow meters since removal of the flow meters in order to calibrate the units was impractical.

The Ministry is willing to accept site verifications of flow measuring devices in comparison to a fully calibrated flow meter if the results include accuracy measurements across the range of flow rates representative of the system.

However, the June 2020 verification reports for the Lucknow flow meters had one deviation value, therefore, did not include accuracy measurements over a range of flow rates that are representative of this DWS.

By November 1, 2020, the owner will provide the author of this report documentation that the Lucknow DWS flow meters have been verified over a range of flow rates that are representative of this DWS or calibrated in accordance with the manufacturer's instructions as per MDWL 087-103 Issue 2, Schedule C condition 3.1.

- **The owner was in compliance with the conditions associated with maximum flow rate or the rated capacity conditions in the Municipal Drinking Water Licence issued under Part V of the SDWA.**

The DWWP (087-203, Issues 3) does not stipulate a maximum flow rate, however, the MDWL (087-103, Issue 2) specifies the rated capacity for Well 4 as 1245 m³/day and Well 5 as 3276 m³/day. There were no exceedances of the rated capacities within the inspection period. The maximum volume taken during the inspection period was 806.08 m³/day and 997.72 m³/day for Lucknow 4 and Lucknow 5 respectively.

- **Appropriate records of flows and any capacity exceedances were made in accordance with the Municipal Drinking Water Licence issued under Part V of the SDWA.**

On seven (7) occasions there were flow rates that were greater than the maximum water taking rate stipulated in the PTTW, however the duration of each of these flow rates was less than one (1) minute, and the ORO documented the subsequent chlorination contact time to ensure proper disinfection.

Capacity Assessment

Note: Five (5) of these instances occurred at the Lucknow 4 pump house and the peak flow rates readings were in exceedance of the capacity of the pump. Subsequently, the ORO asked the company that conducted the calibration, Corix Water Products, to examine this issue and in response a flow meter that had been calibrated off-site was installed. There were no further flow measurement or exceedance issues at Lucknow 4 during the inspection time frame.

Treatment Processes

- **The owner had ensured that all equipment was installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit.**

Until such time as the DWWP is updated and re-issued it should be noted that in the fall of 2016 the owner and Operating Authority installed a new "pre-contact" chlorine analyser at the Well 5 pump house to monitor the chlorine concentration just after injection. This analyzer is also set to alarm and lock-out in the event of a low chlorine event which enables operators to respond before a situation becomes an Adverse Water Quality Incident. Also, in the event the chlorine level drops, the upstream chlorine monitor allows an operator to determine the amount of backflushing needed to remove the inadequately chlorinated water from the contact watermain.

The installation of the new "pre-contact" continuous free chlorine monitor is exempt under Schedule B, 4.0 Minor Modifications, of the new Drinking Water Works Permit (087-203, Issue 3). This exemption was confirmed by the Ministry's Approvals and Licensing Section.

The owner and Operating Authority should provide the Ministry information (e.g. make and model) about the pre-contact free chlorine residual monitor that was installed at this drinking water system through the MDWL and DWWP renewal process.

- **The owner/operating authority was not in compliance with the requirement to prepare Form 1 documents as required by their Drinking Water Works Permit during the inspection period.**

There was one Form 1 completed for this DWS during the inspection review time frame. There was 150 mm diameter PVC DR18 watermain installed on Inglis Street from Campbell Street to Willoughby Street. The Form 1 was signed by P. Eng., Izaak De Jager, on June 29, 2020 and by the Huron-Kinloss CAO, Mary Rose Walden, on September 23, 2020.

The owner representative did not sign the Form 1 document prior to the watermain being put into service as per condition 3.3.1 of Schedule B of the DWWP 087-203, Issue 3.

The owner was reminded of this DWWP requirement during the inspection process.

No further action is required.

- **Records indicated that the treatment equipment was operated in a manner that achieved the design capabilities required under Ontario Regulation 170/03 or a Drinking Water Works Permit and/or Municipal Drinking Water Licence issued under Part V of the SDWA at all times that water was being supplied to consumers.**

There was one Adverse Water Quality Incident (AWQI) within the inspection time frame and no indication that improperly disinfected water was distributed to consumers. The AWQI involved a result of total coliforms of 1 CFU/100 mL from a sample taken in the distribution system. The corresponding free chlorine residual for this sample was 1.50 mg/L and indicative of sufficient disinfection.

- **Records confirmed that the water treatment equipment which provides chlorination or chloramination for secondary disinfection purposes was operated so that at all times and all locations in the distribution system the chlorine residual was never less than 0.05 mg/l free or 0.25 mg/l combined.**

Treatment Processes

The free chlorine residual was measured each day in the distribution system during the inspection period, with the minimum measurement of 0.99 mg/L on March 16, 2020.

- **Where an activity has occurred that could introduce contamination, all parts of the drinking water system were disinfected in accordance with Schedule B, Condition 2.3 of the Drinking Water Works Permit.**

Procedure No. L-OM-09 of the Lucknow Operations and Maintenance Manual refers to the ministry's Watermain Disinfection Procedure (2015) and AWWA disinfection standards (section 14).

The ORO was made aware that the updated Ontario Watermain Disinfection Procedure was issued on August 1, 2020. The ORO was advised that the municipality is required to modify its watermain repair/commissioning procedures and forms to meet the updated procedure's documentation requirements by the date that will be stipulated in the renewed DWWP. The Application for License Renewal Date is November 19, 2020.

Note: The South Lucknow DS, is operated as an extension of the Lucknow DWS. The South Lucknow DS was issued a new Drinking Water Works Permit, (# 080-202, Issue 4) on June 19, 2020. If watermains are installed or repaired within the South Lucknow DS system, the Ministry's updated "Watermain Disinfection Procedure, dated August 2020, must be followed after February 1, 2021 (6 months from the publication date). Prior to February 1, 2021, the Ministry's Watermain Disinfection Procedure, dated November 2015 is to be followed.

The owner of the Lucknow DWS is considering applying to the Ministry to request early implementation of the 2020 Watermain Disinfection Procedure for consistency purposes.

- **The owner had evidence indicating that all chemicals and materials that come in contact with water within the drinking water system met the AWWA and ANSI standards in accordance with the Municipal Drinking Water Licence and Drinking Water Works Permit issued under Part V of the SDWA.**

The owner provided invoices of NSF certified 12% sodium hypochlorite from D.H. Jutzi in Stratford, Ontario.

- **Up-to-date plans for the drinking water system were kept in a place, or made available in such a manner, that they could be readily viewed by all persons responsible for all or part of the operation of the drinking water system in accordance with the DWWP and MDWL issued under Part V of the SDWA.**

The Lucknow Operations Manual contains process flow schematics for well #4 and #5 pump houses and are readily available to operators electronically via Google Documents on individual mobile devices (i.e. smartphones).

Treatment Process Monitoring

- **Primary disinfection chlorine monitoring was conducted at a location approved by Municipal Drinking Water Licence and/or Drinking Water Works Permit issued under Part V of the SDWA, or at/near a location where the intended CT has just been achieved.**

- **Operators were aware of the operational criteria necessary to achieve primary disinfection within the drinking water system.**

Please refer to CT calculations provided by ORO, Nancy Mayhew, and listed in the "Components" section of this report. This information is posted in both pump houses (L4 and L5) of this DWS.

- **The secondary disinfectant residual was measured as required for the distribution system.**

The free chlorine residual was measured each day in the distribution system during the inspection period, with the minimum measurement of 0.99 mg/L on March 16, 2020.

- **Operators were examining continuous monitoring test results and they were examining the results within 72 hours of the test.**

Treatment Process Monitoring

Typically, operators review all of the SCADA trend information generated for drinking water systems operated by Veolia each weekday and note any anomalies in the SCADA Daily Operating Logs. A review of the SCADA login information (Excel file format) documents that an operator reviewed Huron-Kinloss SCADA trend information remotely on a regular basis. Records demonstrate that the SCADA trend data review interval was less than 72 hours throughout the inspection time frame.

- **Samples for chlorine residual analysis were tested using an acceptable portable device.**

Operating Authority staff use Hach portable colorimeters to test the chlorine residual in the field.

- **All continuous monitoring equipment utilized for sampling and testing required by O. Reg.170/03, or Municipal Drinking Water Licence or Drinking Water Works Permit or order, were equipped with alarms or shut-off mechanisms that satisfy the standards described in Schedule 6.**

During the site inspection the SCADA alarm set points were verified at each pump house. The Lucknow 4 pump house SCADA will alarm if the free chlorine residual falls to 0.80 mg/L and would lockout the DWS at 0.50 mg/L. The Lucknow 4 chlorine analyzer is also set to alarm at 0.80 mg/L. (High chlorine residual alarm set points are 3.75 and 3.5 mg/L for the SCADA and analyzer respectively.) The alarm set point meets legislative requirements and was above the free chlorine residual threshold to meet CT requirements, which is 0.26 mg/L under maximum flow conditions.

The Lucknow 5 pump house SCADA will alarm if the free chlorine residual falls to 1.1 mg/L and would lockout the DWS at 1.0 mg/L. The Lucknow 5 chlorine analyzer is also set to alarm at 1.0 mg/L. (High chlorine residual alarm set points are 3.00 and 3.5 mg/L for the SCADA and analyzer respectively.) The alarm set point meets legislative requirements and was above the free chlorine residual threshold to meet CT requirements, which is 0.27 mg/L under maximum flow conditions.

In addition, the pre-contact chlorine monitor alarm is set to alarm at 1.0 mg/L. This continuous monitor is not legislatively required but is helpful to ensuring improperly disinfected water is not directed to consumers.

- **Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and recording data with the prescribed format.**

Continuous monitoring of free chlorine to achieve primary disinfection is recorded at a frequency of once every 2.5 minutes, which is more frequently than legislatively required at 5 minute intervals.

- **All continuous analysers were calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation.**

The continuous analyzers are checked daily, calibrated weekly and cleaned monthly as per manufacturer's instructions (Operations Manual document: L-OM-13).

Distribution System

- **There is a backflow prevention program, policy and/or bylaw in place.**

The H-K-Lucknow Contingency Plan, section L-CP-17 addresses backflow and cross contamination procedures.

- **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 "Lucknow Annual and Summary Report – For the 2019 Operating Year", notes the following:

"The Standpipe is in a state of disrepair, but is currently in operable condition. As it is risky to perform aggressive cleaning without compromising its structural integrity and introducing a potential for contamination, the replacement

Distribution System

of the Standpipe with a new Elevated Tank is currently in the design phase and is expected to begin in 2021."

The Ministry recommends the owner develop a plan to replace the current standpipe that is in a state of disrepair and to implement a routine schedule to cleanout, inspect and maintain the new water storage structure.

- **The owner had implemented a program for the flushing of watermains as per industry standards.**
Operating Authority staff conduct watermain (hydrant) flushing semi-annually.
- **Records confirmed that disinfectant residuals were routinely checked at the extremities and "dead ends" of the distribution system.**
As per the Lucknow Operations Manual, "Daily System Checks" (L-OM-12), "Emphasis should be put on sampling the dead ends of the system".
- **A program was in place for inspecting and exercising valves.**
According to the Lucknow DWS Operations Manual "Valve exercising... should be carried out at the time of the spring flushing" (document L-OM-08-0). Records confirm that valve exercising was conducted with the flushing and was completed in the fall (Oct. 15-18, 2019) and spring (May 4-15, 2020).
- **There was a program in place for inspecting and operating hydrants.**
Hydrant operation is addressed in the Lucknow Operations Manual document L-OM-08-0, and is completed semi-annually with the flushing program.
- **There was a by-law or policy in place limiting access to hydrants.**
Limiting access to hydrants is addressed in the Huron-Kinloss By-Law 2006-109, Section 9.1.5
- **The owner was able to maintain proper pressures in the distribution system and pressure was monitored to alert the operator of conditions which may lead to loss of pressure below the value under which the system is designed to operate.**
The owner confirmed there were no complaints from users regarding water pressure during the inspection period.
- **The donor had an agreement with a receiver system, and the agreement satisfied the requirements prescribed by subsection 5(4) under O. Reg. 170/03.**
There is a water agreement between the Township of Huron-Kinloss (donor) and the Township of Ashfield-Colborne-Wawanosh (ACW) (receiver). Huron-Kinloss By-law 2014-135 establishes that Lucknow DWS will treat the South Lucknow DS as an extension of the Lucknow distribution system. The South Lucknow DS owner has sampling exemptions under O. Reg. 170/03 Section 5(4), based on the water agreement with Huron-Kinloss as stipulated in ACW By-law 60-2014, and ACW By-law 69-2015 that specifies sampling for lead as per O. Reg. 170/03 Schedule 15.1.
- **The donor had provided an Annual Report to the receiver stand alone distribution system(s) connected to this system.**
The Annual Report and Summary Report were combined into one report for the first time during the inspection review period. The "Lucknow Annual Report and Summary Report – For the 2019 Operating Year" was written by ORO, Nancy Mayhew, and was provided to the Lucknow DWS owner, Municipality of Huron-Kinloss and the owner of the, South Lucknow Distribution System (water receiver), the Municipality of Ashfield-Colborne-Wawanosh (ACW) via "Google Docs" before February 28, 2020.

Operations Manuals

Operations Manuals

- **Operators and maintenance personnel had ready access to operations and maintenance manuals.**
A copy of the Operations and Maintenance Manual is available in each of the Lucknow well pump houses.
- **The operations and maintenance manuals contained plans, drawings and process descriptions sufficient for the safe and efficient operation of the system.**
- **The operations and maintenance manuals met the requirements of the Drinking Water Works Permit and Municipal Drinking Water Licence issued under Part V of the SDWA.**
The Lucknow Operations and Maintenance Manual fulfills the requirements stipulated in the DWWP.

Logbooks

- **Logbooks were properly maintained and contained the required information.**
Logbooks are properly maintained and include specified daily checks, alarm summary, work order section as well as daily events and observations.
- **Records or other record keeping mechanisms confirmed that operational testing not performed by continuous monitoring equipment was being done by a certified operator, water quality analyst, or person who suffices the requirements of O. Reg. 170/03 7-5.**
- **For every required operational test and every required sample, a record was made of the date, time, location, name of the person conducting the test and result of the test.**
- **The operator-in-charge ensured that records were maintained of all adjustments made to the processes within his or her responsibility.**
- **Logs or other record keeping mechanisms were available for at least five (5) years.**
Records are maintained by the owner at the Huron-Kinloss municipal office and an owner representative confirmed that records will be kept for the required time frames.

Contingency/Emergency Planning

- **Spill containment was provided for process chemicals and/or standby power generator fuel.**
Handling a spill is dealt with in document L-OM-15 in the Lucknow Operations Manual, and process chemicals, e.g. sodium hypochlorite are kept in secondary containers designed to capture all liquid that could leak from the primary container.
- **Clean-up equipment and materials were in place for the clean up of spills.**
Handling a spill is dealt with in document L-OM-15 in the Lucknow Operations Manual and each operator has materials and equipment to clean up a spill should one occur.

Security

- **All storage facilities were completely covered and secure.**
Please refer to "Other Inspection Findings" of this report.
- **Air vents and overflows associated with reservoirs and elevated storage structures were equipped with screens.**

Security

Please refer to "Other Inspection Findings" of this report.

- **The owner had provided security measures to protect components of the drinking water system.**

The pump houses (4 and 5) are visited daily by an operator and each site, including the standpipe, has signage. The pump houses have metal screens on the windows and keyed lock entry. In addition, the new PLC panels alarm when opened.

Consumer Relations

- **The owner and/or operating authority undertook efforts to promote water conservation and reduce water losses in their system.**

Water conservation measures (i.e. lawn watering) is addressed in the Huron-Kinloss By-Law 99-88.

Certification and Training

- **The overall responsible operator had been designated for each subsystem.**

The Overall Responsible Operator during the inspection period was Nancy Mayhew with Veolia Water Canada.

- **Operators-in-charge had been designated for all subsystems which comprised the drinking water system.**

The Operator-In-Charge (OIC) is designated and documented each day in the pump house logbooks.

- **All operators possessed the required certification.**

The Lucknow DWS is classified as a Class 2 Water Distribution and Supply Subsystem. Persons making operational adjustments to the Lucknow DWS are required to hold, or be deemed to hold, a valid Class 2 Water Distribution and Supply (WD&S) operator's certificate.

On July 15, 2020, emergency order O. Reg. 75/20 Drinking Water System and Sewage Works under the Reopening of Ontario (A Flexible Response to Covid-19) Act, 2020 was amended.

The amended emergency order extends all drinking water certificates and wastewater licences expiring between March 23, 2020 and October 31, 2020 to the later of the following dates:

- the end of the sixth month after the original expiry date
- the end of the third month after July 24, 2020 (termination of Ontario's declaration of emergency, O. Reg. 50/20)

Under this emergency order Nancy Mayhew's Water Distribution Subsystem Class 3 certification is extended to January 31, 2021 (original expiry was July 31, 2020) and Ben Nethery's Water Treatment Subsystem Class 1 certification is extended to March 31, 2021 (original expiry September 30, 2020).

Therefore, during the inspection period, there were primarily four (4) operators who did most of the operational checks and sampling for the Lucknow DWS. All of these operators had adequate and current certification for the inspection period, including an operator with Operator in Training (OIT) certificates for Water Distribution and Supply Subsystem and Water Treatment Subsystem who worked under the direction of a certified operator.

- **Only certified operators made adjustments to the treatment equipment.**
- **An adequately licenced operator was designated to act in place of the overall responsible operator when the overall responsible operator was unable to act**

If ORO, Nancy Mayhew, was unavailable to act, John Graham was the designated ORO for the facility. John Graham holds a Water Treatment Subsystem Class 3 that expires August 31, 2022, and a Water Distribution and

Certification and Training

Supply Subsystem that expires August 31, 2022. The ORO is stipulated each day in the pump house logbooks.

Water Quality Monitoring

- **All microbiological water quality monitoring requirements for raw water samples were being met.**

E. coli and total coliforms were both sampled each week in the raw water at each well, with the greatest period between sampling events of 8 days on two occasions. All samples resulted in no detection of E. coli or total coliforms.

- **All microbiological water quality monitoring requirements for distribution samples were being met.**

Based on a population of 1,100 residents, the Lucknow DWS is required to take nine (8+1) microbiological distribution samples per month, with at least one taken each week. Usually three (3) distribution samples were taken each week and tested for E. coli and total coliforms (average was 13.5 samples/month for each parameter), with the greatest period between sampling events of 8 days on two occasions during the inspection period. All samples within the inspection period resulted in no detection of E. coli or total coliforms. Typically, two-thirds of these samples (average = 67%) were tested for microbial Heterotrophic Plate Count (HPC) with results ranging from 0 to 10 c.f.u./1mL (average = 0.77 c.f.u./1mL).

- **All microbiological water quality monitoring requirements for treated samples were being met.**

E. coli and total coliforms were sampled weekly from the treated water at each pump house, with the greatest period between sampling events of 8 days on two occasions. All samples resulted in no detection of E. coli or total coliforms. HPC was also measured for 100% of the required samples and results ranged from 0 to 6 cfu/1mL.

- **All inorganic water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

The Operating Authority sampled all of the O. Reg 170/03 Schedule 23 inorganic parameters from each pump house on June 4, 2018 with no exceedances. Arsenic was also sampled on twelve (12) occasions since June 2018 due to that result exceeding half of the Maximum Allowable Concentration (MAC) threshold. All Schedule 23 results from June 2018 were below the reportable threshold (0-57% maximum allowable concentration). The subsequent arsenic results ranged from 3.1 to 5.5 mg/L (31%-55% MAC).

The Lucknow DWS is categorized as a large municipal residential system with a ground water source, therefore, as per O. Reg. 170/03 Schedule 13-3, inorganic parameters stipulated in O. Reg. 170/03 Schedule 23 parameters are due to be sampled again in 36 months, or in June 2021. Arsenic sampling needs to be sampled quarterly until the results from two consecutive three-month periods are below half of the standard (i.e., less than 0.005 mg/L).

- **All organic water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

The Operating Authority sampled all of the O. Reg 170/03 Schedule 24 organic parameters (n = 2 X 44 = 88) on June 4, 2018 at both pump houses with no exceedances. All results were below the reportable threshold (0-40% maximum allowable concentration).

The Lucknow DWS is categorized as a large municipal residential system with a ground water source, therefore, as per O. Reg. 170/03 Schedule 13-4, organic parameters stipulated in O. Reg. 170/03 Schedule 24 are due to be sampled again in 36 months, or in June 2021.

- **All haloacetic acid water quality monitoring requirements prescribed by legislation are being conducted within the required frequency and at the required location.**

Total Haloacetic Acids (HAAs) were sampled quarterly throughout the inspection review period with sampling events occurring between 84 and 98 days. This is within the legislative requirements (60-120 days). Typically,

Water Quality Monitoring

HAAs were sampled close to the pump houses, as per the requirement to sample where there is a higher likelihood of elevated HAAs. HAAs generally form at the beginning of the distribution system or may be found just past the chlorination point if the right humic acids are present.

There were seven (7) samples taken on four (4) dates with consistent results of 5.3 ug/L, the Minimum Detection Limit (MDL). The standard for Haloacetic Acids (80 ug/L) came into effect until January 1, 2020. It will be expressed as a Running Annual Average (RAA), but all HAA results were 5.3 during the inspection.

Sampling for HAAs will be due again in the next quarter, i.e. within the July to September 2020 time frame.

- **All trihalomethane water quality monitoring requirements prescribed by legislation were conducted within the required frequency and at the required location.**

Trihalomethanes (THMs) were sampled quarterly throughout the inspection review period with sampling events occurring between 84 and 98 days. This is within the legislative requirements (60-120 days).

There were nine (9) samples taken on four (4) dates with ranging from 4.5 to 12 ug/L and a Running Annual Average of 7.67 ug/L, less than the Ontario Drinking Water Quality Standard (ODWQS) of 100 ug/L.

Sampling for THMs will be due again in the next quarter, i.e. within the July to September 2020 time frame.

- **All nitrate/nitrite water quality monitoring requirements prescribed by legislation were conducted within the required frequency for the DWS.**

Nitrates and nitrites are required to be sampled every three months. Nitrates and nitrites were sampled at each pump house throughout the inspection review period with sampling events occurring between 84 and 98 days. This is within the legislative requirements (60-120 days).

Nitrite and Nitrate had consistent results below the Minimum Detection Limit of the lab test and were recorded as 0.003 mg/L (0.03%MAC) and 0.006 mg/L (0.06%MAC) respectively during the inspection time frame, lower than the ODWQS of 10.0 mg/L.

- **All sodium water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

Sodium is required to be taken and tested once every 5 years or 60 months. Lucknow DWS was most recently sampled for sodium on June 21, 2016, with results of 12.8 and 10.8 mg/L. These sodium concentrations are below the reportable threshold of 20 mg/L. (Sodium has an aesthetic standard of 200 mg/L although a result exceeding 20 mg/L must be reported as this level may impact people on sodium reduced diets.) Sodium is due to be sampled again by June 2021.

- **All fluoride water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

Fluoride is required to be sampled once every 5 years or 60 months and was most recently sampled from treated water at each pump house on August 15, 2017 with results of 1.75 and 1.78 mg/L. These results were in exceedance of the ODQWS of 1.5 mg/L and the subsequent resample results were ranged from 1.72 to 1.74 mg/L (n=4), with two samples taken at each pump house. The Grey Bruce Health Unit is aware of the relatively high fluoride levels which are naturally occurring in this area. The municipality provides this information to consumers through bi-annual newsletters sent out with tax notices. Fluoride is next due to be sampled by August 2022.

- **The owner ensured that water samples were taken at the prescribed location.**
- **The owner was required to increase frequency of monitoring as a result of having exceeded half the value**

Water Quality Monitoring

of an applicable ODWQS of a Schedule 13-2 or 13-4 parameter(s) and that increased monitoring was conducted.

Schedule 13-5. (1) states that 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 of the Ontario Drinking-Water Quality Standards, the frequency of sampling for that parameter shall be increased to every three months until there are two consecutive three-month periods in which the results do not exceed half of the prescribed standard (for ground water sources).

Under Schedule 2 of O. Reg. 169/02, the Ontario Drinking Water Quality Standard for arsenic is 0.01 mg/L. Since samples taken on June 4, 2018 and June 12, 2019 in which the arsenic results were greater than 50% of the MAC, quarterly sampling of arsenic had been implemented for this inspection cycle.

During the current inspection review period arsenic sampling was conducted at a range of 76 and 91 days between sampling events. Two of the eight samples taken at both pump houses were greater than 50% MAC (both were 53% MAC). Results ranged from 3.1 to 5.5 ug/L, with an average of 4.2 ug/L.

- **All sampling requirements for lead prescribed by schedule 15.1 of O. Reg. 170/03 were being met.**

The Lucknow DWS serves a population of approximately 1230 residents in Lucknow and 10 properties in South Lucknow DS with lead sampling differentiated between the two separate systems. Based on previous lead sampling results, the owner was eligible for an exemption from lead plumbing sampling under sub-section 15.1-5 (9) of O. Regulation 170/03. Under this exemption, the required sampling consists of alkalinity and pH samples taken from the distribution system each period and with lead samples taken from the distribution system for two consecutive periods every third year.

As per O. Reg. 170/03 15.1, sampling periods are defined as between:

- December 15 - April 15 and
- June 15- October 15 each year

Given the population served by Lucknow DWS, two distribution samples are required each time lead sampling is due. The correct number of samples were taken during the appropriate time frame and the lead test results were 0.06 and 0.2 ug/L in January 2020 and 0.19 and 0.6 ug/L in July 2020. Lead sampling of the Lucknow distribution system is due again in 2023.

Alkalinity and pH sampling of the distribution system were completed as required within the inspection review period and will be due again for sampling between December 15, 2020 and April 15, 2021.

- **Records confirmed that chlorine residual tests were being conducted at the same time and at the same location that microbiological samples were obtained.**
- **Turbidity was being tested at least once every month from each well that is supplying water to the system.**
Typically operators sampled the raw water turbidity weekly during the inspection time frame, which is more frequently than legislatively required. The monthly average raw water turbidity measurement was 0.14 and 0.16 NTU for the Lucknow 4 and Lucknow 5 production wells respectively.
- **The owner indicated that the required records are kept and will be kept for the required time period.**

Water Quality Assessment

- **Records did not show that all water sample results taken during the inspection review period did not exceed the values of tables 1, 2 and 3 of the Ontario Drinking Water Quality Standards (O.Reg. 169/03).**

Water Quality Assessment

During the inspection review period there was one occurrence of a sample result exceeding a parameter listed under O. Reg. 169/03 for a sample taken on September 24, 2019 with a result of 1 cfu/100 mL for total coliforms. The threshold is no detection (0 cfu/100 mL) of total coliforms as listed in Schedule 1 of O. Reg. 169/03. Please refer to the "Corrective Actions" portion of this report for further details.

Note: Fluoride is considered naturally occurring in the source water and typically exceeds the ODWQS threshold of 1.5 mg/L, however sampling for this parameter was not conducted within the inspection period and is not due again until August 2022.

Reporting & Corrective Actions

- **Corrective actions (as per Schedule 17) had been taken to address adverse conditions, including any other steps that were directed by the Medical Officer of Health.**

There was one Adverse Water Quality Incident (AWQI) during the inspection from a distribution system sample that was taken at the Lucknow Public School on September 24, 2019, with a result of total coliforms of 1 CFU/100 mL and corresponding free chlorine residual of 1.50 mg/L.

The Operating Authority completed all required corrective actions including:

- Resample and test upstream, downstream and at the AWQI site (completed on September 26, 2019)
- Completed distribution system flushing
- The local medical officer of health did not assign additional corrective actions

- **All required notifications of adverse water quality incidents were immediately provided as per O. Reg. 170/03 16-6.**

The Operating Authority provided verbal notification to the Grey Bruce Health Unit and Spills Action Centre within 12 minutes of receiving the verbal notice from the lab at 13:54 on September 26, 2019.

- **All required written notices of adverse water quality incidents were provided as per O. Reg. 170/03 16-7.**

The Operating Authority provided written notification to the Grey Bruce Health Unit and Spills Action Centre within 2 hours of receiving the verbal notice from the lab.

- **In instances where written notice of issue resolution was required by regulation, the notice was provided as per O. Reg. 170/03 16-9.**

The Operating Authority provided written notification of issue resolution to the Spills Action Centre the same day the problem was resolved (September 30, 2019) by receiving water sample results without any detection of total coliforms or E. coli, i.e. 0 CFU/100 mL.

- **Where required continuous monitoring equipment used for the monitoring of chlorine residual and/or turbidity triggered an alarm or an automatic shut-off, a qualified person responded in a timely manner and took appropriate actions.**

The ORO provided a database export Excel file of the alarm history for each month of the inspection period. The alarm history review included examination of each alarm for the Lucknow DWS, plus the corresponding SCADA log-in information as well as the pump house and after-hours logbooks. If required additional SCADA information, e.g. free chlorine residual trend data, was reviewed.

Operators responded to alarms in an appropriate and timely manner.

It is recommended that operators specify in the logbook (pump house or after hours) if an alarm is a nuisance alarm that does not reflect actual conditions, to clearly document that operator response was not required.

- **The Annual Report containing the required information was prepared by February 28th of the following**

Reporting & Corrective Actions

year.

The Annual Report and Summary Report were combined into one report for the first time during the inspection review period. The "Lucknow Annual Report and Summary Report – For the 2019 Operating Year" was written by ORO, Nancy Mayhew, and was provided to the Lucknow DWS owner, Municipality of Huron-Kinloss and the owner of the, South Lucknow Distribution System (water receiver), the Municipality of Ashfield-Colborne-Wawanosh (ACW) via "Google Docs" before February 28, 2020.

The content of the report met the criteria stipulated in O. Reg. 170/03 Section 11 (Annual Report) and was reviewed by municipal council on May 4, 2020 (Item # 4.15) then made available on the municipality's website.

- **Summary Reports for municipal council were completed on time, included the required content, and were distributed in accordance with the regulatory requirements.**

The Annual Report and Summary Report were combined into one report for the first time during the inspection review period. The "Lucknow Annual Report and Summary Report – For the 2019 Operating Year" was written by ORO, Nancy Mayhew, and was provided to the Lucknow DWS owner, the Municipality of Huron-Kinloss and the owner of the South Lucknow Distribution System (water receiver), the Municipality of Ashfield-Colborne-Wawanosh (ACW) via "Google Docs" before February 28, 2020.

The content of the report met the criteria stipulated in O. Reg. 170/03 Schedule 22-2 and was reviewed by municipal council on May 4, 2020 (Item # 4.15) then made available on the municipality's website.

Other Inspection Findings

- **The following instance(s) of non-compliance were also noted during the inspection:**

Standpipe in Disrepair:

The standpipe within the distribution of the Lucknow drinking water system needs to be replaced. The elevated standpipe is 89 years old, having been constructed in 1931, and has clearly deteriorated over time with cracks in the concrete foundation visible. The most recent inspection report of the standpipe was in 2007 shows the interior is painted with a "grease paint" which does not meet current AWWA standards for coating material for finished water storage facilities.

The owner and operating authority are aware of these issues and have applied for provincial funding through the Ontario Community Infrastructure Program, to assist the municipality with the costs to replace the standpipe. In addition, the owner hired consulting engineers to assist with the plans and design for the standpipe replacement. The owner applied for, and received, Authorization to Alter the Drinking Water System issued by the Ministry of the Environment and Climate Change (June 20, 2016, DWWP 087-203, Schedule C). Also, the owner has taken steps to protect and improve the current standpipe site by purchasing the adjacent lot and removing a dilapidated building. However, the standpipe is rundown and the "Lucknow Annual and Summary Report – For the 2019 Operating Year", states the following:

"As it is risky to perform aggressive cleaning without compromising its structural integrity and introducing a potential for contamination, the replacement of the Standpipe with a new Elevated Tank is currently in the design phase and is expected to begin in 2021.

The owner has applied several times for Ontario Community Infrastructure Fund (OCIF) funding without success and have been informed that drinking water projects are not eligible under the current funding program. Municipal staff will be re-evaluating capital plans in the fall of 2020 to offer alternatives to Council for 2021 budget preparation.

Under the Safe Drinking Water Act, 2002 (SDWA) 11(1) 2 ii "every owner of a municipal drinking-water system and, if an operating authority is responsible for the operation of the system, the operating authority for the system shall

Other Inspection Findings

ensure that, at all times in which it is in service, the drinking-water system, is maintained in a fit state of repair".

Also, under the SDWA, a drinking water system means "a system of works, excluding plumbing, that is established for the purpose of providing users of the system with drinking water and includes, (a) any thing used for the collection, production, treatment, storage, supply or distribution of water".

By November 1, 2020 the owner will provide the author this report a plan to ensure the Lucknow standpipe is maintained in a fit state of repair as per section 11 (1) 2 ii of the Safe Drinking Water Act, 2002.

NON-COMPLIANCE WITH REGULATORY REQUIREMENTS AND ACTIONS REQUIRED

This section provides a summary of all non-compliance with regulatory requirements identified during the inspection period, as well as actions required to address these issues. Further details pertaining to these items can be found in the body of the inspection report.

1. The flow measuring devices were not calibrated or verified in accordance with the requirements of the MDWL issued under Part V of the SDWA.

Insufficient flow meter verification

Action(s) Required:

By November 1, 2020, the owner will provide the author of this report documentation that the Lucknow DWS flow meters have been verified over a range of flow rates that are representative of this DWS or calibrated in accordance with the manufacturer's instructions as per MDWL 087-103 Issue 2, Schedule C condition 3.1.

2. The owner/operating authority was not in compliance with the requirement to prepare Form 1 documents as required by their Drinking Water Works Permit during the inspection period.

Form 1 signed after watermain put into use

Action(s) Required:

The owner was reminded of the DWWP requirement for the owner representative to sign a Form 1 document prior to a new or replaced watermain being put into service as per condition 3.3.1 of Schedule B of the DWWP 087-203, Issue 3.

No further action is required.

3. The following instance(s) of non-compliance were also noted during the inspection:

Standpipe in disrepair

Action(s) Required:

By November 1, 2020 the owner will provide the author this report a plan to ensure the Lucknow standpipe is maintained in a fit state of repair as per section 11 (1) 2 ii of the Safe Drinking Water Act, 2002.

SUMMARY OF RECOMMENDATIONS AND BEST PRACTICE ISSUES

This section provides a summary of all recommendations and best practice issues identified during the inspection period. Details pertaining to these items can be found in the body of the inspection report. In the interest of continuous improvement in the interim, it is recommended that owners and operators develop an awareness of the following issues and consider measures to address them.

1. **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.**

Recommend: Replace standpipe

Recommendation:

The Ministry recommends the owner develop a plan to replace the current standpipe that is in a state of disrepair and to implement a routine schedule to cleanout, inspect and maintain the new water storage structure.

SIGNATURES

Inspected By:

Heather Lovely

Signature: (Provincial Officer)



Reviewed & Approved By:

Mark Smith

Signature: (Supervisor)



Review & Approval Date:

October 9, 2020

Note: This inspection does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they apply or may apply to this facility. It is, and remains, the responsibility of the owner and/or operating authority to ensure compliance with all applicable legislative and regulatory requirements.



Ontario

**Ministry of the Environment and Climate Change
Drinking Water Inspection Report**

APPENDIX A

INSPECTION SUMMARY RATING RECORD

Ministry of the Environment - Inspection Summary Rating Record (Reporting Year - 2020-2021)

DWS Name:	LUCKNOW DRINKING WATER SYSTEM
DWS Number:	220002663
DWS Owner:	Huron-Kinloss, The Corporation Of The Township Of
Municipal Location:	Huron-Kinloss

Regulation: O.REG 170/03
Category: Large Municipal Residential System
Type Of Inspection: Detailed
Inspection Date: August 12, 2020
Ministry Office: Owen Sound District Office

Maximum Question Rating: 642

Inspection Module	Non-Compliance Rating
Source	0 / 14
Permit To Take Water	0 / 12
Capacity Assessment	8 / 42
Treatment Processes	4 / 93
Distribution System	0 / 4
Operations Manuals	0 / 42
Logbooks	0 / 30
Certification and Training	0 / 49
Water Quality Monitoring	0 / 152
Reporting & Corrective Actions	0 / 84
Other Inspection Findings	0 / 0
Treatment Process Monitoring	0 / 120
TOTAL	12 / 642

Inspection Risk Rating	1.87%
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FINAL INSPECTION RATING:	98.13%
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Ministry of the Environment - Detailed Inspection Rating Record (Reporting Year - 2020-2021)

DWS Name:	LUCKNOW DRINKING WATER SYSTEM
DWS Number:	220002663
DWS Owner:	Huron-Kinloss, The Corporation Of The Township Of
Municipal Location:	Huron-Kinloss
Regulation:	O.REG 170/03
Category:	Large Municipal Residential System
Type Of Inspection:	Detailed
Inspection Date:	August 12, 2020
Ministry Office:	Owen Sound District Office

Non-compliant Question(s)	Question Rating
Capacity Assessment	
Are the flow measuring devices calibrated or verified in accordance with the requirements of the MDWL issued under Part V of the SDWA?	8
Other Inspection Findings	
In the event that an issue of non-compliance outside the scope of this inspection protocol is identified, a "No" response may be used if further actions are deemed necessary (and approved by the DW Supervisor) to facilitate compliance.	0
Treatment Processes	
Is the owner/operating authority able to demonstrate that, when required during the inspection period, Form 1 documents were prepared in accordance with their Drinking Water Works Permit?	4
TOTAL QUESTION RATING	12

Maximum Question Rating: 642

Inspection Risk Rating	1.87%
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FINAL INSPECTION RATING:	98.13%
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Ontario

**Ministry of the Environment and Climate Change
Drinking Water Inspection Report**

APPENDIX B

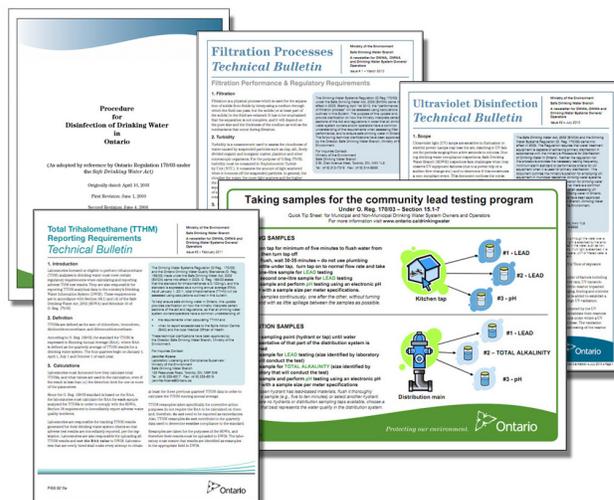
REFERENCE GUIDE FOR STAKEHOLDERS

Key Reference and Guidance Material for Municipal Residential Drinking Water Systems

Many useful materials are available to help you operate your drinking water system. Below is a list of key materials owners and operators of municipal residential drinking water systems frequently use.

To access these materials online click on their titles in the table below or use your web browser to search for their titles. Contact the Public Information Centre if you need assistance or have questions at 1-800-565-4923/416-325-4000 or picemail.moe@ontario.ca.

For more information on Ontario's drinking water visit www.ontario.ca/drinkingwater and email drinking.water@ontario.ca to subscribe to drinking water news.



PUBLICATION TITLE	PUBLICATION NUMBER
Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils	7889e01
FORMS: Drinking Water System Profile Information, Laboratory Services Notification, Adverse Test Result Notification Form	7419e, 5387e, 4444e
Procedure for Disinfection of Drinking Water in Ontario	4448e01
Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids	7152e
Total Trihalomethane (TTHM) Reporting Requirements Technical Bulletin (February 2011)	8215e
Filtration Processes Technical Bulletin	7467
Ultraviolet Disinfection Technical Bulletin	7685
Guide for Applying for Drinking Water Works Permit Amendments, Licence Amendments, Licence Renewals and New System Applications	7014e01
Certification Guide for Operators and Water Quality Analysts	
Guide to Drinking Water Operator Training Requirements	9802e
Taking Samples for the Community Lead Testing Program	6560e01
Community Sampling and Testing for Lead: Standard and Reduced Sampling and Eligibility for Exemption	7423e
Guide: Requesting Regulatory Relief from Lead Sampling Requirements	6610
Drinking Water System Contact List	7128e
Technical Support Document for Ontario Drinking Water Quality Standards	4449e01

ontario.ca/drinkingwater

Principaux guides et documents de référence sur les réseaux résidentiels municipaux d'eau potable

De nombreux documents utiles peuvent vous aider à exploiter votre réseau d'eau potable. Vous trouverez ci-après une liste de documents que les propriétaires et exploitants de réseaux résidentiels municipaux d'eau potable utilisent fréquemment.

Pour accéder à ces documents en ligne, cliquez sur leur titre dans le tableau ci-dessous ou faites une recherche à l'aide de votre navigateur Web. Communiquez avec le Centre d'information au public au 1 800 565-4923 ou au 416 325-4000, ou encore à picemail.moe@ontario.ca si vous avez des questions ou besoin d'aide.



Pour plus de renseignements sur l'eau potable en Ontario, consultez le site www.ontario.ca/eaupotable ou envoyez un courriel à drinking.water@ontario.ca pour suivre l'information sur l'eau potable.

TITRE DE LA PUBLICATION	NUMÉRO DE PUBLICATION
Prendre soin de votre eau potable – Un guide destiné aux membres des conseils municipaux	7889f01
Renseignements sur le profil du réseau d'eau potable, Avis de demande de services de laboratoire, Formulaire de communication de résultats d'analyse insatisfaisants et du règlement des problèmes	7419f, 5387f, 4444f
Marche à suivre pour désinfecter l'eau potable en Ontario	4448f01
Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids (en anglais seulement)	7152e
Total Trihalomethane (TTHM) Reporting Requirements: Technical Bulletin (février 2011) (en anglais seulement)	8215e
Filtration Processes Technical Bulletin (en anglais seulement)	7467
Ultraviolet Disinfection Technical Bulletin (en anglais seulement)	7685
Guide de présentation d'une demande de modification du permis d'aménagement de station de production d'eau potable, de modification du permis de réseau municipal d'eau potable, de renouvellement du permis de réseau municipal d'eau potable et de permis pour un nouveau réseau	7014f01
Guide sur l'accréditation des exploitants de réseaux d'eau potable et des analystes de la qualité de l'eau de réseaux d'eau potable	
Guide sur les exigences relatives à la formation des exploitants de réseaux d'eau potable	9802f
Prélèvement d'échantillons dans le cadre du programme d'analyse de la teneur en plomb de l'eau dans les collectivités	6560f01
Échantillonnage et analyse du plomb dans les collectivités : échantillonnage normalisé ou réduit et admissibilité à l'exemption	7423f
Guide: Requesting Regulatory Relief from Lead Sampling Requirements (en anglais seulement)	6610
Liste des personnes-ressources du réseau d'eau potable	7128f
Document d'aide technique pour les normes, directives et objectifs associés à la qualité de l'eau potable en Ontario	4449f01

ontario.ca/eaupotable