

Report to Council

Report Title:	Lake Rosalind Water Supply and Condition Update		
Prepared By:	Gregory Furtney, Director of Operations		
Department:	Utilities		
Date:	April 9, 2019		
Report Number:	UT2019-05	File Number:	C11, UT
Attachments:	248-026 Lake Rosalind Well 3 Rehabilitation Well 1 Testing Source Water Protection Presentation		

Recommendation:

That the Council of the Municipality of Brockton hereby receives Report Number UT2019- 05 Lake Rosalind Water Supply and Condition Update, prepared by Gregory Furtney, Director of Operations for information purposes.

Report:

Background:

The Lake Rosalind water system (DWS 220007800) is considered to be a Small Municipal Residential Drinking Water System. It is a two (2) Well, (combined Well #3 and Well #1) drinking water system that is owned by the Municipality of Brockton but is operated by Veolia Water. The system provides potable drinking water to Sixty-two (62) residents in the Lake Rosalind area. The Lake Rosalind Water Works pump house is located on part of Lot 67 and 68, Concession 3, NDR on Assessment Roll No. 199-01. The original pump house facilities were constructed in 1988 and was originally designed by Gamsby and Mannerow Limited.

Well #3 is a 200 mm diameter drilled well that is believed to have been constructed in 1987. The Well is constructed with a 200 mm steel casing set to a depth of 15.5 m. The well penetrates a clay aquitard (a geologic formation or stratum that lies adjacent to an aquifer and that allows only a small amount of liquid to pass). The Well pump has a 10 gpm ½ horsepower motor.

Well #1 is a 1.0 m diameter dug Well which is 4.12 m deep. The date of installation for Well #1 is unknown. Well #1 is equipped with a 38 mm HDPE suction line and foot valve with a ½ horsepower jet pump and motor. Well #1 is used only as a supplemental water supply because the raw water has had more issues with bacteria hits than Well #3 and is more susceptible to lower water levels.

Records dating back to 2000 indicate that both Well #3 and Well #1 have seen various inspections and minor upgrades. B.M. Ross was commissioned in 2000 to provide the Municipality with a Lake Rosalind Water Works

Engineer's Report. In 2003, B.M. Ross was commissioned to do a Lake Rosalind Water Works Upgrades and Design Brief. In 2004, B.M. Ross was commissioned to do a Class Environmental Assessment For Water Supply Improvements and Possible Expansion – Environmental Screening Report. Also in 2004, the Municipality of Brockton commissioned a Lake Rosalind and Marl Lake Inland Lake Development Study which was written by French Planning Services Inc. in collaboration with Gartner Lee Limited.

On February 16th, 2016, Carl Seider, Project Manager from the Saugeen, Grey Sauble, Northern Bruce Peninsula Source Water Protection Program provided a presentation to Brockton Municipal Council entitled "Water quantity threat policies – Lake Rosalind".

In November of 2018, Lotowater Technical Services Inc. was commissioned to study and report on the two Wells at Lake Rosalind. That report was completed and sent to staff on December 19th, 2018.

As always, Brockton Municipal Council is provided with monthly and annual reports for each water system, reporting on the water quality testing, in accordance with Schedule 22 and Section 11 of Ontario Regulation 170/03.

Analysis:

The Lake Rosalind Water Works Engineer's Report (2000 – B.M. Ross): This report gives a very detailed assessment of the Wells and the treatment system at the time and compared their findings to the legislation at the time. It also offered suggestions for upgrades.

The Lake Rosalind Water Works Upgrades and Design Brief (2003 – B.M. Ross): This report suggests necessary design upgrades, under Ontario Regulation 459/00, and supplements the application to amend the existing Certificate of Approval with the Ministry of Environment. Upgrades were necessary so that the system was designed and operating under the newest legislative requirements.

The Class Environmental Assessment For Water Supply Improvements and Possible Expansion Report (2004 B.M. Ross): This report was to document the planning and design process followed during the evaluation of alternative solutions to the volume of supply, security and water quality problems with the municipal water system in the Lake Rosalind Community. The Report presented a preferred option and documented the decision-making process leading to the selection of that solution.

With regards to water quantity, the report outlines that the Lake Rosalind Drinking Water System has a total effective operating capacity of approximately 115.2 cubic meters per day. The maximum day demand for the Road 4 service area was estimated to be approximately 106.7 cubic meters per day. The maximum day demand for the larger service area is estimated to be about 407.8 cubic meters per day which exceeds the current supply capability, according to that report.

As for water quality, B.M. Ross suggest in their report that they felt that both wells are considered GUDI (Groundwater Under the Influence of Surface Water) and that the Lake may have been showing signs of increasing levels of nitrates, chlorides, and phosphates, which are indicators, potentially, of faulty or failing localized septic systems. The elevated chloride levels might have been from winter applied road salt.

Six (6) alternative solutions were identified. 1.) Upgrade the existing Well field and treatment facility, 2.) Construct a new Well supply. 3.) Construct a lake based water treatment plant, 4.) Construct a Transmission Main from the Walkerton water supply system, 5.) Construct a Transmission Main from the Hanover water supply system, and 6.) Do nothing. A further possible alternative was the connection to a regional water supply which was being considered to carry water to the southern half of Bruce County based on a supply from either Lake Huron or Georgian Bay. Apparently in early 2004 it was decided that this solution was no longer available for consideration and it was eliminated from the list of feasible alternatives.

After a Technical Committee was struck, a Questionnaire circulated, discussions with various Government Agencies, two (2) Public Meetings, and a discussion with the Town of Hanover, the recommended alternative was alternative solution 1 – Upgrade the existing Well field and Treatment System.

This solution is what we see today, however it does not/ has not increased the water capacity issue. In speaking with our Water Treatment Operators at Veolia Canada, the current system meets the current demand by the homes that are already being serviced but will not support further connections.

The Lake Rosalind and Marl Lake Inland Lake Development Study (2004 – French Planning Services and Gartner Lee Limited): This is a report suggesting Land Use Planning around the lakes. It does talk about the surface water quality of both lakes (Bacterial and Chemical). It also touches on a phytoplankton analysis that the Ministry of Environment and Energy did back in 1985. The Ministry did a biomass analysis and did identify that Lake Rosalind had a dominant phytoplankton family present known as Chrysophyceae which accounted for 44% of the biomass collected and analyzed. Blue-green algae are members of the Chrysophyceae family however the report does not specifically say that the collected biomass was specifically Blue-Green Algae.

In response to the above information, please note that the water quality has and does shift each year and that this information would need, at some point, to be studied and reported upon again.

Source Water Protection: On February 16th, 2016, Carl Seider, Project Manager from the Saugeen, Grey Sauble, Northern Bruce Peninsula Source Water Protection Program provided Brockton Municipal Council with a presentation entitled “Water Quantity Threat Policies – Lake Rosalind”. After the Walkerton Tragedy, the Province of Ontario established a comprehensive drinking water protection “framework” that is now wide spread across Ontario.

One of the items that the Source Water Protection Committee looks at is the “Water Budget”. The overall objective is to identify threats (quantity) to municipal drinking water supplies and to address those threats. The committee reviewed and assessed, through a Risk Assessment process, that the municipal supplies in the Town of Hanover & the Community of Lake Rosalind had a moderate potential for hydrologic stress. The Committee discovered that the Wells have a slow recharge rate due to clay soil, that water levels fluctuate dramatically from year to year, that there were Ministry inspection reports that identified significant shortages in 2005, and that their study identified the system as a “Significant Risk Level” for water quantity threats.

The Source Water Protection Committee and Plan suggested that the Municipality of Brockton Review it’s Permits to Take Water (PTTW), which we do and record at least weekly, that the Municipality do ongoing maintenance of their Tier 3 Water Budget Models, and finally that the Municipality shall develop and implement a Water Management Plan using the Tier 3 water budget findings. The Water Management plan

shall address 1.) Issues with water supply, 2.) Future Development, 3.) New water supply options; and 4.) Water Conservation. They also recommend that the Municipal Official Plan must be updated or amended with the Water Management Plan. The update or amendment to the Official Plan must be initiated within three (3) years and completed within five (5) years of the effective date of the Source Protection Plan. Staff have reached out to Mr. Seider to see what needs to be done and where we are at with the timelines on our Source Water Protection Plan. An update will follow.

The next steps, provided by the Source Water Protection Committee in 2016, was to develop the Water Management Plan and include the rehabilitation or retrofitting of existing wells, installation of additional well(s), and doing a Feasibility Study and determine costs associated with extending the existing water supplies from Hanover.

Lake Rosalind Well #3 Rehabilitation and Well #1 Testing: In November of 2018, Lotowater Technical Services Inc. was asked to do an assessment and review of the condition of Well #3 and Well #1 and to make recommendations. In the conclusion of the report, Lotowater includes seven (7) recommendations and documents that the drinking water system “has been working well over the last 5 plus years with no significant issues. However, Lotowater recommends the following actions be considered to increase the reliability and security of the wells.”

1. Install a new stainless steel liner in Well #3 to repair the hole in the well casing and raise the well casing and ground level to facilitate easier access and maintenance.
2. Operational changes to pumping procedures under low water levels
3. Operational changes to pumping procedures under high water levels
4. Establish a warning criteria for different levels of water conservation based on well levels
5. Consider automating level collection at Well #1 and Well #3 using self-contained data logging transducers and log it daily.
6. Consider installing remote well level readouts in the pump house so operators can easily check well levels and optimize pumping schemes to balance pumping between the two wells.
7. Update the well level hydrographs and pumping history plots annually and have a hydrologist and/or groundwater professional review and comment.

These are all recommendations that staff have discussed with Veolia Canada and will have built into subsequent Municipal Budget requests.

In conclusion, the drinking water supply, from Well #3 and Well #1, is sufficient and capable (quantity) to continue to produce clean potable drinking water to the current residents that are connected to the system. However, in speaking with the Water Treatment Operators from Veolia Canada, there is very little capacity to meet the demand of the rest of the residents in that area. The B.M. Ross “Class EA for Water Supply Improvements and Possible Expansion Study” in 2004 also supports this notion. The water quality meets and exceeds Provincial Standards and Legislative requirements which is documented in the monthly and annual reports produced by Veolia Canada.

With respect to the water quality and quantity of the surface water in Lake Rosalind, like any water supply across Ontario - Ground Water or Surface Water Sources, there are identified threats that need to be reviewed. The Source Water Protection Plan and our own Water Management Plan will strive to mitigate these threats. That includes water quantity threats as well as biological and chemical threats. The only absolute way to mitigate these threats are with a secure and consistent fresh water supply, raw or treated.

Cost estimates to update and further the Class Environmental Assessment For Water Supply Improvements and Possible Expansion Report done by B.M. Ross in 2004 for the Lake Rosalind Community would be estimated to be around the \$55,000 to \$75,000 range depending on the detail within the scope of the study. Project costs including Engineering Studies, Permit Fees, Project Management Services and Construction would vary significantly based on the Council endorsed solution. This updated study, if directed by Brockton Municipal Council, would be consistent with the “Water and Sewer Utilities Recommendation” outlined by the Environmental Services Focus Group during the Municipal Services Review Process in 2016.

Staff will ensure that a copy of this report is provided to the Lake Rosalind Residents Association.

Sustainability Checklist:

What aspect of the Brockton Sustainable Strategic Plan does the content/recommendations in this report help advance?

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| • Do the recommendations help move the Municipality closer to its Vision? | Yes |
| • Do the recommendations contribute to achieving Cultural Vibrancy? | Yes |
| • Do the recommendations contribute to achieving Economic Prosperity? | Yes |
| • Do the recommendations contribute to Environmental Integrity? | Yes |
| • Do the recommendations contribute to the Social Equity? | Yes |

Financial Impacts/Source of Funding:

- Do the recommendations represent a sound financial investment from a sustainability perspective?
N/A

No financial impact at this time. The costs associated with a Feasibility Study/ Class Environmental Assessment would need to be built into the 2020 Municipal Budget.

Reviewed By:



Trish Serratore, Chief Financial Officer

Respectfully Submitted by:



Gregory Furtney, Director of Operations

Reviewed By:



Sonya Watson, Chief Administrative Officer