Technical Memorandum

Casselman Piped Water Supply Feasibility Study

January 2024

Prepared for:

CORPORATION OF THE MUNICIPALITY OF CASSELMAN
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1.0 Introduction

J.L Richards & Associates Limited (JLR) was retained by the Municipality of Casselman (Casselman) to conduct a Piped Water Supply Feasibility Study to identify alternative sources for water supply. This study investigated the viability of outsourcing Casselman's total future water demand from a nearby municipality via a new transmission line. The extent of the study area is shown in Figure 1. Two connection points within the City of Clarence-Rockland were identified at Cheney and at Bourget as potential options. A hydraulic model was developed to assess different routing scenarios and determine the transmission main properties. Additionally, a preliminary cost estimate was performed for the routing options. The study forms part of a two-part feasibility study to determine alternative water supply options for Casselman due to their increasing demand and water quality issues with their current source, the South Nation River.

1.1 Background

In 2022, JLR was retained by Casselman to complete a Water and Wastewater Infrastructure Master Plan in accordance with the Municipality Class Environmental Assessment (MECA) requirements. Through the Master Plan, it was determined that water and wastewater infrastructure projects would require prioritization to address future servicing needs and ensure appropriate performance and reliability of the water and wastewater systems in short, mid, and long-term planning horizons.

To address concerns regarding the quantity and quality of raw water from the South Nation River, JLR recommended that the Municipality complete a Class EA to determine a water supply source to support mid- and long-term development and increasing water demand. Water sourcing options include the continued supply from the South Nation River, from a new groundwater supply well(s), or from another municipality via a new transmission main.

Supply of drinking water from another municipality via a transmission line is not uncommon and has been adopted by other municipalities near Casselman, including the Township of Russell, which receives drinking water from the City of Ottawa. Most recently, in 2020, the Village of Limoges entered into an agreement with the City of Clarence-Rockland to provide Limoges with additional water supply via a new transmission main between the Cheney Water Tower and the Limoges Water Treatment Plant reservoirs. The agreement was the result of several studies conducted to identify additional sources of water supply to support Limoges' anticipated growth. Construction of the new 9.8 km, 400 mm High Density Polyethylene (HDPE) transmission watermain began in September 2021 and became operational in June 2022. Water supply was expected to support the immediate maximum day demand of 346 m^3/day at the time of connection and increase to support Limoges' ultimate maximum day water demand of 7,076 m^3/d in 2042.

This study focuses on the feasibility for Casselman to source its drinking water from a nearby municipality via a new transmission main.

2.0 Existing System Description

Casselman is located along Highway 417 near the South Nation River, south of the Nation Municipality. The water distribution system currently services 4,048 people and consists of the Casselman Water Treatment Plant (WTP) located at 832 Laval Street; an elevated water storage tank with a total usable volume of 3,801 m^3 located at 756 Brebeuf Street, and over 22 km of watermains.

2.1 Water Treatment Plant

The Casselman WTP has a rated capacity of 3,182 m^3/day and operates under the Ministry of the Environment, Conservation and Parks (MECP) Drinking Water License Number 173-101, Drinking Water Works Permit No. 173-201, and Permit-to-Take-Water (PTTW) No. 6067-9EGMS2. The facility is owned by Casselman and operated by the Ontario Clean Water Agency (OCWA). It sources raw water from the South Nation River and includes an Actiflo ® treatment system, dual media filtration, primary disinfection using chlorine and ultraviolet treatment, and secondary disinfection using chloramination with ammonium sulphate. Additionally, raw water is treated with potassium permanganate during the summer months when influent manganese concentrations are elevated. As per the 2023 Phase 1 Master Plan completed by JLR, the Casselman WTP is currently operating at 62% of its rated capacity.

Refer to Figure 2 for a location plan and overview of the water infrastructure.

3.0 Projected Water Demands

3.1 Current Flow Rates

As per the Master Plan, the current (2023) water demand was determined by using available flow data over the past five years (2018-2022). The average day demand was determined by averaging the total daily treated flows between 2018 and 2022, and was calculated to be 1,031 m^3/d (12 L/s). The maximum day demand was taken as the average of the maximum day flow reported for each of the past five years, which was calculated to be 1,968 m^3/d (23 L/s). As the peak hourly data was not specifically recorded, the peak hour demand was estimated using a theoretical peaking factor of 1.5 times the maximum day demand, as recommended in Ministry of the Environment, Conservation, and Parks (MECP) Design Guidelines for Drinking Water Systems (2008) for a community of this size. The peak hour is estimated to be 2,953 m^3/d (34 L/s). Table 1 below summarizes the average day, maximum day and peak hour demands within Casselman.

Table 1: Existing Casselman Water Demand

Years	Average Day	Maximum Day	Peak Hour
Current (2023) (m^3/day)	1,031	1,968	2,953 (1)
Current (2023) (L/s)	12	23	34 (1)
Percent (%) of Rated Capacity Used	Not applicable	62%	Not applicable

Years	Average Day	Maximum Day	Peak Hour
(1) Peak hour demand calculated using a theoretical peaking factor of 1.5 times the maximum day demand, MECP Design Guidelines for Drinking Water Systems (2008)			

3.2 Future Water Demand

The design parameters used to calculate the future water demands of the water distribution system are summarized in Table 2.

Table 2: Design Parameters – Future Water Flow Demand

Future Water Flow Projection – Design Parameters		
Parameter	**Residential**	**Industrial / Commercial / Institutional**
Average Day Flow (1)	350 L/cap/day	35,000 L/ha/day (Light Industrial) 45,000 L/ha/day (Industrial) 28,000 L/ha/day (Commercial)
Maximum Day Flow (2)	1.92 x Average Day	1.92 x Average Day
Peak Hour Flow (1)	1.5 x Maximum Day	1.5 x Maximum Day
(1) MECP Design Guidelines for Drinking Water Systems (2008) (2) Peak factor determined from average and maximum day demand data provided in Table 1		

Based on these design parameters and the future residential development outlined in the Master Plan, the projected short, mid, and long-term water demands were calculated and are presented in Table 3.

Table 3: Future Water Demands

Demand Scenario	Short-Term (2023-2027)	Mid-Term (2028-2032)	Long-Term (2033-2047)
Total Serviced Population (1)	6,357	8,120	8,902
ICI Development Area (ha)	0.25	2.74	19.64
Future Average Day (m^3/day)	1,850	2,580	3,690
Future Maximum Day (m^3/day)	3,552	4,954	7,085
Future Peak Hour (m^3/day)	5,328	7,430	10,627
(1) The total serviced population represents residential population only and excludes equivalent institutional households and populations.			

3.3 Projected Timing for Casselman WTP Expansion

Based on water demands and growth development timelines a graph representing the projected maximum day water demand from the WTP and anticipated timing to reach 80%, 90%, and 100% of the rated capacity was prepared. Refer to Figure 3.

This graph indicates that based on the growth numbers presented in the Master Plan, 80% of the WTP rated capacity will be reached by the end of 2023, 90% WTP rated capacity will be reached by the end of 2024, and the rated capacity of the WTP will be reached by the end of 2025.

4.0 Pre-Screening of Surrounding Municipalities

A pre-screening within the study area was conducted to identify municipalities with existing drinking water distribution systems. The municipalities included The City of Clarence-Rockland, The City of Ottawa, The Township of Russell, The Municipality of the Nation, and the Township of North Stormont. Due to supply demand limitations within Limoges existing capacity, reliance on the Limoges system was rendered unfeasible.

4.1 City of Clarence-Rockland

The City of Clarence-Rockland (The City) is located approximately 10 km northwest, direct linear of Casselman. The City provides drinking water to approximately 10,000 residents and businesses within the municipality. Water services consist of the Water Treatment Facility and the Water Distribution System (WDS) that is owned by the City Regional Water Supply System and operated by OCWA. Raw water is sourced from the Ottawa River and treated drinking water is distributed to the City of Clarence-Rockland, the five Hamlets (Clarence Creek, St. Pascal Baylon, Hammond, Bourget, Cheney), and The Nation Municipality (Limoges).

The Clarence-Rockland Water Treatment Plant is a conventional filtration type treatment plant with Actiflo® pre-treatment with a rated capacity of 13,500 m^3/day. The WDS consists of a network more than 160 kilometres (km) of watermain pipes; the Caron booster station with a rated capacity of 4,000 m^3/day; the Rockland Elevated Tower with storage capacity of 3,800 m^3; the Bouvier Road Water tower with storage capacity of 2,500 m^3; and the Cheney Water Tower with a storage capacity of 1,000 m^3.

As per the Clarence-Rockland Master Plan Update completed by Jacobs Consultancy Canada Inc. (Jacobs), The City requires major infrastructure upgrades, including the expansion of the existing WTP capacity to support the projected water demands. Jacobs recommended the following phased infrastructure upgrades for the WTP expansion:

- Phase 1 – meets the 2041 maximum day demand (25,800 m^3/day) with an additional 13,500 m^3/day capacity expansion.
- Phase 2 – meets the ultimate maximum day demand (42,000 m^3/day) with an additional 15,000 m^3/day capacity expansion beyond Phase 1.

Given that The City sources its drinking water from the Ottawa River, an abundant water source, it is possible that The City could supply Casselman with their projected future demand.

4.2 Township of Russell and the City of Ottawa

The Township of Russell (Township) is located approximately 14 km west of Casselman. The Township is bounded by the City of Ottawa to the west, the Nation Municipality to the east, the Township of North Dundas to the south, and the City of Clarence-Rockland to the north. There are four major urban communities within the Township which include Embrun, Russell, Marionville, and part of Limoges. Treated water is supplied by the City of Ottawa (Ottawa) through a 9 km, 450 mm feedermain from the Leitrim Road Pumping station to the Embrun Reservoir. Ottawa sources its drinking water from the Ottawa River. Given the long distance and residence time in the watermain from Ottawa, the water has to be rechloraminated to achieve the required residual for secondary disinfection before distribution to Russell, Embrun, and Marionville. The Embrun Reservoir is the hub from which treated water is distributed to the rest of the system.

Given that the Township of Russell's agreement with the City of Ottawa did not allow for additional connections to the distribution system in 2020, connecting to the Township of Russell's infrastructure would not be feasible.

Alternatively, direct connection to the City of Ottawa's 450 mm Russell feedermain is beyond the study area. Additionally, connection to this feedermain may render unfeasible for the following reasons:

- Distance – New water main would be greater than 30 km in length.
- Capacity – Existing 450 mm Russell feedermain would need to be twined or upsized to support Casselman's demand, see Section 6.2 for Casselman watermain sizing requirements. Additionally, the Township of Russell's agreement did not allow for additional connections to the distribution system which may suggest that the City of Ottawa may not be upgrading their feedermain.
- Political - Political concerns may arise should Casselman be permitted to connect to City of Ottawa infrastructure while the Township of Russell is limited.

As a result, a direct connection to the City of Ottawa not considered further during this analysis.

4.3 Township of North Stormont

The Township of North Stormont is located south of Casselman. North Stormont provides water services to its Urban Settlement Areas (Crysler, Finch, and Moose Creek), each consisting of a distinct water distribution network. Water service infrastructure is operated and maintained by OCWA.

4.3.1 Village of Crysler

The Village of Crysler sources its drinking water from two groundwater wells, where Well No. 1 is used for production and Well No. 2 is used as standby. The wells are each rated at a maximum allowable rate of 1,685 m^3/d as per the PTTW No. 1075-9AENZU. The water distribution system consists of a treatment facility with a rated capacity of 1,685 m^3/d, an elevated storage tank with a storing capacity of 1,238 m^3, and approximately 11 km of Polyvinyl Chloride (PVC) distribution piping.

4.3.2 Village of Finch

The Village of Finch sources its drinking water from two groundwater production wells. The wells are each rated at a maximum allowable rate of 778 m^3/d as per the PTTW No. 7327-83ZL7J. The water distribution system consists of a treatment facility with a rated capacity of 777.6m^3/d, an elevated storage tank with a storing capacity of 580 m^3, and approximately 9 km of PVC distribution piping.

4.3.3 Village of Moose Creek

The Village of Moose Creek sources its drinking water from three groundwater production wells. Well No. 1, No. 2, and No. 3 are rated at a maximum allowable rate of 64 m^3/d, 298 m^3/d, and 298 m^3/d, respectively, as per the PTTW No. 4000-9YGLJP. The water distribution system consists of a treatment facility with a rated capacity of 896 m^3/d, an elevated storage tank with a storing capacity of 622 m^3, and approximately 7 km of PVC distribution piping.

Given the rated capacity of the existing water intake and nature of the small systems in North Stormont, water supply to Casselman via a feedermain would not be technically feasible.

5.0 Watermain Routing Options

As a result of the pre-screening of the surrounding municipalities, the City of Clarence-Rockland was selected as a feasible municipality for supplying the Village of Casselman with drinking water through the construction of a new transmission main. A high-level assessment of possible routing options between Casselman and Clarence-Rockland was conducted. The Hamlet of Cheney and Bourget were identified as the two closest areas containing water infrastructure to which a transmission main could be connected.

North of Casselman, there is a 20 km section of the South Nation River that is subject to large scale retrogressive landslides. The area is identified as the Casselman to Lemieux Potential Retrogressive Landslide Area (PRLA) and its extent is outline in Figure 1. The PRLA has been subject to decades of geotechnical studies, which in accordance with historical data conclude that a major retrogressive landslide could occur within the PRLA at any moment, endangering lives and resulting in the loss of buildings, infrastructure, and land. Given these findings, all routing options presented below followed the existing rights-of-way and avoided PRLA.

5.1 Option 1 – Cheney to Casselman

This routing option was presented to provide a direct connection between the Cheney Water Tower and existing Casselman watermain infrastructure along Principale Street. The general proposed watermain path is summarized below and is shown in Figure 4:

- Begins in Cheney at the Water tower;
- Follows Russell Road West Until Indian Creek Road;
- Follows Indian Creek Road south until Racette Road;
- From Racette Road it follows east through Des Pins Street;
- From Des Pins Street it follows south through Gagnon Side Road;

- From Gagnon Side Road it follows east through Calypso Street and south through Baker Road until Route 500-W;
- Follows Route 500 W until Casselman's Principale Street.

The proposed route is approximately 22 km in length containing three (3) water crossings, four (4) municipal drain crossings, and two (2) railway crossings.

5.2 Option 2 – Cheney to Casselman via Limoges

This routing option was presented to provide an opportunity for cost sharing between Limoges and Casselman, assuming that Limoges will expand its infrastructure to obtain water from Clarence-Rockland at the same time. The proposed route follows existing watermain construction currently servicing Limoges between the Cheney Water Tower and the Limoges Water Treatment Plant. The routing is then extended to provide a connection to existing Casselman watermain infrastructure along Principale Street. The general proposed watermain path is summarized below and is shown in Figure 5:

- Begins in Cheney at the Water tower;
- Follows Russell Road West Until Indian Creek Road;
- Follows Indian Creek Road south until Clarence Cambridge Way;
- Follows Clarence Cambridge Way west, which then becomes Limoges Road and continues south through Limoges Road until Calypso Street;
- Follows Calypso Street until Baker Road;
- Follows Baker Road South until Route 500-W;
- Follows Route 500 W until Casselman's Principale Street.

The proposed route is approximately 26 km in length containing three (3) water crossings, three (3) municipal drain crossings, and four (4) railway crossings.

5.3 Option 3 – Bourget to Casselman

This routing option was presented to provide a direct connection between existing Bourget watermain infrastructure along Champlain Road and existing Casselman watermain infrastructure along Principale Street. The general proposed watermain path is summarized below and is shown in Figure 6:

- Begins at existing infrastructure at the intersection of Laval Street and Champlain Road;
- Follows Champlain Road South until Chemin Clarence Cambridge;
- From Chemin Clarence Cambridge, travels west until Indian Creek Road;
- Follows Indian Creek Road south until Racette Road;
- From Racette Road it follows east through Des Pins Street;
- From Des Pins Street it follows south through Gagnon Side Road;
- From Gagnon Side Road it follows east through Calypso Street and south through Baker Road until Route 500-W;
- Follows Route 500 W until Casselman's Principale Street.

The proposed route is approximately 29.5 km in length containing four (4) water crossings, three (3) municipal drain crossings, and two (2) railway crossings.

5.4 Routing Recommendations

On November 8, 2023, a pre-consultation meeting was held between Clarence-Rockland, The Nation, Casselman, Jacobs (Clarence-Rockland's acting consultant), and JLR. During the meeting JLR introduced the proposed watermain routing options and inquired about preferred connection locations within Clarence-Rockland. It was understood that connections to the Cheney Water Tower or the Hamlet of Bourget could be feasible routing options and that the proposed watermain would solely service Casselman, regardless of the path. Given that cost sharing opportunity between Limoges and Casselman was disregarded as an option and given the increased length of pipe in comparison to a direct route from the Cheney Water Tower, Option 2 does not present additional routing benefit.

Option 3 contains the longest path for connecting Casselman to the existing infrastructure in Bourget. Given that the PRLA was identified between Casselman and Bourget, a more direct routing option was not feasible. Therefore, the increased route distance to avoid the PRLA along with the most water crossings encountered render this route unfavorable.

As a result, Option 1, a more direct route from the Cheney Water Tower to existing watermain infrastructure along Principale Street is preferred as it presents the shortest distance which would indicate a more economical option for the Municipality.

6.0 Design Modelling

6.1 Design Basis

A Hazen-Williams headloss and pressure assessment was completed for Route Option 1, to estimate the expected pressures along the transmission route and to propose the required watermain size. Given that boundary conditions for the Cheney Water Tower connection point were not readily available at the time of writing this report, the analysis was carried out using MECP Design Guidelines for recommended pressures and assuming a minimum of 40 PSI provided at Casselman. Once boundary conditions for Clarence-Rockland are available, a more detailed model should be assessed to obtain a better understanding of expected pressures along the proposed transmission main.

The analysis approach was conducted as follows:

- Maintain transmission line pressures between 40 – 80 PSI at all locations along the line;
- Target of minimum 40 PSI at the end of the transmission line (Casselman)
- Ground elevation profile determined using Google Earth to obtain high and low points along the route;

The following assumptions were made for the analysis:

- Assume a booster station will be implemented at Casselman to provide adequate pressures downstream;
- Headloss calculations per the Hazen-Williams equation
- Concrete pressure pipe, inner diameter selections of 406 mm, 457 mm, 508 mm, and 610 mm
- C-factor of 120 for all sizes regardless of material, based on City of Ottawa Design Guidelines

- Flow demand of 7,085 m^3/d as outlined for future demand in Table 3.

Given the total length of the proposed water transmission main re-chlorination may be required to prevent water quality issues. Sizing, phasing, and re-chlorination requirements should be reviewed in subsequent studies.

6.2 Results

The results of the analysis indicated that two booster stations would likely be required, one near Cheney to provide adequate pressures, and one at Casselman to provide pressures necessary to convey drinking water to the remaining water distribution system. The watermain size to convey the future maximum daily flow of 7,085 m^3/d was determined to be a minimum of 457 mm.

It should be noted that results obtained from this preliminary model should be refined once more information is from the Clarence-Rockland water distribution system. Additionally, the necessary upgrades within the Casselman infrastructure to support future water flows were beyond the scope of this project and should be analyzed in detail during the future Schedule 'B' Water supply Class EA; however, it should be noted that the existing 200 mm watermain along Principale Street may require upsizing to convey future flows.

7.0 Costing

A Class D Opinion of Probable Cost (OPC) was prepared for the recommended transmission line, the Clarence-Rockland infrastructure upgrades to sustain Casselman's future water demand, and a first-time users fee associated with connecting to the Clarence-Rockland infrastructure.

Please note that in providing opinions of probable construction costs, it should be understood that J.L. Richards & Associates Limited has no control over the cost or availability of labor, equipment or materials, or over market conditions or the Contractor's method of pricing, and that our opinions of probable construction costs are made on the basis of our professional judgment and experience. We make no warranty, express or implied, that the bids or the negotiated cost of the Work will not vary from our opinion of probable construction cost.

JLR has observed extraordinary market conditions in effect and beyond its reasonable control, including, but not limited to, rising inflation, ongoing supply chain disruptions, availability of any or sufficient number of tender bid submissions, and unusual increases in material costs. These market conditions could have a material impact on the project's budget, schedule, the accuracy of any cost estimates, and on the number and quality of tender submissions by bidders. JLR will make a good faith effort to cooperate with the client to respond to the impact of the foregoing conditions on the project, if any, but JLR shall not be liable for any resultant changes to the project price, schedule, retender, or re-work of its designs and shall be entitled to additional fees for its efforts.

7.1 Transmission Line Between Cheney Water Tower and Casselman

Based on recent project costing from the Limoges and Clarence-Rockland water transmission main connection, a cost updated to include current inflation of $1,600 per linear meter of watermain was chosen.

Table 4: Estimated Cost for New Transmission Line between Cheney ET and Casselman

Q3 2021 Limoges to Cheney Watermain Construction Cost ($/m)	**Q3 2021 - Q3 2023 Index rate (Based on Division Composite CPI[1])**	**Q3 2023 Adjusted Base Cost ($/m)**	**Length of Transmission line[2]** (m)	**Total**
$1,326	1.206	$1,600	21,950	$35,200,000
[1] Statistics Canada – Building Construction price indexes (non-residential building) [2] 457 mm diameter watermain				

Table 5 Estimated Total Cost for New Transmission Watermain

Description	**Cost**
New Watermain from Cheney ET to Casselman Principale St.	$35,200,000
Railway Crossings	$800,000
Engineering (10%)	$3,600,000
Contingency (10%)	$3,600,000
TOTAL	**$43,200,000**

7.2 Clarence-Rockland Upgrades to Support Casselman Future Demands

At the time of writing this technical memorandum, Clarence-Rockland's necessary water distribution system upgrades to support Casselman's future demands were not available. Based on a review of The Limoges Servicing Study completed by CH2M Hill (Jacobs) in April 2018, a base unit cost for infrastructure upgrades per unit of water demand was calculated ($/m^3/d) by using the total estimated cost that Limoges would pay to upgrade Clarence-Rockland's existing infrastructure to convey treated water from the WTP to Cheney. The base unit cost was then corrected to include inflation and scaled using Casselman's water demand.

Table 6: Estimated Costs to Upgrade Clarence-Rockland WTP and WDS Leading up to Cheney ET

Limoges Total Costs to upgrade Clarence-Rockland WTP and WDS[1] **($)**	**$26,650,000**[2]
Limoges Water Demand (m^3/d)	7,076
Q2 2018 – Base Unit Cost for infrastructure upgrade per unit of water demand ($/$m^3$/d)	$3,766
Q2 2018 – Q3 2023 Inflation Index Rate (Based on Division Composite CPI)[3]	1.506

Q3 2023 – Base Unit Cost for infrastructure upgrade per unit of water demand ($/m^3/d)	$5,671
Long-Term Casselman Maximum Day Demand (m^3/d)	7,085
Q3 2023 – Casselman Cost to upgrade Clarence-Rockland WTP and WDS ($)	**$40,200,000**[2]

1. CH2M Hill Canada Limited. 2018. Clarence-Rockland and Limoges Water Servicing Study.
2. Excludes HST, includes engineering and contingency costs.
3. Statistics Canada – Building Construction price indexes (non-residential building).

7.3 Compensation for use of Existing Clarence-Rockland Infrastructure/First-Time User Fee

As per the Limoges Servicing Study (CH2M, 2018), a cost for using existing Clarence-Rockland infrastructure that does not require upgrading for servicing Limoges was determined. The cost was determined by using estimated replacement costs and then scaling it based on available spare capacity in the existing network of watermains that convey water from the Clarence-Rockland WTP to the Cheney ET. The cost reported in the Servicing Study was consistent with the first time-users fee reported in consultation with The Nation Municipality.

Table 7: First Time Users Fee

Q2 2022 – First Time User Fee	Q2 2022 - Q3 2023 Index rate (Based on Division Composite CPI)	Q3 2023 – First Time User Fee
$2,600,000	1.094	$2,900,000

7.4 Summary of Costs

The summary of both total estimated costs is shown below.

Table 8: Summary of Total Estimated Costs

Description	Mid-Term (2028 - 2032)	Long-Term (2033 - 2047)
Cheney to Casselman		
New watermain from Cheney ET to Casselman Principale St.	$35,200,000	-
Railway Crossings	$800,000	-

Description	Mid-Term (2028 - 2032)	Long-Term (2033 - 2047)
Engineering (10%)	$3,600,000	-
Contingency (10%)	$3,600,000	-
Subtotal	$43,200,000	-
Clarence-Rockland to Cheney ET		
Future Clarence-Rockland WTP and WDS Upgrades	$28,100,000	$12,100,000
First Time User Fee	$2,900,000	-
Subtotal	$31,000,000	$12,100,000
TOTAL ESTIMATED COST [1]	**$74,200,000**	**$12,100,000**
1. Excludes HST		

8.0 Conclusion

This study investigated the viability for outsourcing Casselman's total future water demand from a nearby municipality via a new transmission line. Two connection points within the City of Clarence-Rockland were identified at Cheney and Bourget as potential options. A connection to the Cheney Water Tower proved to be the favourable option given its shorter distance. A hydraulic model was developed to assess preferred option and determined that a watermain 22 km long with a minimum diameter of 457 mm would satisfy Casselman's water requirements. A preliminary OPC estimate was performed for the preferred routing option and indicates that costs of $74.2 million for the Mid-term and $12.1 million for the Long-Term period, in 2023 dollars, could be anticipated for the proposed work. Further studies should be conducted once more information becomes available from the Clarence-Rockland water distribution system to provide more accurate cost estimates and hydraulic modelling parameters.

This report has been prepared by J.L. Richards & Associates Limited for Casselman's exclusive use. Its discussions and conclusions are summary in nature and cannot properly be used, interpreted or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope and limitations. This report is based on information, drawings, data, or reports provided by the named client, its agents, and certain other suppliers or third parties, as applicable, and relies upon the accuracy and completeness of such information. Any inaccuracy or omissions in information provided, or changes to applications, designs, or materials may have a significant impact on the accuracy, reliability, findings, or conclusions of this report.

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9.0 References

CH2M Hill Canada Limited. April 2018. Clarence-Rockland and Limoges Water Servicing Study.

J.L. Richards Associates Limited. 2023. Phase 1 Report – Casselman Water and Wastewater Infrastructure Master Plan.

Jacobs Consultancy Canada Incorporated. January 2023. City of Clarence-Rockland Water Master Plan Update.

R.V Anderson Associates Limited. January 2020. Village of Limoges Potable Water and Wastewater Master Plan.

R.V Anderson Associates Limited. June 2020. Village of Limoges Water Supply Cheney-Limoges Water Transmission Main.

South Nation River Conservation Authority. 2014. Casselman to Lemieux Potential Retrogressive Landslide Area.

WSP Canada Incorporated. April 2018. Township of Russel Water and Wastewater Master Plan Update.

Ontario Clean Water Agency. February 2019. Crysler Drinking Water System Annual Report, Township of North Stormont.

Ontario Clean Water Agency. February 2019. Finch Drinking Water System Annual Report, Township of North Stormont.

Ontario Clean Water Agency. February 2019. Moose Creek Drinking Water System Annual Report, Township of North Stormont.

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Casselman Elevated Water Storage Tank
756 Brebeuf St

Casselman Water Treatment Plant
832 Laval St

TOWNSHIP OF CHAMPLAIN
TOWNSHIP OF ALFRED AND PLANTAGENET
CITY OF CLARENCE-ROCKLAND
MUNICIPALITY OF THE NATION
TOWNSHIP OF NORTH GLENGARRY
MUNICIPALITY OF CASSELMAN
CITY OF OTTAWA
TOWNSHIP OF RUSSELL
TOWNSHIP OF NORTH STORMONT
TOWNSHIP OF SOUTH GLENGARRY
TOWNSHIP OF NORTH DUNDAS
TOWNSHIP OF SOUTH STORMONT
MUNICIPALITY OF SOUTH DUNDAS
NORTH GRENVILLE
CITY OF CORNWALL

Clarence Point
Rockland
Clarence Creek
St-Pascal-Baylon
Hammond
Bourget
Cheney
Limoges
Embrun
Russell
Maxville
Moose Creek
Crysler
Finch

Deschenes Lac
Dollard-des-Ormeaux Lac

FIGURE 1: STUDY AREA

P:\15000\16953-130 - Casselman Water Supply EA\03-Procuction\07-Plan\16953_Casselman\16953_Casselman.aprx

DU BOISE
ROUTE 500
ZARAKI
MELIANE
SARAH
FILION
MARTIN
MARIA
MERCIER
FRANCESS
MARIA
FRANCESS
DORE
ARGILE
LAFONTAINE
BARRAGE
NATURE
NV STREET 4
NV STREET 3
BRISSON
LAURIER
MONTCALM
ST-JEAN
DOLLARD
ST-PAUL
BREBEUF
CARTIER
STATION
CARTIER
ST-JOSEPH
YVON
LAVAL
LEVESQUE
VANESSA
PERCY
DESNOYERS
JOLIETTE
MARQUETTE
ST-ISIDORE
ROUTE 650
Water Treatment Plant
Eleveated Storage Tank
DES PINS
ALBERT
DUHAMEL
CASTONGUAY
DES CEDRES
PROMENADE DES ERABLES
ISABELLE
ALICE
FAUCHER
STE-ANNE
ST-JOSEPH
PRINCIPALE
DES EPINETTES
STE-MARIE
GAGNE
RACINE
LAFLECHE
BOILEAU
RICHER
SAUVE-TERRASSE
ROGER
INDUSTRIEL
417 RAMP 417
HIGHWAY 417
417 RAMP
417
417 RAMP
417 RAMP
N

Legend

- Isolation Valve
- Hydrant
- Valve Box
- Hydrant Lead
- Watermain
- Municipal Boundary

AURELE

PROJECT:
MUNICIPALITY OF CASSELMAN
WATER - PIPED WATER SUPPLY FEASIBILITY
CASSELMAN, ONTARIO

DRAWING:
DRINKING WATER
INFRASTRUCTURE

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DESIGN:	TB
DRAWN:	SC/KT/TB
CHECKED:	JM
JLR #:	16953-130

DRAWING #:
FIGURE 2

File Location: V:\16000\16953-117 - Casselman Water Wastewater CAD Update\2-Design\1-Civil_00-GIS\water_supply_feasibility.mxd

Plot Date: December 20, 2023 1:55:54 PM

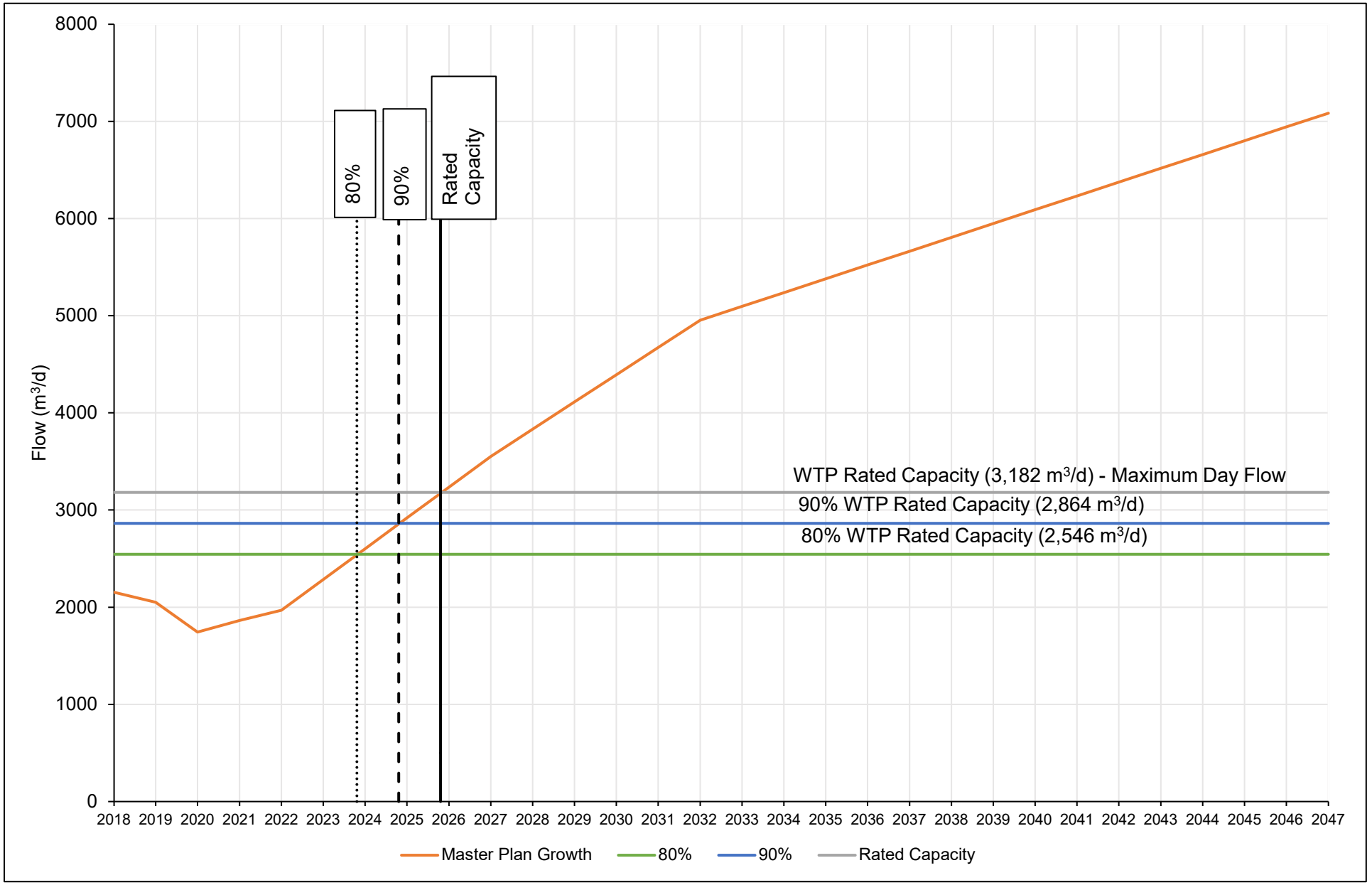


FIGURE 3: CASSELMAN WTP FLOW PROJECTION

FIGURE 4 - Option 1: Cheney to Casselman

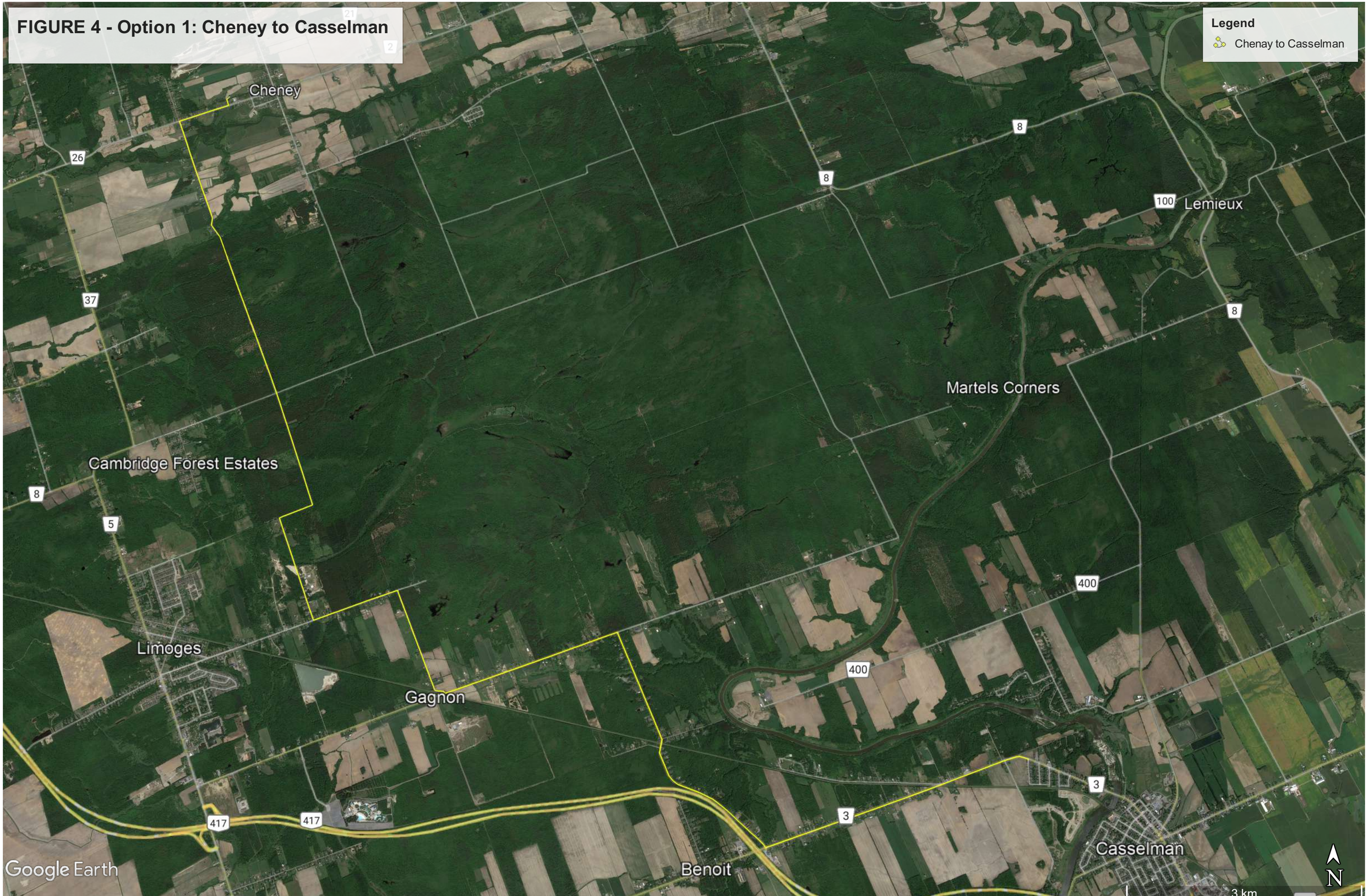


FIGURE 5 - Option 2: Cheney to Casselman via Limoges

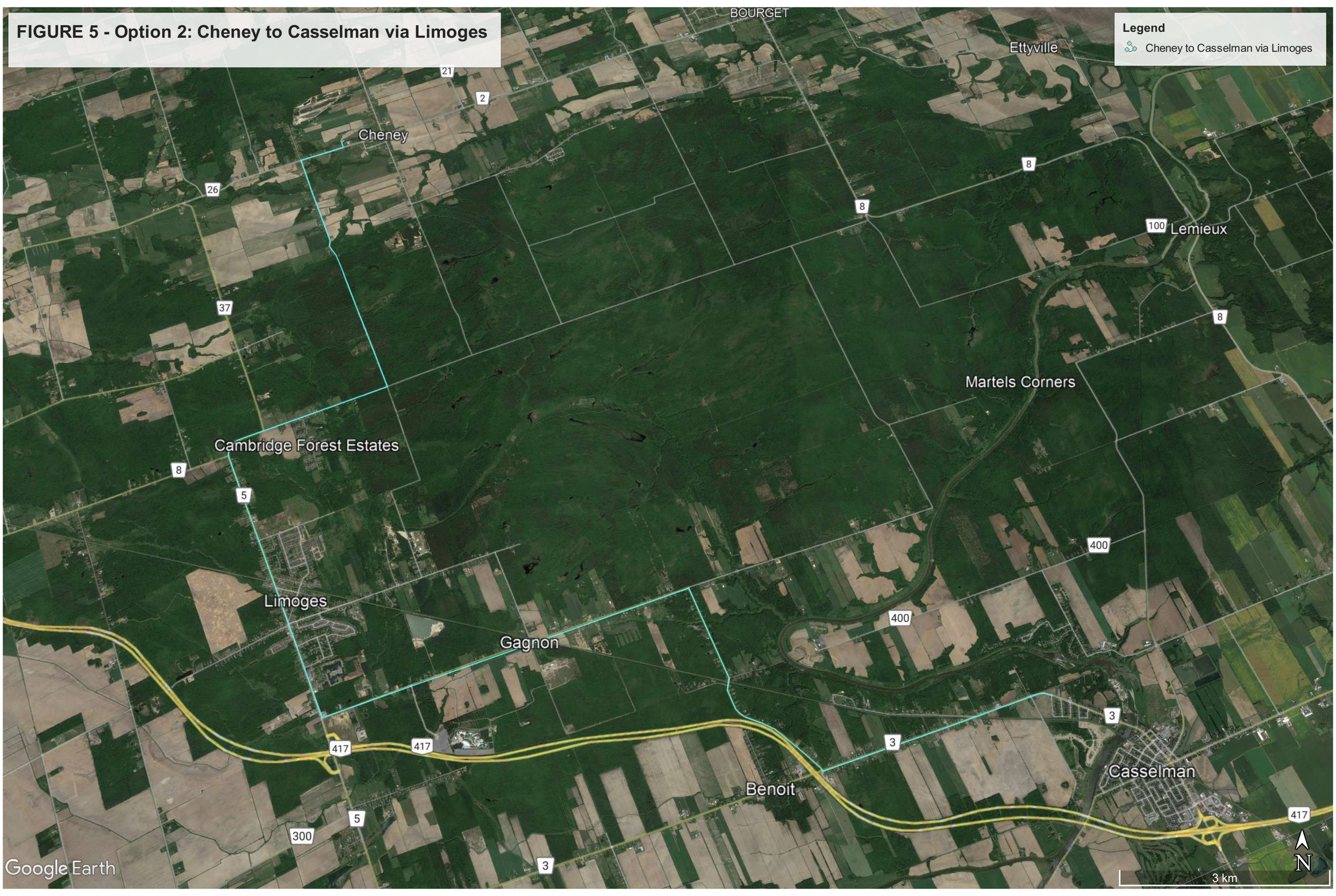
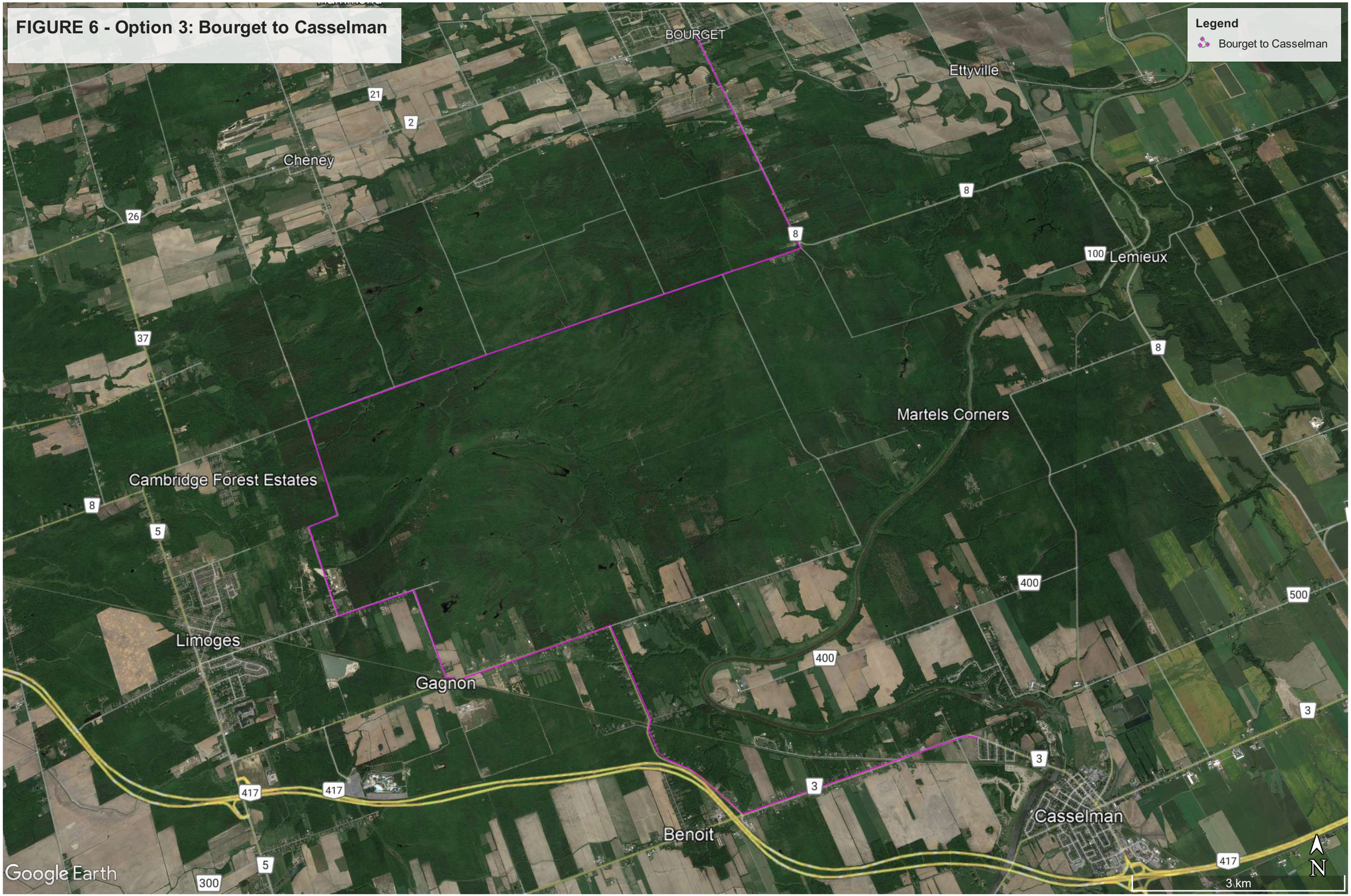


FIGURE 6 - Option 3: Bourget to Casselman



Appendix A

Hazen-William Assessment

Hazen Williams Formula

Hazen Williams equation (Mays, 1999; Streeter et al., 1998; Viessman and Hammer, 1993) where k=0.85 for meter and seconds units or 1.318 for

$$H = L\left[\frac{V}{kC}\left(\frac{4}{D}\right)^{0.63}\right]^{1/0.54} \qquad V = \frac{Q}{A} \qquad A = \frac{\pi}{4}D^2$$

Headloss: Cheney to Casselman

Q=	57.34	L/s
C=	120	
Dia.=	406	mm
L=	25200	m
V=	0.4429103	m/s
A=	0.1294619	m^2
H=	15.343438	m
P1=	21.822047	psi

	Cheney to Casselman	Casselman					
From Google Earth	Ground Elev.	66	61	69	61	71	75	63
Elev. minus starting point	Elev. Difference (m)	0	-5	3	-5	5	9	-3
Convert elev. to psi	Elev. (psi)	0	-7.1	4.3	-7.1	7.1	12.8	-4.3
From Google Earth	Distance from Casselman	0.0	3.7	6.1	6.7	7.5	11.3	13.4
Distance from previous point	Relative Dist. (m)	0	3700	2400	600	800	3800	2100
<--From headloss calculation	Friction Headloss (m)	0	2.3	1.5	0.4	0.5	2.3	1.3
Convert headloss to psi	Friction Headloss (psi)	0	3.2	2.1	0.5	0.7	3.3	1.8
Total H from starting point	Total Headloss (psi)	0	3.2	5.3	5.8	6.5	9.8	11.6
Psi(start) + Total H - Elev.(psi)	**Pressure (psi)**	**48**	**58.3**	**49.0**	**60.9**	**47.4**	**45.0**	**63.9**

Hazen Williams Formula

Hazen Williams equation (Mays, 1999; Streeter et al., 1998; Viessman and Hammer, 1993) where k=0.85 for meter and seconds units or 1.318 for

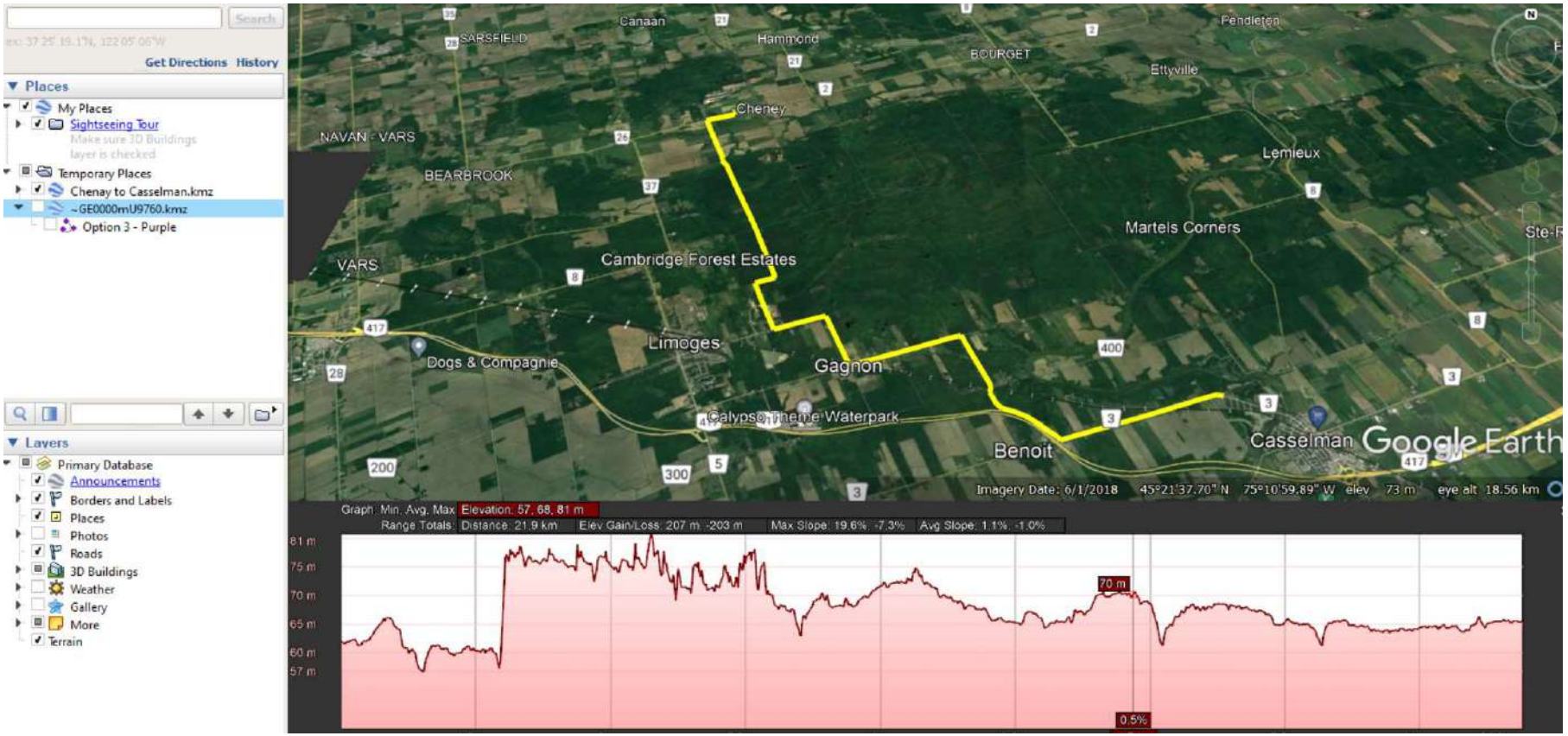
$$H = L\left[\frac{V}{kC}\left(\frac{4}{D}\right)^{0.63}\right]^{1/0.54} \qquad V = \frac{Q}{A} \qquad A = \frac{\pi}{4}D^2$$

Headloss: Cheney to Casselman

Q=	82	L/s
C=	120	
Dia.=	457	mm
L=	25200	m
V=	0.4999097	m/s
A=	0.1640296	m^2
H=	16.723614	m
P1=	23.784988	psi

	Cheney to Casselman	Casselman					
From Google Earth	Ground Elev.	66	61	69	61	71	75	63
Elev. minus starting point	Elev. Difference (m)	0	-5	3	-5	5	9	-3
Convert elev. to psi	Elev. (psi)	0	-7.1	4.3	-7.1	7.1	12.8	-4.3
From Google Earth	Distance from Casselman	0.0	3.7	6.1	6.7	7.5	11.3	13.4
Distance from previous point	Relative Dist. (m)	0	3700	2400	600	800	3800	2100
<--From headloss calculation	Friction Headloss (m)	0	2.5	1.6	0.4	0.5	2.5	1.4
Convert headloss to psi	Friction Headloss (psi)	0	3.5	2.3	0.6	0.8	3.6	2.0
Total H from starting point	Total Headloss (psi)	0	3.5	5.8	6.3	7.1	10.7	12.6
Psi(start) + Total H - Elev.(psi)	**Pressure (psi)**	**47**	**57.6**	**48.5**	**60.4**	**47.0**	**44.9**	**63.9**

Option 1


Search
Get Directions
History
Places
My Places
Sightseeing Tour
Make sure 3D Buildings layer is checked
Temporary Places
Chenay to Casselman.kmz
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Option 3 - Purple
Layers
Primary Database
Announcements
Borders and Labels
Places
Photos
Roads
3D Buildings
Weather
Gallery
More
Terrain
SARSFIELD
Canaan
Hammond
BOURGET
Pendleton
Ettyville
Cheney
NAVAN - VARS
BEARBROOK
Lemieux
Martels Corners
VARS
Cambridge Forest Estates
Limoges
Dogs & Compagnie
Gagnon
Calypso Theme Waterpark
Benoit
Casselman
Google Earth
Imagery Date: 6/1/2018 45°21'37.70" N 75°10'59.89" W elev 73 m eye alt 18.56 km
Graph: Min, Avg, Max Elevation: 57, 68, 81 m
Range Totals: Distance: 21.9 km Elev Gain/Loss: 207 m -203 m Max Slope: 19.6% -7.3% Avg Slope: 1.1% -1.0%
81 m
75 m
70 m
65 m
60 m
57 m
70 m
0.5%

Appendix B

Meeting Minutes

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Water and Wastewater Infrastructure Master Plan
Municipality of Casselman

Client Meeting
Piped Water Supply Feasibility Study

Attendance:	Pierre-Paul Beauchamp	Municipality of Casselman (Casselman)
	Yves Morrissette	Municipality of Casselman
	Pascal Doucet	Municipality of Casselman
	Martin Allard	Municipality of Casselman
	Geneviève Lajoie	Municipality of Casselman
	Francyn Leblanc	Municipality of Casselman
	Simon Thibeault	Municipality of Casselman
	Josée Brizard	The Nation Municipality (the Nation)
	Guylain Lafleche	The Nation Municipality
	Marc Legault	The Nation Municipality
	Marc-Olivier Gratton	The Nation Municipality
	Nadia Knebel	The Nation Municipality
	Nicholas Pigeon	The Nation Municipality
	Sébastien Mainville	The Nation Municipality
	Pierre Voisine	City of Clarence-Rockland (Clarance-Rockland)
	Jean-Luc Jubinville	City of Clarence-Rockland
	Philippe Cormier	City of Clarence-Rockland
	Susan Jingmiao Shi	J.L. Richards & Associates Limited (JLR)
	Jordan Morrissette	J.L. Richards & Associates Limited
	Meaghan Keon	J.L. Richards & Associates Limited

The meeting commenced at 10:30 a.m. on Wednesday, May 31, 2023.

The following summary of the discussions of this meeting has been prepared to record decisions reached and actions required for the project. Please advise the undersigned of any errors or omissions within the next three business days.

ITEM	ACTION BY	DUE BY

Introduction

Y. Morrissette initiated introductions, all present are noted above.

The purpose of the meeting is to discuss the possibility of supplying water to Casselman from Clarance-Rockland and/or Limoges (located in the Nation and currently has a water servicing agreement with Rockland). JLR/Casselman prepared a list of questions and circulated to all prior to the meeting which were discussed as follows.

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Municipality of Casselman

Client Meeting
Piped Water Supply Feasibility Study

P. Voisine summarized a conversation which occurred the day prior with Y. Morrisstte. It was noted that the questions are very detailed, and a feasibility study is required to see first if getting water from Clarance-Rockland and through what means is feasible and the best solution forward.

Question 1 – What is the diameter of the current watermain from Clarence-Rockland to Limoges? Is it the same size throughout the way? How could it be connected to our system?

- N. Pigeon noted the watermain from Clarance-Rockland to Limoges is the same size and material throughout: 9.7 km long, 400 mm HDPE
- P. Voisine noted connecting Casselman via Limoges may be difficult and can cause issues. A more direct route from Clarance-Rockland should to be considered.
- J. Brizard noted the Nation will facilitate and aid Casselman should the best route be through Limoges.

Question 2 – What was the cost per meter of watermain from Clarence-Rockland to Limoges?

- P. Cormier noted the total project cost of connecting Limoges to Cheney was $12.8 million, which is equivalent to $1,326/m. This cost includes pumping station, reservoir, re-chlorination, and other upgrades.
- N. Pigeon noted the Nation can provide the associated Feasibility Study completed by CH2M Hill (Jacobs) in 2017.

The Nation **ASAP**

Question 3 – Does the watermain have enough capacity to feed Casselman? Would there be a possibility to store water in Limoges and pump to Casselman with the existing watermain size?

- This should be reviewed in a Feasibility Study.

Question 4 – Is there a twinning watermain already in place? Or should it be considered?

- This would be reviewed in a Feasibility Study.
- Y. Morrissette inquired if watermain twinning was ever considered by the Nation. N. Pigeon noted that the Nation is operating on wells and will be fully switched to Clarance-Rockland water in the long term (30 years).
- The Nation has a future water demand of 6,900 m^3/day capacity which will be completed through phased approach in upcoming years.

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Municipality of Casselman

Client Meeting
Piped Water Supply Feasibility Study

Question 5 – Does Clarence-Rockland have enough water production capacity to feed Casselman and future growth? Projected maximum day demand is 8,700 m^3/d for Casselman to 2047.

- P. Cormier noted that Clarance-Rockland tracks upgrade needs and associated timelines for the WTP and associated infrastructure. The Ottawa River has enough water, the infrastructure is the limiting factor. Adding Casselman will trigger upgrades needed throughout the system to support the new demand.
- P.P. Beauchamp inquired on the trajectory of the pipe from Clarance-Rockland to the Nation. P. Cormier noted it travels from the WTP to the Cheney water tower down Indian Road and through the forest to the Limoges plant, it also travels under a creek for some portion.

Question 6 – What was the cost to each municipality to bring the pipe to Limoges? What would be the cost (or the formula used) that Casselman would pay to each municipality for the cost sharing of the current pipe?

- N. Pigeon noted that the costs were spilt between Clarance-Rockland and Limoges and the construction of the watermain from Cheney to Limoges was 100% paid by the Nation. A $2.6 million first time user fee was applied. Future project costs will be divided by consumption and demand.
- J.L. Jubinville noted this agreement is public and can be shared with JLR/Casselman. The agreement will be reviewed next year between the Nation and Clarance-Rockland for any required changes. **Rockland** **ASAP**
- J. Morrissette inquired if there are any other agreements on the horizon. P. Voisine noted they have a meeting coming up with various surrounding areas CAOs to get a sense if other areas will need to source water from Clarance-Rockland. **Rockland** **ASAP**

Question 7 – What would be the ideal trajectory to lay down the pipe to Casselman? Is a river crossing necessary? Is there another routing alternative that should be reviewed? How would this affect the cost that Casselman would pay?

- This would be reviewed in a Feasibility Study.

Question 8 – Was there funding available from senior levels of government for the watermain project?

- P. Voisine advised that no government funding was provided to connect the Nation. Advised that it is wise to inform provincial leaders soon of the need for funding for Casselman for this. **Casselman** **ASAP**

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Municipality of Casselman

Client Meeting
Piped Water Supply Feasibility Study

Question 9 – Has the City initiated the Schedule C Class EA for the Clarence-Rockland WTP; can additional capacity be provided via upgrades at the WTP to service Casselman and future growth?

- Y. Morrissette advised that Casselman will need to be connected within the next 5-10 years.
- J. Brizard advised that discussions of connecting the Nation to Clarance-Rockland started in 2015 and the system was connected in 2022.
- Clarance-Rockland staff noted they are initiating major works at the WTP next year. The Schedule C Class EA for the Clarance-Rockland WTP will start this fall. The design basis currently only considers Clarance-Rockland, and the Nation demands.
- Casselman will send the Master Plan information to Clarance-Rockland as soon as possible such that information can be fed into the Schedule C Class EA for Clarance-Rockland WTP. **JLR/Casselman Dec. 2023**
- Clarance-Rockland indicated that they are looking for commitment from Casselman to connect. **JLR/Casselman Dec. 2023**

Question 10 – Has there been any advancement on work related to upgrades to Caron Booster Station? Can the capacity be increased to service Casselman?

- The Caron BPS will be upgraded at the same time as the Clarance-Rockland WTP.
- J. Morrissette noted these questions arose from review of the 2023 Clarance-Rockland Master Plan completed by Jacobs as a potential area to tie into; but recognizes that this would be answered in a Feasibility Study.

Question 11 – Would the timing for the Bouvier Booster Station need to be advanced to service Casselman?

- This would be reviewed in a Feasibility Study.

Question 12 – Would upgrades for new transmission main from Caron Booster Station to Bourget or Limoges be required?

- This would be answered in a Feasibility Study.

Other Items:

- The next step is for Casselman council to have a formal discussion with Clarance-Rockland council regarding this manner. **Casselman ASAP**

Meeting adjourned.

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Water and Wastewater Infrastructure Master Plan
Municipality of Casselman

Client Meeting
Piped Water Supply Feasibility Study

Prepared by:

Meaghan Keon

Meaghan Keon, MASc., P.Eng.
Environmental Engineer

Reviewed By:

Susan Shi

Susan Jingmiao Shi, P.Eng., M.Eng.
Associate
Senior Environmental Engineer

Distribution: All attendees

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

Municipality of Casselman
Piped Water Supply Feasibility Study

PROJECT INITIATION MEETING (M-1)
Minutes of Meeting No. 1

Attendance:	Pierre-Paul Beauchamp (PB)	Municipality of Casselman	ppbeauchamp@casselman.ca
	Yves Morrissette (YM)	Municipality of Casselman	ymorrissette@casselman.ca
	Jordan Morrissette (JM)	J.L. Richards & Associates Limited	jmorrissette@jlrichards.ca
	Susan Jingmiao Shi (SS)	J.L. Richards & Associates Limited	sshi@jlrichards.ca
	Kevin Cortez (KC)	J.L. Richards & Associates Limited	kcortez@jlrichards.ca

The meeting commenced at 9:00 a.m. on Thursday, August 17, 2023 at Microsoft Teams.

The following summary of the discussions of this meeting has been prepared to record decisions reached and actions required for the project. Please advise the undersigned of any errors or omissions within the next three business days.

ITEM		ACTION BY	DUE BY
1.1	OPENING REMARKS / INTRODUCTION		
	• JLR introduced the project and stated that the piped water supply feasibility study is intended to determine the feasibility of a nearby municipality to supply the Municipality of Casselman (The Municipality) with safe and reliable drinking water, and to determine a preferred routing option to get water to Casselman.		
	• This study will happen concurrently with the groundwater supply study, both of which will feed into a Schedule 'B' Water Supply Class EA.		
1.2	PROJECT COMMUNICATIONS		
	• Pierre-Paul Beauchamp is the main point of contact for the Municipality. Yves Morrissette is to be copied on all correspondence.		
	• Susan Shi is the Project Manager from JLR, supported by Kevin Cortez. Jordan Morrissette is the QA lead and client liaison.		
	• Other key project members will include:		
	○ OCWA will provide technical support as needed. Dawn Crump as the point of contact for OCWA.		
	○ JLR civil team will provide modelling support.		
1.3	REVIEW AND DISCUSSION OF AVAILABLE INFORMATION		
	• South Nation Conservation Authority (SNCA) Casselman-Lemieux Retrogressive Landslide Area Map was discussed. Refer to the attached mapping. It was discussed and agreed that there are potential landslide areas surrounding Casselman.		
	• The Municipality is aware of the potential landslide areas surrounding the Municipality. JLR will contact the SNCA to request additional information.	JLR	
	• JLR noted that the geotechnical conditions will feed into the evaluation of the routing and risk assessment.		
	• The Municipality will reach out to the Nation to request the geotechnical recommendation from the Cheney to Limoges Piped Water Supply Study.	MUNICIPALITY	
	• If geotechnical information from the Limoges water supply project is insufficient, JLR discussed the possibility for a high-level geotechnical study		

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Municipality of Casselman
Piped Water Supply Feasibility Study

PROJECT INITIATION MEETING (M-1)
Minutes of Meeting No. 1

ITEM		ACTION BY	DUE BY
	to address potential issues/feasibility for routing a watermain within the surrounding landslide areas. • Municipality suggested to wait until the SNCA and the Nation responded in order to determine what landslide information is available for the areas surrounding Casselman, Lemieux, Limoges, Bourget, Cheney, North Stormont, and Embrun.		
1.4	CONFIRMATION OF PROJECT UNDERSTANDING • The overall objective of the piped water supply feasibility study is to determine a different water source and watermain routing from the neighbouring municipalities already supplying drinking water to their residents, to completely replace the existing Casselman surface water source. This study to form part of the Schedule 'B' Water Supply EA. • 4 preliminary supply routing options were presented during the meeting, including the following. Refer to the attachment for a general location mapping. o Alternative 1: Connect to Cheney o Alternative 2: Connect to Bourget o Alternative 3: Connect to Embrun o Alternative 4: Connect to North Stormont • The Municipality requested that a routing option through Limoges (The Nation) should be considered. The Municipality will follow up with Josée Brizard from The Nation to provide more context regarding the reasoning to connect Casselman to Limoges. • JLR noted that the cost sharing agreement can become more complicated going through Limoges, however, if the route provides the most benefit, it can be considered. • Further discussions will be needed with Limoges regarding what pumping can be available as there will be a necessity for a booster station if the route through Limoges is considered. • JLR noted that the feasibility study and Class EA is a proponent-driven process with various evaluation criteria determined based on the municipality's needs. JLR will complete a water model and an evaluation matrix to support the preferred option(s). The rationale for the decision on the preferred alternative(s) will be documented.	MUNICIPALITY	Sept. 2023
1.5	REVIEW OF WORK PLAN AND PROJECT SCHEDULE • Completion of the Master Plan is a priority. • The City of Clarence-Rockland is looking for the Casselman Masterplan. Municipality/JLR to provide Master Plan to Clarence-Rockland once it becomes available. • JLR plan to complete the feasibility study report in December.	JLR	Sept. 2023

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Municipality of Casselman
Piped Water Supply Feasibility Study

PROJECT INITIATION MEETING (M-1)
Minutes of Meeting No. 1

ITEM		ACTION BY	DUE BY
1.6	OTHER TOPICS/BUSINESS • The Municipality inquired about the effects the public opinion of recent water quality events in July and its impact on the water supply feasibility study. JLR informed the Municipality that the public comments should be documented in the feasibility study as a driver for switching water source. The Municipality will provide public comments to JLR to include with this study.	MUNICIPALITY	Sept. 2023
1.7	NEXT STEPS • Further discussions with the Nation shall occur regarding watermain and pumping capacity that may be made available as there will be a necessity for a booster station if the route through Limoges is considered.		

Meeting adjourned at 9:36 a.m.

Next meeting will be held on TBD

Prepared by: Issued on: September 27, 2023

Kevin Cortez, M.Eng., EIT
Environmental Engineering Intern

Reviewed by:

Susan Jingmiao Shi, P.Eng., M.Eng.
Associate, Senior Environmental Engineer

Distribution: All attendees

N

Casselman Water Treatment Plant
832 Laval St

Casselman Elevated Water Storage Tank
756 Brebeuf St

CITY OF CLARENCE-ROCKLAND

TOWNSHIP OF CHAMPLAIN

TOWNSHIP OF ALFRED AND PLANTAGENET

MUNICIPALITY OF THE NATION

MUNICIPALITY OF CASSELMAN

TOWNSHIP OF NORTH GLENGARRY

TOWNSHIP OF SOUTH GLENGARRY

CITY OF OTTAWA

TOWNSHIP OF RUSSELL

TOWNSHIP OF NORTH STORMONT

TOWNSHIP OF SOUTH STORMONT

TOWNSHIP OF NORTH DUNDAS

MUNICIPALITY OF SOUTH DUNDAS

MUNICIPALITY OF NORTH GRENVILLE

CITY OF CORNWALL

Clarence Point
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Cheney
Limoges
Embrun
Russell
Maxville
Moose Creek
Crysler
Finch

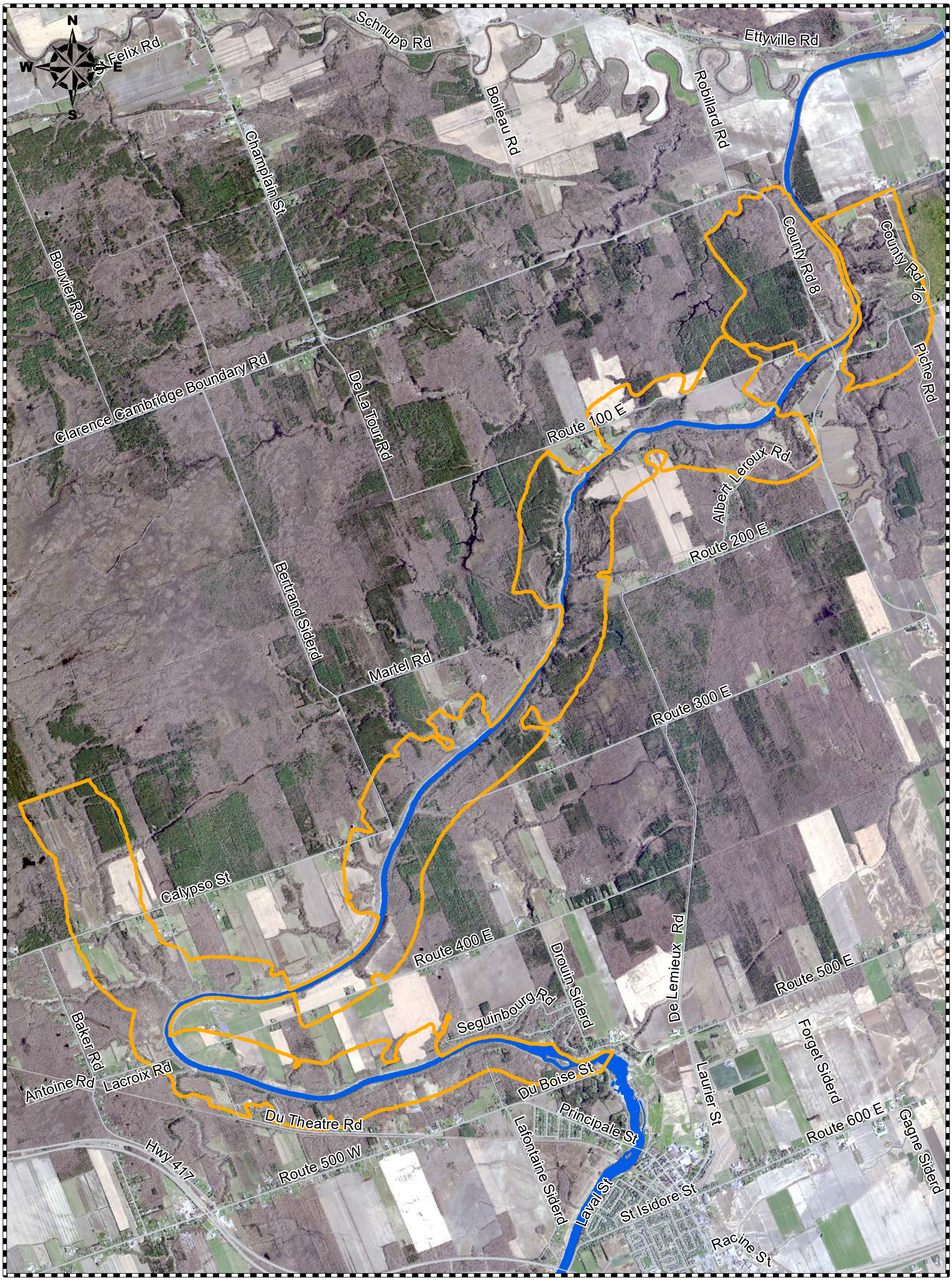
Lac Dollard-des-Ormeaux
Lac Deschênes
Garry Loch
Rideau River

174
417
416
138
401

Legend

- Location
- Watermain
- Roads
- Watercourse
- Waterbody
- Developed Watermain
- 20km Buffer
- Urban Areas
- Municipal Boundary

Casselman to Lemieux Potential Retrogressive Landslide Area



SOUTH NATION CONSERVATION
DE LA NATION SUD

0 700 1,400 2,800 4,200
Meters

Road
Major Watercourse
Potential Retrogressive Landslide Area

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Municipality of Casselman
Piped Water Supply Feasibility Study

Surrounding Municipalities Meeting
Minutes of Meeting No. 2

Attendance:	Name	Company	Email
	Pierre-Paul Beauchamp	Municipality of Casselman (Casselman)	ppbeauchamp@casselman.ca
	Yves Morrissette	Municipality of Casselman	ymorrissette@casselman.ca
	Josée Brizard	The Nation Municipality (The Nation)	jbrizard@nationmun.ca
	Marc Legault	The Nation Municipality	mlegault@nationmun.ca
	Nadia Knebel	The Nation Municipality	nknebel@nationmun.ca
	Marc-Olivier Gratton	The Nation Municipality	mogratton@nationmun.ca
	Nicholas Pigeon	The Nation Municipality	npigeon@nationmun.ca
	Jean-Luc Jubinville	City of Clarence-Rockland (Clarence-Rockland)	jjubinville@clarence-rockland.com
	Philippe Cormier	City of Clarence-Rockland	pcormier@clarence-rockland.com
	Edouard Bahout	Jacobs	edouard.bahout@jacobs.com
	Susan Jingmiao Shi	J.L. Richards & Associates Limited (JLR)	sshi@jlrichards.ca
	Kevin Cortez	J.L. Richards & Associates Limited	kcortez@jlrichards.ca

The meeting commenced at 2:00 p.m. on Wednesday, November 8, 2023 at Microsoft Teams.

The following summary of the discussions of this meeting has been prepared to record decisions reached and actions required for the project. Please advise the undersigned of any errors or omissions within the next three business days.

ITEM		**ACTION BY**	**DUE BY**

1.1 OPENING REMARKS

- JLR introduced the project and stated that the piped water supply feasibility study is intended to determine the feasibility of a nearby municipality to supply Casselman with safe and reliable drinking water. The study is taking place concurrently with a surface water feasibility study and groundwater supply study, all of which will feed into an upcoming Schedule 'B' Water Supply Class EA.
- A PowerPoint Presentation was prepared and included in the attachment for reference.

1.2 PROJECT PROGRESS

- JLR completed high level watermain routing options between Clarence-Rockland and Casselman and presented options during the meeting. Clarence-Rockland and the Nation did not have concerns during the meeting on the proposed routing options.
- JLR developed four water demand scenarios. Scenarios 1 and 2 considered Casselman's 10-year and 25-year water demand, respectively. Scenarios 3 and 4 considered Casselman and Limoges combined 10-year and 25-year water demand, respectively. Clarence-Rockland specified that a direct connection is required to connect to Casselman and they would not allow pipe sharing between the Nation and Casselman.

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• JLR requested whether Clarence-Rockland has a preference in terms of connection points to their system, i.e., Cheney vs. Bourget. Clarence-Rockland did not indicate a preference at the meeting. Clarence-Rockland to analyze the best connection point. • The Nation will coordinate with their planning department to evaluate any issues with the routing options. • JLR inquired if there were any anticipated issues/challenges tying into Clarence-Rockland's infrastructure. Clarence-Rockland stated that the Water Treatment Plant and booster pumping stations are approaching capacity and has become the bottleneck of their distribution system. However, the Ottawa River is a good water source and there is ample space to expand the treatment plant. To prepare for connection for Casselman's supply, the majority of upgrades will need to be determined as soon as possible. It was noted that the water demand was quite high, and sizing of the treatment plant and booster stations are dependant on the demand. JLR to include Casselman's Master Plan along with the meeting minutes.	JLR	
1.3 DISCUSSION • **The feasibility study is being prepared under the assumption that Clarence-Rockland Water Treatment Plant (WTP) can support Casselman's future water demand. What would be the anticipated upgrades to the Clarence-Rockland water distribution system and WTP? Does Clarence-Rockland foresee any limitations/restrictions to the expansion of their Water Treatment Plant?** - Modelling of the Clarence-Rockland system would be required with additional water demand to determine system upgrades. - Clarence-Rockland will require upgrades to the existing Bouvier Booster Station. • **What are the boundary conditions at the Cheney/Bourget connection? The water model out at Cheney/Bourget has been requested and is necessary to finalize the feasibility study.** • **Does Clarence-Rockland have other suggestions for piped water connection point?** - No other connection points were identified during this meeting. • **What details should the feasibility study provide to support Clarence-Rockland's Master Plan / Schedule 'C' Class EA for WTP? What impact does it have on the Nation's Master Plan / Class EA?** - The existing pipe connecting Limoges to Cheney will remain dedicated solely for Limoges. • **What is the anticipated schedule for the completion of Clarence-Rockland Schedule 'C' Class EA for WTP?** - Clarence-Rockland indicated that they require one to one and half years for the Class EA for WTP and booster stations. - If Casselman intents to connect, the Class EA will be put on hold, Clarence-Rockland will require commitment from Casselman regarding connection by March 2024.	Clarence-Rockland/ Jacobs	

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Other Discussion Topics: • JLR indicated that Casselman expects to exceed their WTP capacity in 2026, based on the short-term growth. Clarence-Rockland stated that the connection between Limoges to Cheney took 7 years from planning to completion. Clarence-Rockland indicated that connection to Casselman within the next 2 years is a very aggressive schedule. Clarence-Rockland indicated a reasonable connection date will be by 2030 based on 3-year Class EA/Design and 3-year construction. • JLR inquired about the timeline for the political discussion and involvement. The Nation stated that the precedence has been made and the political component is expected to be straightforward. Casselman will be looking to streamline the process. Clarence-Rockland does not foresee any issues on the political end. • JLR inquired if the Nation considered City of Ottawa water connection during their piped water feasibility study. The Nation stated that the connection to the City of Ottawa (via Russel) infrastructure was a lot more expensive. • Overall, Clarence-Rockland and the Nation are on board with the proposed piped water solution.	Casselman	Mar. 2024

Meeting adjourned at 2:52 p.m.

Next meeting will be held on TBD

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ITEM	**ACTION BY**	**DUE BY**

Prepared by:

Kevin Cortez, M.Eng., EIT
Environmental Engineering Intern

Issued on: November 30, 2023

Reviewed by:

Susan Jingmiao Shi, P.Eng., M.Eng.
Associate, Senior Environmental Engineer

Distribution: All attendees
Attachment: Meeting PowerPoint Presentation