



Final Project File Report:
Bender Hill Sewage Pumping Station
Schedule B Class Environmental Assessment



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The Regional Municipality of Niagara
GMBP Project Number: 617108



GUELPH | OWEN SOUND | LISTOWEL | KITCHENER | LONDON | HAMILTON | GTA

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January 11, 2020

Our File: 617108

Niagara Region
1815 Sir Isaac Brock Way
Thorold, ON, L2V 4T7

Attention: Lisa Vespi
Senior Project Manager, Water and Wastewater Services

Re: Final Project File Report: Bender Hill Sewage Pumping Station
Schedule B Class Environmental Assessment

GM BluePlan Engineering Limited (GMBP) is pleased to submit this Draft Project File Report for the Bender Hill Sewage Pumping Station (SPS) Schedule B Class Environmental Assessment to the Regional Municipality of Niagara (Region).

This Project File Report provides a comprehensive review of the various solutions, the evaluation criteria, and the final recommendation for the preferred solution for the Bender Hill SPS. Our team has conducted an in-depth examination of the facility's history, servicing needs, and stakeholder/public requirements. In particular, this report is intended to:

- Provide an overview of how the various options were developed;
- Summarize the comparison of all options based on the evaluation criteria; and
- Provide a recommended solution that best suits the needs of the problem statement.

If you have any questions, or require any additional information, please contact the undersigned.

Yours truly,

GM BLUEPLAN ENGINEERING LIMITED

Per:

A handwritten signature in black ink, appearing to read 'A Beattie', written over a light blue circular stamp.

Amanda Beattie
Asset Management

Per:

A handwritten signature in black ink, appearing to read 'David Watt', written over a light blue circular stamp.

David Watt
Vice-President

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Yuraima Redondo
Asset Management

Table of Contents

1.	INTRODUCTION	1
2.	CLASS ENVIRONMENTAL ASSESSMENT PROCESS	2
2.1	Ontario's Environmental Assessment Act	2
2.2	Class Environmental Assessment Process	3
3.	OVERVIEW OF THE BENDER HILL SEWAGE PUMPING STATION AND CATCHMENT AREA	5
3.1	Study Area.....	5
3.2	Planning Considerations	5
3.2.1	Existing Land Use	5
3.2.2	Niagara Park's Commission Master Plan.....	5
3.3	Natural Environment.....	5
3.3.1	Niagara River	5
3.3.2	Niagara Gorge	6
3.3.3	Source Water Protection	6
3.3.4	Geotechnical, Hydrogeological and Archaeological Resources	6
3.4	Existing Municipal Infrastructure.....	6
3.4.1	Existing Water and Wastewater System	6
3.4.2	Existing Road Network and Trails.....	7
3.5	Catchment Area	7
3.6	Bender Hill SPS.....	8
3.7	Existing and Future Capacity Requirements	9
3.8	Summary	10
4.	PROBLEM/OPPORTUNITY STATEMENT	10
5.	ALTERNATIVE SOLUTIONS AND EVALUATION METHODOLOGY	12
5.1	Alternative Solutions.....	12
5.1.1	Alternative 1: Do Nothing	12
5.1.2	Alternative 2: Station Rehabilitation & Upgrades	12
5.1.3	Alternative 3: Station Replacement (Existing Location)	12
5.1.4	Alternative 4: Station Replacement (Bird Kingdom Parking Garage).....	12
5.1.5	Alternative 5: Station Replacement (Corner of John Street and River Road) ...	13

5.1.6	Alternative 6: Station Replacement (East side of River Road)	13
5.1.7	Alternative 7: Station Rebuild and Upgrades	13
5.1.8	Alternative 8: Station Rehabilitation and New Station (Tourist Core)	13
5.1.9	Alternative 9: Station Upgrades and Road Realignment	13
5.1.10	Alternative 10: Station Replacement and Road Realignment	13
5.2	Evaluation Methodology for Assessing Alternatives	14
5.2.1	Evaluation Criteria	14
5.2.2	Evaluation Scoring Methodology	17
6.	EVALUATION OF ALTERNATIVE SOLUTIONS	18
6.1	Evaluation of Alternative Solutions	18
6.2	Detailed Review of Short-listed Solutions	21
7.	PREFERRED ALTERNATIVE, IMPACTS AND MITIGATIONS	27
7.1	Summary of the Preferred Alternative	27
7.2	Traffic Impact and Mitigation Measures	29
7.3	Construction Dust and Noise Control	30
7.4	Environmental Protective Measures for Consideration During Construction	30
7.5	Utilities	31
8.	CONSULTATION PROCESS	31
8.1	Contact List	31
8.2	Communication and Consultation Summary	32
9.	APPROVAL REQUIREMENTS	33
9.1	Ministry of Environment, Conservation and Parks	33
9.2	City of Niagara Falls	33
9.3	Niagara Parks Commission	33
9.4	Electrical Safety Authority	33
10.	ANTICIPATED PROJECT TIMELINES	33
11.	SUMMARY AND CONCLUSIONS	34
11.1	Public Review Period and Next Steps	34

List of Tables

Table 1 – Issues/Needs Definitions	11
Table 2 – Evaluation Of Sub-Categories	15
Table 3 – Criteria Importance Weighting	17
Table 4 – Results Of Alternatives Evaluation (Using Weighted Criteria)	19
Table 5 – Short-Listed Option 9 Assessment	21
Table 6 – Short-Listed Option 10 Assessment	22
Table 7 – Short-Listed Option 2 Assessment	23
Table 8 – Short-Listed Option 2 Assessment	23
Table 9 – Potential Traffic Impacts And Mitigating Measures	29

List of Figures

Figure 1 – Bender Hill Sps Location	1
Figure 2 – Municipal Class Ea Planning And Design Process	4
Figure 3 – Bender Hill Sps Catchment Area	8
Figure 4 – Conceptual Layout Of The Short-Listed Alternative 9	24
Figure 5 – Conceptual Layout Of The Short-Listed Alternative 10	25
Figure 6 – Conceptual Layout Of The Short-Listed Alternative 2	26
Figure 7 – Conceptual Layout Of The Preferred Upgrade Solution At The Bender Hill Sewage Pumping Station	28

Appendices

Appendix A – Condition Assessment Report
Appendix B – Alternatives Details
Appendix C – Evaluation of Alternatives
Appendix D – Study Contact List
Appendix E – Environmental Assessment Notices
Appendix F – Public Information Center Materials

Executive Summary

The Regional Municipality of Niagara (Region) initiated a Schedule 'B' Class Environmental Assessment (Class EA) to investigate a preferred solution for the rehabilitation or replacement of the Bender Hill Sewage Pumping Station (SPS) located at 5615 River Road in the City of Niagara Falls.

The Bender Hill SPS ("the station") is located completely underground, within the right-of-way of River Road and in close proximity to the WEGO bus stop. The station is just north of the Canada Border Services Agency (CBSA) structure at the Rainbow Bridge. Opposite and east of the pumping station site is green space that includes a paved sidewalk and trees which are located along the edge of the Niagara gorge.

West of the pumping station is the Bird Kingdom tourist attraction. To the south, on the other side of Bender Street is the north entrance to the CBSA facility and the entrance to the Rainbow Bridge. To the southeast is a bus pull-in area, located on the edge of the gorge. The study area and existing state of the site is depicted in Figure ES-1.



Figure ES1 - Project Study Area

The station collects wastewater flows from a significant portion of the City of Niagara Falls core tourist district, including sanitary sewage flows from Eastwood Crescent, and Murray Street to Main Street.

The facility was constructed in 1962 and was upgraded in 1997 and emergency repairs were completed in 2016. The condition of existing equipment and building structure pose several challenges to the long-term viability of the facility in its current state, including:

- Continued degradation of the concrete structure due to corrosive elements such as road salts from de-icing operations and hydrogen sulfide generated from the sewage inside the wet well.
- There is no dedicated space for the Region's service vehicles to park and service the facility which poses operational challenges including worker safety and accessibility as well as restriction of local vehicular traffic.
- There has been recent commercial interest within the current catchment area that could increase flows beyond the capacities identified in the latest Master Servicing Plan (MSP). Therefore, the facility should be able to accommodate future growth when and if required.

As part of Phase 1 of the Municipal Class EA process, a problem/opportunity statement is developed to provide a clear statement that identifies the opportunities and challenges that are being addressed. The problem/opportunity statement for the Bender Hill SPS Options Analysis Class EA is to **determine the necessary upgrades at the station to achieve: increased capacity to meet 2041 needs, improve health and safety, station accessibility, prevent ingress of corrosive road salt, and replace aging infrastructure while providing a wider platform for pedestrian traffic and WEGO bus riders.**

Phase 2 of the Municipal Class EA process identifies alternative solutions to address the problem/opportunity by considering the existing natural, social, and economic environments. As part of this Class EA process, the Region considered alternative station locations, rebuild and/or station expansions, and design concepts to confirm the preferred solution. Ideas, concepts, and detailed solutions and sites were evaluated based on set criteria that considered technical viability, environmental impacts, socio-economic impacts, and financial costs.

A total of ten (10) long list alternatives were evaluated on five key factors: environmental impacts, social impacts, constructability impacts, financial impacts and operational considerations. To ensure a collaborative decision-making process, a workshop was held with all project stakeholders to evaluate the ten alternatives based on set and approved evaluation criteria with each stakeholder weighting each criteria; the results of which determined the short list of alternatives.

The three highest ranked alternatives were subject to further review, including an evaluation of the alternatives against the key drivers of the project, high-level cost estimates and subsequent consultation with project stakeholders. Based on the detailed review **Option 9 – Rehabilitation of the Existing Station and Realignment of River Road** is recommended as the preferred solution to the defined problem

statement for this project, that takes into consideration environmental, social, constructability, financial, and operational considerations.

The scope of this preferred alternative includes structural and mechanical rehabilitation within the station to restore its capacity. To address operator safety and accessibility issues, it is recommended River Road be realigned to limit vehicular and pedestrian traffic at the station. The Region conducted extensive review with the City of Niagara Falls (“City”) and the Niagara Parks Commission (“NPC”) to address the synergies available with each stakeholder during the project. A depiction of the recommendation for the realignment of River Road in addition to upgrades within the existing station’s footprint as shown conceptually in Figure ES-2 below.

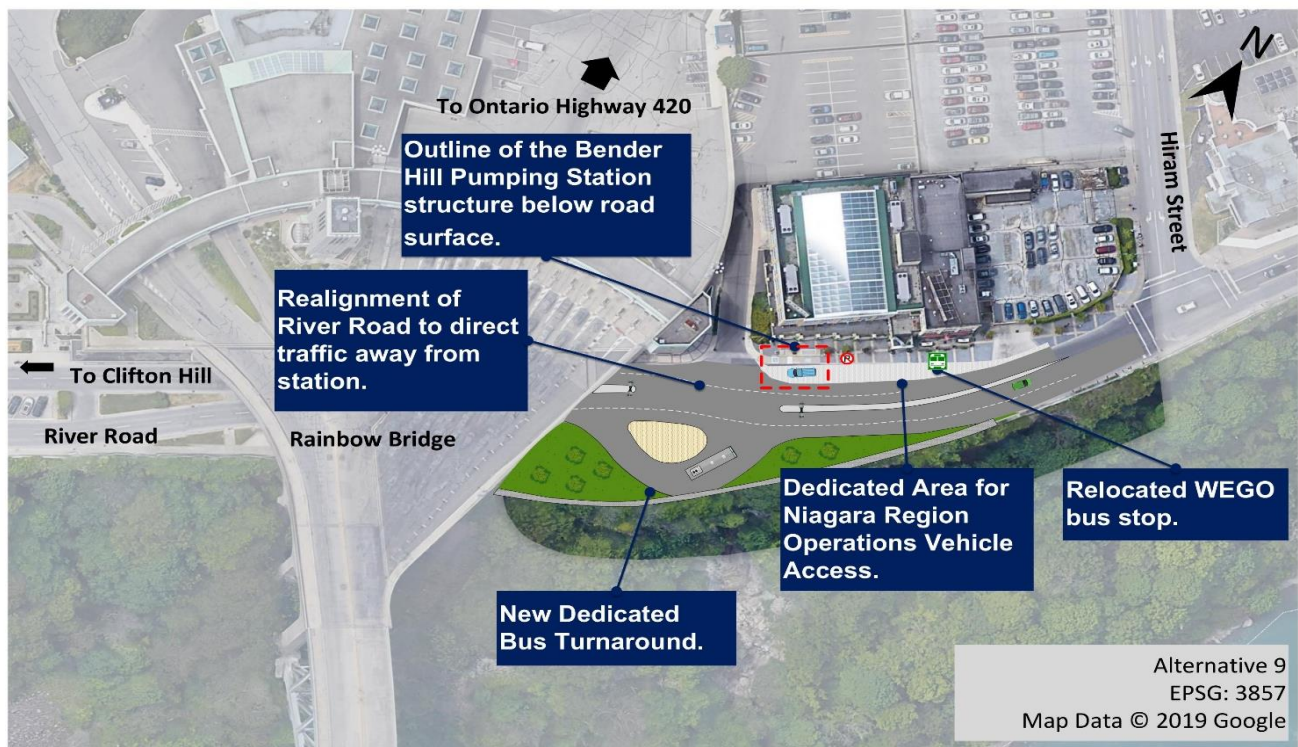


Figure ES2 – Project Study Area

The design stage is estimated to take place in 2020 and have a duration of 12 months, followed by an estimated 24 months for construction, anticipated to commence in Fall of 2021. Through the EA process, NPC has restricted construction during Victoria Day and Labour Day to reduce social impacts during the peak tourist season. It is anticipated regulatory approvals will be requested from the City and the Ministry of the Environment, Conservation, and Parks (MECP). Consultation with the Niagara Peninsula Conservation Authority (NPCA) is recommended to confirm approval requirements under O.Reg. 155/06., prior to the start of construction. It is recommended to commence construction following Labour Day 2021 at the end of the peak tourist season as well as the 2021 Canada Games which are scheduled to take place between August 6th and August 21st, 2021. The Region will further review construction phasing during the design phase.

THE REGIONAL MUNICIPALITY OF NIAGARA

NOTICE OF STUDY COMPLETION

Bender Hill Sanitary Pumping Station

Municipal Class Environmental Assessment

THE STUDY

Niagara Region has completed a study to evaluate options for improving the Bender Hill Sewage Pumping Station located at 5615 River Rd. in Niagara Falls. The station began operating in 1962 and has serviced the City to the present day. The station has undergone a variety of upgrades and maintenance since its construction. Recent inspections of the site have shown that work must be completed to improve worker safety and to address old and deteriorated pump station components.

This study was undertaken in accordance with the requirements of the Municipal Class EA process (October 2000, as amended in 2007, 2011 and 2015) for Schedule 'B' projects. The Class EA process included public and agency review at key milestones to solicit input, as well as one Public Information Centre.



STUDY RECOMMENDATIONS

Through an extensive evaluation process that included public engagement with local residents and businesses, the Region of Niagara, the City of Niagara Falls and Niagara Parks Commission, the study recommends the rehabilitation of the station's structural and mechanical components. In addition, the study recommends the realignment of River Road to allow for the safe routing of traffic in the areas surrounding the station and to improve pedestrian and Region of Niagara operations staff safety.

PUBLIC CONSULTATION

The EA Project File Report is available for public review at the following locations. Following review, interested persons should provide written comments to the Project team within a 30-calendar day review period beginning on Saturday, Jan. 11, 2020 and ending on Sunday, Feb. 9, 2020.

Niagara Region
Office of the Regional Clerk
1815 Sir Isaac Brock Way
Thorold, ON L2V 4T7
905-980-6000

Toll-Free: 1-800-263-7215 Fax: 905-687-4977

City of Niagara Falls
Clerk's Department
4310 Queen St., PO Box 1023
Niagara Falls, ON L2E 6X5
905-356-7521

Fax: 905-356-9083

Hours: 8:30 a.m. - 4:30 p.m.

Project information and reports can be found on the website:

<https://www.niagararegion.ca/projects/bender-hill/default.aspx>

If, after consulting with Niagara Region, you have significant unresolved concerns with the study, you have the right to make a written request to the Minister of Environment, Conservation and Parks (11th Floor, Ferguson Block, 77 Wellesley St. W, Toronto, ON, M7A 2T5) to appeal the study results, known as a Part II Order request. The Part II Order request must be received by the Minister during the 30-day review period, and a copy of the request should be forwarded to the Director of the Ministry and the Region. If there are no outstanding concerns after the end of the public review period, the study will be considered to have met the requirements of the Municipal Class EA, and the project may proceed to implementation.

Anyone that wishes to comment on or to be involved in this study may contact:

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Personal information collected at public meetings or submitted in writing is collected under the authority of the Municipal Act, 2001, and will be used by members of Regional Council and Regional staff. The written submissions including names and contact information and the report of the public meeting will be made available to the public. Questions should be referred to Anne-Marie Norio, Regional Clerk at 905-980-6000 ext. 3220.

*If you require any accommodations for a disability in order to attend and participate in meetings or events, please let us know in advance so that arrangements can be made in a timely manner. Please contact the **Accessibility Advisory Coordinator** at 905-980-6000 ext. 3252 or accessibility@niagararegion.ca.*

This notice was first issued on Jan. 11, 2020.

List of Abbreviations

Abbreviation	Term
ANSIs	Areas of Natural and Scientific Interest
CBSA	Canada Border Services Agency
City	City of Niagara Falls
EA	Environmental Assessment
EAA	Environmental Assessment Act
ESR	Environmental Study Report
GMBP	GM BluePlan Engineering Ltd.
HDPE	High Density Polyethylene (pipe material)
MEA	Municipal Engineers Association
MECP	Ministry of Environment, Conservation and Parks
MNRF	Ministry of Natural Resources and Forestry
MTO	Ministry of Transportation Ontario
NPC	Niagara Parks Commission
NPCA	Niagara Peninsula Conservation Authority
PIC	Public Information Meeting
Project	Schedule B Class Environmental Assessment for the upgrade or relocation of the Bender Hill SPS
ROW	Right of Way
Region	Regional Municipality of Niagara
SPS	Sewage Pumping Station
Station	Bender Hill Sewage Pumping Station

1. Introduction

The Regional Municipality of Niagara (the Region) retained GM BluePlan Engineering Ltd. (GMBP) to undertake a Schedule 'B' Municipal Class Environmental Assessment (EA) to identify and develop a preferred solution for rehabilitation and/or replacement of the Bender Hill Sewage Pumping Station (SPS) in the City of Niagara Falls.

The Bender Hill SPS is located underground along the road right-of-way and immediately underneath a WEGO bus stop at 5615 River Road, just north of the Canada Border Services Agency (CBSA) structure at the Rainbow Bridge. Opposite and east of the pumping station site is green space that includes a walking trail and trees which are located on the edge of the Niagara gorge. West of the pumping station is the Bird Kingdom facility. To the south, on the other side of Bender Street is the north entrance to the CBSA facility and the entrance to the Rainbow Bridge. To the southeast is a bus pull-in area, located on the edge of the gorge. The location of the station is shown on Figure 1.



Figure 1 – Bender Hill SPS Location

The station was commissioned in 1962 and has since undergone upgrades and various maintenance activities, while continuing to service the community. Recent investigations have shown that the condition of the Bender Hill SPS has deteriorated and many components

of the station are at near the end of their useful operating life. Major capital upgrades to the Bender Hill SPS are required to maintain the safe and long-term operation of this facility. The objectives of this Schedule B Class EA are to identify and assess viable alternatives to rehabilitate or replace the Bender Hill SPS and select a preferred alternative. The study identifies the problems / opportunities associated with the pumping station, develops and evaluates alternative solutions, determine the most feasible solution, and identifies methods to avoid or minimize impacts to the community and natural environment.

2. Class Environmental Assessment Process

2.1 Ontario's Environmental Assessment Act

Ontario's Environmental Assessment Act (EAA) was passed in 1975 and was proclaimed in 1976. The EAA requires proponents to examine and document the environmental effects that could result from major projects or activities and their alternatives. Municipal undertakings became subject to the EAA in 1981. The EAA's comprehensive definition of the environment is:

- Air, land or water;
- Plant and animal life, including human life;
- The social, economic and cultural conditions that influence the life of humans or a community;
- Any building, structure, machine or other device or thing made by humans;
- Any solid, liquid, gas, odour, heat, sound, vibration, or radiation resulting directly or indirectly from human activities; and
- Any part of a combination of the foregoing and the interrelationships between any two or more of them, in or of Ontario.

The purpose of the EAA is the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management of the environment in Ontario (RSO 1990, c.18, s.2). It is the objective of EAA proponents to ensure that decisions result from a rational, objective, transparent, replicable, and impartial planning process.

To meet the requirements of Ontario's EA Act, class environmental assessments were approved by the Minister of the Environment in 1987 as a means of obtaining project-specific approval under the Ontario EA Act. The Class EA approach streamlines the planning and approvals process for projects that are:

- Recurring;
- Similar in nature;
- Usually limited in scale;
- Predictable in the range of environmental impacts; and
- Responsive to mitigation.

2.2 Class Environmental Assessment Process

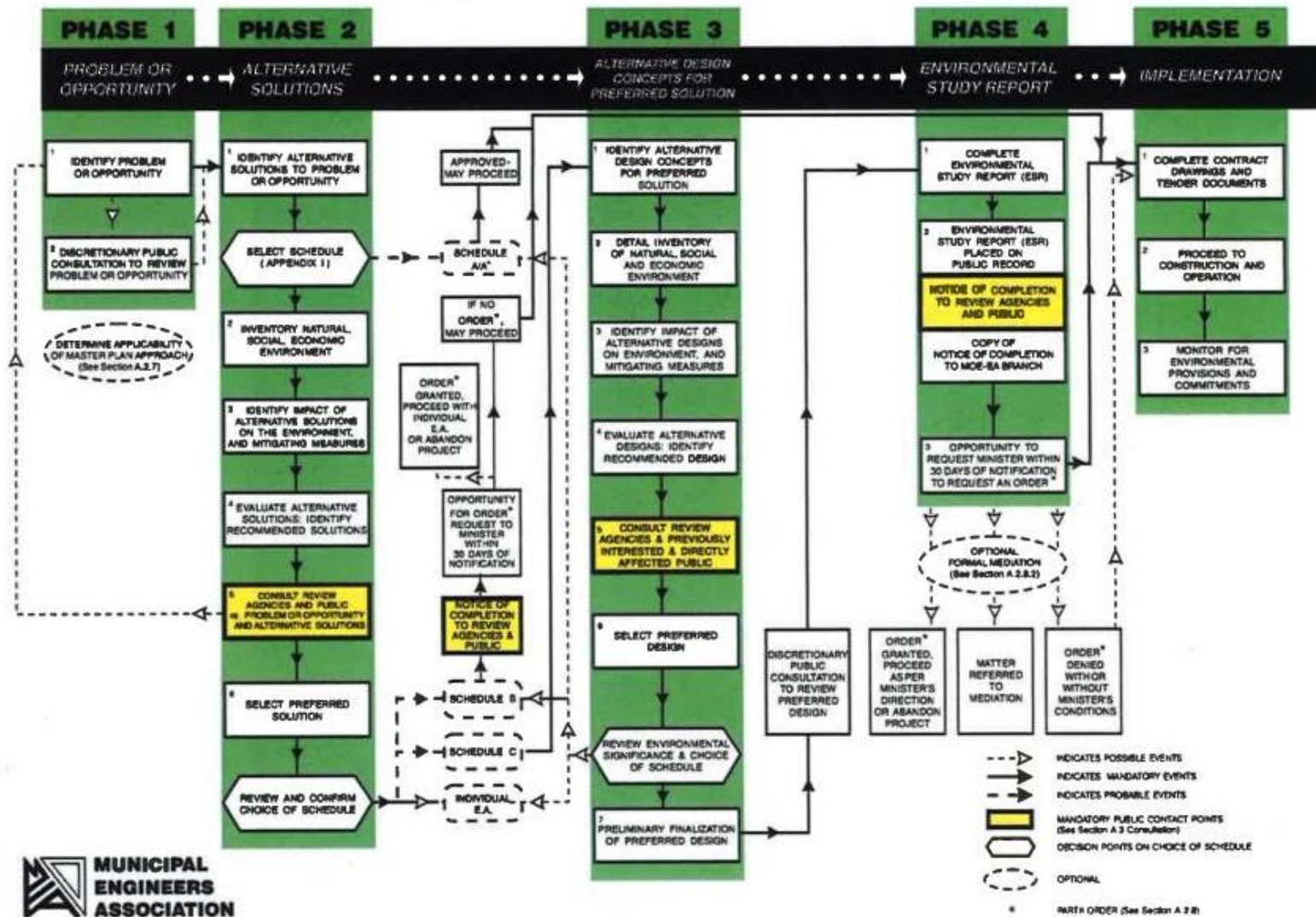
The Municipal Class Environmental Assessment, prepared by the Municipal Engineers Association (October 2000, as amended in 2007, 2011 and 2015) outlines the procedures to be followed to satisfy Class EA requirements for water, wastewater, stormwater management and road projects. The Municipal Engineers Association (MEA) process provides municipalities with a five-phase planning procedure approved under the EA Act for proponents to follow to meet Ontario EA requirements.

- **Phase 1: Problem or Opportunity Definition;**
- **Phase 2: Identification and Evaluation of Alternative Solutions** to Determine a Preferred Solution while taking input from the public and other stakeholders into consideration;
- **Phase 3: Examination of Alternative Methods** of Implementation of the Preferred Solution while taking input from the public and other stakeholders into consideration;
- **Phase 4: Documentation of the Class EA process** in the form of an Environmental Study Report (ESR) for public review; and
- **Phase 5: Implementation and Monitoring.**

Projects subject to the Class EA process are classified into following four “schedules” depending on the degree of the expected impacts. Figure 2 illustrates the Municipal Class EA planning and design process with the phases required for each schedule.

This project is designated as a **Schedule B** project in accordance with the requirements of the Municipal Class Environmental Assessment process, prepared by the Municipal Engineers Association (October 2000, as amended in 2007, 2011 and 2015), and as such requires completion of Phase 1 and 2. The Class EA Schedule B process includes public and review agency consultation, evaluation of alternative solutions, impact assessment of alternative solutions, selection a preferred solution, and identification of measures to mitigate adverse impacts.

The Canadian Environmental Assessment Act does not apply to this project as it does not adversely impact federal lands or receive federal funding.



*Source: Municipal Engineers Association, Municipal Class EA Manual, 2015

Figure 2 – Municipal Class EA Planning and Design Process

3. Overview of The Bender Hill Sewage Pumping Station and Catchment Area

3.1 Study Area

If the Bender Hill SPS is to be rehabilitated or replaced it must be located on or near the site of the existing Bender Hill SPS to take advantage of the existing sewage collection system. Therefore, the study area is defined as being close to the existing station, as illustrated in Section 1, Figure 1. The study area is surrounded by the Niagara Gorge to the east, the Bird Kingdom facility to the north, and the CBSA facility and the entrance to the Rainbow Bridge to the south. To the southeast is a bus pull-in area, located on the edge of the gorge.

The following provides an overview of the existing and planned land uses, policies affecting the study area, and planning and servicing considerations that could potentially affect future infrastructure improvements.

3.2 Planning Considerations

3.2.1 Existing Land Use

The study area is located within the jurisdiction of the Niagara Park Commission, an agency of the Government of Ontario. It is composed of commercial land use in the core tourist area of Niagara Falls. This includes a main traffic artery (River Road) that provides passage to and from the Falls. In addition, the study area is adjacent to the Rainbow Bridge, an international border crossing that is managed and operated by the Niagara Falls Bridge Commission.

3.2.2 Niagara Park's Commission Master Plan

The Niagara Parks Commission has initiated a 10-year development plan for Queen Victoria Park from the Rainbow bridge to the Welland River. The project is intended to prioritize the safety and enjoyment of pedestrians throughout the entire park by considering current traffic and parking issues and allow for better integration with pedestrian traffic. More information on this study is available at: <https://www.niagaraparks.com/>.

3.3 Natural Environment

The sections below describe the study area's natural environmental and ecological features.

3.3.1 Niagara River

The station is adjacent to the Niagara River, a large watercourse located to the east of the station; it forms part of the border with the state of New York in the United States. The Canadian federal government has designated the Niagara River as an Area of Concern, however it should be noted the preferred solution does not involve any modification or impact to the Niagara River. In addition, the Niagara River serves as habitat for a series of species-at-risks a listing of which can be found within the MNR's online database. However, impact

to these species and their respective habitat is not expected as the study area resides within an existing road right-of-way and construction.

3.3.2 Niagara Gorge

The Niagara Gorge is identified as Woodland in Ecoregion 7E as defined by the Ministry of Resources and Forestry (MNRF). In addition, MNRF Natural Heritage Area online map identifies the gorge as Areas of Natural and Scientific Interest (ANSIs).

ANSIs are lands and waters with features that are important for natural heritage protection, appreciation, scientific study or education, and are designated by the Province according to standardized evaluation procedures. ANSIs are ranked by the MNRF as being either Provincially or regionally significant.

No ANSIs, Environmentally Significant Areas (ESA), or sensitive species are located within the study area. However, construction impacts must be mitigated to protect the sensitive areas of the Niagara Gorge.

3.3.3 Source Water Protection

Based on the Conservation Ontario Source Water Protection portal, the study area is not located within the Niagara Peninsula Source Protection Area.

3.3.4 Geotechnical, Hydrogeological and Archaeological Resources

The study area is a developed commercial area which has been previously disturbed hosting significant underground infrastructure. The Region had previously conducted a geotechnical investigation and geo-environmental screening program within the study area, which indicated that the subsurface stratigraphy typically comprised of sand, silt, till mantling and limestone bedrock.

Under the Ontario Heritage Act there is potential for the City to designate surrounding properties to be of cultural heritage value or interest. At this time based on past studies and available information there were no listed properties of cultural heritage value. Further, with the previous works and area disturbances the potential for archaeological or cultural resources in the study area are low.

3.4 Existing Municipal Infrastructure

3.4.1 Existing Water and Wastewater System

There are existing watermains, stormwater sewers, and sanitary sewers within the study area. These are the property of NPC, City, Region and the Bridge Commission. All underground infrastructure must be protected during construction and operation must be maintained.

3.4.2 Existing Road Network and Trails

The site is located adjacent to the Green Line Bird Kingdom WEGO bus stop. A large parking lot is located at the south of the Bender Hill SPS, property of NPC, which is leased and used by the CBSA employees and business owners for the businesses under the Rainbow Bridge.

There is a walkway on each side of River Road through the study area that provides passage for pedestrians under the bridge.

3.5 Catchment Area

The Bender Hill Sewage Pumping Station collects wastewater flows from a significant portion of the City of Niagara Falls core tourist district, including sanitary sewage flows from Eastwood Crescent, and Murray Street to Main Street, as shown on Figure 3.

Flows to the station are conveyed by a 750 mm combined sewer from the south, receiving contributing flows from two sewers (375 mm) flowing east on Bender Street, and by a 375 mm sewer flowing from the north. None of these sewers are received directly to the station's wet well, but rather they flow either directly or indirectly to a structure located southeast of the pumping station. From this structure, flow is conveyed to the wet well through a 750 mm diameter sewer.

Flows that exceed the capacities of the above sewers are conveyed to an outfall structure located east of the station discharging to the Niagara River. The overflow receives storm sewer overflow from a 900 mm sewer entering from the south and from a 200 mm sewer entering from the north and receives storm sewer flow from a 1500 mm diameter storm sewer from Bender Hill entering from the west and from a 900 mm diameter storm sewer from River Road entering from the north.

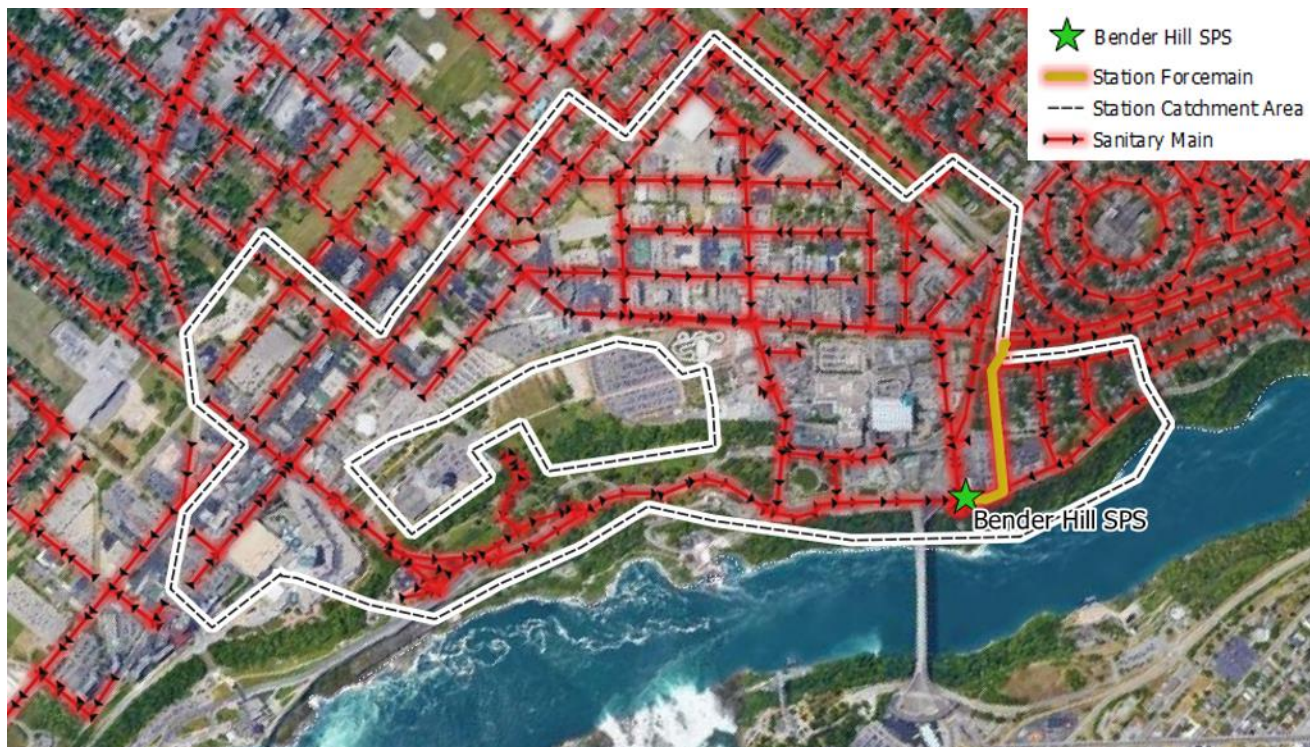


Figure 3 – Bender Hill SPS Catchment Area

3.6 Bender Hill SPS

The station was constructed in 1962 and was upgraded in 1997, when the current pumps were installed. Firm capacity of the station, according to the February 1997 MECP Certificate of Approval, is 330 L/s, based on three duty pumps and one standby pump, each with a capacity of 110 L/s at 32 to 35 meters total dynamic head (TDH); which indicates the height that a fluid is to be pumped. The station is equipped with a 600 mm HDPE forcemain that discharges to a gravity sewer just east of Palmer Avenue with an estimated flow velocity of 1.5 m/s. The current forcemain was constructed in 2011 to replace the original concrete forcemain that was built with the original station.

The station consists of a wet well, a dry well and a separate room for electrical equipment. The wet well receives the flows from the sewer catchment area and is located on the south side of the station. The pump room and electrical equipment are on the north side. Access hatches to the dry are located within the sidewalk right of way along River Road.

The studies previously completed highlighted the following station issues:

- AECOM 2010 Condition Assessment noted that the wet well currently has no ventilation system of any kind which likely compounds existing issues resulting from hydrogen sulfide gas.
- AMEC 2013 Condition Assessment noted issues with the wet well and dry well concrete, process valves and process piping caused by significant condensation in the dry well. AMEC also noted that the variable frequency drives are approaching the end

of their service life and that the existing SCADA system does not meet current Niagara Region standards.

As a direct result of the previous condition assessment, emergency concrete repair work was undertaken in 2016. However, the station's concrete continues to degrade due to the presence of corrosive elements, primarily road salts used for de-icing operations along the sidewalk and the WEGO bus stop immediately above the station.

As part of the preliminary investigations under this assignment, GMBP completed a condition assessment to confirm the existing process and structural conditions of the station and where possible the associated sewers/structures to support the evaluation of the alternatives. The assessment report is provided in **Appendix A**. In general, the following summarizes the key findings:

1. Significant deterioration was noted within the wet well likely due to hydrogen sulfide corrosion.
2. Moderate to severe deterioration within the dry well structure was noted due to road de-icing salts.
3. Moderate to severe crack development between the original and new wet well structures.
4. Surrounding infrastructure (discharge sewers, overflow chamber, and drop structure) were found to be in fair condition.
5. Pump capacity was approximately 24% below their theoretical firm capacity, possibly due to wear and tear.
6. The hydraulic conveyance capacity of the existing 600 mm forcemain was found to be in excellent condition given its age.
7. The existing overflow structure was found to be in fair condition.
8. The receiving sewer along Palmer Avenue was found to be generally in fair condition with some areas of grease deposition and fine root intrusion.

3.7 Existing and Future Capacity Requirements

The firm capacity of the station is 330 L/s, based on three duty pumps and one standby pump. Existing average flows to the station are approximately 263 L/s. Based on the capacity of the downstream sewer, the capacity of the Bender Hill SPS can be upgraded to a maximum rate of 464 L/s.

The 2016 Master Servicing Plan (MSP) growth projections forecast little growth within the Bender Hill SPS catchment area to the year 2041. Restoring the Bender Hill SPS to its 330 L/s firm capacity will allow the Region to meet MSP growth projections. However, discussions with project stakeholders indicated that there are several large-scale developments being proposed within the station's catchment area, meaning an increase in capacity will be required (possibly to the maximum of 464 L/s). One objective of this Class EA, therefore, is to

select a preferred alternative that has the ability to restore the station's firm capacity in the near term to and have the ability to increase capacity to meet growth in the long term.

3.8 Summary

The information presented in this section provides information necessary to define evaluation criteria, assess the impacts of the alternatives on natural, social and infrastructure, select the preferred solutions and develop measures to mitigate impacts.

4. Problem/Opportunity Statement

Since its construction, there has been a number of upgrades to the station to maintain its operation. However, the station is approaching the end of its theoretical useful life. The station continues to degrade and poses operational challenges.

Several factors have been identified that challenge the long-term viability of the facility which can be summarized as follows:

- 1- Concrete structure continues to be damaged by corrosive elements including road salts and hydrogen sulfide attack from sanitary sewage inside the wet well.
- 2- There is no dedicated space for the Region's service vehicles to park and service the facility which poses operational challenges, such as worker safety, accessibility and restricts local vehicular traffic.
- 3- There is interest for commercial development in the area that has the potential to increase flows to the drainage area.

The purpose of this Class EA is to determine the most feasible way to address existing and future SPS requirements, by considering the pumping station's age, current condition, and the anticipated increase in future flows. The Class EA provides an evidence-based, multi-faceted and traceable examination of all pump station, collection system, and environmental constraints in view of long-term performance objectives to derive the best possible solution at the lowest lifecycle cost.

The Phase 1 problem/opportunity statement for the Bender Hill SPS Schedule B Class EA is **to determine the necessary upgrades at the station to achieve: increased capacity to meet 2041 needs, improve health and safety, station accessibility, prevent ingress of corrosive road salt, and replace aging infrastructure while providing a wider platform for pedestrian traffic and WEGO bus riders.**

The development of a servicing strategy for the pumping station is required to:

- Increase the life span of the pumping station or replace.
- Address short-term and long-term upgrade requirements to convey flows based on the needs of the existing service area and planned future expanded service area.
- Meet operational, health and safety needs and standards.

The project team identified several issues that challenge the long-term viability of the station; it was determined that the issues presented in Table 1 below need to be addressed as part of the Bender Hill SPS EA study:

Table 1 – Issues/Needs Definitions

Identified Issues/Needs	Definition
Capacity Requirements	Pumping station capacity maintainability or increase
Growth	Ability to restore the station's firm capacity in the near term and have the ability to increase capacity to meet growth in the long term.
Overflows	Potential reduction of overflow events
Structural Concerns	Deteriorations issues repairs in the structural components of the station
Operability and Worker Safety	Limit or remove the traffic and access issues due to the location of the site. In addition, any improvement to ventilation will be considered.
Public Safety Concerns	Safety structures addition to address public concerns
Equipment	Reduction of risk of failure by replacement of current equipment
Forcemain Long term viability	Ability to keep in service the newly replaced forcemain useful life
Environmental Impacts	Construction and overflow impact
Deterioration (condensation, salt and hydrogen sulfide)	Ability to mitigate or eliminate the deterioration noted in the station
Implications to Region wide Infrastructure	Impact to the Region facility inventory
Impact to surrounding areas and landowners	Impact to surrounding businesses and Niagara Parks
Traffic Restrictions	Impact to local traffic
Related Cost	Investment value
Approvals	Amount of approvals require for all project related activities
External Funding Opportunities through Development Charges or Grants	Probability to obtain external funding to cover project costs

5. Alternative Solutions and Evaluation Methodology

The steps in the development and assessment of alternative solutions are as follows:

1. Identify alternative solutions that meet the objectives of this study
2. Establish criteria, with importance weightings to assess the alternative solutions
3. Evaluate the alternatives based on the criteria and their weighting
4. Provide a more comprehensive review, including high-level cost estimates for the 3 alternatives that ranked the highest (i.e. most beneficial)
5. Confirm the preferred alternative based on the review
6. Develop mitigation measures for the preferred alternative solution, as well as identify the plan for implementation.

As part of this assessment both the public and the necessary agencies were consulted. Any resulting input received as considered and responded to accordingly, details of these communications and received feedback are provided in Section 8.2.

5.1 Alternative Solutions

As a first step in the Phase 2 assessment process alternative solutions were developed. In total, ten (10) alternatives were considered. Each alternative was defined by providing a description of the type of work and its respective benefits and disadvantages; please refer to **Appendix B** for these details. A summary of these alternatives is presented below:

5.1.1 Alternative 1: Do Nothing

With the do nothing alternative, no changes to the existing pump station or repair of existing structure are considered.

5.1.2 Alternative 2: Station Rehabilitation & Upgrades

This alternative involves rehabilitation of station structural, mechanical and electrical components to address the immediate operational concerns and restore the station's firm capacity. In addition, it includes the relocation of the WEGO bus stop.

5.1.3 Alternative 3: Station Replacement (Existing Location)

This alternative involves partial demolition of the existing facility and construction of a new sewage pumping station within the same location. The new station would be located within the road right-of-way under River Road and connect to the existing 600 mm diameter forcemain.

5.1.4 Alternative 4: Station Replacement (Bird Kingdom Parking Garage)

Under Alternative 4, the existing facility would be entirely demolished and a new sewage pumping station constructed under the parking garage structure of "Bird Kingdom", located at the corner of Hiram Street and River Road. Partial demolition and rebuilding of the parking garage are also necessary with this alternative to allow construction of the new station, which

would be located outside the road right of way and connect to the existing 600 mm diameter forcemain.

5.1.5 Alternative 5: Station Replacement (Corner of John Street and River Road)

This alternative also includes total demolition of the existing facility and construction of a new sewage pumping station. The location of the new sewage pumping station is at the undeveloped lot located at the corner of John Street and River Road. An extension of the existing sanitary sewer is also required to direct flows to the new station further north. The facility's discharge will connect to the existing 600 mm diameter forcemain.

5.1.6 Alternative 6: Station Replacement (East side of River Road)

This alternative involves partial demolition of the existing facility and construction of a new submersible lift station within the confined area between River Road and the Niagara Gorge, immediately north of the Rainbow Bridge. Existing structure will be demolished or turned into an overflow storage/diversion structure.

5.1.7 Alternative 7: Station Rebuild and Upgrades

This alternative involves structural and mechanical rehabilitation of the Bender Hill SPS with the added scope of decommissioning the Seneca Street SPS located further north and redistribution of the associated sanitary flows to Bender Hill SPS. Both Seneca Street SPS and Bender Hill SPS discharge into the same sanitary sewer along Palmer Avenue. By redistributing flows to Bender Hill SPS, Seneca Street SPS can be decommissioned and the Region can save its operating and maintenance cost. Flow redistribution involves construction of approximately a 600 mm diameter, 1 km long gravity sewer along River Road from Seneca Street to the Bender Hill SPS.

5.1.8 Alternative 8: Station Rehabilitation and New Station (Tourist Core)

With this alternative a new sewage pumping station would be constructed at the south end of the tourist core of Niagara Falls to intercept sanitary sewage flows currently draining to the Bender Hill SPS. The new facility would discharge sanitary flows to the future South End WWTP. The Bender Hill SPS would then become redundant and taken out of service.

5.1.9 Alternative 9: Station Upgrades and Road Realignment

This alternative involves structural and mechanical rehabilitation of the Bender Hill SPS with the added scope of realigning River Road in the vicinity of the station to direct traffic away from the station and provide a dedicated space for the Region's operation vehicles. In addition, it includes the relocation of the WEGO bus stop.

5.1.10 Alternative 10: Station Replacement and Road Realignment

This alternative includes partial demolition of the existing facility and construction of a new sewage pumping station within the same location with the added scope of realigning River Road in the vicinity of the station to direct traffic away from the station and provide a dedicated space for the Region's operation vehicles. In addition, it includes the relocation of the WEGO bus stop.

5.2 Evaluation Methodology for Assessing Alternatives

5.2.1 Evaluation Criteria

Evaluation criteria was developed to reflect the issues and opportunities outlined in Section 4, and the natural, social and infrastructure considerations identified in Section 3.3. Evaluation criteria was grouped into the following categories:

- 1- **Environmental Impacts** - short and long-term impacts to the existing and surrounding natural environment including soil, groundwater, and terrestrial habitat.
- 2- **Social Impacts** - impacts on adjacent businesses, local traffic, public safety, and heritage features.
- 3- **Constructability Impacts** - short-term impacts during construction including local traffic, impact to existing utilities and infrastructure, and overall duration and complexity of construction.
- 4- **Financial Impacts:** - construction costs as well as the long-term impact to the facility's lifecycle cost. Opportunities for consolidation of municipal assets and capital funding are also considered.
- 5- **Operational Considerations** - impacts on the facility's current operability, ability to meet future capacity needs, safety of operators, and risk of critical failures.

For each evaluation category, the project team defined sub-categories that allowed for the discretization and evaluation of significant issues related to an alternative. Sub-categories are presented in Table 2.

Table 2 – Evaluation of Sub-Categories

Category	Sub-Category	Details
Environmental Impact The alternative's environmental impact on the surface and subsurface features, fauna and flora environment	Potential Impact on Terrestrial Features / Habitat	The alternative's potential effect on the local habitat and terrestrial features
	Potential Effects to Local Groundwater / Soil Systems	The alternative's effect on surrounding groundwater properties (e.g. water saturation) and soil layers
	Impact on Overflows	The impact the alternative will have on the local environment when put under periods of extreme flows
	Potential of Presence of Species at Risk	The alternative's potential impact on plant and animal species at risk that may be present
	Approvals	The municipal and ministry approvals required for the alternative to be constructed
Social Impact The alternative's societal impact on current and future landowners, users, public safety and historical features.	Impacts on Adjacent Residents / Businesses / Traffic	The alternative's effect on nearby landowners including businesses and residents, as well as users including foot and vehicle traffic
	Land Acquisition Requirements	The alternative's required land acquisition and operating permits
	Compatibility with Current / Planned Land Uses	The alternative's compatibility with current and planned land uses
	Public Safety Concerns	The alternative's impact on public safety for pedestrians, landowners, and vehicles
	Impacts on Archaeological / Cultural Heritage Features	The alternatives impact on cultural heritage and archaeological features that will be affected by the use and construction of the alternative
Financial Impact	Construction Cost	The alternative's cost based on land acquisition and constructions costs

Category	Sub-Category	Details
Financial Impact The direct and long term costs of the alternative considering funding opportunities.	Lifecycle Cost (Operation and maintenance related)	The alternative's cost to maintain the current functions over its lifecycle
	Consolidation of Assets/Facilities Portfolio	The alternative's impact on other wastewater facilities and assets
	Funding Opportunities (DC)	The number of funding opportunities that are achievable with the alternative
Constructability Impact The alternative's construction feasibility considering physical features (surface, subsurface), existing infrastructure, and compatibility with recent and future works.	Proximity / Impacts to Existing Infrastructure / Traffic	The sensitivity of the alternative's location during construction to minimize its impact on existing infrastructure and traffic
	Significant Construction Risk Issues	The alternative's major risks during construction including the area of the construction zone and use of heavy-machine
	Constructability Issues (Access, Slope, Depth, Soil, Groundwater, Vegetation)	Potential issues for the construction of the alternative due to surface and subsurface features
	Impacts to Recent Improvements / Opportunity to Coordinate with Future Works	The impact of the alternative's construction on recent improvement to the system and the compatibility of the new construction for future works.
Operational Considerations Evaluation of the alternative considering its operational competency to satisfy current, future demands, along with worker accessibility, and long-term viability.	Risk of Critical Failures	The alternative's risk of being exposed to critical failures caused by climactic conditions or use
	Ability to meet Future Capacity Needs	The alternative's ability to satisfy increased future capacity
	Worker safety and Operability	The alternative's effect on worker accessibility and workplace safety
	Deterioration (condensation, salt and H ₂ S)	The alternative's effectiveness in limiting deterioration caused by the environment
	Address Structural Concerns Associated with Structure	The level of the alternative's structural integrity to handle structural concerns faced by the current infrastructure

5.2.2 Evaluation Scoring Methodology

The impacts of each sub-category criterion were evaluated for each alternative and scored on a one to ten scale, where a score of one would indicate a negative impact and a score of ten being a beneficial impact. This scoring was applied through consensus of all key stakeholders based on the group's professional judgement and information available at the time of evaluation.

Recognizing each stakeholder group within the project team (Niagara Region, City of Niagara Falls and Niagara Parks Commission) may have different perspectives when it comes to priorities an evaluation workshop was held as part of the process to determine the relative importance of each sub-criteria. Each stakeholder was asked to assign an importance weighting to each sub-criteria.

During the alternative's evaluation workshop each stakeholder provided their proposed criterion weights which were then averaged, rounded and used for initial scoring. Results for each category were as presented on Table 3.

Table 3 – Criteria Importance Weighting

Category	Sub-Category	Average Weighting (Percent)*
Environmental Impact	Potential Impact on Terrestrial Features / Habitat	25
	Potential Effects to Local Groundwater / Soil Systems	
	Impact on Overflows	
	Potential of Presence of Species at Risk	
	Approvals	
Social Impact	Impacts on Adjacent Residents / Businesses / Traffic	20
	Land Acquisition Requirements	
	Compatibility with Current / Planned Land Uses	
	Address Public Safety Concerns	
	Impacts on Archaeological / Cultural Heritage Features	
Constructability Impact	Proximity / Impacts to Existing Infrastructure and/or Traffic	15
	Significant Construction Risk Issues	
	Constructability Issues (Access, Slope, Depth, Soil, Groundwater, Vegetation)	
	Impacts to Recent Improvements/Opportunity to Coordinate with Other Works	

Category	Sub-Category	Average Weighting (Percent)*
Financial Impact	Construction Cost	15
	Lifecycle Cost (Operation and maintenance related)	
	Consolidation of Assets/Facilities Portfolio	
	External Funding Opportunities	
Operational Considerations	Risk of Critical Failures	25
	Ability to meet Future Capacity Needs	
	Provide for worker safety and ease of operability	
	Address deterioration (condensation, road de-icing salts and hydrogen sulfide)	
	Address Structural Concerns Associated with Structure	
	Provide operational Flexibility	
	Forcemain Long term viability	
Total		100

As indicated in Table 3 the criteria were deemed fairly similar in importance; with some minor variations. For example, worker safety and structural concerns were rated more important than others, and forcemain long-term viability less (given it has sufficient capacity to meet long-term needs).

All ten alternatives were assessed using the sub-criteria and the weightings to identify a score for each alternative. This was completed by multiplying the sub-criterion score by the average weight (%) for each criterion. The resulting total score indicates the relative ranking of the alternatives; an alternative with a higher score indicates a preferable solution (i.e. an alternative with more beneficial impacts and low negative impacts). Based on this evaluation the top three alternatives with the highest score were short-listed and an additional review was conducted including completion of high-level cost estimates for each of the three solutions. The next section details the evaluation process.

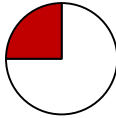
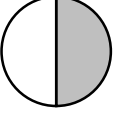
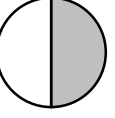
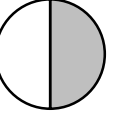
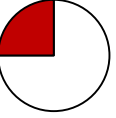
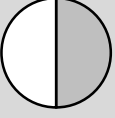
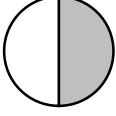
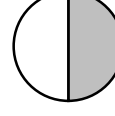
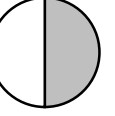
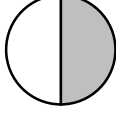
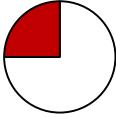
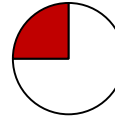
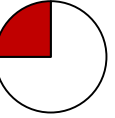
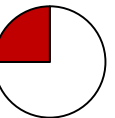
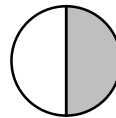
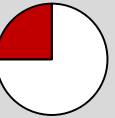
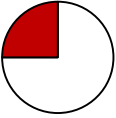
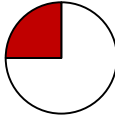
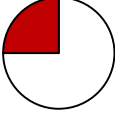
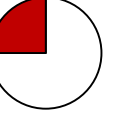
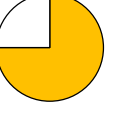
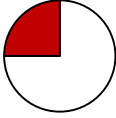
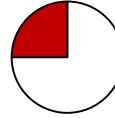
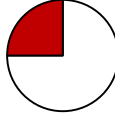
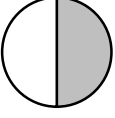
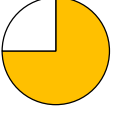
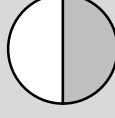
6. Evaluation of Alternative Solutions

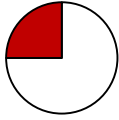
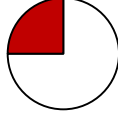
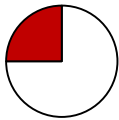
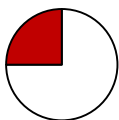
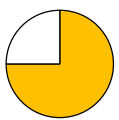
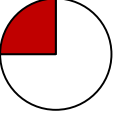
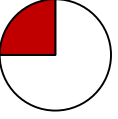
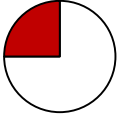
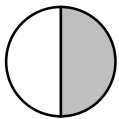
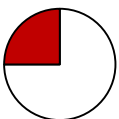
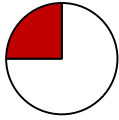
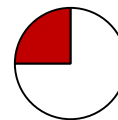
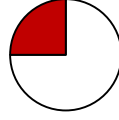
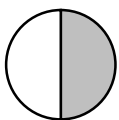
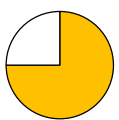
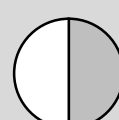
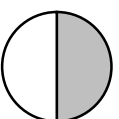
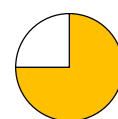
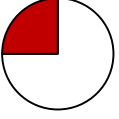
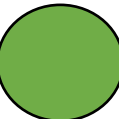
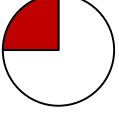
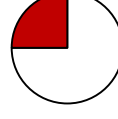
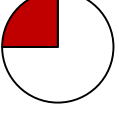
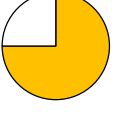
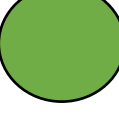
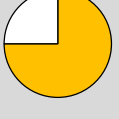
As presented in Section 6, a series of steps were taken to evaluate the alternatives considered. The details of this evaluation are provided in the following sections.

6.1 Evaluation of Alternative Solutions

The details of the evaluation are provided in **Appendix C** including the initial scoring of alternatives on the one to ten scale and the applied weightings as described in Section 6.2.2. A summary of the results of the final weighted evaluation are present in Table 4, including normalized percentages of the final score for each alternative. In addition, this table also summarizes the potential negative impact(s) for each alternative.

Table 4 – Results of Alternatives Evaluation (Using Weighted Criteria)

Alternatives	Environmental Impact	Social Impact	Constructability Impact	Financial Impact	Operational Considerations	Summary Score	Summary of Impacts
Alternative 1: Do Nothing No changes to equipment or infrastructure							- Alternative carried for evaluation purposes. - Continued safety risk for station operators and station degradation.
Alternative 2: Station Rehabilitation & Upgrades Replacement of components and repairs to the existing station's structure with relocation of WEGO Bus Stop							- Pedestrian and vehicular impact as existing station is within the right-of-way and sidewalk. - Moderate construction period due to station location and site constraints. - Continued safety risk for station operators.
Alternative 3: Station Replacement (Existing Location) Demolition and construction of a new station at the same location							- Pedestrian and vehicular impact as existing station is within the right-of-way and sidewalk. - Lengthy construction period due to station location and site constraints. - Continued safety risk for station operators. - Potential for major impacts to surrounding businesses as rock excavation may be required.
Alternative 4: New Station (Bird Kingdom Parking Garage) Construction of a new station in the Bird Kingdom Parking Garage							- Potential for major impacts to surrounding businesses as rock excavation may be required. - Moderate construction period due to station location and site constraints. - Requires land acquisition.
Alternative 5: New Station (Corner of John St. and River Rd.) Construction of a new station at the corner of John St. & River Rd.							- Potential for major impacts to surrounding businesses as rock excavation may be required. - Moderate construction period due to station location and site constraints. - Requires land acquisition.

Alternatives	Environmental Impact	Social Impact	Constructability Impact	Financial Impact	Operational Considerations	Summary Score	Summary of Impacts
Alternative 6: New Station (East side of River Rd.) Construction of a new station on the East side of River Rd. adjacent to the existing site							- Potential for major impacts to surrounding businesses as rock excavation may be required. - Moderate construction period due to station location and site constraints. - Requires land acquisition.
Alternative 7: Station Rebuild and Upgrades Decommissioning Seneca Pump Station and redirect flows to Bender Hill Pump Station							- Pedestrian and vehicular impact as existing station is within the right-of-way and sidewalk. - Lengthy construction period due to station location and site constraints. - Continued safety risk for station operators.
Alternative 8: Station Rehabilitation and New Station (Tourist Core) Minor rehabilitation and new station in tourist core with redirected flows from Bender Hill							- Pedestrian and vehicular impact as existing station is within the right-of-way and sidewalk. - Moderate construction period due to station location and site constraints. - Continued safety risk for station operators.
Alternative 9: Station Upgrades and Road Realignment Replacement of components and structural repairs with realignment of River Rd. and relocation of WEGO Bus Stop							Moderate construction period due to station location and site constraints.
Alternative 10: Station Replacement and Road Realignment Replace station infrastructure in the same location with realignment of River Rd. and relocation of WEGO Bus Stop							- Potential for major impacts to surrounding businesses as rock excavation may be required. - Lengthy construction period due to station location and site constraints.

6.2 Detailed Review of Short-listed Solutions

The three alternatives with the highest scores as summarized in Table 4 were considered the short-listed alternatives. In addition, Alternative 1: Do Nothing is carried as this is a consideration under the MEA.

High-level cost estimates were calculated for comparison purposes only and distributed as follows:

- Low Cost Alternative for Capital under \$ 5 M
- Medium Cost Alternative for Capital between \$ 5 – 10 M
- High Cost Alternative for Capital above \$ 10 M

In summary, the short-listed alternatives are as follows, listed in ranked order (highest to lowest):

Alternative 9: Station Upgrades and Road Realignment

This alternative involves replacement of pumping station components and structural repairs with realignment of River Rd. and relocation of WEGO Bus Stop. An illustration of the scope of this alternative is shown on Figure 4.

A summary of the specific impacts of the Alternative 9 for each of the criteria assessed is presented in Table 5.

Table 5 – Short-Listed Option 9 Assessment

Criteria	Impact	
Environmental Impacts		Reduced overflow frequency as a result of station capacity increase
		Increased station resiliency due to upgrades
Social Impacts		Improved public safety as the station access is no longer in an active lane of traffic, and is now further from the WEGO Bus Stop
Constructability Impacts		Major temporary impact in the area during road realignment
Financial Impacts		Medium cost alternative (Between \$ 5 and \$ 10 M)
Operational Considerations		Increased equipment and structure service life
		Increased operator safety
		Reduced corrosion due to bus stop relocation

Alternative 10: Station Replacement and Road Realignment

Alternative 10 involves replacing pumping station infrastructure in the same location with realignment of River Rd. and relocation of WEGO Bus Stop. An illustration of the scope of this alternative is shown on Figure 5.

A summary of the specific impacts of the Alternative 9 for each of the criteria assessed is presented in Table 6.

Table 6 – Short-Listed Option 10 Assessment

Criteria	Impact	
Environmental Impacts		Reduced overflow frequency as a result of station capacity increase
		Major impact due to rock excavation
Social Impacts		Improved public safety as the station access is no longer in an active lane of traffic, and is now further from the WEGO Bus Stop
Constructability Impacts		Extended period of construction with major impact to surrounding businesses
		Major impact in for surrounding businesses as rock excavation is required
Financial Impacts		High cost alternative (Over \$ 5 M)
Operational Considerations		Increased equipment and structure service life
		Increased operator safety
		Reduced corrosion due to bus stop relocation

Alternative 2: Station Rehabilitation & Upgrades

Replacement of components and repairs to the existing station's structure with relocation of WEGO Bus Stop are the major components of Alternative 2. An illustration of the scope of this alternative is shown on Figure 6.

A summary of the specific impacts of the Alternative 9 for each of the criteria assessed is presented in Table 7.

Table 7 – Short-Listed Option 2 Assessment

Criteria	Impact	
Environmental Impacts		Increased station resiliency and protection for potential overflows
Social Impacts		Pedestrian impact as existing station is within the sidewalk and road
		Station Access close to existing WEGO bus stop
Constructability Impacts		Lengthy construction impact due to station location and site constraints
Financial Impacts		Low cost alternative (Less than \$ 5M)
Operational Considerations		Continued safety risk for station operators
		Reduction in salt corrosion as a result of the WEGO bus stop relocation

Alternative 1: Do Nothing

No changes to equipment or infrastructure.

Table 8 – Short-Listed Option 2 Assessment

Criteria	Impact	
Environmental Impacts		No upgrades for resiliency and protection from potential overflows
Social Impacts		No increase in space for pedestrians
		Station Access close to existing WEGO bus stop
Constructability Impacts	No construction Impacts as there is no construction	
Financial Impacts		Continued increase in maintenance costs and service disruptions
		No Capital Cost
Operational Considerations		Continued safety risk for station operators
		Continued station corrosion due to road salt

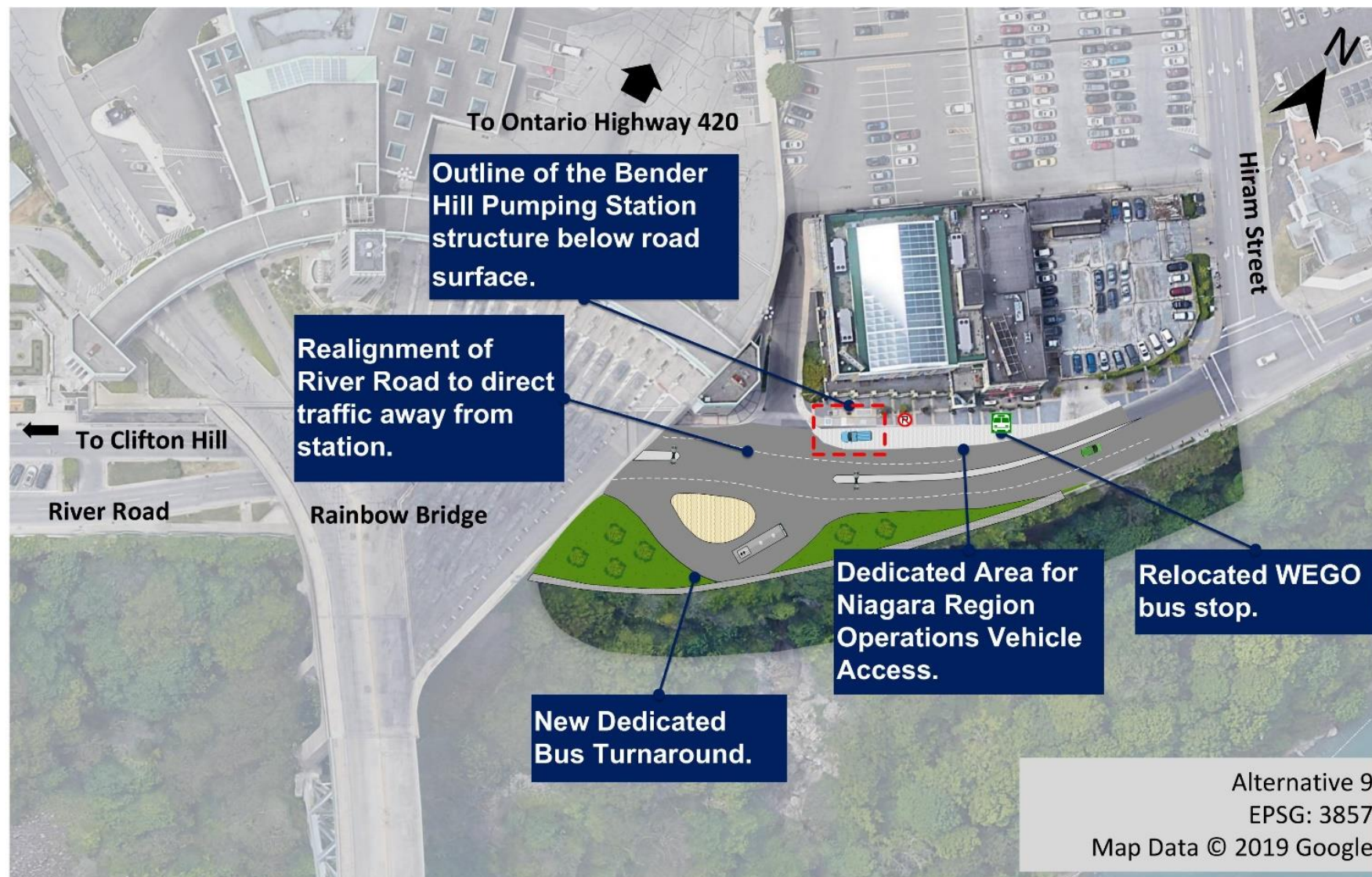


Figure 4 – Conceptual Layout of the Short-listed Alternative 9

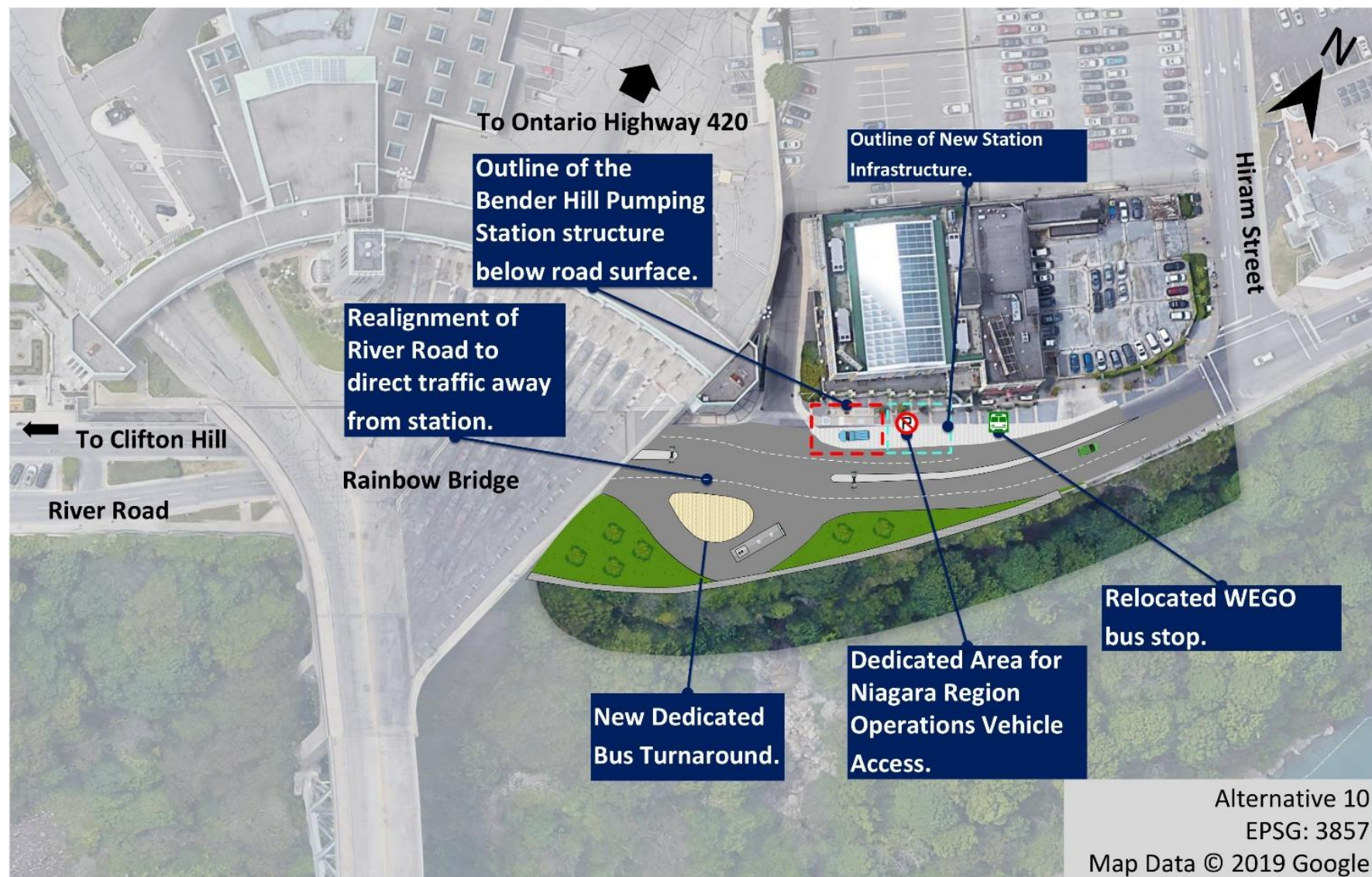


Figure 5 – Conceptual Layout of the Short-listed Alternative 10

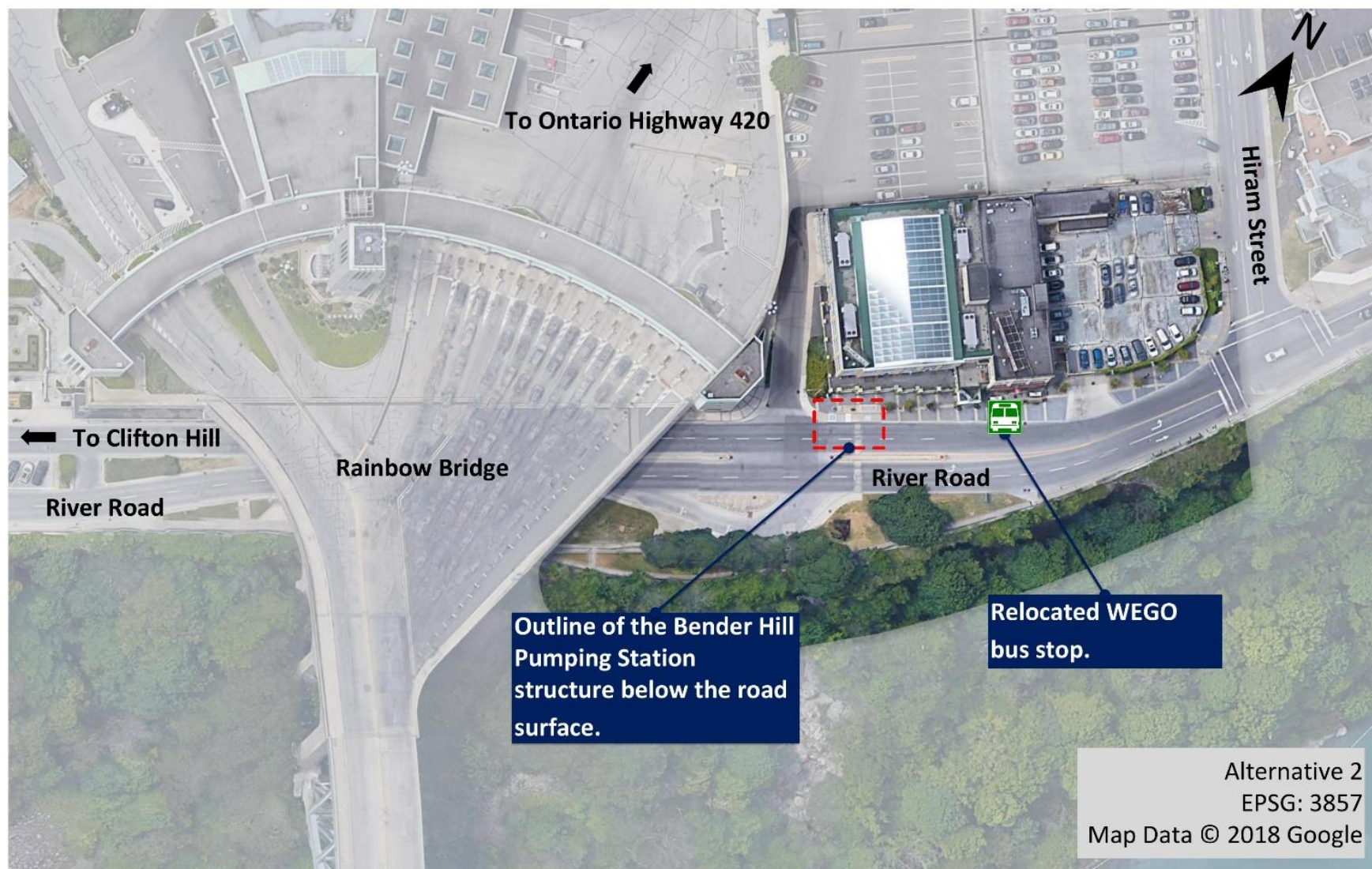


Figure 6 – Conceptual Layout of the Short-listed Alternative 2

7. Preferred Alternative, Impacts and Mitigations

Based on a detailed review of the short-list of alternatives, the evaluation of the key drivers of the project, the project costs and subsequent consultation with project stakeholders, **Option 9 – Rehabilitation of the Existing Station and Realignment of River Road** is recommended as the preferred solution.

7.1 Summary of the Preferred Alternative

Figure 7 shows a conceptual layout of the preferred solution. The scope of the preferred solution addresses the problem/opportunity statement for this project and includes the following works:

- Rehabilitation of the station's structural components in order to increased station resiliency and repair current damages.
- Upgrade or replace the existing pumps to restore the existing station capacity in the near term and have the capability to increase the capacity in the long term to meeting growth.
- Install safety grating to improve worker safe access to the station and improve public safety, as access hatches are located in the sidewalk.
- Realign River Road to allow for a safe entry that will direct traffic away from the station and provide a dedicated space for the Region's operation vehicles.
- Relocate of the WEGO Bus station to improve public safety and reduce corrosion as a direct result of salt ingress into the underground station.

The frequency of overflow from the station can be expected to be reduced if the capacity of the pumping station is increased. The following are additional benefits of the recommended alternative:

- ✓ Allows for use of the newly replaced forcemain
- ✓ Provides safer access for maintenance and operations
- ✓ Opportunity to improve overall aesthetics of the area via road realignment and landscaping

Station upgrades must be designed such that continued operation of the existing facility is maintained during construction. It is suggested to incorporate a construction sequencing and staging plan as part of the technical specifications for the construction contract.

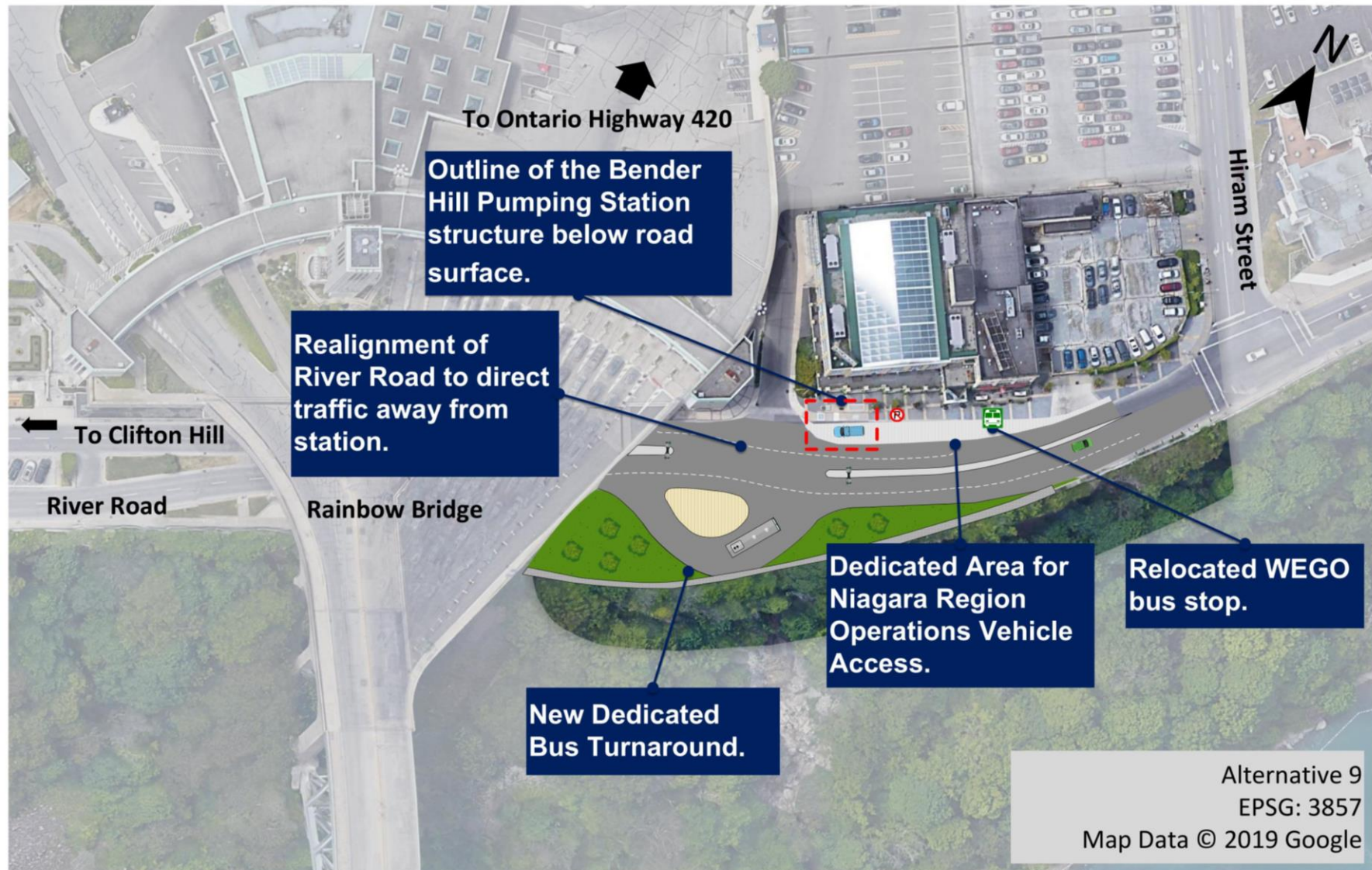


Figure 7 – Conceptual Layout of the Preferred Upgrade Solution at the Bender Hill Sewage Pumping Station

7.2 Traffic Impact and Mitigation Measures

The preferred solution is anticipated to impact traffic in the surrounding area during construction. Table 9 lists several impacts to traffic and mitigation measures to be considered.

Table 9 – Potential Traffic Impacts and Mitigating Measures

Impact	Mitigation Measure
Impact to pedestrian accessibility to nearby businesses	Provide adequate and clear construction signage and maintain clear and safe pedestrian pathway particularly along the west sidewalk of River Road. Public outreach and communication including regular status updates and a hotline for the general public and surrounding businesses to report any concerns.
Potential impact to the private driveway access to the CBSA parking lot behind Bird Kingdom.	A dedicated entrance to the CBSA Parking lot can be provided via Hiram Street. A temporary easement may be required. Construction parking must be offsite and stipulated in the construction contract. Provide provisions in the construction contract to defer work during peak weekends or special tourist events to maximize availability of public parking.
Local Traffic delays	Avoid construction during the peak tourist season (Victoria Day through Labour Day). Avoid construction during the Niagara 2021 Canada Summer Games. Maintain a Traffic Management Plan throughout the construction period with dedicated flag persons to ensure at least one lane of traffic is maintained at all times.
Impact to WEGO bus traffic schedule due to delay	Consult with WEGO to consider temporary relocation of the bus stop or temporary diversion of the route around the construction area.

Additional impact considerations and potential mitigation measures are presented in the following sections.

7.3 Construction Dust and Noise Control

Construction associated with the recommended solution may result in noise, vibration, and dust in the surrounding area. The following are some of the potential dust and noise mitigation measures to be considered:

- Use water or calcium chloride to control dust. The suitability of using calcium chloride should be confirmed with the NPCA and the City of Niagara Falls considering proximity to the Niagara River.
- Provide regular road sweeping to maintain public road free of mud.
- Restrict working hours for construction, in accordance with the City of Niagara Fall's Noise Control By-law.

7.4 Environmental Protective Measures for Consideration During Construction

Construction activities should included planned protective measures in order to protect the surrounding environment. The following are some of the recommended mitigation measures to be implemented.

- 1- **Tree Protection/Removal:** an existing tree inventory and vegetation survey is recommended to be undertaken for the work area by a Certified Arborist to document existing conditions and identify impact to existing trees as a result of road realignment. It is anticipated that some existing trees will require removal to facilitate construction. A tree protection/removals plan is anticipated to be part of the design phase.
- 2- **Erosion and Sediment Control:** erosion and sediment control measure such as silt-trap fabrics should be implemented around the work area to minimize the impact of road resurfacing work on the surrounding environment, particularly the Niagara gorge. Silt control fencing will require maintenance throughout construction until final restoration is completed.
- 3- **Environmental Spills:** potential sources of spills including fuels and lubricants used by the contractor for construction machinery. It is recommended that a spills action plan is undertaken by the contractor to avoid accidental spills into the environment. Control measures include dedicated fueling areas with containment located at least 30 m away from direct drainage areas into the Niagara gorge. Any environmental spills must be reported to the MECP via the Spills Action Centre.
- 4- **Sanitary Sewage Overflows due to Construction:** the construction upgrade work at the Bender Hill pump station should be undertaken by an experienced contractor in a manner that reduces the risk of total station failure and resultant spills. Therefore, a construction sequencing and implementation plan should be developed to allow for phased upgrades without interruption of service. External bypass pumping should be considered where total power shutdown is required for facility upgrade.
- 5- **Odour Control:** repair work within the existing wet well should be undertaken in a manner than reduces odour emissions to the surrounding area. Positive ventilation should be maintained into the wet well areas. Any potential vent sources may require

the installation of an activated-charcoal filter to adsorb potential odours and volatile organic compounds.

- 6- **Settlement and Vibration Monitoring:** monitoring of ground settlement and vibration within the working area is recommended to be undertaken by an experienced vendor during construction to avoid impacts to existing buildings and structure from construction activities. Vibration monitoring must be continuous and near key structures including the Rainbow Bridge.

7.5 Utilities

The recommended solution comprises utilities typical of an urban area including municipal water, sanitary and storm sewers, electrical and other utilities. The project stakeholders identified the location of known existing utilities and services within existing rights-of-way and the pumping station. During detailed design, it is recommended to complete a detailed subsurface utility engineering investigation to confirm location of existing infrastructure and incorporate any required relocations as part of the road realignment works.

8. Consultation Process

Public and agency consultation is an important component of the Class EA process and included informing members of the community and stakeholders to provide balanced and objective information and consulting them to obtain feedback on the study process, alternatives, and preliminary preferred solution.

The primary goals and objectives of the public consultation process are to:

- Present clear and concise information at key stages of the study process;
- Solicit community, regulatory and Regional staff input;
- Identify concerns that might arise from the undertaking;
- Consider stakeholder comments when developing the preferred solution; and
- Meet Municipal Class EA consultation requirements.

8.1 Contact List

A Study Contact List was compiled of relevant and interested parties, including review agencies, local area municipalities and interested members of the community. This list was developed at the outset of the study and was updated as comments were received and was used for mail and e-mail correspondence, where applicable. Agency stakeholders included: First Nations, Conservation Authorities, Federal Agencies, Municipal Representatives and Provincial Agencies. The full Study Contact List is provided in **Appendix D**.

It must be highlighted that the City and NPC were part of the project team and several meetings took place to discuss the project scope and incorporate any input of these key stakeholders into the assessment process. There have been no other noted concerns from other agencies with respect to this project

8.2 Communication and Consultation Summary

The following public and agency consultation activities were undertaken as part of the various stages of this Class EA process, including study commencement, a Public Information Center, and study completion. A copy of the distributed communications is provided in **Appendix E**.

Study Commencement

The formal Notice of Commencement was distributed to public and agency stakeholders as follows:

- Emailed to federal, municipal, provincial and conservation authorities stakeholders included in the Stakeholders List on July 15th, 2018,
- Mailed to business stakeholders included in the Study Contact List on July 15th, 2018, and
- Advertised in the Niagara Falls Review.

Public Information Centre

The Notice of Public Information Center (PIC) was distributed to public and agency stakeholders as follows:

- Emailed to federal, municipal, provincial and conservation authorities stakeholders included in the Stakeholders List on September 10th, 2019,
- Mailed to business stakeholders included in the Study Contact List on September 10th, 2019,
- In-person delivered to adjacent businesses on September 11th, 2019,
- Advertised in the Niagara This Week Website on September 20th, 2019,
- Advertised in the Niagara Falls Review on September 20th, 2019 and September 22nd, 2019,
- Region's dedicate project Website (<https://www.niagararegion.ca/projects/bender-hill/default.aspx>)

In order to comply with the Municipal Class EA process, the Region hosted a Public Information Centre to elicit input on the study process and the preliminary preferred servicing solution and infrastructure projects. The PIC took place at Niagara Falls City Hall, Committee Rooms 2A-2B on September 24th, 2019. The public meeting was set for 5:00 – 8:00 pm and a dedicated meeting for key project stakeholders was held at 4:00 pm.

The PIC was attended by three (3) people, excluding the project team and no concerns were highlighted by stakeholders.

Representative from the Region, City of Niagara Falls, Niagara Parks Commission and engineering consultant, GM BluePlan Engineering, were present to engage attendees.

Copies of the PIC display panels, sign-in sheets, and comment sheets are provided in **Appendix F**.

Study Completion

The Notice of Completion was published and distributed on January 11th, 2020. The notices were made public by the following means:

- Emailed to federal, municipal, provincial and conservation authorities stakeholders included in the Stakeholders List on January 10th, 2020,
- Mailed to business stakeholders included in the Study Contact List on January 10th, 2020,
- Advertised in the Niagara Falls Review on January 11th, 2020,
- Advertised in the Niagara This Week Website on January 16th, 2020,
- Region's dedicate project Website (<https://www.niagararegion.ca/projects/bender-hill/default.aspx>)

9. Approval Requirements

The following section identifies the anticipated permits and approvals required from various agencies during detailed design and prior to construction.

9.1 Ministry of Environment, Conservation and Parks

- Environmental Compliance Approval (Sewage) for any upgrades to the sewage pumping station that increases its capacity beyond the current firm capacity.

9.2 City of Niagara Falls

- Site Plan Approval and Building Permit are required from the City of Niagara Falls for the road realignment and works inside the existing station.

9.3 Niagara Parks Commission

- A construction permit from the Niagara Parks Commission is required since the work area is located within the NPC-managed lands.

9.4 Electrical Safety Authority

- ESA Design Review and Permit may be required if the existing electrical service is going to be upgraded to increase the pumping capacity of the station.

10. Anticipated Project Timelines

The following are the anticipated timelines for the proposed upgrades:

- Preliminary and Detailed Design, permitting, and tender: **Winter 2020 – Summer 2021**
- Construction period: **Fall 2021 – Fall 2023**

It is recommended that construction begin after Labour Day 2021 which will follow the peak tourist season as well as the 2021 Canada Games which are scheduled to take place between August 6th and August 21st, 2021. The Region will review construction sequencing and phasing during the detailed design phase.

11. Summary and Conclusions

During this Municipal Class EA, the Regional Municipality of Niagara worked closely with key stakeholders to address and resolve key issues or challenges associated with evaluating alternative servicing needs for the Bender Hill Sewage Pumping Station which continues to experience ongoing operational challenges due to its age and location under River Road in the heart of the tourist district of the City of Niagara Falls.

Based on the comprehensive review of ten different alternative solutions against a multiple bottom line evaluation process that takes into consideration environmental, social, constructability, financial, and operational factors, **Option 9 – Rehabilitation of the Existing Station and Realignment of River Road** was identified as the recommended solution to the problem statement for this study.

The recommended solution offers the best asset value to the Region from an operations, maintenance and lifecycle perspective whilst having the least overall impact to the natural and social environment.

Provided no comments or Part II orders are received during the 30-day review process, it is recommended that the Region proceed with design of the facility upgrade and realignment with River Road according to the solution outlined herein.

11.1 Public Review Period and Next Steps

This Project File Report meets the requirements of a Schedule B Municipal Class EA study. Filing of this document initiates the 30-day public review period starting Saturday, January 11th, 2020 and ending Sunday, February 9th, 2020. A copy of the Notice of completion is provided at the beginning of this report.



Appendix A - Condition Assessment Report



Prepared By:



In association with:



The Regional Municipality of Niagara

Bender Hill SPS Process and Structural Condition Assessment Report

GMBP File: 617108

June 6, 2018



Executive Summary

GM BluePlan Engineering (GMBP) was retained by Niagara Region to undertake a Class EA including options analysis for rehabilitation and/or replacement of the Bender Hill Sewage Pumping Station (SPS) in the City of Niagara Falls. The objective of the project is to provide an evidence-based, multi-faceted and traceable examination of options to derive the best possible solution at the lowest lifecycle cost.

The first stage of this project was to confirm the current condition of the Bender Hill SPS and associated inlet sewer, overflow structure, and discharge forcemain and sewer, including draw down testing, and structural examination of the wet well and dry well. This report documents the observed condition of the facility on April 4, 2018. The assessment was completed by GMBP staff supported by PipeFlo Contracting Corp. (PipeFlo), who completed CCTV and manned entries of the wet well, overflow structure, and the discharge sewer.

The following is a summary of key findings and potential mitigation measures:

- 1) The average capacity of the existing sewage pumps was measured to be 87 L/s, compared to the published capacity of 114 L/s, or approximately 24% drop in capacity. The existing pumps can be replaced with identical or larger pumps to restore capacity.
- 2) The calculated hydraulic conductivity of the existing 600 mm diameter discharge forcemain was 150, which is considered excellent.
- 3) The existing station and the 600 mm forcemain from Bender Hill SPS to the discharge sewer at Palmer Avenue has a maximum theoretical peak capacity of 464 L/s, compared to the measured peak of approximately 263 L/s, subject to electrical system capacity limitation¹.
- 4) A significant wet weather event occurred the day before the inspection. As a result, turbulent flows were observed into the wet well, which is believed to contribute to air entrainment into the pumps and release of hydrogen sulfide in the wet well. Raising the average water level to above the invert of the inlet sewer may alleviate some of the entrainment but a permanent solution requires structural reconfiguration of the wet well and inlet sewer.
- 5) The wet well structure above the water level exhibited intermediate to severe deterioration. Cementitious coating repair can be completed, although recoating is recommended every five years.
- 6) The dry well structure exhibited segments of deterioration, particularly at the interface between the original building construction and dry well expansion. An active leak was observed through a crack in the electrical room directly below River Road. Observed deterioration includes honeycombing, spalling, cracks, and exposed rebar along walls and roof slabs. Surface level repairs of the electrical room roof slab are recommended. However, extended lane closure along River Road will be required. It should be noted that de-icing road salts used above the structure will continue to pose a challenge for long term durability *of the structure*.

- 7) The dry well staircase was observed to be in generally good condition. However, additional supports are recommended for added rigidity.
- 8) A portion of the existing overflow drop shaft to the Niagara gorge was accessed and inspected by a CCTV camera rover. Accessed areas were observed to be in fair condition. However, safety and security concerns were noted at the exterior drop shaft behind the sidewalk barrier wall including the railing and the access cover.
- 9) The 675 mm diameter discharge sewer downstream of the discharge forcemain was inspected by a CCTV camera. The sewer was in good condition, with some grease deposits and minor fine root intrusion.

The following additional investigations are recommended to confirm the findings in this report, subject to the outcome of the Class EA process:

- 1) Complete core sampling of select areas within the dry well structure to confirm the structural integrity of the existing dry well structure.
- 2) Complete an electrical system assessment to confirm the maximum potential expansion capacity of the Bender Hill SPS.

¹ Electrical system review was not included as part of this assessment.

TABLE OF CONTENTS

1. INTRODUCTION	1
1.1 Facility Overview	1
1.2 Objectives of the Investigation	2
2. FIELD INVESTIGATIONS	3
2.1 Pump Performance and Forcemain Hydraulic Assessment	3
2.2 Structural Inspections	4
2.3 Sewer Inspections	4
3. RESULTS AND DISCUSSIONS	4
3.1 Pump Capacity Assessment	4
3.2 Forcemain Hydraulic Conductivity	5
3.3 Inlet Flow to Wet Well	7
3.4 Structural Assessment	7
3.4.1 Wet Well	7
3.4.2 Dry Well	8
3.5 Exterior Sewer	10
3.5.1 Overflow Chamber and Drop Shaft	10
3.5.2 Discharge Sewer	10
4. CONCLUSION	12

APPENDICES

APPENDIX A: PIPEFLO REPORTS

Report Prepared By: Rafiq Qutub, M.Eng., P.Eng., Process Engineer

Report Reviewed By: Wei Wang, P.Eng., Senior Structural Engineer

Amanda Beattie, P.Geo., E.I.T., C.E.T., Pmp, Asset Management Specialist

The Regional Municipality of Niagara

Bender Hill SPS Process and Structural Condition Assessment Report

Draft Report

Gmbp File: 617108

1. Introduction

GM BluePlan Engineering (GMBP) was retained by Niagara Region to undertake a Class EA including options analysis for rehabilitation and/or replacement of the Bender Hill Sewage Pumping Station (SPS) in the City of Niagara Falls. The objective of this project is to provide an evidence-based, multi-faceted and traceable examination of options to derive the best possible solution at the lowest lifecycle cost.

As part of the background review, a condition assessment was undertaken to confirm the existing process and structural condition of the facility and associated sewers/structures to support the options evaluation. This report documents the findings of the assessment.

1.1 Facility Overview

The Bender Hill SPS is located completely underground at 5615 River Road just north of the Canada Border Services Agency (CBSA) structure at the Rainbow Bridge, below the south bound lane of River Road underneath a WEGO bus stop was constructed in 1962. Upgrades to the station were performed in 1997 and emergency concrete repair work was completed in 2016, however we understand the station's concrete continues to be damaged by corrosive elements such as road de-icing agents and hydrogen sulfide attack.

The facility is a dry well/wet well type facility consisting of two wet well cells and one dry well with four 70 hp submersible dry pit pumps (two constant speed and two variable speed). The electrical room is located above the dry well and accessed via a staircase. Two 750 mm diameter horizontal shafts across River Road provide positive supply and exhaust ventilation to the dry well structure.

According to the 1997 Certificate of Approval, the rated capacity of each pump is 110 L/s at a TDH between 32 m and 35 m. Draw down testing by RVA was completed in 2014 and showed an average pumping rate of 81 L/s. The pumps connect to a common 600 mm diameter PVC DR18 forcemain that discharges to a gravity sewer along Palmer Avenue that can theoretically handle

464 L/s of flow². The current pumps were installed in 1997 and the forcemain was constructed in 2011 to replace the original concrete forcemain.

Flows to the station are conveyed via a 750 mm and a 900 mm diameter reinforced concrete combined sewers. An overflow structure is located upstream of the 750 mm sewer that measures approximately 2.5 m long by 2.5 m wide and 13 m deep. In the event of pump station failure or severe storms where wet well level rises more than 4.63 m above the wet well floor, excess inflows discharge to the adjacent drop shaft directly to the Niagara gorge. Refer to Figure 1 for a plan of existing sewers in the vicinity of the facility.

An exterior drop shaft is located over the barrier wall along River Road that provides direct access to the Niagara gorge and outfall. The shaft is covered by an access hatch and fenced by railing.

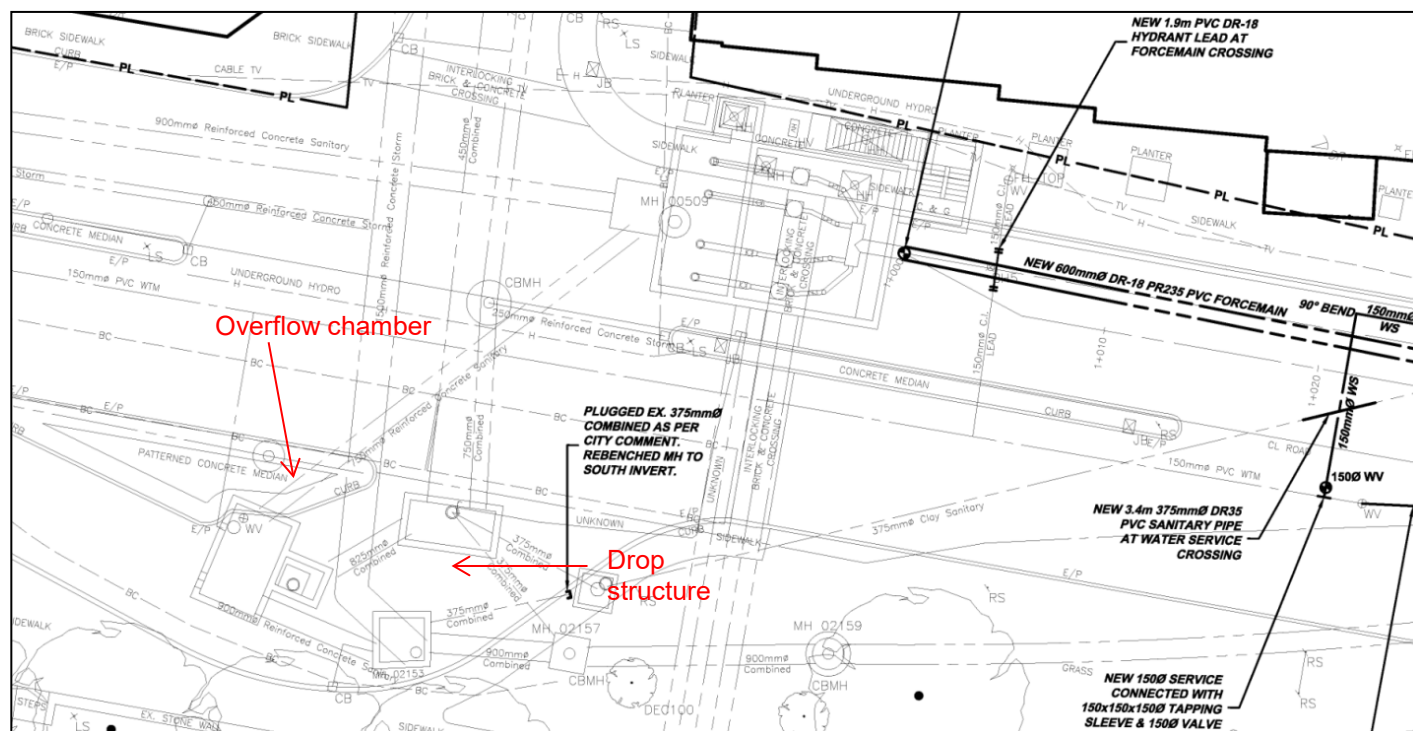


Figure 1 Existing Inlet and Overflow Sewer at Bender Hill SPS

1.2 Objectives of the Investigation

The objectives of inspection and field testing were to:

1. Confirm of current pump capacity via draw down testing.
2. Confirm the hydraulic conductivity of the existing 600 mm forcemain via pressure data logging combined with draw down testing.

² The calculated sewer flow rate considers discharge from the Seneca SPS of approximately 68 L/s, for a total capacity of 532 L/s.

3. Inspect the structural condition of the dry well and wet well.
4. Inspect of the condition of the overflow chamber and drop shaft.

Field inspection was conducted on Wednesday April 4, 2018 by GMBP and PipeFlo Contracting Corporation (PipeFlo) and the team was supported by Niagara Region operations staff.

2. Field Investigations

2.1 Pump Performance and Forcemain Hydraulic Assessment

High resolution data loggers were installed on the discharge side of the four pumps upstream of the check valve (Figure 2). The data loggers recorded instantaneous pressures which were used to calculate wet wells levels when the pumps were off and the pump discharge pressures when the pumps were running. This setup eliminated the need for a separate level logger to record wet well levels.

Different pump combinations were tested to calculate the capacity and heads with different pump combinations (one, two, and three pumps). The differential pressures between running and non-running pumps were used to calculate the pump total dynamic head (TDH) and subsequently the C-factor of the forcemain using the Hazen-Williams equation. The drop in wet well level during the pumping cycles was used to calculate the discharge flowrates. Correction for inlet flows was applied by recording the rate of wet well rise immediately before and after the pumping cycle.



Figure 2 High resolution pressure logger mounted at the pump discharge

2.2 Structural Inspections

CCTV and personnel inspections were completed of the wet well to confirm interior dimensions and record the observed structural condition of the wet well above the water level. Visual inspection was undertaken for the dry well areas including the pump room, staircase, and electrical room. No destructive testing was completed as part of the assessment.

2.3 Sewer Inspections

Both CCTV and personnel inspections were completed for the overflow manhole from which the 750 mm inlet gravity sewer to the wet well flows. However, it was not possible to CCTV the inlet 750 mm gravity sewer pipe due to high water level and debris present. The CCTV camera was lowered to the overflow drop structure to approximately 14.7 m below grade level. Further inspection was not completed due to access limitation. CCTV inspection was also completed for the forcemain discharge manhole along Palmer Avenue (SMH_00355). Approximately 95.0 m of 675 mm diameter gravity sewer (SGM_02903) was inspected up to the next buried manhole (SMH_00356). Inspection reports and photographs from the sewers including the wet well are provided in **Appendix A**.

3. RESULTS AND DISCUSSIONS

3.1 Pump Capacity Assessment

Figure 3 shows a summary of the measured capacities of the four pumps at Bender Hill SPS compared to the results of the draw down testing completed in 2014 by RVA and the certified pump capacities. The results show that the pumps are performing below their original performance at an average of 87 L/s compared to the original capacity of 114 L/s, or approximately 24% less than the stated pump capacity values. The reason for the drop in capacity may include the degradation of the impeller diameter over years of operation.

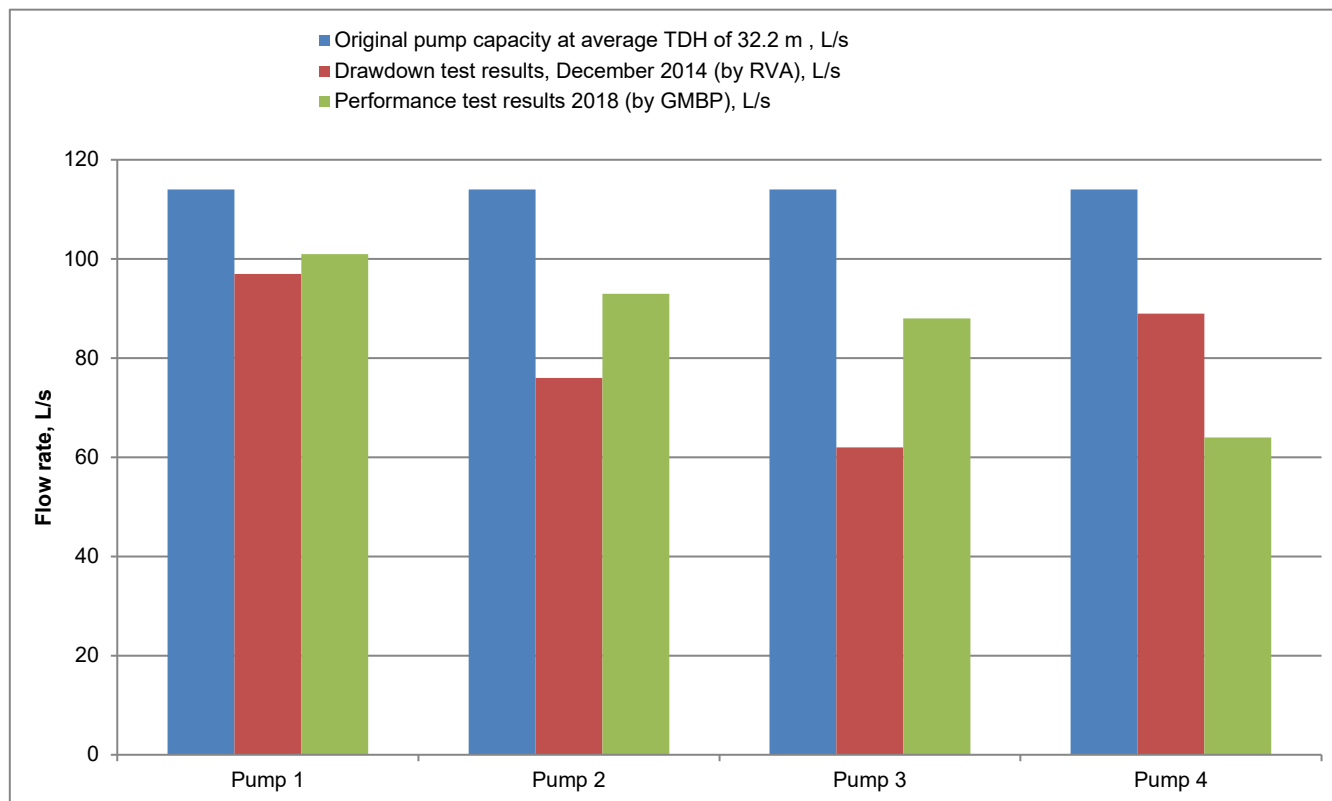


Figure 3 Summary of Pump Rated Capacities

3.2 Forcemain Hydraulic Conductivity

Figure 4 show the system curves for one, two, and three pump operations against the original pump curves. Individual data points for different pump combinations are also shown. The system curves were developed using a common C-factor value that covers most operating points. The results show an average C-factor of 150 in the 600 mm diameter forcemain which is considered excellent given the age and forcemain material.

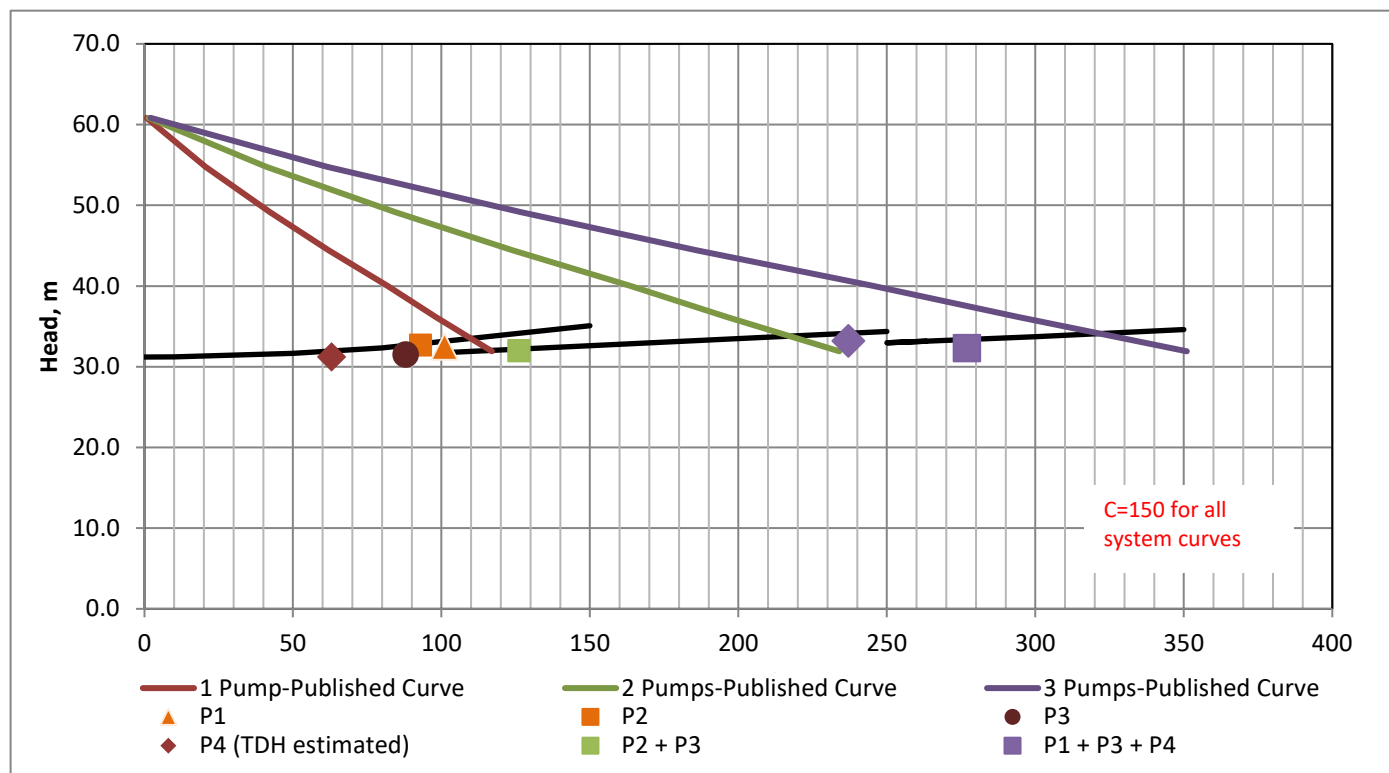


Figure 4 System Curves based on Field Testing against Original Pump Curves

Theoretical Expansion Capacity

Based on the maximum capacity of the downstream sewer, the capacity of the Bender Hill SPS can be upgraded to a maximum rate of 464 L/s using the existing 600 mm forcemain and installing new 130 hp submersible pumps, subject to assessment of the existing electrical infrastructure.

Table 1 Potential Expansion Capacity of the Bender Hill SPS using Existing Forcemain

Parameter	Existing Station	Theoretical Expansion
Maximum Flow (L/s)	263 (average measured)	464
Head (m)	32.9	37.1
Total Power Draw (hp)	195	387
Forcemain Velocity (m/s)	1.0	1.7
Using 3 pumps combination, each motor is rated for (hp)	70	130

3.3 Inlet Flow to Wet Well

High inflows were observed in the wet well at the time of inspection. As shown in Figure 5, the cascading flows into the wet well pool below causes release of hydrogen sulfide which contributes to the deterioration of the wet well structure, as well as air entrainment which gets carried into the pumps. One option to address this issue is to raise the average wet well level above the invert of the inlet sewer to slow down flow velocities prior to reaching the wet well. A permanent solution requires structural reconfiguration of the wet well structure.



Figure 5 Observed flows at the inlet to the Bender Hill SPS wet well on April 4, 2018

3.4 Structural Assessment

3.4.1 Wet Well

CCTV and personnel inspections were completed of the wet well to confirm interior dimensions and record the observed structural condition of the wet well above the water level. No destructive testing was completed as part of the assessment. The following are key findings:

- Concrete wall surfaces above the grating exhibited intermediate to severe signs of deterioration.
- The underside of the roof appeared to be in good condition.
- Exposed concrete aggregate and reinforcement was observed.
- Steel framing, ladder rungs, and platform exhibited signs of corrosion.

Concrete and steel deterioration is believed to have occurred due to the aggressive nature of hydrogen sulfide corrosion.

The application of cementitious coating on the wet well wall surfaces would offer protection from further degradation. The advantage of cementitious coating over epoxy coating is that it can be

applied under humid conditions whereas epoxy coating requires strict temperature and humidity control, which is impossible to achieve in a live wet well cell. However, cementitious coating does not offer a permanent solution as it needs to be reapplied every five years.

It is recommended to replace the existing steel platforms and ladders with a corrosion-resistant material such as fibre-reinforced plastic (FRP) or Type 316L stainless steel.

3.4.2 Dry Well

Visual inspection was undertaken for the dry well areas including the pump room, staircase, and electrical room. No destructive testing was completed as part of the assessment. The following are key findings:

- Severe cracks, honeycombing, and signs of failed polyurethane injections were observed in the dry well, particularly at the interface between the original structure and the new dry well staircase structure.
- Active leaks were observed around the access hatch to the electrical room, located immediately below River Road.
- There were signs of non-active leaks as evidenced by calcium carbonate build-up at different areas in the dry well including the electrical room. The staircase was found to be in good shape, although additional supports are recommended to provide rigidity.

Core samples are recommended to be obtained from select areas within the dry well structure to confirm the structural integrity of reinforced concrete walls.

Selection of repair methodology for the roof structure depends on the timing and traffic control restrictions along River Road. Surface level repair of the roof structure is preferable over repairs below grade level.

The location of the structure under the road and continued exposure to de-icing salts will continue to pose a challenge to the long-term durability of the structure.



Figure 6 Honeycombing and exposed rebar at the interface between the original and new dry well structures (looking up, outside electrical room door)



Figure 7 Signs of cracks and failed polyurethane injections at the interface between the original and new dry well structures (dry well lower level, looking towards the staircase, photo rotated 90 degrees counterclockwise)

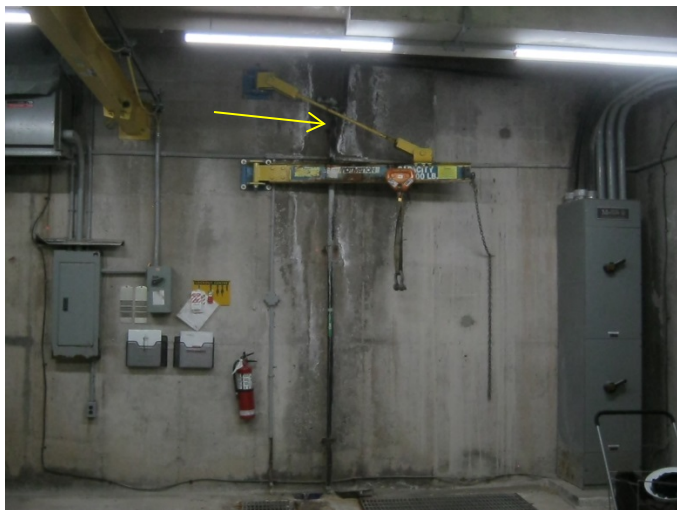


Figure 8 Active leaks observed under the access hatch in the electrical room



Figure 9 Active leaks observed around the access hatch to the electrical room (looking up)



Figure 10 Signs of non-active leaks observed at the corner wall of the electrical room (photo rotated 90 degrees clockwise)



Figure 11 Existing staircase in the dry well was found to be in good shape. However, additional supports are recommended for the railings.

3.5 Exterior Sewer

3.5.1 Overflow Chamber and Drop Shaft

In general, observed areas inside the overflow chamber and drop shaft were found to be in good condition and no major deterioration was noted. However, the railing around the exterior drop shaft access does not provide adequate safety protection, and the access hatch cover was found to be unsecured which presents a potential safety and security concern. It is recommended to install adequate protective railing around the hatch and provide a means of securing the hatch opening via a pad lock.

3.5.2 Discharge Sewer

In general, the sewer was observed to be in good condition minor fine root intrusion and grease deposits noted at specific locations.



Figure 12 Unsecured access hatch and inadequate railing around the exterior drop shaft to the Niagara gorge



Figure 13 A view from the top of the drop shaft showing the outfall to the Niagara gorge



Figure 14 Setup of the CCTV rover at the discharge sewer along Palmer Avenue



Figure 15 CCTV rover being launched at the discharge manhole of the 600 mm forcemain

4. CONCLUSION

In conclusion this report outlines the findings from field investigations conducted at the Bender Hill SPS and associated inlet and discharge sewers on April 4th, 2018. Key findings include:

1. A measured average pump capacity of 87 L/s, representing a 24% drop in capacity from the original certified values.
2. Significant deterioration within the wet well likely due to hydrogen sulfide corrosion.
3. Moderate to severe deterioration within the dry well structure due to road de-icing salts and cracks developing at the interface between the original and new wet well structures.
4. Surrounding infrastructure (discharge sewers, overflow chamber, and drop structure) were found to be in fair condition with highlighted safety concerns around the exterior drop shaft access.

Upon review of these observations GM BluePlan has provided some interim remedial works to address the deterioration. However, as this assessment is being completed under the Municipal Class EA project for Bender Hill SPS, key considerations/rehabilitation works will be detailed within the short list of alternative options for the rehabilitation, replacement or relocation of the station.

APPENDIX A: PIPEFLO REPORTS

Appendix A1 - Wet Well Inspection



PIPEFLO CONTRACTING CORP.

111 FRID STREET

HAMILTON, ONTARIO L8P 4M3

TOLL-FREE: 1-866-711-4567, TELEPHONE: 905-572-7767, FAX: 905-572-7768

Surveyors name PIPEFLOSC	Certificate Number U-511-12735	System Owner GM BLUEPLAN ENGINEERING LTD.	Survey Customer GM BLUEPLAN ENGINEERING LTD	Drainage Area	Sheet 1
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P/O No. 617108 BENDER H	Pipeline Segment Reference 1	Date 20180404	Time 08:19	Location (Street Name and number) 5615 RIVER RD.	Locality NIAGARA FALLS ONT.
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Further Location details 2615 RIVER RD.	Upstream Manhole Number WET WELL	Rim to Invert 5.1	Grade to Invert	Rim to Grade
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Downstream Manhole Number WET WELL	Rim to Invert 5.1	Grade to Invert	Rim to Grade	Use of Sewer Sanitary	Direction Downstream	Flow Control	Height 4
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Width 7	Shape Square	Material RCP	Ln. Method	Pipe Joint Length	Total Length 5.1	Length Surveyed 5.3	Year Laid	Year Rehabilitated	Tape / Media Number 1
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Purpose F	Sewer Category	Pre-Cleaning Not Known	Cleaned	Weather Light Rain	Additional Information CCTV FROM TOP OF WET WELL DOWN INSPECTING ALL AREAS OF WET WELL AND PIPES COMING IN. CHAMBE R
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Distance (Meters)	Code		Continuous defect	Value			Joint	Circumferential Location		Image Ref.	Struct. Grade	O&M Grade	Remarks	
	Group/ Descriptor	Modifier/ severity		S/M/L	Inches			%	At / From					To
					1st	2nd								
0.0	AMH									AMH@0			Starting Manhole: WET WELL IS 7M X 3.5M IN SIZE	
0.0	MWL					25				MWL@0				
0.6	DA	GS				5		6	6	DAGS@0.6		2	COVERING MOST OF LOWER CHAMBER WEST WALL IN GOOD SHAPE DOOR WAY TO EMERGENCY EXIT DOING H2S TEST	
4.0	MGO									MGO@4				
4.0	SRV							1	4	SRV@4	5		NORTH WALL	
4.0	MGO									MGO@4_1			NORTH WALL H2S TEST NO H2S ATTACK	
4.0	MGO									MGO@4_2			CEILING OF WET WELL VERY GOOD CONDITIN NO SIGNS OF H2S ATTACK	
4.0	MGO									MGO@4_3			FLOOR GRATEING IS GREASE SPLATTERED AND SHOWING SIGNS OF RUSTING	
5.0	MGO									MGO@5			SOUTH WALL ROTTEN RUNGS BROKEN NO H2S ATTACK ON SOUTH WALL REBAR AT BOTTOM BY FLOOR GRATING	
5.1	SAV							9	10	SAV@5.1	3		NORTH WALL	
5.1	SRI							8	11	SRI@5.1	1		WEST WALL ABOVE DOOR	
5.1	SRV							2	5	SRV@5.1	5		IN DOOR WAY	
5.1	MGO									MGO@5.1			STEEL FRAMING FOR VALVE WHEELS AND SAFTEY RAILING CORRODED	
5.1	TB					100		11		TB@5.1				
5.1	SAV							8	11	SAV@5.1	1	3	AROUND REBAR ON NORTH WALL	
5.1	SRV							4		SRV@5.1	1	5	EAST WALL	
5.1	SRI							5	8	SRI@5.1	1	1		



PIPEFLO CONTRACTING CORP.

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Surveyors name PIPEFLOSC	Certificate Number U-511-12735	System Owner GM BLUEPLAN ENGINEERING LTD.	Survey Customer GM BLUEPLAN ENGINEERING LTD	Drainage Area 	Sheet 2
------------------------------------	--	---	---	--------------------------	-------------------

P/O No. 617108 BENDER H	Pipeline Segment Reference 1	Date 20180404	Time 08:19	Location (Street Name and number) 5615 RIVER RD.	Locality NIAGARA FALLS ONT.
--------------------------------------	--	-------------------------	----------------------	--	---------------------------------------

Further Location details 2615 RIVER RD.	Upstream Manhole Number WET WELL	Rim to Invert 5.1	Grade to Invert 	Rim to Grade
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Downstream Manhole Number WET WELL	Rim to Invert 5.1	Grade to Invert 	Rim to Grade 	Use of Sewer Sanitary	Direction Downstream	Flow Control 	Height 4
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Width 7	Shape Square	Material RCP	Ln. Method 	Pipe Joint Length 	Total Length 5.1	Length Surveyed 5.3	Year Laid 	Year Rehabilitated 	Tape / Media Number 1
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Purpose F	Sewer Category 	Pre-Cleaning Not Known	Cleaned 	Weather Light Rain	Additional Information CCTV FROM TOP OF WET WELL DOWN INSPECTING ALL AREAS OF WET WELL AND PIPES COMING IN. CHAMBE R
---------------------	---------------------------	----------------------------------	--------------------	------------------------------	--

Distance (Meters)	Code		Continuous defect	Value			Joint	Circumferential Location		Image Ref.	Struct. Grade	O&M Grade	Remarks	
	Group/ Descriptor	Modifier/ severity		S/M/L	Inches			%	At / From					To
					1st	2nd								
5.1	MGO									MGO@5.1_1			EAST WALL H2S TEST OK	
5.3	SRV							11	1	SRV@5.3	5		IN CROSS SUPPORT BEAM	
5.3	AMH									AMH@5.3			WET WEL	

Segment	Structural								O & M								Overall							
	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Rating	Quick	Index	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Rating	Quick	Index	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Rating	Quick	Index
20180404-WET WELL-WET WELL	2	0	6	0	20	28	5432	3.5	0	2	0	0	0	2	2100	2.0	2	2	6	0	20	30	5432	3.3

Upstream MH	Downstream MH	Size	Material	Total Length	City
WET WELL	WET WELL	4	Reinforced Concrete Pipe	5.1	NIAGARA FALLS ONT.

Surveyor's Name	Certificate Number	Street Address	Location Details
PIPEFLOSC	U-511-12735	5615 RIVER RD.	2615 RIVER RD.

Direction	Purpose	Weather	Date	Time	Length Surveyed
Downstream	Routine Assessment	Light Rain	20180404	08:19	5.3

Additional Information

CCTV FROM TOP OF WET WELL DOWN INSPECTING ALL AREAS OF WET WELL AND PIPES COMING IN. CHAMBE R

	Ftg.	Code	Description	Pct.	Position	Cont.	Comment
	0.0	AMH	Access Point - Manhole				Starting Manhole: WET WELL IS 7M X 3.5M IN SIZE
	0.0	MWL	Water Level	25			
	0.6	DAGS	Deposits Attached: Grease	5	6 to 6		COVERING MOST OF LOWER CHAMBER
	4.0	MGO	General Observation				WEST WALL IN GOOD SHAPE DOOR WAY TO EMERGENCY EXIT DOING H2S TEST
	4.0	SRV	Surface: Reinforcement Visible		1 to 4		NORTH WALL
	4.0	MGO	General Observation				NORTH WALL H2S TEST NO H2S ATTACK
	4.0	MGO	General Observation				CEILING OF WET WELL VERY GOOD
	4.0	MGO	General Observation				CONDITIN NO SIGNS OF H2S ATTACK
	4.0	MGO	General Observation				FLOOR GRATEING IS GREASE SPLATTERED AND SHOWING SIGNS OF RUSTING
	5.0	MGO	General Observation				SOUTH WALL ROTTEN RUNGS
	5.1	SAV	Surface: Aggregate Visible		9 to 10		BROKEN NO H2S ATTACK ON SOUTH WALL REBAR AT BOTTOM BY FLOOR GRATING
	5.1	SRI	Surface: Roughness Increased		8 to 11		NORTH WALL
							WEST WALL ABOVE DOOR



PIPEFLO CONTRACTING CORP.

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Upstream MH	Downstream MH	Size	Material	Total Length	City
WET WELL	WET WELL	4	Reinforced Concrete Pipe	5.1	NIAGARA FALLS ONT.

Surveyor's Name	Certificate Number	Street Address	Location Details
PIPEFLOSC	U-511-12735	5615 RIVER RD.	2615 RIVER RD.

Direction	Purpose	Weather	Date	Time	Length Surveyed
Downstream	Routine Assessment	Light Rain	20180404	08:19	5.3

Additional Information

CCTV FROM TOP OF WET WELL DOWN INSPECTING ALL AREAS OF WET WELL AND PIPES COMING IN. CHAMBE R

Ftg.	Code	Description	Pct.	Position	Cont.	Comment
	5.1	SRV	Surface: Reinforcement Visible	2 to 5		IN DOOR WAY
	5.1	MGO	General Observation			STEEL FRAMING FOR VALVE WHEELS AND SAFTEY RAILING CORRODED
	5.1	TB	Tap, Break-in / Hammer	11		
	5.1	SAV	Surface: Aggregate Visible	8 to 11		AROUND REBAR ON NORTH WALL
	5.1	SRV	Surface: Reinforcement Visible	4		EAST WALL

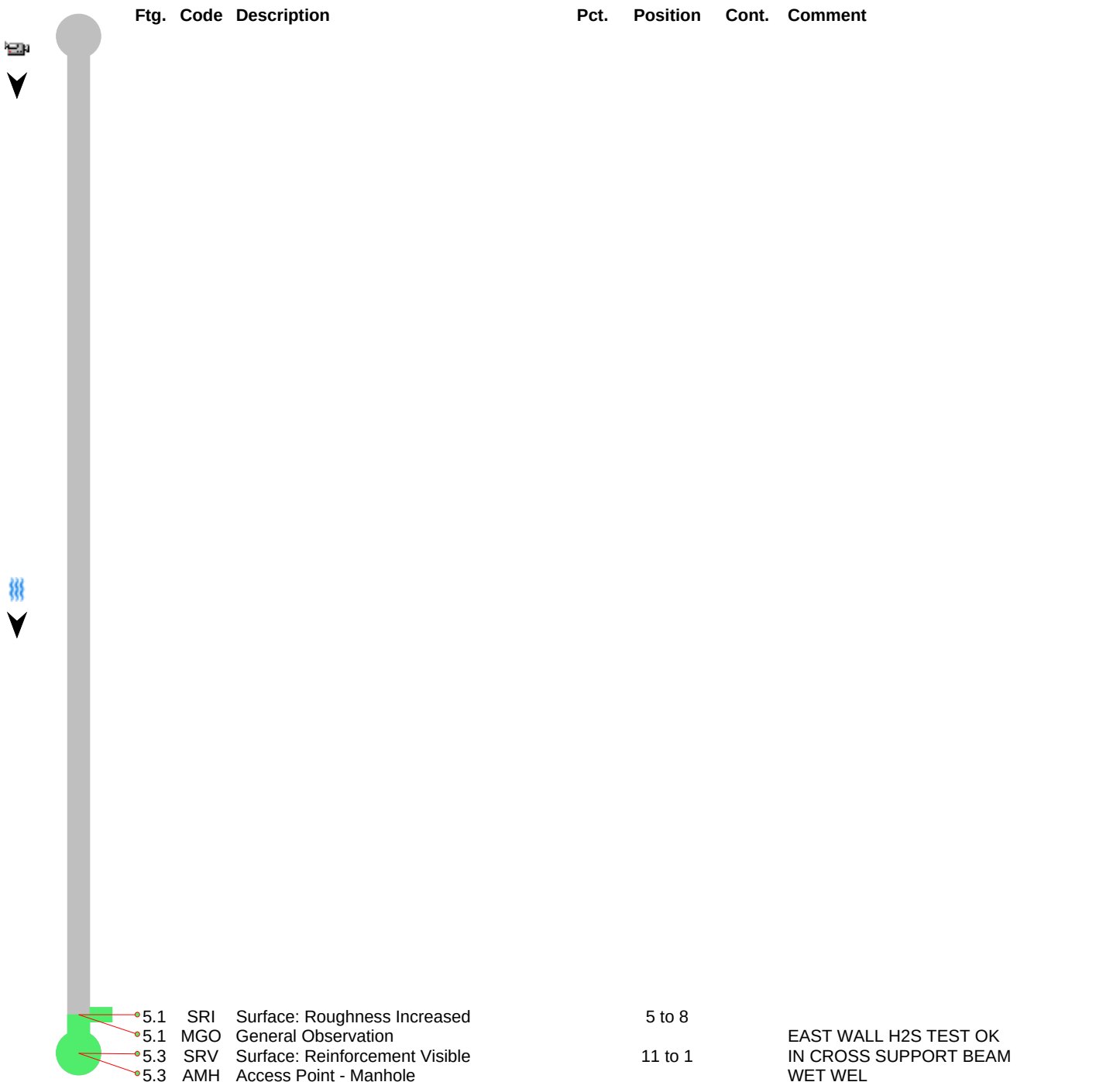
**PIPEFLO CONTRACTING CORP.**

111 FRID STREET

HAMILTON, ONTARIO L8P 4M3

TOLL-FREE: 1-866-711-4567, TELEPHONE: 905-572-7767, FAX: 905-572-7768

Upstream MH WET WELL	Downstream MH WET WELL	Size 4	Material Reinforced Concrete Pipe	Total Length 5.1	City NIAGARA FALLS ONT.
Surveyor's Name PIPEFLOSC	Certificate Number U-511-12735	Street Address 5615 RIVER RD.	Location Details 2615 RIVER RD.		
Direction Downstream	Purpose Routine Assessment	Weather Light Rain	Date 20180404	Time 08:19	Length Surveyed 5.3
Additional Information CCTV FROM TOP OF WET WELL DOWN INSPECTING ALL AREAS OF WET WELL AND PIPES COMING IN. CHAMBE R					



Upstream MH WET WELL	Downstream MH WET WELL	Size 4	Material Reinforced Concrete Pipe	Total Length 5.1	City NIAGARA FALLS ONT.
Surveyor's Name PIPEFLOSC	Certificate Number U-511-12735	Street Address 5615 RIVER RD.	Location Details 2615 RIVER RD.		
Direction Downstream	Purpose Routine Assessment	Weather Light Rain	Date 20180404	Time 08:19	Length Surveyed 5.3
Additional Information CCTV FROM TOP OF WET WELL DOWN INSPECTING ALL AREAS OF WET WELL AND PIPES COMING IN. CHAMBE R					



AMH - Access Point - Manhole @ 0.0 m.
Starting Manhole: WET WELL IS 7M X 3.5M IN SIZE



MWL - Water Level @ 0.0 m.

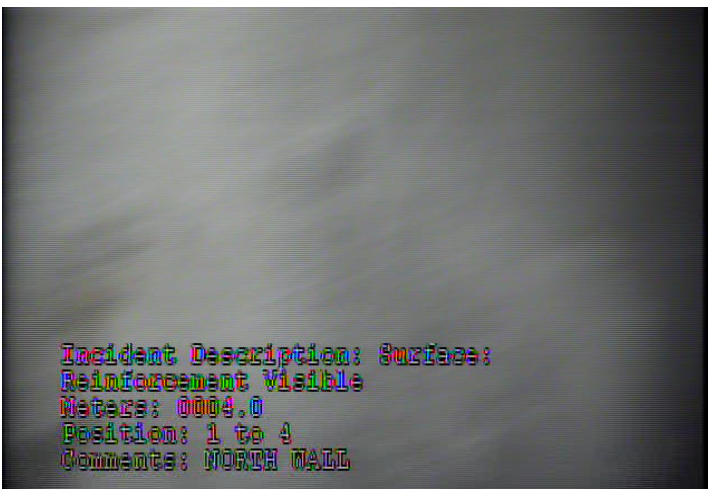


DAGS - Deposits Attached: Grease @ 0.6 m. COVERING MOST OF LOWER CHAMBER



MGO - General Observation @ 4.0 m.
WEST WALL IN GOOD SHAPE DOOR WAY TO EMERGENCY EXIT DOING H2S TEST

Upstream MH WET WELL	Downstream MH WET WELL	Size 4	Material Reinforced Concrete Pipe	Total Length 5.1	City NIAGARA FALLS ONT.
Surveyor's Name PIPEFLOSC	Certificate Number U-511-12735	Street Address 5615 RIVER RD.	Location Details 2615 RIVER RD.		
Direction Downstream	Purpose Routine Assessment	Weather Light Rain	Date 20180404	Time 08:19	Length Surveyed 5.3
Additional Information CCTV FROM TOP OF WET WELL DOWN INSPECTING ALL AREAS OF WET WELL AND PIPES COMING IN. CHAMBE R					



SRV - Surface: Reinforcement Visible @ 4.0 m. NORTH WALL



MGO - General Observation @ 4.0 m. NORTH WALL H2S TEST NO H2S ATTACK



MGO - General Observation @ 4.0 m. CEILING OF WET WELL VERY GOOD CONDITIN NO SIGNS OF H2S ATTACK



MGO - General Observation @ 4.0 m. FLOOR GRATEING IS GREASE SPLATTERED AND SHOWING SIGNS OF RUSTING

Upstream MH WET WELL	Downstream MH WET WELL	Size 4	Material Reinforced Concrete Pipe	Total Length 5.1	City NIAGARA FALLS ONT.
Surveyor's Name PIPEFLOSC	Certificate Number U-511-12735	Street Address 5615 RIVER RD.		Location Details 2615 RIVER RD.	
Direction Downstream	Purpose Routine Assessment	Weather Light Rain	Date 20180404	Time 08:19	Length Surveyed 5.3
Additional Information CCTV FROM TOP OF WET WELL DOWN INSPECTING ALL AREAS OF WET WELL AND PIPES COMING IN. CHAMBE R					



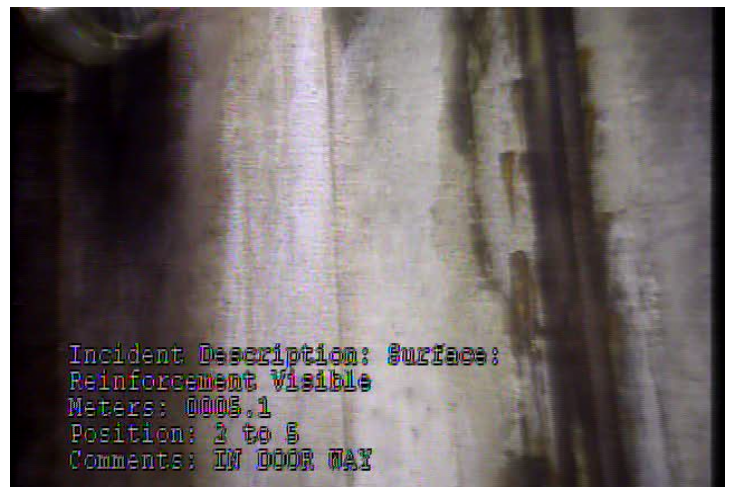
MGO - General Observation @ 5.0 m.
SOUTH WALL ROTTEN RUNGS
BROKEN NO H2S ATTACK ON SOUTH
WALL REBAR AT BOTTOM BY FLOOR
GRATING



SAV - Surface: Aggregate Visible @ 5.1 m.
NORTH WALL

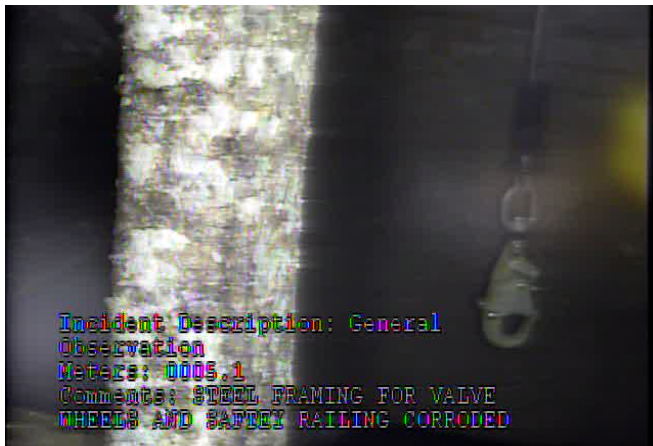


SRI - Surface: Roughness Increased @ 5.1 m. WEST WALL ABOVE DOOR



SRV - Surface: Reinforcement Visible @ 5.1 m. IN DOOR WAY

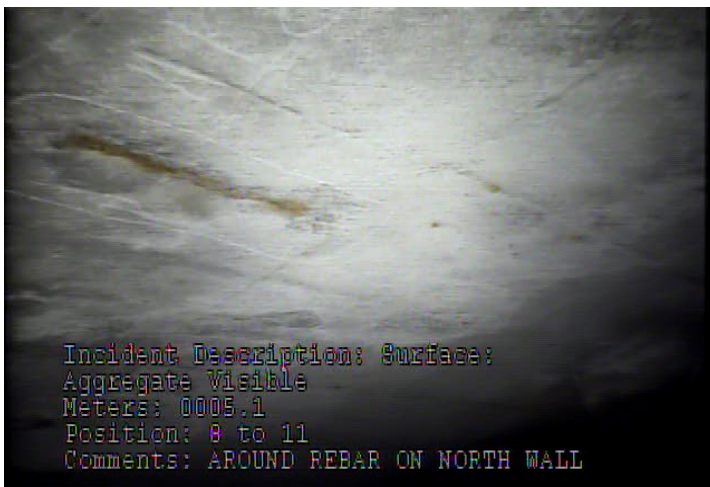
Upstream MH WET WELL	Downstream MH WET WELL	Size 4	Material Reinforced Concrete Pipe	Total Length 5.1	City NIAGARA FALLS ONT.
Surveyor's Name PIPEFLOSC	Certificate Number U-511-12735	Street Address 5615 RIVER RD.		Location Details 2615 RIVER RD.	
Direction Downstream	Purpose Routine Assessment	Weather Light Rain	Date 20180404	Time 08:19	Length Surveyed 5.3
Additional Information CCTV FROM TOP OF WET WELL DOWN INSPECTING ALL AREAS OF WET WELL AND PIPES COMING IN. CHAMBE R					



MGO - General Observation @ 5.1 m.
STEEL FRAMING FOR VALVE WHEELS
AND SAFETY RAILING CORRODED



TB - Tap, Break-in / Hammer @ 5.1 m.



SAV - Surface: Aggregate Visible @ 5.1 m.
AROUND REBAR ON NORTH WALL



SRV - Surface: Reinforcement Visible @
5.1 m. EAST WALL

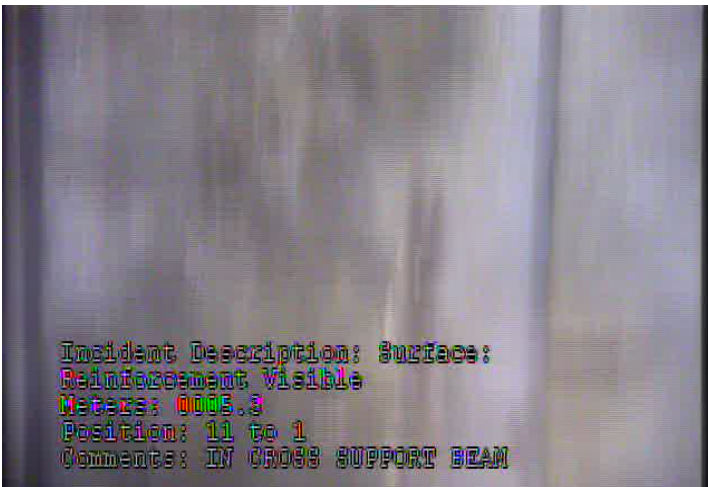
Upstream MH WET WELL	Downstream MH WET WELL	Size 4	Material Reinforced Concrete Pipe	Total Length 5.1	City NIAGARA FALLS ONT.
Surveyor's Name PIPEFLOSC	Certificate Number U-511-12735	Street Address 5615 RIVER RD.	Location Details 2615 RIVER RD.		
Direction Downstream	Purpose Routine Assessment	Weather Light Rain	Date 20180404	Time 08:19	Length Surveyed 5.3
Additional Information CCTV FROM TOP OF WET WELL DOWN INSPECTING ALL AREAS OF WET WELL AND PIPES COMING IN. CHAMBE R					



SRI - Surface: Roughness Increased @ 5.1 m.



MGO - General Observation @ 5.1 m.
EAST WALL H2S TEST OK



SRV - Surface: Reinforcement Visible @ 5.3 m. IN CROSS SUPPORT BEAM



AMH - Access Point - Manhole @ 5.3 m.
WET WELL

Appendix A2 - Gravity Sewer to Wet Well Inspection



PIPEFLO CONTRACTING CORP.

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HAMILTON, ONTARIO L8P 4M3

TOLL-FREE: 1-866-711-4567, TELEPHONE: 905-572-7767, FAX: 905-572-7768

Surveyors name PIPEFLOSC	Certificate Number U-511-12735	System Owner GM BLUEPLAN ENGINEERING LTD.	Survey Customer GM BLUEPLAN ENGINEERING LTD	Drainage Area	Sheet 1
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P/O No. 617108 BENDER H	Pipeline Segment Reference B	Date 20180404	Time 09:57	Location (Street Name and number) 5615 RIVER RD.	Locality NIAGARA FALLS ONT.
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Further Location details 2615 RIVER RD.	Upstream Manhole Number GRAVITY SEWER	Rim to Invert 4.7	Grade to Invert	Rim to Grade
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Downstream Manhole Number WET WELL	Rim to Invert 5.1	Grade to Invert	Rim to Grade	Use of Sewer Sanitary	Direction Downstream	Flow Control	Height 750
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Width	Shape Circular	Material RCP	Ln. Method	Pipe Joint Length	Total Length 30	Length Surveyed 0	Year Laid	Year Rehabilitated	Tape / Media Number B
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Purpose F	Sewer Category	Pre-Cleaning Not Known	Cleaned	Weather Light Rain	Additional Information CCTV FROM 750MM GRAVITY SEWER TO WET WELL CHAMBER
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Distance (Meters)	Code		Continuous defect	Value			Joint	Circumferential Location		Image Ref.	Struct. Grade	O&M Grade	Remarks	
	Group/ Descriptor	Modifier/ severity		S/M/L	Inches			%	At / From					To
					1st	2nd								
0.0	AMH									AMH@0			Starting Manhole: GRAVITY SEWER	
0.0	MWL					60				MWL@0				
0.0	DS	GV				40		4	8	DSGV@0		5		
0.0	DS	GV				40		4	8	DSGV@0_1		5		
0.0	MSA									MSA@0			TOO MUCH DEBRIS TO GET INTO PIPE	

Segment	Structural								O & M								Overall							
	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Rating	Quick	Index	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Rating	Quick	Index	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Rating	Quick	Index
20180404-GRAVITY SEWER-WET WELL	0	0	0	0	0	0	0000		0	0	0	0	10	10	5200	5.0	0	0	0	0	10	10	5200	5.0

**PIPEFLO CONTRACTING CORP.**

111 FRID STREET

HAMILTON, ONTARIO L8P 4M3

TOLL-FREE: 1-866-711-4567, TELEPHONE: 905-572-7767, FAX: 905-572-7768

Upstream MH	Downstream MH	Size	Material	Total Length	City
GRAVITY SEWER	WET WELL	750	Reinforced Concrete Pipe	30	NIAGARA FALLS ONT.

Surveyor's Name	Certificate Number	Street Address	Location Details
PIPEFLOSC	U-511-12735	5615 RIVER RD.	2615 RIVER RD.

Direction	Purpose	Weather	Date	Time	Length Surveyed
Downstream	Routine Assessment	Light Rain	20180404	09:57	0

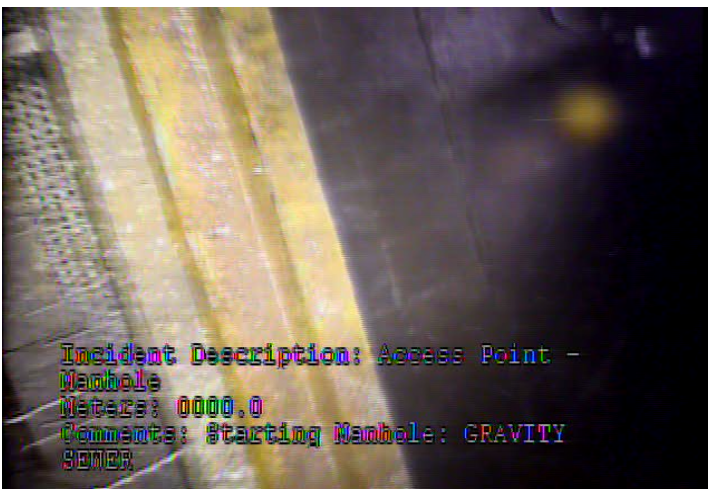
Additional Information

CCTV FROM 750MM GRAVITY SEWER TO WET WELL CHAMBER

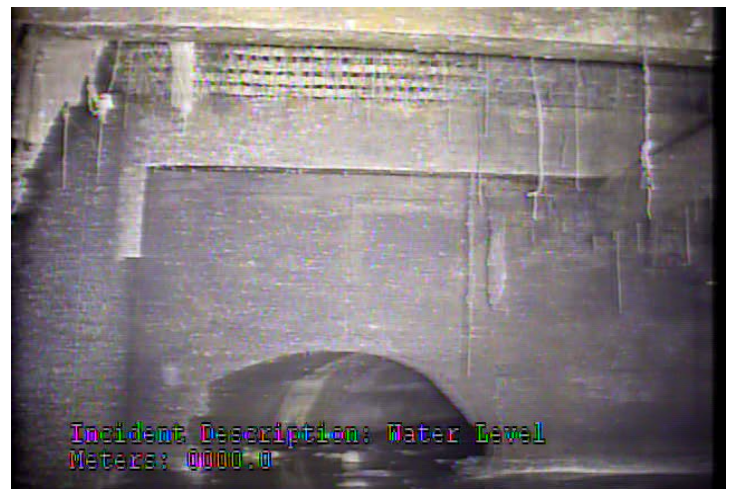
	Ftg.	Code	Description	Pct.	Position	Cont.	Comment
	0.0	AMH	Access Point - Manhole				Starting Manhole: GRAVITY SEWER
	0.0	MWL	Water Level	60			
	0.0	DSGV	Deposits Settled: Gravel	40	4 to 8		
	0.0	DSGV	Deposits Settled: Gravel	40	4 to 8		
	0.0	MSA	Survey Abandoned				TOO MUCH DEBRIS TO GET INTO PIPE



Upstream MH GRAVITY SEWER	Downstream MH WET WELL	Size 750	Material Reinforced Concrete Pipe	Total Length 30	City NIAGARA FALLS ONT.
Surveyor's Name PIPEFLOSC	Certificate Number U-511-12735	Street Address 5615 RIVER RD.	Location Details 2615 RIVER RD.		
Direction Downstream	Purpose Routine Assessment	Weather Light Rain	Date 20180404	Time 09:57	Length Surveyed 0
Additional Information CCTV FROM 750MM GRAVITY SEWER TO WET WELL CHAMBER					



AMH - Access Point - Manhole @ 0.0 m.
Starting Manhole: GRAVITY SEWER



MWL - Water Level @ 0.0 m.

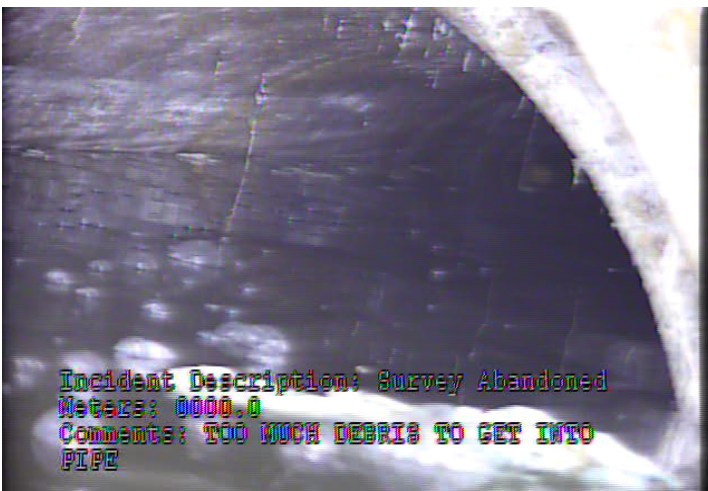


DSGV - Deposits Settled: Gravel @ 0.0 m.



DSGV - Deposits Settled: Gravel @ 0.0 m.

Upstream MH GRAVITY SEWER	Downstream MH WET WELL	Size 750	Material Reinforced Concrete Pipe	Total Length 30	City NIAGARA FALLS ONT.
Surveyor's Name PIPEFLOSC	Certificate Number U-511-12735	Street Address 5615 RIVER RD.		Location Details 2615 RIVER RD.	
Direction Downstream	Purpose Routine Assessment	Weather Light Rain	Date 20180404	Time 09:57	Length Surveyed 0
Additional Information CCTV FROM 750MM GRAVITY SEWER TO WET WELL CHAMBER					



MSA - Survey Abandoned @ 0.0 m. TOO MUCH DEBRIS TO GET INTO PIPE

Appendix A3 - Over Flow / Drop Structure Inspection



PIPEFLO CONTRACTING CORP.

111 FRID STREET

HAMILTON, ONTARIO L8P 4M3

TOLL-FREE: 1-866-711-4567, TELEPHONE: 905-572-7767, FAX: 905-572-7768

Surveyors name PIPEFLOSC	Certificate Number U-511-12735	System Owner GM BLUEPLAN ENGINEERING LTD.	Survey Customer GM BLUEPLAN ENGINEERING LTD.	Drainage Area	Sheet 1
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P/O No. 617108 BENDER H	Pipeline Segment Reference C	Date 20180404	Time 11:01	Location (Street Name and number) 5615 RIVER RD.	Locality NIAGARA FALLS ONT.
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Further Location details 2615 RIVER RD.	Upstream Manhole Number OVER FLOW (DROP STRUCTURE)	Rim to Invert 50	Grade to Invert	Rim to Grade
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Downstream Manhole Number OVER FLOW (DROP STRUCTURE)	Rim to Invert 50	Grade to Invert	Rim to Grade	Use of Sewer Stormwater	Direction Downstream	Flow Control	Height 3000
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Width 3000	Shape Square	Material RCP	Ln. Method	Pipe Joint Length	Total Length 157	Length Surveyed 14.7	Year Laid	Year Rehabilitated	Tape / Media Number C
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Purpose F	Sewer Category	Pre-Cleaning Not Known	Cleaned	Weather Light Rain	Additional Information CCTV DROP STRUCTURE
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Distance (Meters)	Code		Continuous defect	Value			Joint	Circumferential Location		Image Ref.	Struct. Grade	O&M Grade	Remarks
	Group/ Descriptor	Modifier/ severity		S/M/L	Inches			%	At / From				
					1st	2nd							
0.0	AMH									AMH@0			Starting Manhole: OVER FLOW (DROP STRUCTURE)
0.0	MWL					0				MWL@0			
0.0	TB	A			900			3		TBA@0			
0.0	TB				900			9		TB@0			
0.0	TB	A			1050			12		TBA@0 1			
0.0	MGO									MGO@0			8 METERS FROM GRATE TO BOTTOM OF CHAMBER TOTAL DEPTH IS 13 M ETERS. CHAMBER IS 2.5 M X 2.5 M SQUARE ANOTHER DROP PIPE DROP PIPE
14.7	MGO									MGO@14.7			
14.7	MSA									MSA@14.7			

Segment	Structural									O & M									Overall								
	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Rating	Quick	Index		Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Rating	Quick	Index		Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Rating	Quick	Index	
20180404-OVER FLOW (DROP STRUCTURE)-OVER	0	0	0	0	0	0	0000			0	0	0	0	0	0	0000			0	0	0	0	0	0	0000		

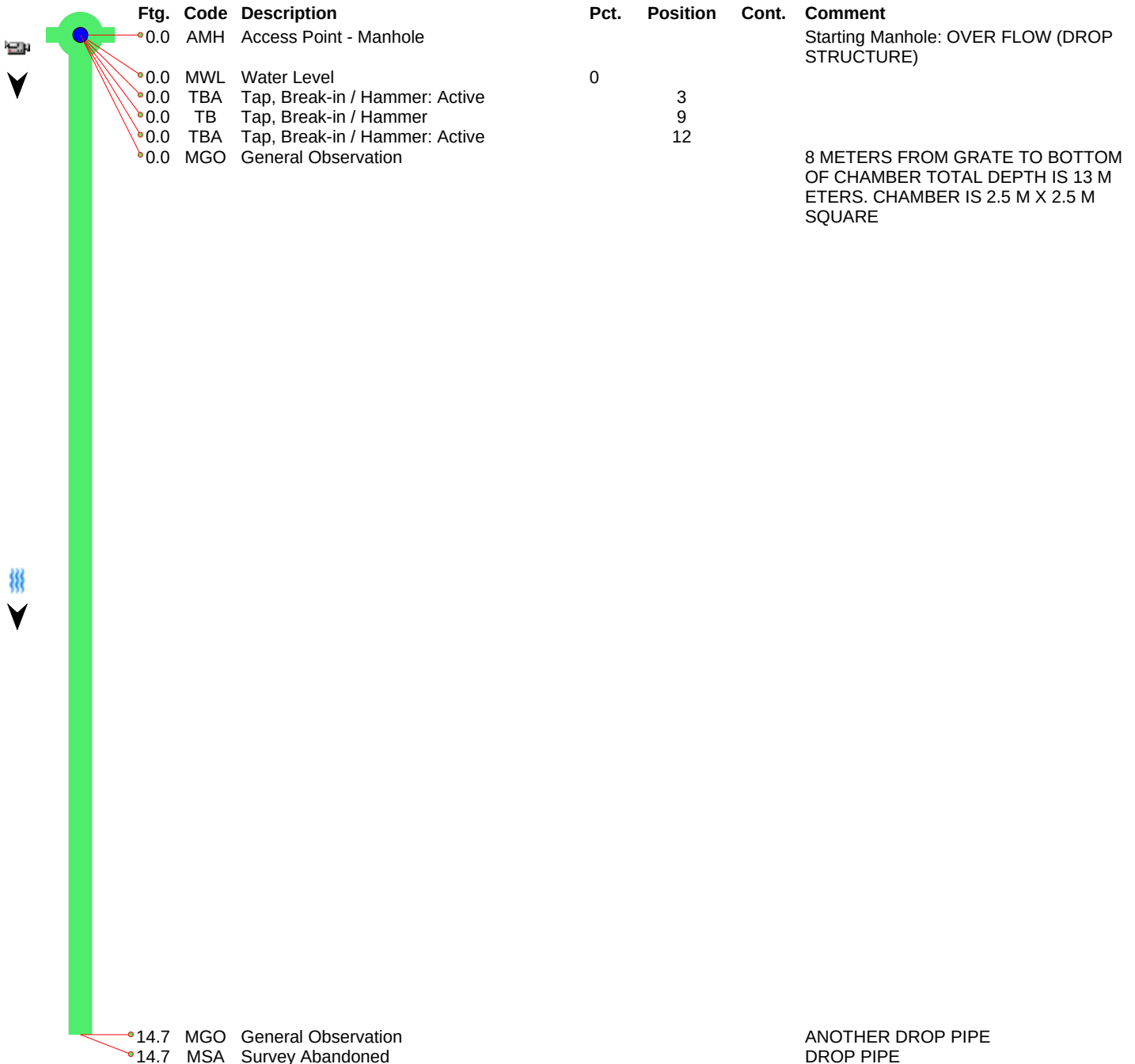
**PIPEFLO CONTRACTING CORP.**

111 FRID STREET

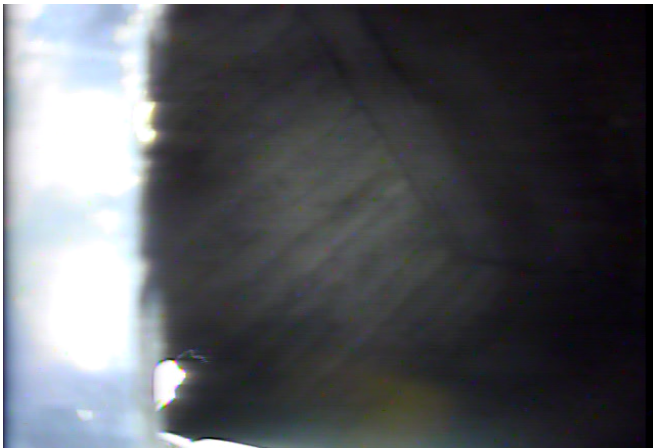
HAMILTON, ONTARIO L8P 4M3

TOLL-FREE: 1-866-711-4567, TELEPHONE: 905-572-7767, FAX: 905-572-7768

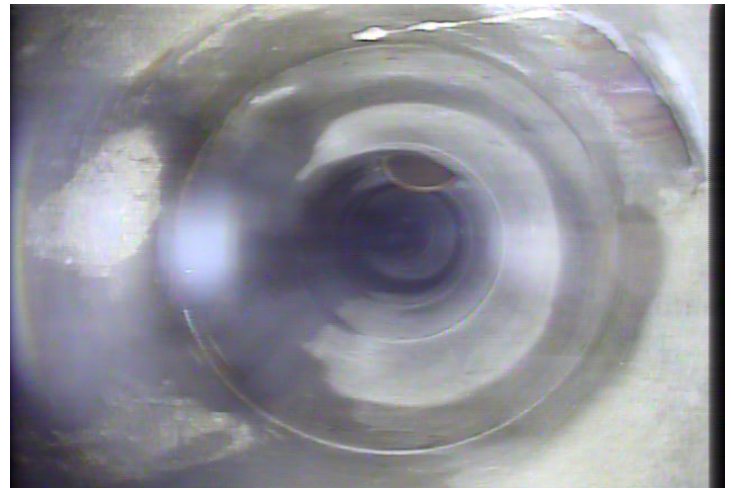
Upstream MH OVER FLOW (DROP STRUCTURE)	Downstream MH OVER FLOW (DROP STRUCTURE)	Size 3000	Material Reinforced Concrete Pipe	Total Length 157	City NIAGARA FALLS ONT.
Surveyor's Name PIPEFLOSC	Certificate Number U-511-12735	Street Address 5615 RIVER RD.	Location Details 2615 RIVER RD.		
Direction Downstream	Purpose Routine Assessment	Weather Light Rain	Date 20180404	Time 11:01	Length Surveyed 14.7
Additional Information CCTV DROP STRUCTURE					



Upstream MH OVER FLOW (DROP STRUCTURE)	Downstream MH OVER FLOW (DROP STRUCTURE)	Size 3000	Material Reinforced Concrete Pipe	Total Length 157	City NIAGARA FALLS ONT.
Surveyor's Name PIPEFLOSC	Certificate Number U-511-12735	Street Address 5615 RIVER RD.	Location Details 2615 RIVER RD.		
Direction Downstream	Purpose Routine Assessment	Weather Light Rain	Date 20180404	Time 11:01	Length Surveyed 14.7
Additional Information CCTV DROP STRUCTURE					



AMH - Access Point - Manhole @ 0.0 m.
Starting Manhole: OVER FLOW (DROP STRUCTURE)



MWL - Water Level @ 0.0 m.

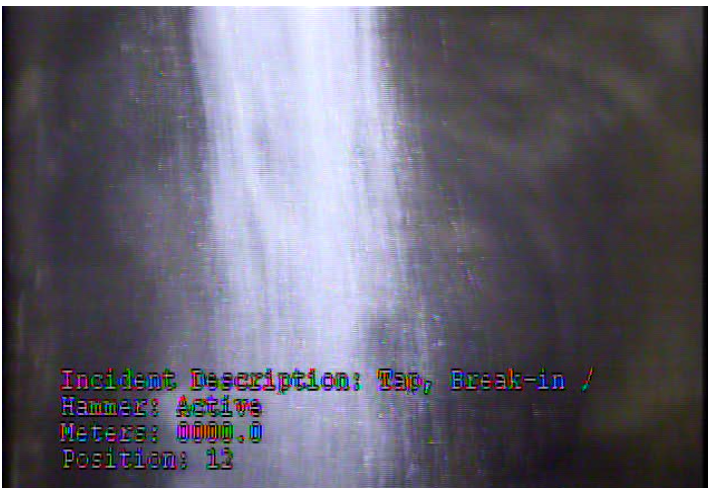


TBA - Tap, Break-in / Hammer: Active @ 0.0 m.

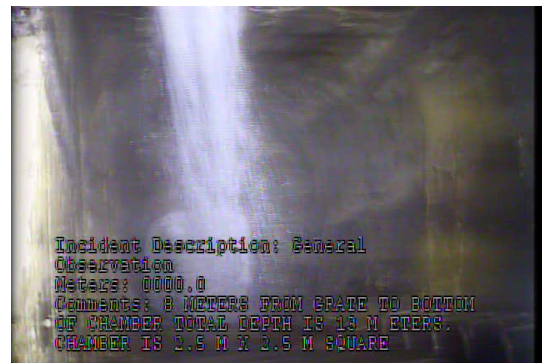


TB - Tap, Break-in / Hammer @ 0.0 m.

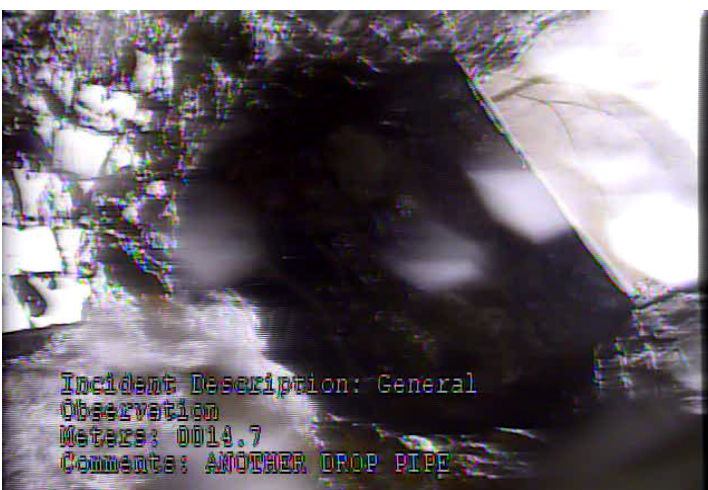
Upstream MH OVER FLOW (DROP STRUCTURE)	Downstream MH OVER FLOW (DROP STRUCTURE)	Size 3000	Material Reinforced Concrete Pipe	Total Length 157	City NIAGARA FALLS ONT.
Surveyor's Name PIPEFLOSC	Certificate Number U-511-12735	Street Address 5615 RIVER RD.	Location Details 2615 RIVER RD.		
Direction Downstream	Purpose Routine Assessment	Weather Light Rain	Date 20180404	Time 11:01	Length Surveyed 14.7
Additional Information CCTV DROP STRUCTURE					



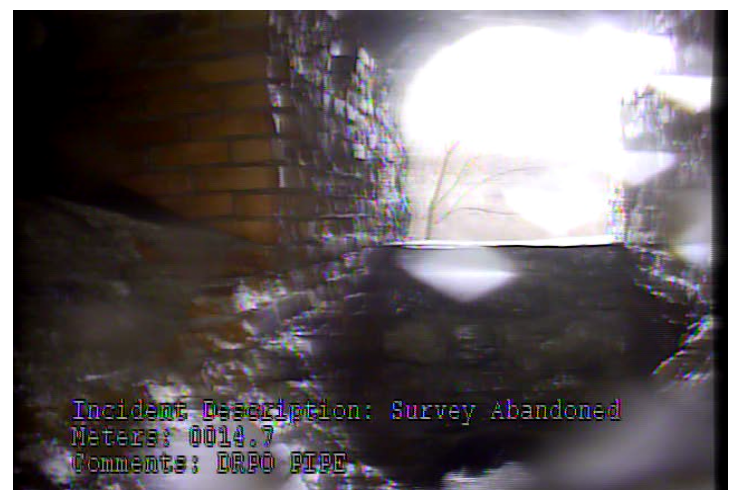
TBA - Tap, Break-in / Hammer: Active @ 0.0 m.



MGO - General Observation @ 0.0 m. 8 METERS FROM GRADE TO BOTTOM OF CHAMBER TOTAL DEPTH IS 13 METERS. CHAMBER IS 2.5 M X 2.5 M SQUARE



MGO - General Observation @ 14.7 m. ANOTHER DROP PIPE



MSA - Survey Abandoned @ 14.7 m. DROP PIPE

Appendix A4 - Forcemain Discharge Inspection



PIPEFLO CONTRACTING CORP.

111 FRID STREET

HAMILTON, ONTARIO L8P 4M3

TOLL-FREE: 1-866-711-4567, TELEPHONE: 905-572-7767, FAX: 905-572-7768

Surveyors name PIPEFLOSC	Certificate Number U-511-12735	System Owner GM BLUEPLAN ENGINEERING LTD.	Survey Customer GM BLUEPLAN ENGINEERING LTD.	Drainage Area	Sheet 1
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P/O No. 617108 BENDER H	Pipeline Segment Reference D	Date 20180404	Time 12:30	Location (Street Name and number) PALMER AVE	Locality NIAGARA FALLS ONT.
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Further Location details EASEMENT	Upstream Manhole Number FORCEMAIN	Rim to Invert 2	Grade to Invert	Rim to Grade
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Downstream Manhole Number DISCHARGE MH	Rim to Invert 2	Grade to Invert	Rim to Grade	Use of Sewer Combined	Direction Downstream	Flow Control	Height 600
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Width	Shape Circular	Material RCP	Ln. Method	Pipe Joint Length	Total Length 96	Length Surveyed 95	Year Laid	Year Rehabilitated	Tape / Media Number D
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Purpose F	Sewer Category	Pre-Cleaning Not Known	Cleaned	Weather Light Rain	Additional Information CCTV FORCEMAIN TO DISCHARGE MH
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Distance (Meters)	Code		Continuous defect	Value				Joint	Circumferential Location		Image Ref.	Struct. Grade	O&M Grade	Remarks
	Group/ Descriptor	Modifier/ severity		S/M/L	Inches		%		At / From	To				
					1st	2nd								
0.0	AMH									AMH@0			Starting Manhole: FORCEMAIN	
0.0	MWL					5				MWL@0				
0.0	DA	GS	S01				5	8	4	DAGS@0				
47.8	RF	L						10	2	RFL@47.8		1		
86.6	LR						10			LR@86.6		1		
95.0	DA	GS	F01				5	8	4	DAGS@95		2×62		
95.0	AMH									AMH@95			BURIED	

Segment	Structural									O & M									Overall								
	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Rating	Quick	Index		Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Rating	Quick	Index		Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Rating	Quick	Index	
20180404-FORCEMAIN-DISCHARGE MH	0	0	0	0	0	0	0000			2	124	0	0	0	126	2K12	2.0		2	124	0	0	0	126	2K12	2.0	

**PIPEFLO CONTRACTING CORP.**

111 FRID STREET

HAMILTON, ONTARIO L8P 4M3

TOLL-FREE: 1-866-711-4567, TELEPHONE: 905-572-7767, FAX: 905-572-7768

Upstream MH	Downstream MH	Size	Material	Total Length	City
FORCEMAIN	DISCHARGE MH	600	Reinforced Concrete Pipe	96	NIAGARA FALLS ONT.

Surveyor's Name	Certificate Number	Street Address	Location Details
PIPEFLOSC	U-511-12735	PALMER AVE	EASEMENT

Direction	Purpose	Weather	Date	Time	Length Surveyed
Downstream	Routine Assessment	Light Rain	20180404	12:30	95

Additional Information

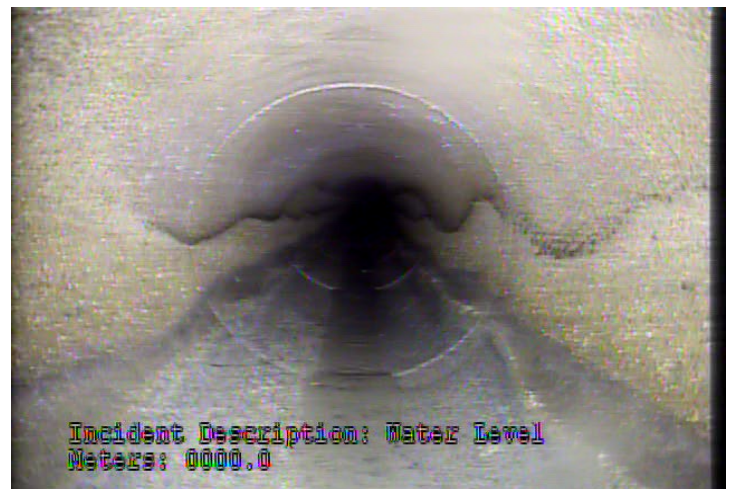
CCTV FORCEMAIN TO DISCHARGE MH

	Ftg.	Code	Description	Pct.	Position	Cont.	Comment
	0.0	AMH	Access Point - Manhole				Starting Manhole: FORCEMAIN
	0.0	MWL	Water Level	5			
	0.0	DAGS	Deposits Attached: Grease	5	8 to 4	S01	
	47.8	RFL	Roots, Fine: Lateral		10 to 2		
							
							
	86.6	LR	Line - Right	10			
	95.0	DAGS	Deposits Attached: Grease	5	8 to 4	F01	
	95.0	AMH	Access Point - Manhole				BURIED

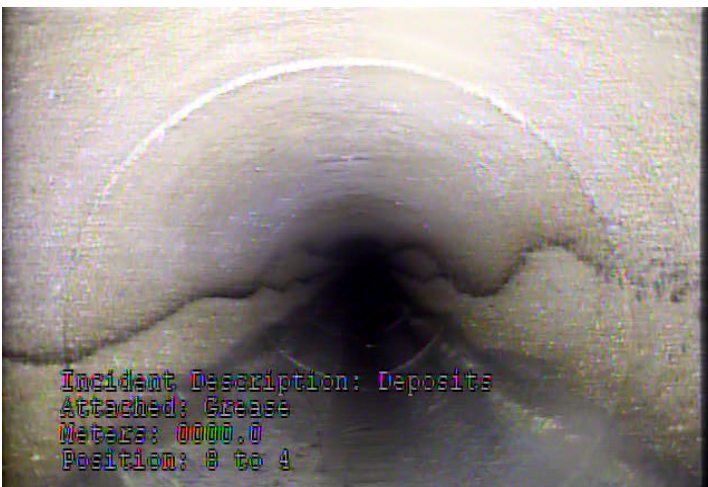
Upstream MH FORCEMAIN	Downstream MH DISCHARGE MH	Size 600	Material Reinforced Concrete Pipe	Total Length 96	City NIAGARA FALLS ONT.
Surveyor's Name PIPEFLOSC	Certificate Number U-511-12735	Street Address PALMER AVE	Location Details EASEMENT		
Direction Downstream	Purpose Routine Assessment	Weather Light Rain	Date 20180404	Time 12:30	Length Surveyed 95
Additional Information CCTV FORCEMAIN TO DISCHARGE MH					



AMH - Access Point - Manhole @ 0.0 m.
Starting Manhole: FORCEMAIN



MWL - Water Level @ 0.0 m.



DAGS - Deposits Attached: Grease @ 0.0 m.



RFL - Roots, Fine: Lateral @ 47.8 m.

Upstream MH FORCEMAIN	Downstream MH DISCHARGE MH	Size 600	Material Reinforced Concrete Pipe	Total Length 96	City NIAGARA FALLS ONT.
Surveyor's Name PIPEFLOSC	Certificate Number U-511-12735	Street Address PALMER AVE	Location Details EASEMENT		
Direction Downstream	Purpose Routine Assessment	Weather Light Rain	Date 20180404	Time 12:30	Length Surveyed 95
Additional Information CCTV FORCEMAIN TO DISCHARGE MH					



LR - Line - Right @ 86.6 m.



DAGS - Deposits Attached: Grease @ 95.0 m.


AMH - Access Point - Manhole @ 95.0 m.
BURIED



Appendix B - Alternatives Details



**Bender Hill Sanitary SPS
Rehabilitation or Replacement
Alternatives
(Options Analysis)**

Option 1 – Do Nothing

Details

- Structure remains unchanged
- No mechanical, structural, or electrical upgrades
- No changes to current operating practices

Benefits

- ✓ No capital expenditure

Disadvantages

- x Access and operator safety issues will remain
- x Structure deterioration due to road salts will remain an issue
- x The wet well will continue to deteriorate due to hydrogen sulfide attack
- x No pumping capacity increase to accommodate any potential flow increase in the future
- x Increase risk of a critical system failure

**Bender Hill Sanitary SPS
Rehabilitation or Replacement
Alternatives
(Options Analysis)**

Option 2 – Station Rehabilitation & Upgrades

Details

- Structure remains in place
- Upgrade of station structural, mechanical and electrical components
- Propose an increase in station capacity ~ 464 L/s (max capacity of receiving sewer)
- Reallocation of bus stop to reduce the amount of road salt entering the station
- Safety grating will be added
- Overflow structure will be secured

Benefits

- ✓ Allows for an increase in station capacity
- ✓ Addresses immediate repair needs for the dry well and wet well structures
- ✓ Increases the reliability of the mechanical and electrical systems to meet latest industry standards
- ✓ Allows for use of the newly replaced forcemain

Disadvantages

- x Access and operator safety issues will remain
- x Salt deterioration will remain an issue
- x Constructability issues (timing, traffic, duration)

**Bender Hill Sanitary SPS
Rehabilitation or Replacement
Alternatives
(Options Analysis)**

Option 3 – Station Replacement (Same Location)

Details

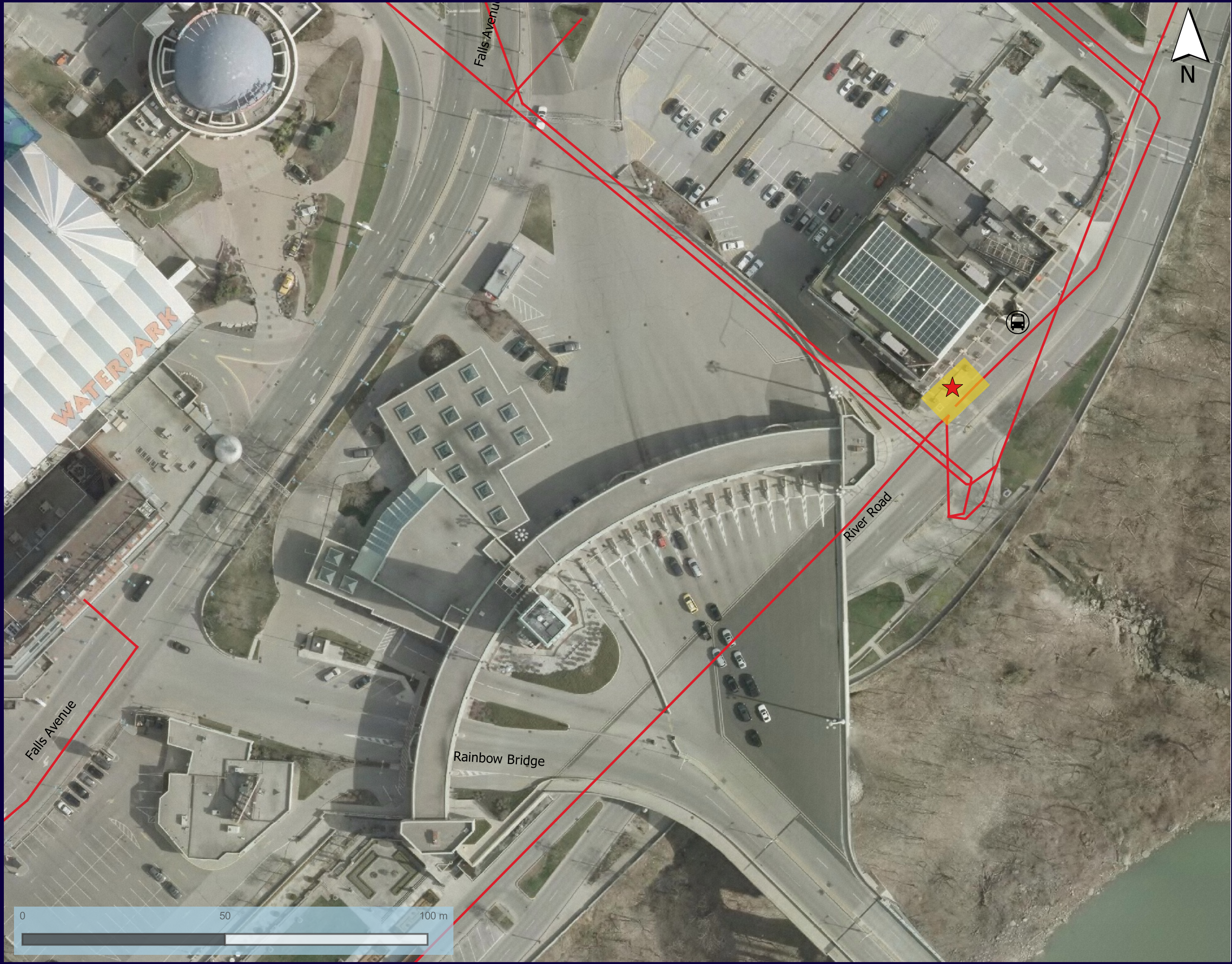
- Completely new station/equipment including structure located at the same location of the current station
- Propose an increase in station capacity ~ 464 L/s (max capacity of receiving sewer)
- Re-location of bus stop to reduce the amount of road salt entering the station
- Safety grating will be added
- Overflow structure will be secured

Benefits

- ✓ Allows for an increase in station capacity
- ✓ Allows for use of the newly replaced forcemain
- ✓ Allows for a longer structural asset useful life

Disadvantages

- x Access and operator safety issues will remain
- x Salt deterioration will remain an issue
- x Constructability issues (timing, traffic, duration)
- x High impact to traffic and vicinity during construction
- x High costs to construct a new station



Bender Hill Sewage Pumping Station
Options Analysis

Options Location
Same as Current Station Location
(Options 1, 2, 3)

- ★ Bender Hill SPS
- 🚌 New Bus Stop Location
- Sanitary Main
- Locations
Same Location as Current Station

**Bender Hill Sanitary SPS
Rehabilitation or Replacement
Alternatives
(Options Analysis)**

Option 4 – Station Re-Location To Bird Kingdom Parking Garage

Details

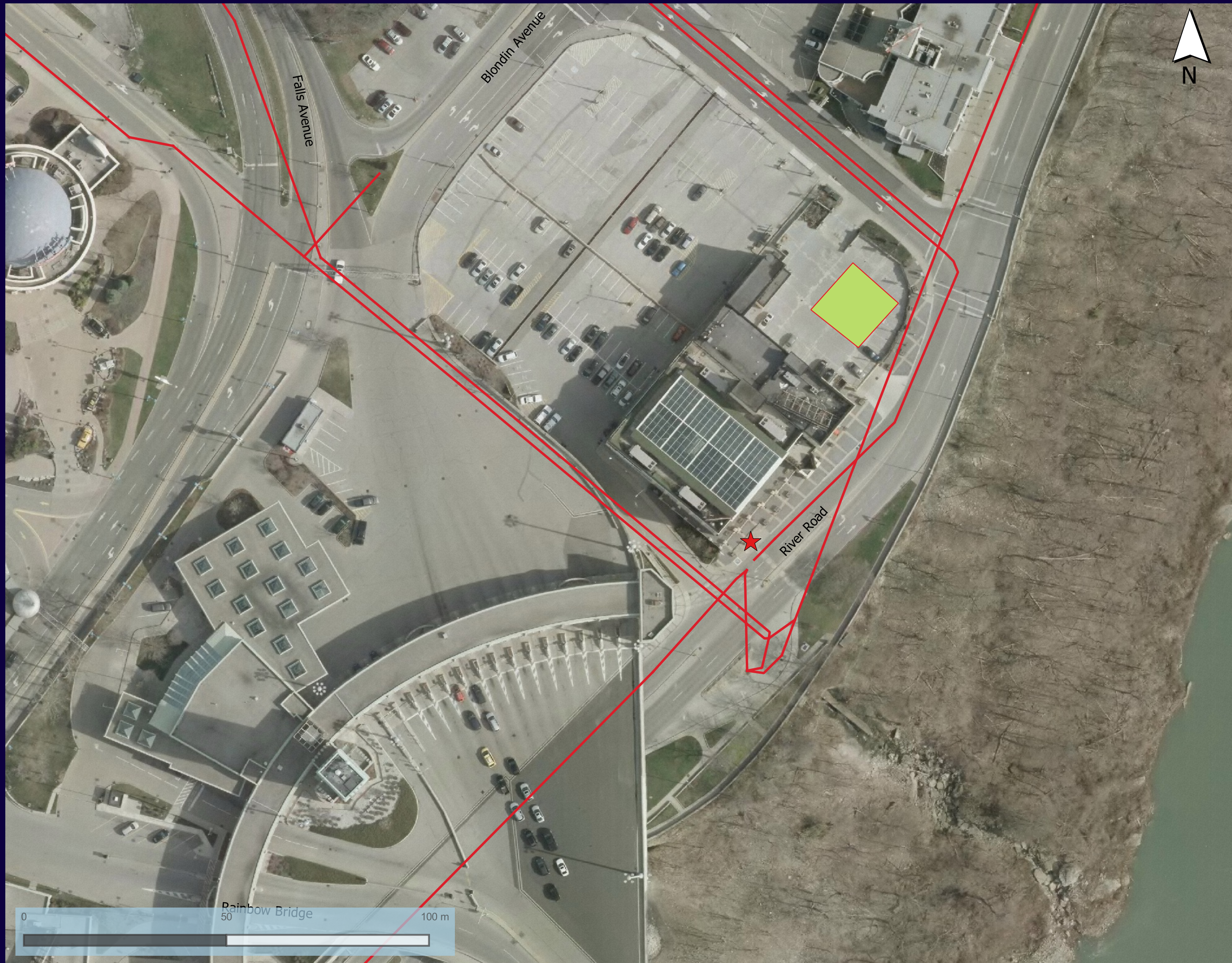
- Completely new station/equipment including structure located at the Bird Kingdom Parking Garage
- Propose an increase in station capacity ~ 464 L/s (max capacity of receiving sewer)
- Safety grating will be added
- Overflow structure will be secured

Benefits

- ✓ Allows for an increase in station capacity
- ✓ Provides safer access for maintenance and operations
- ✓ Opportunity to use current station as diversion structure
- ✓ Extended structure life from reducing road salt impact
- ✓ Low impact to traffic and vicinity during construction

Disadvantages

- x Constructability issues (timing, traffic, duration)
- x High costs to construct a new station
- x High risk and cost due to requirement for land acquisition



Options Location

Relocation to Bird Kingdom Parking Garage
(Options 4)

★ Bender Hill SPS
Sanitary Main

Locations
Relocation to
Bird Kingdom Garage

**Bender Hill Sanitary SPS
Rehabilitation or Replacement
Alternatives
(Options Analysis)**

Option 5 – Station Re-Location to John St And River Rd Available Land

Details

- Completely new station/equipment including structure located at the corner of John St and River Rd
- Propose an increase in station capacity ~ 464 L/s (max capacity of receiving sewer)
- Safety grating will be added
- Overflow structure will be secured
- New sanitary main required to connect to current system
- Requires new forcemain

Benefits

- ✓ Allows increase in station capacity
- ✓ Provides safer access for maintenance and operations
- ✓ Opportunity to use current station as diversion structure
- ✓ Once constructed the station/maintenance poses a moderate impact to traffic
- ✓ Extended structure life from reducing road salt intake

Disadvantages

- x Constructability issues (timing, traffic, duration)
- x High costs to construct a new station and forcemain
- x High risk and cost due to requirement for land acquisition



Bender Hill Sewage Pumping Station
Options Analysis

Options Location

Relocation to John St. & River Rd.
(Options 5)

★ Bender Hill SPS
Sanitary Main

Locations
Relocation to
John St and River Rd

**Bender Hill Sanitary SPS
Rehabilitation or Replacement
Alternatives
(Options Analysis)**

Option 6 – Station Re-Location across the Street

Details

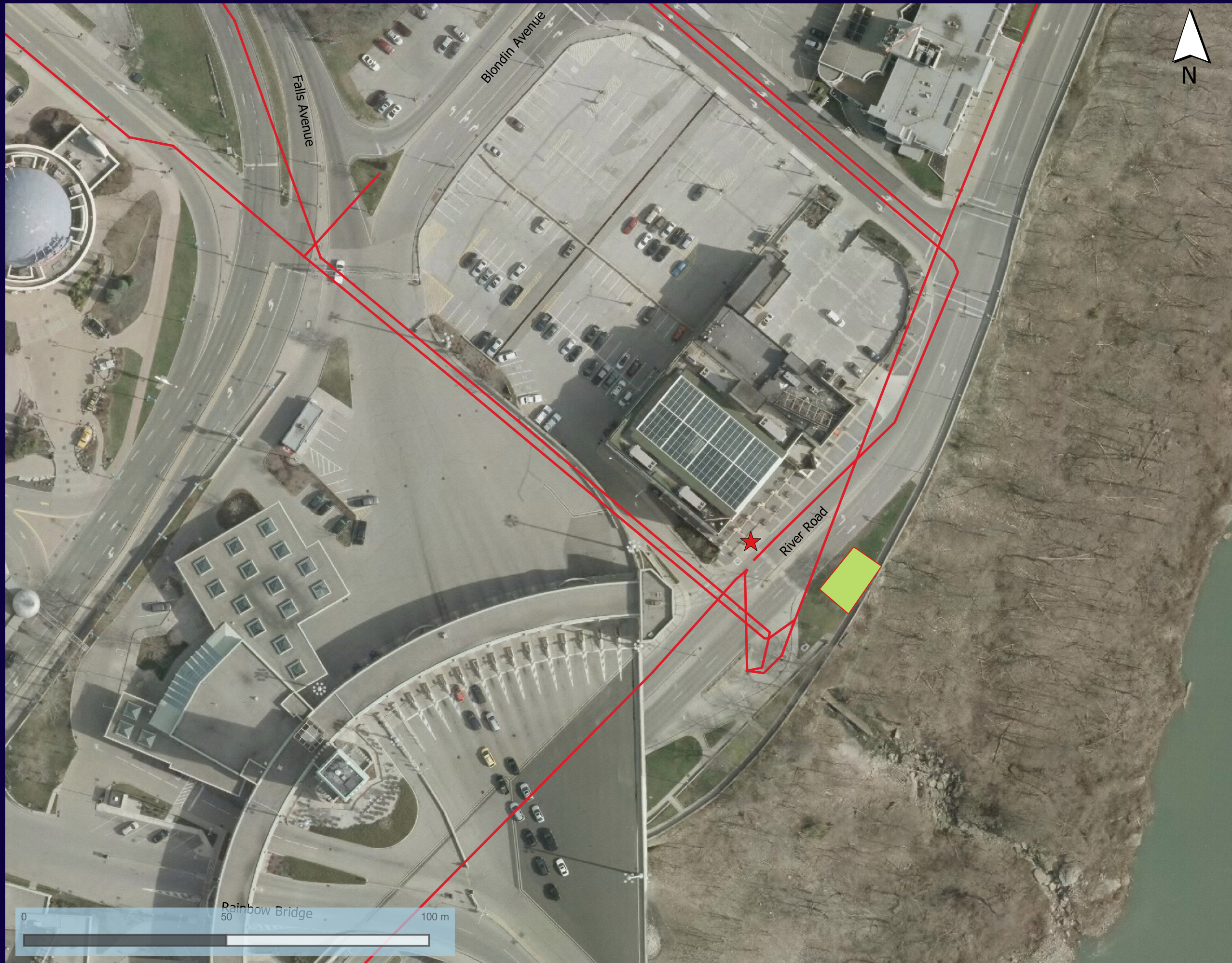
- Completely new station/equipment including structure
- Propose an increase in station capacity ~ 464 L/s (max capacity of receiving sewer)
- Safety grating will be added
- Overflow structure will be secured
- Proposed area is NPC property
- Requires minor main to connect to new system
- Requires new forcemain to connect to existing FM

Benefits

- ✓ Allows increase in station capacity
- ✓ Allows for use of the newly replaced forcemain
- ✓ Provides safer access for maintenance and operations
- ✓ Opportunity to use the current station as diversion structure
- ✓ Extended structure life from reducing road salt intake

Disadvantages

- x Constructability issues (timing, traffic, duration)
- x High costs to replace all assets/structure
- x High cost due to construction/location risk



Options Location

Relocation Accross the Street from Current
Location
(Options 6)

★ Bender Hill SPS
Sanitary Main

Locations
Relocation Accross the Street
from Current Location

**Bender Hill Sanitary SPS
Rehabilitation or Replacement
Alternatives
(Options Analysis)**

Option 7 – Decommission of Seneca SPS and Major Upgrades to Bender Hill

Details

- Decommission of Seneca PS
- Redirection of flows to Bender Hill SPS via gravity
- Requires new gravity sewer between Seneca PS and Bender Hill PS
- Major upgrades to Bender Hill PS to increase capacity ~ 532 L/s (max capacity of receiving sewer)
- Upgrade of station structural, mechanical and electrical components
- Safety grating will be added
- Overflow structure will be secured
- Reallocation of bus stop to reduce the amount of road salt entering the station

Benefits

- ✓ Allows increase in station capacity
- ✓ Allows for use of the newly replaced forcemain
- ✓ Reduces a facility the Region must operate and maintain

Disadvantages

- x Access and operator safety issues will remain
- x Salt deterioration will remain an issue
- x Constructability issues (timing, traffic, duration)



Bender Hill Sewage Pumping Station
Options Analysis

Options Location
Decommission of Seneca SPS &
Redistribution of Flows (Options 7)

- ★ Bender Hill SPS
- 🚌 New Bus Stop Location
- Sanitary Main
- Locations
- Seneca PS

**Bender Hill Sanitary SPS
Rehabilitation or Replacement
Alternatives
(Options Analysis)**

**Option 8 – New Station in Tourist Court, Minor Rehab at Bender Hill and
Redirection of Flows**

Details

- New station around Murray Street / Stanley Ave that can be designed to meet future growth demands
- Minor rehabilitation of Bender Hill PS to address safety concern around the overflow drop shaft and structural rehabilitation of the dry well and wet well
- Redistribution of flow away from the tourist core to the south end WWTP
- Requires new forcemain for the new station
- Required new sanitary main for the redistribution of flow
- Reallocation of bus stop to reduce the amount of road salt entering the station

Benefits

- ✓ Allows increase in station capacity
- ✓ Redirection of flows allows for opportunity for growth in the area

Disadvantages

- x Access and operator safety issues will remain
- x Adds a new facility to Region Infrastructure to maintain
- x Salt deterioration will remain an issue
- x Constructability issues (timing, traffic, duration)
- x High costs with a new facility and forcemain



Bender Hill Sewage Pumping Station
Options Analysis

Options Location
New Station in Tourist Court & Redistribution
of
Flows to South End WWTP (Options 8)

- ★ Bender Hill SPS
- 🚌 New Bus Stop Location
- Sanitary Main
- Locations
- New Station

**Bender Hill Sanitary SPS
Rehabilitation or Replacement
Alternatives
(Options Analysis)**

Option 9 – Realignment of River Road Near Bender Hill SPS and Minor Station Upgrades

Details

- Structure remains in place as is with minor repairs
- Station access footprint increases by realigning the road
- River Rd. is realigned to divert traffic away and facilitate operator access/safety
- Minor upgrades proposed to increase in station capacity ~ 464 L/s (max capacity of receiving sewer)
- Relocation of bus stop and realignment of the road to reduce the amount of road salt affecting the underground structure
- Safety grating will be added
- Overflow structure will be secured
- May assist in growth related demands with upgraded pumps

Benefits

- ✓ Allows increase in station capacity
- ✓ Allows for use of the newly replaced forcemain
- ✓ Provides safer access for maintenance and operations
- ✓ Opportunity to improve overall aesthetics of the area via road realignment and landscaping

Disadvantages

- x Constructability issues (timing, traffic, duration)
- x Capital cost associated with road realignment and potential utility relocations

**Bender Hill Sanitary SPS
Rehabilitation or Replacement
Alternatives
(Options Analysis)**

Option 10 – Realignment of River Road and Station Replacement

Details

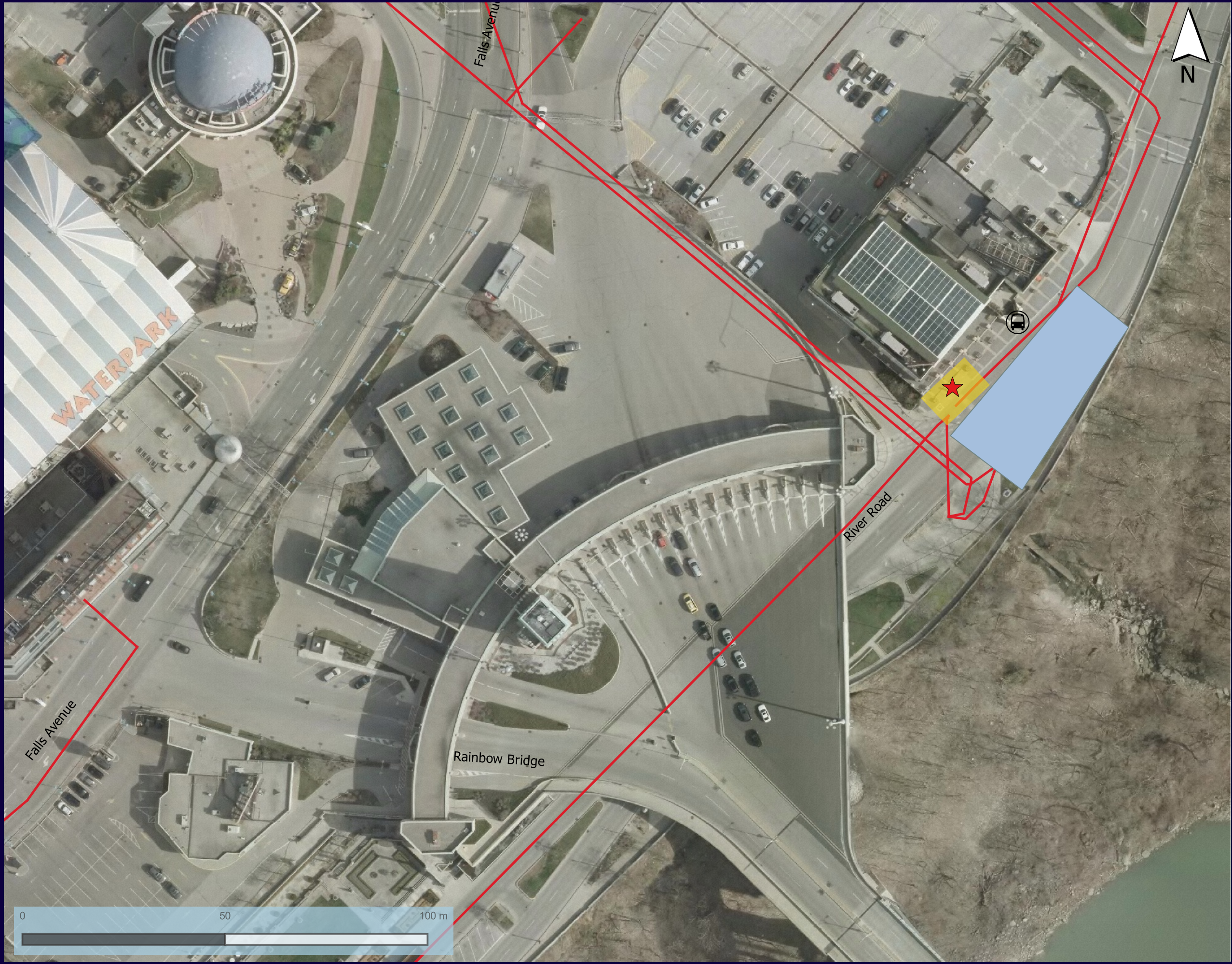
- Completely new infrastructure/equipment including structure at the same location of the current station
- River Rd. is realigned to divert traffic away and facilitate operator access/safety
- Propose an increase in station capacity ~ 464 L/s (max capacity of receiving sewer)
- Relocation of bus stop and realignment of the road to reduce the amount of road salt affecting the underground structure
- Safety grating will be added
- Overflow structure will be secured
- May assist in growth related demands with upgraded pumps

Benefits

- ✓ Allows increase in station capacity
- ✓ Allows for use of the newly replaced forcemain
- ✓ Provides safer access for maintenance and operations
- ✓ Extended structure life by reducing the impact of road salts
- ✓ Opportunity to improve overall aesthetics of the area via road realignment and landscaping

Disadvantages

- x Constructability issues (timing, traffic, duration)
- x High costs to replace all assets/structure and utility relocations



Bender Hill Sewage Pumping Station
Options Analysis

Options Location
Same as Current Station Location
with Road Realignment (Options 9, 10)

- ★ Bender Hill SPS
- 🚌 New Bus Stop Location
- Sanitary Main
- Locations
 - Realigning of Road
 - Same Location as Current Station



Appendix C - Evaluation of Alternatives



Bender Hill Sanitary SPS Rehabilitation or Replacement Alternatives (Options Analysis)
Summary and Evaluation of Alternatives
Unweighted Criteria

	Environmental Impact					Social Impact					Constructability Impact					Financial Impact				Operational Considerations								Summary of Impact Points
Alternative Servicing Options	Potential Impact on Terrestrial Features / Habitat	Potential Effects to Local Groundwater / Soil Systems	Impact on overflows	Potential of Presence of Species at Risk	Approvals	Impacts on Adjacent Residents / Businesses / Traffic	Land Acquisition/Easement Requirements	Compatibility with Current / Planned Land Uses	Public Safety Concerns	Impacts on Archaeological / Cultural Heritage Features	Proximity / Impacts to Existing Infrastructure / Traffic	Significant Construction Risk Issues	Constructability Issues (Access, Slope, Depth, Soil, Groundwater, Vegetation)	Impacts to Recent Improvements / Opportunity to Coordinate with Future Works	Construction Cost	Lifecycle Cost (Operation and maintenance related)	Consolidation of Assets/Facilities Portfolio	Funding Opportunities (DC)	Risk of critical failures	Ability to meet Future Capacity Needs	Worker safety and Operability	Deterioration (condensation, salt and H2S)	Address structural concerns associated with structure	Operational Flexibility	Forcemain Long term viability	Sum of Impact Points out of 250		
Option 1 - Do Nothing	5	5	1	5	4	5	5	5	1	5	5	5	5	5	5	3	5	5	3	1	1	1	1	1	5	92		
Option 2 - Station Rehabilitation & Upgrade	3	5	7	5	3	5	5	5	1	5	3	3	3	5	4	7	5	7	7	10	1	3	5	5	5	117		
Option 3 - Station Replacement (Same Location)	1	1	7	5	3	3	5	5	3	3	3	3	3	7	1	7	5	3	5	10	3	3	10	7	5	111		
Option 4 - Station Relocation (to Bird Kingdom Parking Garage)	1	1	7	3	1	1	1	1	7	1	1	1	1	5	1	7	5	3	7	10	5	7	10	7	5	99		
Option 5 - Station Relocation (to John & River street available land)	1	1	8	1	1	3	1	1	5	1	1	1	1	1	1	7	5	7	7	10	5	7	10	5	1	92		
Option 6 - Station Relocation (across the street)	1	1	10	3	1	3	1	1	7	1	1	1	1	7	1	7	5	3	7	10	5	7	10	7	3	104		
Option 7 - Decommission of Seneca & Major Upgrades at Bender Hill	1	1	5	3	1	7	3	5	1	3	1	1	1	7	1	7	10	7	7	10	1	3	3	5	5	99		
Option 8 - New station, minor rehab on Bender Hill & Redirection of flows away from the tourist core from Murray St to Stanley Ave to WWTP (South end)	1	1	8	1	1	1	1	3	5	1	1	1	1	5	1	7	1	7	7	10	5	10	7	7	1	94		
Option 9 - Realignment of River Road near Bender Hill SPS and stations upgrades	3	5	7	5	3	7	5	7	10	5	1	3	3	7	3	10	5	10	7	10	10	7	5	5	5	148		
Option 10 - Realignment of River Road and station replacement	1	1	10	3	1	1	1	5	10	3	1	1	1	7	1	10	5	10	10	10	10	10	10	7	5	134		

10 High, positive impact
7 Major impact
5 Neutral, status quo, no impact
3 Minor impact

Summary and Evaluation of Alternatives

Weighted Criteria

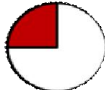
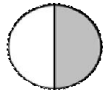
	Environmental Impact					Social Impact					Constructability Impact				Financial Impact				Operational Considerations							Summary of Results	
	Potential Impact on Terrestrial Features / Habitat	Potential Effects to Local Groundwater / Soil Systems	Impact on overflows	Potential of Presence of Species at Risk	Approvals	Impacts on Adjacent Residents / Businesses / Traffic	Land Acquisition/Easement Requirements	Compatibility with Current / Planned Land Uses	Public Safety Concerns	Impacts on Archaeological / Cultural Heritage Features	Proximity / Impacts to Existing Infrastructure / Traffic	Significant Construction Risk Issues	Constructability Issues (Access, Slope, Depth, Soil, Groundwater, Vegetation)	Impacts to Recent Improvements / Opportunity to Coordinate with Future Works	Construction Cost	Lifecycle Cost (Operation and maintenance related)	Consolidation of Assets/ Facilities Portfolio	Funding Opportunities (DC)	Risk of critical failures	Ability to meet Future Capacity Needs	Worker safety and Operability	Deterioration (condensation, salt and H2S)	Address structural concerns associated with structure	Operational Flexibility	Forcemain Long term viability	Sum of Weighted Score out of 1000	Normalized Score out of 100
Alternative Options Impact Evaluation Weighintgs	5	5	5	5	5	4	4	4	4	4	5	4	4	2	5	5	2	3	3	2	7	4	6	2	1	100	
Option 1 - Do Nothing	25	25	5	25	20	20	20	20	4	20	25	20	20	10	25	15	10	15	9	2	7	4	6	2	5	359	36
Option 2 - Station Rehabilitation & Upgrade	15	25	35	25	15	20	20	20	4	20	15	12	12	10	20	35	10	21	21	20	7	12	30	10	5	439	44
Option 3 - Station Replacement (Same Location)	5	5	35	25	15	12	20	20	12	12	15	12	12	14	5	35	10	9	15	20	21	12	60	14	5	420	42
Option 4 - Station Relocation (to Bird Kingdom Parking Garage)	5	5	35	15	5	4	4	4	28	4	5	4	4	10	5	35	10	9	21	20	35	28	60	14	5	374	37
Option 5 - Station Relocation (to John & River street available land)	5	5	40	5	5	12	4	4	20	4	5	4	4	2	5	35	10	21	21	20	35	28	60	10	1	365	37
Option 6 - Station Relocation (across the street)	5	5	50	15	5	12	4	4	28	4	5	4	4	14	5	35	10	9	21	20	35	28	60	14	3	399	40
Option 7 - Decommission of Seneca & Major Upgrades at Bender Hill	5	5	25	15	5	28	12	20	4	12	5	4	4	14	5	35	20	21	21	20	7	12	18	10	5	332	33
Option 8 - New station, minor rehab on Bender Hill & Redirection of flows away from the tourist core from Murray St to Stanley Ave to WWTP (South end)	5	5	40	5	5	4	4	12	20	4	5	4	4	10	5	35	2	21	21	20	35	40	42	14	1	363	36
Option 9 - Realignment of River Road near Bender Hill SPS and stations upgrades	15	25	35	25	15	28	20	28	40	20	5	12	12	14	15	50	10	30	21	20	70	28	30	10	5	583	58
Option 10 - Realignment of River Road and station replacement	5	5	50	15	5	4	4	20	40	12	5	4	4	14	5	50	10	30	30	20	70	40	60	14	5	521	52

Bender Hill Sanitary SPS Rehabilitation or Replacement Alternatives (Options Analysis)

Summary and Evaluation of Alternatives

Results

	Environmental Impact		Social Impact		Constructability Impact		Financial Impact		Operational Considerations	
	Category Sum of Weighted Score	Percentage Weighted Score out of 250	Category Sum of Weighted Score	Percentage Weighted Score out of 200	Category Sum of Weighted Score	Percentage Weighted Score out of 150	Category Sum of Weighted Score	Percentage Weighted Score out of 150	Category Sum of Weighted Score	Percentage Weighted Score out of 250
Alternative Options Impact Evaluation Weighintgs	25		20		15		15		25	
Option 1 - Do Nothing	100	40%	84	42%	75	50%	65	43%	35	14%
Option 2 - Station Rehabilitation & Upgrade	115	46%	84	42%	49	33%	86	57%	105	42%
Option 3 - Station Replacement (Same Location)	85	34%	76	38%	53	35%	59	39%	147	59%
Option 4 - Station Relocation (to Bird Kingdom Parking Garage)	65	26%	44	22%	23	15%	59	39%	183	73%
Option 5 - Station Relocation (to John & River street available land)	60	24%	44	22%	15	10%	71	47%	175	70%
Option 6 - Station Relocation (across the street)	80	32%	52	26%	27	18%	59	39%	181	72%
Option 7 - Decommission of Seneca & Major Upgrades at Bender Hill	55	22%	76	38%	27	18%	81	54%	93	37%
Option 8 - New station, minor rehab on Bender Hill & Redirection of flows away from the tourist core from Murray St to Stanley Ave to WWTP (South end)	60	24%	44	22%	23	15%	63	42%	173	69%
Option 9 - Realignment of River Road near Bender Hill SPS and stations upgrades	115	46%	136	68%	43	29%	105	70%	184	74%
Option 10 - Realignment of River Road and station replacement	80	32%	80	40%	27	18%	95	63%	239	96%

Percentage Weighted Score Range		Pie Representation Assigned
Minimum	Maximum	
0%	40%	
41%	60%	
61%	72%	
73%	100%	



Appendix D - Study Contact List





Date: 11/26/2019 File: 617108
 To: Lisa Vespi, Senior Project Manager
 From: GM BluePlan Engineering Ltd.
 Project: Bender Hill (Options Analysis)
 Subject: Stakeholders List

STAKEHOLDERS LIST

Stakeholder	Stakeholder Type	Contact Details	Communication Method	
			Email	Mailout
Niagara Parks Commission (Niagara Parks)	Government Agency	Ellen Savoia 7805 Niagara River Parkway, P.O. Box 150 Niagara Falls, Ontario, Canada L2E 6T2	✓	
		Marcello Gruosso 7805 Niagara River Parkway, P.O. Box 150 Niagara Falls, Ontario, Canada L2E 6T2	✓	
City of Niagara Falls (City)	Local Area Municipality	Erik Nickel Director of Municipal Works, City of Niagara Falls	✓	
		Kent Schachowskoj	✓	
Canada Border Services Agency (CBSA)	Government Agency	Jodi Covelli Infrastructure Project Officer/Operations Branch 4342 Queen St, Niagara Falls, L2E 7J7	✓	
Niagara Peninsula Conservation Authority (NPCA)	Conservation Authority	David Deluce Manager, Plan Review & Regulations Niagara Peninsula Conservation Authority (NPCA) 250 Thorold Road West, 3rd Floor Welland, ON L3C 3W2	✓	

Stakeholder	Stakeholder Type	Contact Details	Communication Method	
			Email	Mailout
Ministry of Natural Resources and Forestry (MNRF)	Government Agency	Ms. Tammy Verhaeghe District Manager, Guelph District 1 Stone Road W, Ontario Government Building Guelph, ON N1G 4Y2	✓	
		Mr. Ian Thornton Resources Operations Supervisor, Guelph District 1 Stone Road W, Ontario Government Building Guelph, ON N1G 4Y2	✓	
Ministry of the Environment, Conservation and Parks (MECP)	Government Agency	Kim Groombridge, District Manager Niagara District Office Ministry of the Environment, Conservation and Parks 301 St. Paul Street, 9th Floor, Suite 15 St. Catharines ON L2R 3M8	✓	
		Sylvain Campbell Provincial Officer #1278, Water Inspector Niagara District Office - West Central Region	✓	
Environment and Climate Change Canada (ECCC)	Government Agency	Mark Chambers A/Head, Northern Areas of Concern Great Lakes Areas of Concern Regional Director General's Office – Ontario Environment & Climate Change Canada 867 Lakeshore Rd., Burlington, Ontario L7S 1A1	✓	

Stakeholder	Stakeholder Type	Contact Details	Communication Method	
			Email	Mailout
Niagara Falls Bridge Commission	Government Agency	Mark Decker c/o Niagara Falls Bridge Commission PO Box 395 L2E 6P8	✓	
		PO BOX 395 Stn Main L2E 6T8 Niagara Falls, ON		✓
Ontario Ministry of Transportation	Government Agency	1201 Wilson Ave. Building "D" - 3 rd Floor M3M 1J8 North York, ON		✓
22986422 Ontario Inc.	Adjacent Business Owner	10 Canal St. L2N 4S6 St. Catharines, ON		✓
5507 River Development Inc.	Adjacent Business Owner	7100 Woodbine Ave. Suite 206 L3R 5J2 Markham, ON		✓
Six Nations of the Grand River Territory	First Nations	Chief G. Ava Hill 2498 Chiefswood Road P.O. Box 5000 Ohsweken, ON N0A 1M0		✓
Metis Nation of Ontario	First Nations	Dr. Mark Knell Manager, Environmental Assessments and Regulatory Issues 311-75 Sherborne Street Toronto, ON M5A 2P9		✓
Haudenosaunee Confederacy	First Nations	Mr. Allan MacNaughton Chief c/o Haudenosaunee Development Institute 16 Sunrise Court, Suite 407 P.O. Box 714 Ohsweken, ON N0A 1M0		✓

Stakeholder	Stakeholder Type	Contact Details	Communication Method	
			Email	Mailout
Six Nations of the Grand River Territory	First Nations	Mr. Lonny Bomberly Director Land and Resources 1695 Chiefswood Road, P.O. Box 5000 Ohsweken, ON N0A 1M0		✓
Ontario Native Affairs Secretariat	First Nations	Mr. Matt Garrow Director - Strategic Policy and Planning 720 Bay Street, 4th Floor Toronto, ON M5G 1J5		✓
Association of Iroquois and Allied Indians	First Nations	Mr. Geoff Stonefish Office Manager 387 Princess Avenue London, ON N6B 2A7		✓
Niagara Region Metis Council	First Nations	Mr. Derek Pont President 3250 Schmon Parkway, Unit 1a Thorold, ON L2V 4Y6		✓
Six Nations of the Grand River Territory	First Nations	Mr. W. Paul General Wildlife Manager 1721 Chiefswood Road, P.O. Box 5000 Ohsweken, ON N0A 1M0		✓
Chiefs of Ontario	First Nations	Ms. RoseAnne Archibald Ontario Regional Chief 468 Queens Street East Toronto, ON M5A 1T7		✓
Mississaugas of the New Credit First Nation	First Nations	Ms. Cynthia Jamieson Executive Director 2789 Mississauga Road, R.R. #6 Hagersville, ON N0A 1H0		✓



Stakeholder	Stakeholder Type	Contact Details	Communication Method	
			Email	Mailout
Fort Erie Friendship Centre	First Nations	Ms. Jennifer Dockstader Executive Director 796 Buffalo Road Fort Erie, ON L2A 5E1		✓
Niagara Centre Regional Native	First Nations	Ms. Jaynane Burning-Fields Executive Director 382 Airport Road Niagara-on-the-Lake, ON L0S 1J0		✓



Appendix E - Environmental Assessment Notices



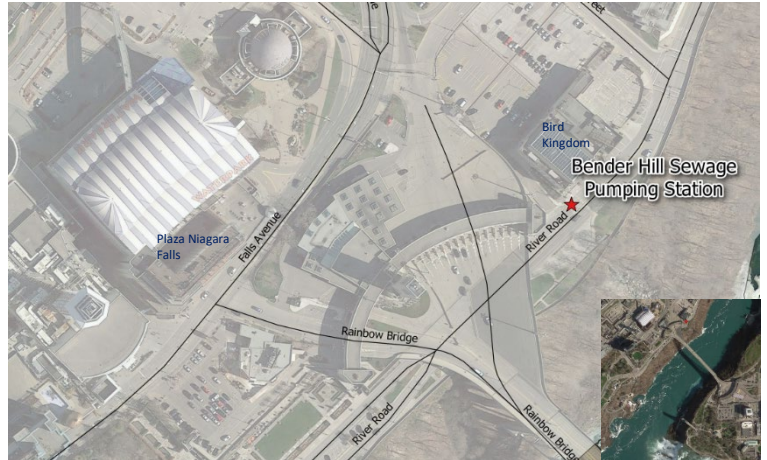
Appendix E.1. - Notice of Commencement

**THE REGIONAL MUNICIPALITY OF NIAGARA
NOTICE OF STUDY COMMENCEMENT
Bender Hill Sanitary Pumping Station
Municipal Class Environmental Assessment**

WHAT

The Regional Municipality of Niagara (The Region) has initiated a Municipal Class Environmental Assessment (EA) Study to assess the preferred strategy for rehabilitation / replacement of the Bender Hill Sewage Pumping Station (The Site) located in the City of Niagara Falls at 5615 River Road. The station was commissioned in 1962 and has since undergone upgrades and various maintenance activities while continuing to service the City. Recent investigations indicate the station will require rehabilitation to accommodate the projected population growth within the City.

WHERE



WHY

Investigations conducted at the Site indicate aging infrastructure and the need for rehabilitation. In addition, the Region's Master Servicing Plan and the City of Niagara Falls Pollution Prevention Control Plan indicate growth related capacity demands that will impact the sanitary flows at the Site. Considering this, the Region has identified the need to initiate a Municipal Class EA to conduct an assessment of the Site and determine a preferred solution to address these future requirements for the Site.

HOW

This study is being planned as a Schedule "B" Class EA, satisfying Phases 1 and 2 of the Municipal Engineers Association (MEA) Class EA process, which is a planning process approved under Ontario's Environmental Assessment Act. This study will define the problems / opportunities associated with the pumping station, develop and evaluate alternative strategies, determine the most feasible solution, and identify methods to avoid or minimize impacts to the community and natural environment.

GET INVOLVED

The Regional Municipality of Niagara encourages the public and stakeholders to participate in this planning process. The Region will be hosting a Public Information Centre (PIC) later this summer (2018) to obtain input on the preliminary results of the study. Notification of the PIC will be advertised in the local community newspaper and notices mailed to businesses located within the immediate study area. Additional project information is located on the study's website at: www.niagararegion.ca/news/notices.

Upon completion of the study, a Project File Report documenting the study process will be prepared and made available for public review and comment. Anyone that wishes to comment on or to be involved in this study should indicate their interest, preferably in writing to:

Lisa Vespi, P.Eng., PMP
Senior Project Manager
Niagara Region
1815 Sir Isaac Brock Way
Thorold, ON L2V 4T7
Phone: 905-980-6000 x. 3640
Email: Lisa.Vespi@niagararegion.ca

David Watt, O.L.S., C.E.T.
Project Manager
GM Blue Plan Engineering Limited
410 Lewis Road, Unit 18
Stoney Creek, ON L8E 5Y7
Phone: 905.643.6688
Email: David.Watt@gmblueplan.ca

This notice was first issued on April 27th, 2018.

Local

Good food and laughs to support victims

Victim Services
Niagara to launch
canine assistance
program

ALEX LUPUL
Special to The Niagara Falls Review —
In the name of crime and tragedy,
Victim Services Niagara is using
an evening of good food and
laughter to make a difference.

Working out of Niagara Re-
gional Police headquarters in
Niagara Falls, Victim Services
Niagara connects victims of a
criminal act, traumatic circum-
stance or disaster with a support
team of crisis responders who
help them cope with the impact of
distressing moments, 24-hours a
day, seven days a week.

The non-profit organization
uses a team of nearly 100 dedicat-
ed volunteer crisis responders,
who go through 75 hours of train-
ing and a rigorous screening
process, to assist victims of such
situations as abduction or sui-
cide.

Last year, the organization
assisted nearly 1,600 clients. In an
average year there are more than
1,200 victims of crime and trage-
dy in Niagara, resulting in 495 on
scene/in-person visits and 889
followup phone calls.

While the program is housed in
police headquarters, the organi-
zation isn't a part of the police
service, nor is the program fund-
ed by it.

"I think that's where people
have kind of overlooked us as a
charity of choice in the past,"
said Angela Arsenio, executive
director.

"We're funded by the Ministry
of the Attorney General and,
unfortunately, they reduced
their funding to us a couple of
years ago by 25 per cent."

Victim Services Niagara re-
ceives just under \$200,000 from
the ministry, with an increase



Angela Arsenio, executive director of Victim Services Niagara, left, and Katarina Etezadi, event manager and community outreach for Ruth's Chris Steak House, stand outside of the Niagara Falls restaurant.

expected soon, which will be used
to serve gender-based-violence
clients.

While the budget has under-
gone a significant cut, call vol-
ume has nearly doubled since
2013, forcing the program to ac-
complish more with less.

"We will be getting more fund-
ing from the Ministry of the At-
torney General shortly, but it
still won't be enough to cover
everything we do," said Arsenio.
"That's why we're in the position
of reaching out to our community

and seeing if we can get some
extra support to do what we do, to
keepus 24/7."

As a result, Arsenio visited
Niagara Falls city council and
made a request for funding of a
new canine program, a request
that council was unable to fulfil.

That's where Ruth's Chris
Steak House stepped in.
"When the management team
at Ruth's Chris heard Angela
speak at council, an organization
that many people tend to over-
look, they immediately jumped

on-board to assist in any way that
they could," said Katarina Eteza-
di, event manager and communi-
ty outreach in collaboration with
Ruth's Chris Steak House.

On May 3, Ruth's Chris Steak
House will be hosting a fundrais-
ing dinner to benefit Victim Ser-
vices Niagara.

For \$100 a person, supporters
will be treated to a five-course
meal at the Niagara Falls restau-
rant followed by a live comedy
show at Yuk Yuk's.

Dave Hemstad will be the head-

liner of the show, with Ted Mor-
ris also being featured, while
Scott Faulconbridge will act as
MC. All three comedians have
been featured on Just for Laughs.

"I love the fact that someone
can come and have a dinner and
hear about the seriousness of
what we do, and also go and enjoy
the rest of their evening," said
Arsenio. "I think it's really im-
portant, it's good to have balance
in this work."

Proceeds from next month's
fundraiser dinner will be used to
establish a canine assistance
program.

Similar to the highly trained
dogs provided to those with visu-
al or auditory impairments, Vic-
tims Services Niagara would
receive a dog that fits the pro-
gram's needs. Out of a lineup of
five people, the highly attuned
dog would be capable of identifi-
ying which person is under du-
ress, going directly to that person
to assist.

Arsenio feels that the dog will
be an enrichment to the work
that the program is already do-
ing. "Sometimes emergency
responders can seem intimidat-
ing, for children, youth, or people
with a disorder where communi-
cation is a problem," she said.
"But a dog is a great equalizer. A
dog can come in and provide
support and be less intimidating
than a person in uniform."

The trained dog will act as a
"silent partner" to children and
vulnerable adults when they
want to file a report. In such situ-
ations, oftentimes adults can't
accompany a child as they may
influence the interview. But
during these moments a dog can
be present, providing the child
with the silent support needed
during that time.

Arsenio remains grateful for
the support from Ruth's Chris.

"It's really an incredible gift
for an organization like us, who
are so small, but the need is so
great."



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www.candoordoc.com

PUBLIC NOTICE

THE REGIONAL MUNICIPALITY OF NIAGARA
MUNICIPAL CLASS ENVIRONMENTAL
ASSESSMENT
NOTICE OF STUDY COMMENCEMENT
Bender Hill Sanitary Pumping Station
in the City of Niagara Falls

**WHAT**

Niagara Region (the Region) has initiated a Municipal Class Environmental Assessment (EA) Study to assess the preferred strategy for rehabilitation / replacement of the Bender Hill Sewage Pumping Station (the site) located in the City of Niagara Falls at 5615 River Rd. The station was commissioned in 1962 and has since undergone upgrades and various maintenance activities while continuing to service the City. Recent investigations indicate the station will require rehabilitation to accommodate the projected population growth within the City.

**WHERE**



**WHY**

Investigations conducted at the site indicate aging infrastructure and the need for rehabilitation. In addition, the Region's Master Servicing Plan and the City of Niagara Falls Pollution Prevention Control Plan indicate growth related capacity demands that will impact the sanitary flows at the site. Considering this, the Region has identified the need to initiate a Municipal Class EA to conduct an assessment of the site and determine a preferred solution to address these future requirements for the site.

**HOW**

This study is being planned as a Schedule "B" Class EA, satisfying Phases 1 and 2 of the Municipal Engineers Association (MEA) Class EA process, which is a planning process approved under Ontario's Environmental Assessment Act. This study will define the problems / opportunities associated with the pumping station, develop and evaluate alternative strategies, determine the most feasible solution, and identify methods to avoid or minimize impacts to the community and natural environment.

**GET INVOLVED**

Niagara Region encourages the public and stakeholders to participate in this planning process. The Region will be hosting a Public Information Centre (PIC) later this summer (2018) to obtain input on the preliminary results of the study. Notification of the PIC will be advertised in Niagara Region's website (www.niagararegion.ca), in the local newspaper, and notices will be mailed to businesses located within the immediate study area.

Upon completion of the study, a Project File Report documenting the study process will be prepared and made available for public review and comment. Anyone who wishes to comment on or to be involved in this study should indicate their interest, preferably in writing to:

Lisa Vespi, P.Eng., PMP
Senior Project Manager
Niagara Region Water and Wastewater Services
3501 Schmon Pkwy., PO Box 1042
905-980-6000 ext. 3640
lisa.vespi@niagararegion.ca

David Watt, O.L.S., C.E.T.
Project Manager
GM BluePlan Engineering Limited
410 Lewis Rd., Unit 18
Stoney Creek, ON L8E 5Y7
905-643-6688
david.watt@gmblueplan.ca

This notice was first issued on April 28, 2018.

**Niagara Region**

 [/niagararegion](https://www.facebook.com/niagararegion)

www.niagararegion.ca

 [@niagararegion](https://twitter.com/niagararegion)



CMV

Appendix E.2. - Public Information Center

THE REGIONAL MUNICIPALITY OF NIAGARA
NOTICE OF PUBLIC INFORMATION CENTRE
Bender Hill Sanitary Pumping Station
Municipal Class Environmental Assessment

WHAT IS THE STUDY ABOUT?

Niagara Region has started a study to look at options for improving the Bender Hill Sewage Pumping Station (The Site) located at 5615 River Rd. in Niagara Falls. The station opened in 1962 and has serviced the City during a variety of upgrades and maintenance over the years. Recent examinations of the site have shown that work must be done at the site to improve safety and repair old infrastructure.

WHERE IS IT LOCATED?



REASON FOR THE STUDY

Reviews of the site show that the older infrastructure needs repairs and improvements. Also, this area is expected to grow with future development, and the site will need to increase its ability through infrastructure upgrades to keep up with the demand of pumping wastewater from the area. With this in mind, the Region is starting a Municipal Class EA Schedule 'B' Study to assess the site and find the preferred solutions to meet these needs.

GET INVOLVED

Niagara Region encourages anyone interested in this study to take part in the planning process. The Region invites you to come to a drop-in information session that will present details about the study, the process used to decide on possible solutions and allow you to share your comments.

Public Information Centre #1	
Date / Time	Tuesday, Sept. 24, 2019 from 5 – 8 p.m.
Location	Niagara Falls City Hall, Committee Rooms 2A-2B

When the study is complete, a Report about the study process will be available for public review and comment. Anyone that wishes to comment on or to be involved in this study may contact:

Lisa Vespi, P.Eng., PMP®
Senior Project Manager
Niagara Region, Water and Wastewater Services
3501 Schmon Pkwy., PO Box 1042
Thorold, ON L2V 4T7
905-980-6000 ext. 3640
Toll-free: 1-800-263-7215
Fax: 905-685-5205
lisa.vespi@niagararegion.ca

David Watt, O.L.S., C.E.T.
Project Manager
GM BluePlan Engineering Limited
1266 South Service Road, Unit C31,
Stoney Creek, L8E 5R9
905-643-6688
david.watt@gmblueplan.ca

Personal information collected at public meetings or submitted in writing is collected under the authority of the Municipal Act, 2001, and will be used by members of Regional Council and Regional staff. The written submissions including names and contact information and the report of the public meeting will be made available to the public. Questions should be referred to Anne-Marie Norio, Regional Clerk at 905-980-6000, ext. 3220.

*If you require any accommodations for a disability in order to attend and participate in meetings or events, please let us know in advance so that arrangements can be made in a timely manner. Please contact the **Accessibility Advisory Coordinator** at 905-980-6000 ext. 3252 or accessibility@niagararegion.ca.*

This notice was first issued on Sept. 12, 2019.

PUBLIC NOTICE

THE REGIONAL MUNICIPALITY OF NIAGARA NOTICE OF PUBLIC INFORMATION CENTRE

Bender Hill Sanitary Pumping Station Municipal Class Environmental Assessment

WHAT IS THE STUDY ABOUT?

Niagara Region has started a study to look at options for improving the Bender Hill Sewage Pumping Station (The Site) located at 5615 River Rd. in Niagara Falls. The station opened in 1962 and has serviced the City during a variety of upgrades and maintenance over the years. Recent examinations of the site have shown that work must be done at the site to improve safety and repair old infrastructure.

REASON FOR THE STUDY

Reviews of the site show that the older infrastructure needs repairs and improvements. Also, this area is expected to grow with future development, and the site will need to increase its ability through infrastructure upgrades to keep up with the demand of pumping wastewater from the area. With this in mind, the Region is starting a Municipal Class EA Schedule 'B' Study to assess the site and find the preferred solutions to meet these needs.

WHERE IS IT LOCATED?



GET INVOLVED

Niagara Region encourages anyone interested in this study to take part in the planning process. The Region invites you to come to a drop-in information session that will present details about the study, the process used to decide on possible solutions and allow you to share your comments and concerns.

Additional Information about the Bender Hill SPS Study is available at niagararegion.ca/projects.

Public Information Centre #1

Date / Time	Thursday, Sept. 24, 2019 from 5 – 8 p.m.
Location	Niagara Falls City Hall, Committee Rooms 2A-2B

When the study is complete, a Report about the study process will be available for public review and comment. Anyone that wishes to comment on or to be involved in this study may contact:

Lisa Vespi, P.Eng., PMP®
Senior Project Manager
Niagara Region, Water
and Wastewater Services
3501 Schmon Pkwy., PO Box 1042
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Toll-free: 1-800-263-7215
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lisa.vespi@niagararegion.ca

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GM BluePlan Engineering
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david.watt@gmblueplan.ca

Personal information collected at public meetings or submitted in writing is collected under the authority of the Municipal Act, 2001, and will be used by members of Regional Council and Regional staff. The written submissions including names and contact information and the report of the public meeting will be made available to the public. Questions should be referred to Anne-Marie Norio, Regional Clerk at 905-980-6000, ext. 3220.

If you require any accommodations for a disability in order to attend and participate in meetings or events, please let us know in advance so that arrangements can be made in a timely manner. Please contact the Accessibility Advisory Coordinator at 905-980-6000 ext. 3252 or accessibility@niagararegion.ca.

This notice was first issued on Sept. 12, 2019.

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>NHL PREVIEW

Blues surrounded by tough teams in the West

The Central Division may be the strongest in the league this year, champs will discover

LARRY LAGE
THE ASSOCIATED PRESS

St. Louis had better dig in for its repeat bid.

The defending Stanley Cup champion Blues will have their hands full in the Western Conference, which seems to have a slew of contenders. And, every team in the entire league is going to give the Blues its best shot each game.

“There’s going to be a whole different feel for us that we’ve got to figure out, ‘OK, how can we elevate our game?’ We’re not going to catch teams by surprise,” said Blues centre Ryan O’Reilly, last season’s National Hockey League playoff MVP and top defensive forward. “We’re going to need to make changes and grow ourselves to be better this year and to do it again.”

Dallas, Vegas, Calgary, Colorado, San Jose and Winnipeg all go into the season with a shot to knock off St. Louis and keep the Cup in the West after the coveted trophy was won by Eastern Conference teams the previous three years. And even though the Nashville Predators appears to be somewhat overlooked this season, it’s not wise to count them out in the race, especially with the addition of centre MattDuchene.

The Central Division, which may earn both wild cards again in the conference, may be the strongest in the NHL.

Shining stars

Dallas seems set up for success with star players all over the place, giving the franchise a legitimate chance to reach the



ASSOCIATED PRESS FILE PHOTO



CANADIAN PRESS FILE PHOTO

conference finals for the first time since 2008.

Tyler Seguin, Alexander Radulov and Jamie Benn provide plenty of scoring power. Second-year coach Jim Montgomery can roll four lines after the front office bolstered the team’s depth by signing 35-year-old Joe Pavelski, who was an All-Star last year with San Jose for the third time in four years.

Defenceman John Klingberg said, 27, is potentially going into the prime year of his career and 20-year-old Miro Heiskanen is a future star on the blue line,

coming off a 33-point rookie season in which he was durable enough to play all 82 games. Goaltender Ben Bishop looks like he might be at his best at the age of 32.

Third time a charm?

The Golden Knights are hoping their third year is more like their first, when they reached the Stanley Cup final, and not like their second season that ended in the first round with a Game 7 loss to the Sharks. Vegas returns its top nine scorers and three-time Stanley Cup

After 13 seasons in San Jose, Joe Pavelski, pictured left, has landed at his new home in Dallas.

PLAYOFF PREDICTIONS (IN ORDER)

Central: Stars, Blues, Predators
West: Golden Knights, Flames, Sharks
Wild card: Avalanche, Jets
West champion: Stars

mate Leon Draisaitl is a 100-point scorer, but the Edmonton Oilers might be relegated to playing only in the regular season for a third straight year and 13th time in 14 seasons.

â Patrick Kane and Jonathan Toews may not have enough talent around them to avoid missing the playoffs a third straight year in Chicago for the first time in more than a decade.

â The Minnesota Wild signed Zach Parise and Ryan Suter to 13-year, \$98-million contracts in 2012 and they may miss the playoffs two straight years for the first time since then.

â The Los Angeles Kings hired former San Jose and Edmonton coach Todd McLellan, but he will have a hard time stopping the franchise from falling short of the post-season in two straight years for the first time since a six-season drought that ended in 2010.

â Under first-year coach Dallas Eakins, the Anaheim Ducks may miss the playoffs in consecutive seasons for the first time since 2000-02.

â The Arizona Coyotes have failed to make the post-season for seven straight years, a drought that trails only Buffalo’s in the NHL, and probably will extend the run this time around. The Vancouver Canucks could sit out a fifth straight year, which would be a franchise record.



CANADIAN PRESS FILE PHOTO

Thomas Chabot has shown high skill, offensive and defensive abilities in his first two NHL seasons. He is pictured recently at training camp in Ottawa.

Ottawa signs defender Chabot to eight-year, \$64M contract

THE CANADIAN PRESS

OTTAWA — The Ottawa Senators have locked up another member of their young core.

The team announced Thursday it has agreed to an eight-year, US\$64-million contract extension with star defenceman Thomas Chabot.

The slick 22-year-old has 23 goals and 80 points in 134 career National Hockey League games.

Selected 18th overall in the 2015 NHL draft, Chabot had 14 goals and 55 points in his first full NHL season in 2018-19. “Thomas is an exceptional talent and an outstanding teammate, who is impactful both on and off the ice,” Senators general manager Pierre Dorion said in a statement. “He is the type of player that can develop into a core member of a championship-level team.”

The signing is a statement for a franchise that saw three of its best players — Erik Karlsson, Mark Stone and Matt Duchene — traded away in the last 12 months. The three were unable to come to terms on new contracts in the nation’s capital.

Chabot, six-foot-two and 200 pounds, has one year left on his entry-level deal. He will earn \$7 million in both 2020-21 and ’21-22, \$4 million in ’22-23, \$8 million in ’23-24, \$10 million in ’24-25, ’25-26 and ’26-27, and \$8 million in ’27-28.

The rebuilding Senators, who bought four seasons of Chabot’s potential unre-

stricted free agency window with the deal, also signed centre Colin White to a six-year, \$28.5-million extension last month.

Ottawa finished last in the NHL in 2018-19, and is expected to wind up in a similar position this season.

Despite those prognostications, Chabot said at the NHL/players’ association media tour last month in Chicago that he’s looking forward to getting going. “It’s going to be a fun year,” said the native of Saint-Marie, Que. “Everybody’s really excited.

“There’s a lot of young talent coming.”

At the time, Chabot didn’t tip his hand about where negotiations on a contract extension stood.

“Whatever happens, happens,” he said. “I’m sure my agents will keep me in the loop and let me know what happens. But I’ll leave that up to them and focus on what I can control right now.” Chabot was also asked if all the restricted free agents in limbo this summer and training camp made him think twice about his status.

“Everybody’s in different situations, right? It’s all different teams. We all have different stories,” said Chabot, who could have become an RFA next summer. “Any hockey player will tell you that getting something and some security would be the best thing. My agents are taking care of that, and I’ll be made aware of it, if something comes up.”

PUBLIC NOTICE

THE REGIONAL MUNICIPALITY OF NIAGARA

NOTICE OF PUBLIC INFORMATION CENTRE

Bender Hill Sanitary Pumping Station

Municipal Class Environmental Assessment

WHAT IS THE STUDY ABOUT?

Niagara Region has started a study to look at options for improving the Bender Hill Sewage Pumping Station (The Site) located at 5615 River Rd. in Niagara Falls. The station opened in 1962 and has serviced the City during a variety of upgrades and maintenance over the years. Recent examinations of the site have shown that work must be done at the site to improve safety and repair old infrastructure.

WHERE IS IT LOCATED?

REASON FOR THE STUDY

Reviews of the site show that the older infrastructure needs repairs and improvements. Also, this area is expected to grow with future development, and the site will need to increase its ability through infrastructure upgrades to keep up with the demand of pumping wastewater from the area. With this in mind, the Region is starting a Municipal Class EA Schedule 'B' Study to assess the site and find the preferred solutions to meet these needs.

GET INVOLVED

Niagara Region encourages anyone interested in this study to take part in the planning process. The Region invites you to come to a drop-in information session that will present details about the study, the process used to decide on possible solutions and allow you to share your comments.

Additional Information about the Bender Hill SPS Study is available at niagararegion.ca/projects.

Public Information Centre #1	
Date / Time	Tuesday, September 24, 2019 from 5 – 8 p.m.
Location	Niagara Falls City Hall, Committee Rooms 2A-2B

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Lisa Vespi, P.Eng., PMP®

Senior Project Manager

Niagara Region, Water and Wastewater Services

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David Watt, O.L.S., C.E.T.

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Appendix F - Public Information Center Materials



Appendix F.1. - Comment Form for Stakeholders

Thank you for taking the time to fill out this comment form. Please place it in the box provided or email it to the address below. **Your input is important.** Comments will become part of the public record with the exception of personal information.

1. Do you think any criteria or important indicators were missed? If so, please indicate below:

2. What do you think about the evaluating criteria? Do you think any criteria are more or less important than the others?

	More Important than the other categories	Same importance as the other categories	Less important than the other categories
Environmental Impacts			
Social and Cultural Impacts			
Constructability Impacts			
Financial Viability			
Operational Benefits			

Please explain your rationale:

3. Do you agree with the identified advantages and disadvantages for the short-listed alternatives?

- ☐ Yes
☐ No

If no, please indicate your preference below:

	Advantages	Disadvantages
Do Nothing		
Station Rehabilitation & Upgrades		
Station Upgrades and Road Realignment		
Station Rebuild and Road Realignment		

4. Do you have any other questions or comments?

5. Would you like to be added to the study mailing list?

- ☐ Yes
☐ No

If yes, please indicate below:

Name: _____

Street Address: _____

City/Province: _____ Postal Code: _____

Phone: _____ E-mail: _____

Thank you for taking the time to fill out this comment form. For additional questions or concerns regarding this project, please contact:

Lisa Vespi, P.Eng., PMP
Senior Project Manager
Niagara Region
1815 Sir Isaac Brock Way
Thorold, ON L2V 4T7
Lisa.Vespi@niagararegion.ca

David Watt, OLS, CET
Project Manager
GM BluePlan Engineering Limited
1266 South Service Road, Unit C31
Stoney Creek, ON L8E 5R9
David.Watt@gmblueplan.ca

Appendix F.2. - Comment Form for Public

Thank you for taking the time to fill out this comment form. Please place it in the box provided or email it to the address below. **Your input is important.** Comments will become part of the public record with the exception of personal information.

1. How did you hear about this Public Information Event?

☐ Newspaper ad

☐ Personal letter or email

☐ Word of mouth

☐ Website

☐ Other _____

2. What was your main reason for attending the Public Information Event?

3. Did this Public Information Event meet your information needs?

☐ Yes

☐ Somewhat

☐ No

Please explain: _____

4. If you asked a question, did the representatives available answer your question sufficiently?

- ☐ Yes
☐ Somewhat
☐ No

Please explain: _____

5. Other questions or comments:

If you would like to receive updates about the Bender Hill Sewage Pumping Station Options Analysis, please provide your name and contact information:

Name: _____

Affiliation: _____

Address: _____

City/Province: _____ Postal Code: _____

Email: _____

Thank you for taking the time to fill out this comment form. For additional questions or concerns regarding this project, please contact:

Lisa Vespi, P.Eng., PMP
Senior Project Manager
Niagara Region
1815 Sir Isaac Brock Way
Thorold, ON L2V 4T7
Lisa.Vespi@niagararegion.ca

David Watt, OLS, CET
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GM BluePlan Engineering Limited
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Stoney Creek, ON L8E 5R9
David.Watt@gmblueplan.ca

Appendix F.3. - Public Information Center Boards

Niagara Region

Bender Hill Sewage Pumping Station Options Analysis

Schedule B: Municipal Class Environmental Assessment

Public Information Centre

September 24th, 2019

City of Niagara Falls City Hall, Committee Room 2A & 2B

5:00 – 8:00 pm

Welcome!

Please sign in and take a comment sheet.

Meeting is a “drop-in” format with display materials.

Take an information bulletin and review the display materials.

Members of the study team are available to answer questions.

We welcome your feedback as your opinion will influence this study.

Please place comment sheets in the box provided.

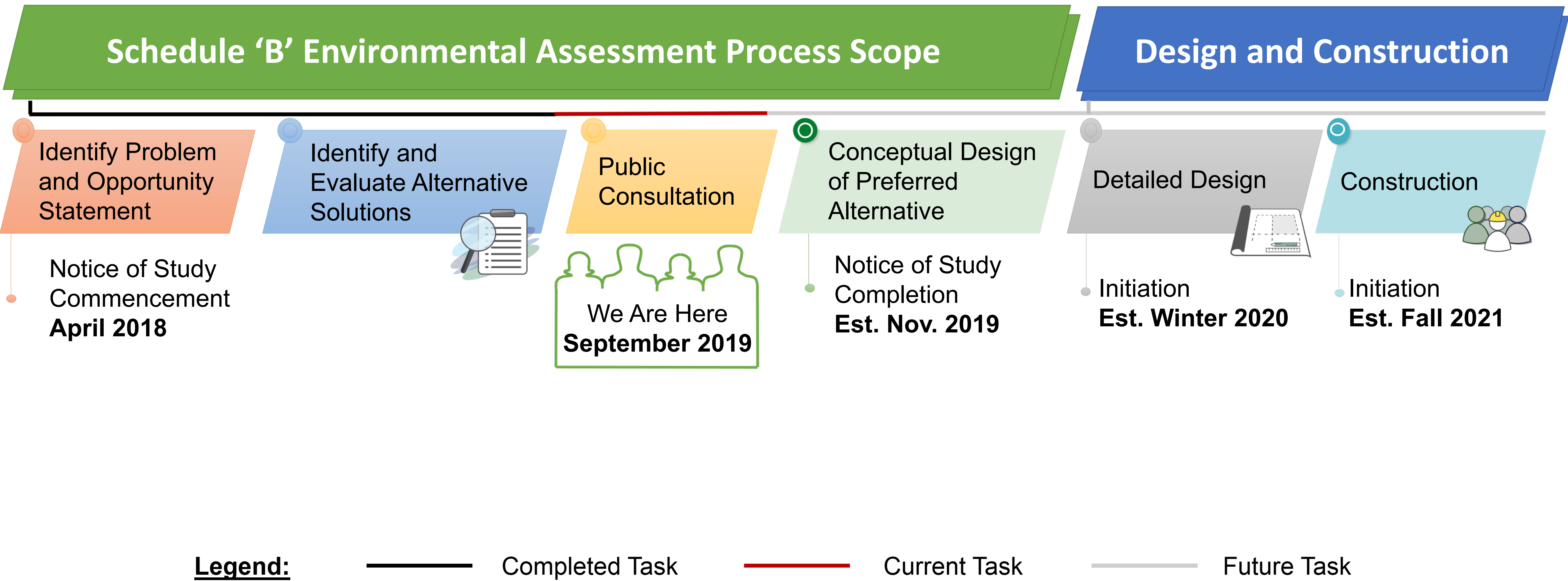
Why are we here?

The purpose of today’s meeting is to introduce the project, gather information, and solicit feedback.



Please note that photos and videos will be taken during this event. If you have any issues, please speak to a member of the project team.

This project is following the **Class Environmental Assessment** process, which is a decision-making process that all Ontario municipalities follow for infrastructure projects.



Problem and Opportunity Statement

The purpose of this study is to determine a preferred alternative for the necessary upgrades at the Bender Hill Pumping Station, the goal is to achieve the following:

- Increase station capacity to meet 2041 servicing needs
- Improve worker health and safety and accessibility
- Prevent the ingress of corrosive road salt to the station
- Replace aging infrastructure and equipment
- Provide a wider platform for pedestrian traffic and WEGO bus riders



This is defined as the Problem Opportunity Statement under the Class EA process

Bender Hill Pumping Station Background Details:

- Located at 5615 River Road in the City of Niagara Falls
- Commissioned in 1962; has since undergone minor upgrades
- Planned future development will require additional station capacity

Project Stakeholder Infrastructure

To Ontario Highway 420

Hiram Street

City of Niagara Falls:
Owns the Underground
Water and Wastewater
Infrastructure.

To Clifton Hill

Rainbow Bridge

River Road

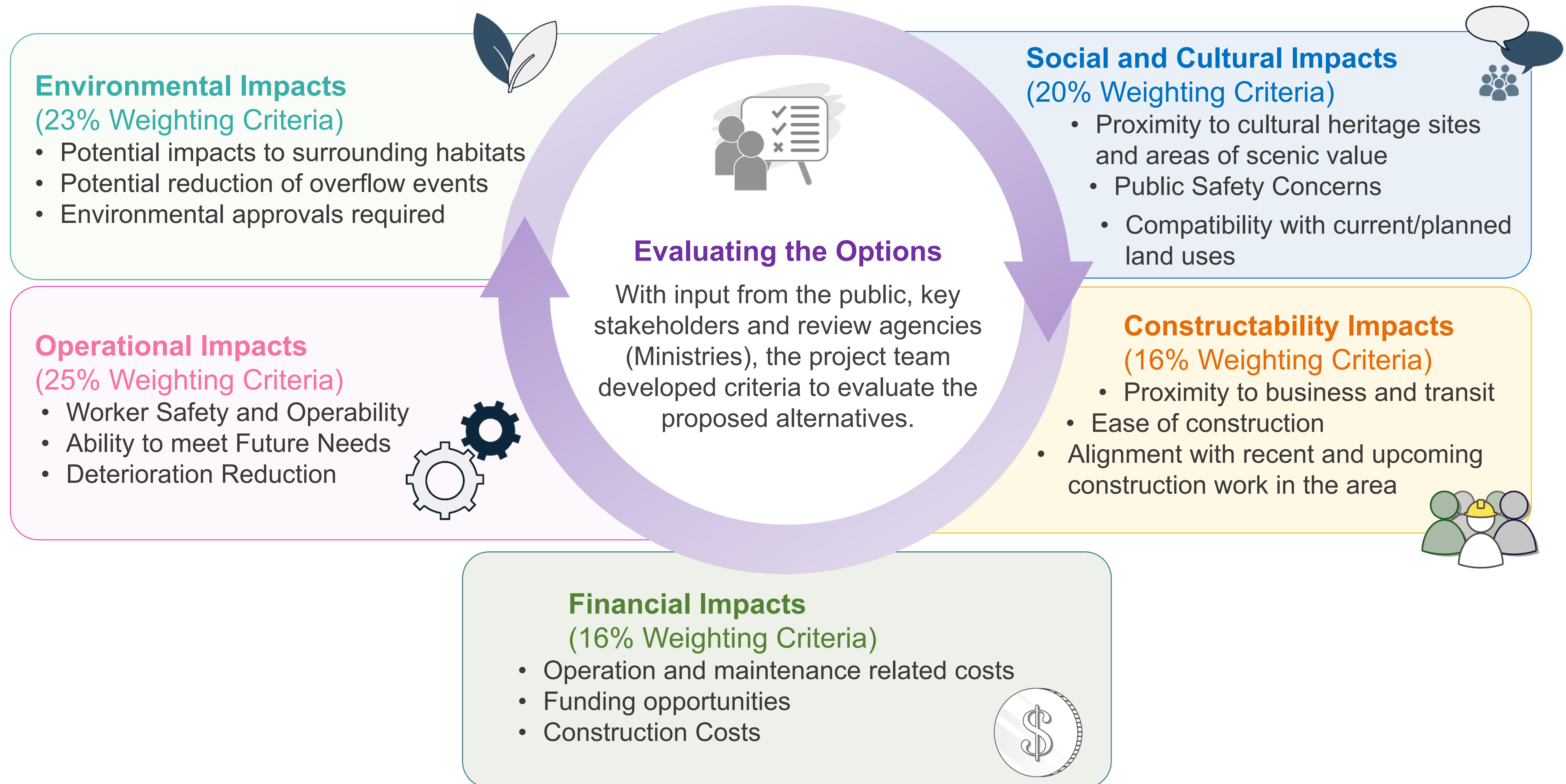
River Road

**Niagara Parks
Commission:** Manages
WE GO Bus Services &
Owns River Rd.

Niagara Region: Owns the
Bender Hill Pumping Station,
the Station Forcemain and
Some Wastewater
Infrastructure Coming Into
the Station.

Alternative Solutions	Scope of Work					Fulfills Problem Statement
						
Alternative 1: Do Nothing No changes to equipment or infrastructure						
Alternative 2: Station Rehabilitation & Upgrades Replacement of components and repairs to the existing station’s structure with relocation of WEGO Bus Stop	✓					
Alternative 3: Station Replacement (Existing Location) Demolition and construction of a new station at the same location					✓	
Alternative 4: New Station (Bird Kingdom Parking Garage) Construction of a new station in the Bird Kingdom Parking Garage		✓				✓
Alternative 5: New Station (Corner of John St. and River Rd.) Construction of a new station at the corner of John St. & River Rd.		✓				✓
Alternative 6: New Station (East side of River Rd.) Construction of a new station on the East side of River Rd. adjacent to the existing site		✓				✓
Alternative 7: Station Rebuild and Upgrades Decommissioning Seneca Pump Station and redirect flows to Bender Hill Pump Station	✓			✓		✓
Alternative 8: Station Rehabilitation and New Station (Tourist Core) Minor rehabilitation and new station in tourist core with redirected flows from Bender Hill		✓		✓		✓
Alternative 9: Station Upgrades and Road Realignment Replacement of components and structural repairs with realignment of River Rd. and relocation of WEGO Bus Stop	✓		✓			✓
Alternative 10: Station Replacement and Road Realignment Replace station infrastructure in the same location with realignment of River Rd. and relocation of WEGO Bus Stop			✓		✓	✓

Legend of scope of work

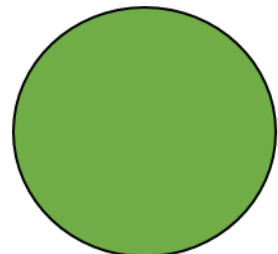


Long List of Alternative Evaluation Screening



Alternatives	Environmental (23%)	Social (20%)	Constructability (16%)	Financial (16%)	Operational (25%)	Summary Score
1 - Do Nothing						
2 - Station Rehabilitation & Upgrades						
3 - Station Replacement (Existing Location)						
4 - New Station (Bird Kingdom Parking Garage)						
5 - New Station (Corner of John St. and River Rd.)						
6 - New Station (East Side of River Rd Adjacent to Existing Station)						
7 - Station Rebuild and Upgrades						
8 - Station Rehabilitation and New Station (Downtown Tourist Core)						
9 - Station Upgrades and Road Realignment						
10 - Station Replacement and Road Realignment						

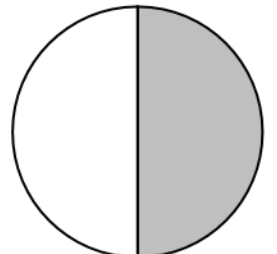
Legend of Impact per Category:



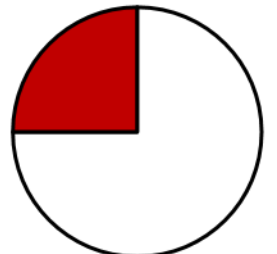
Major Positive



Minor Positive



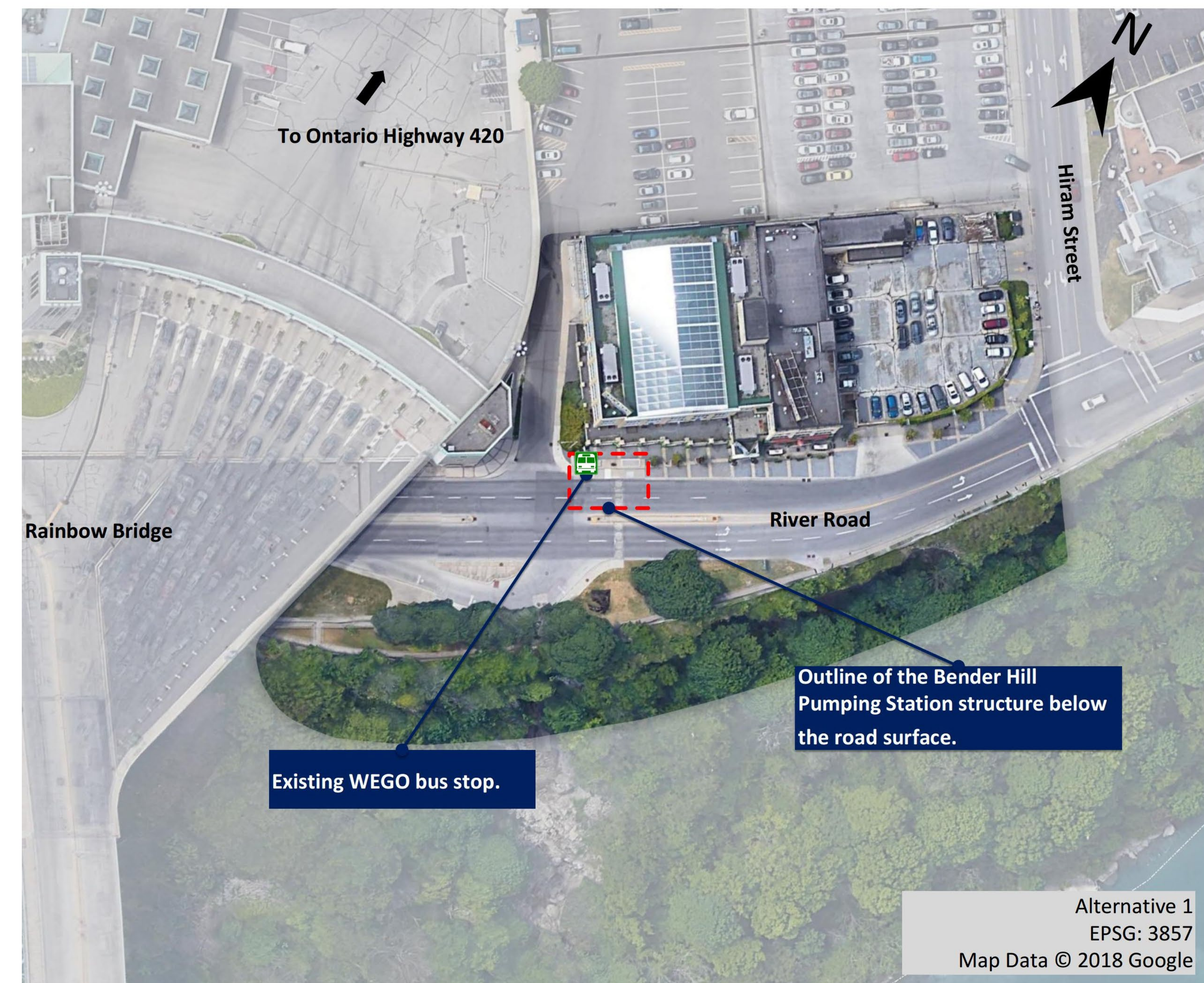
Neutral



Negative

Alternative 1: Do Nothing

No changes to equipment or infrastructure



This is a mandatory alternative under the EA Process



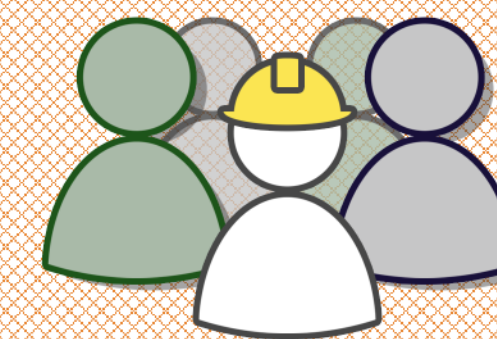
No upgrades for resiliency and protection from potential overflows



No increase in space for pedestrians



Station Access close to existing WEGO bus stop



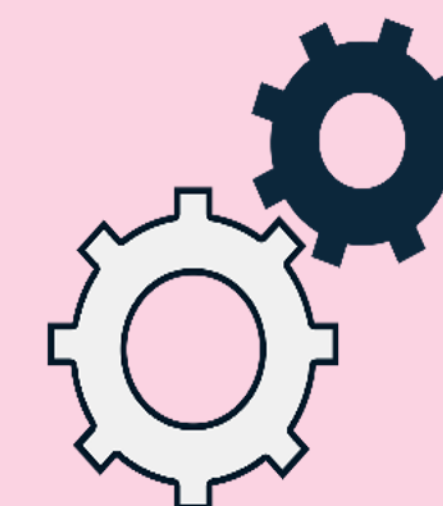
No construction Impacts as there is no construction



Continued increase in maintenance costs and service disruptions



No Capital Cost



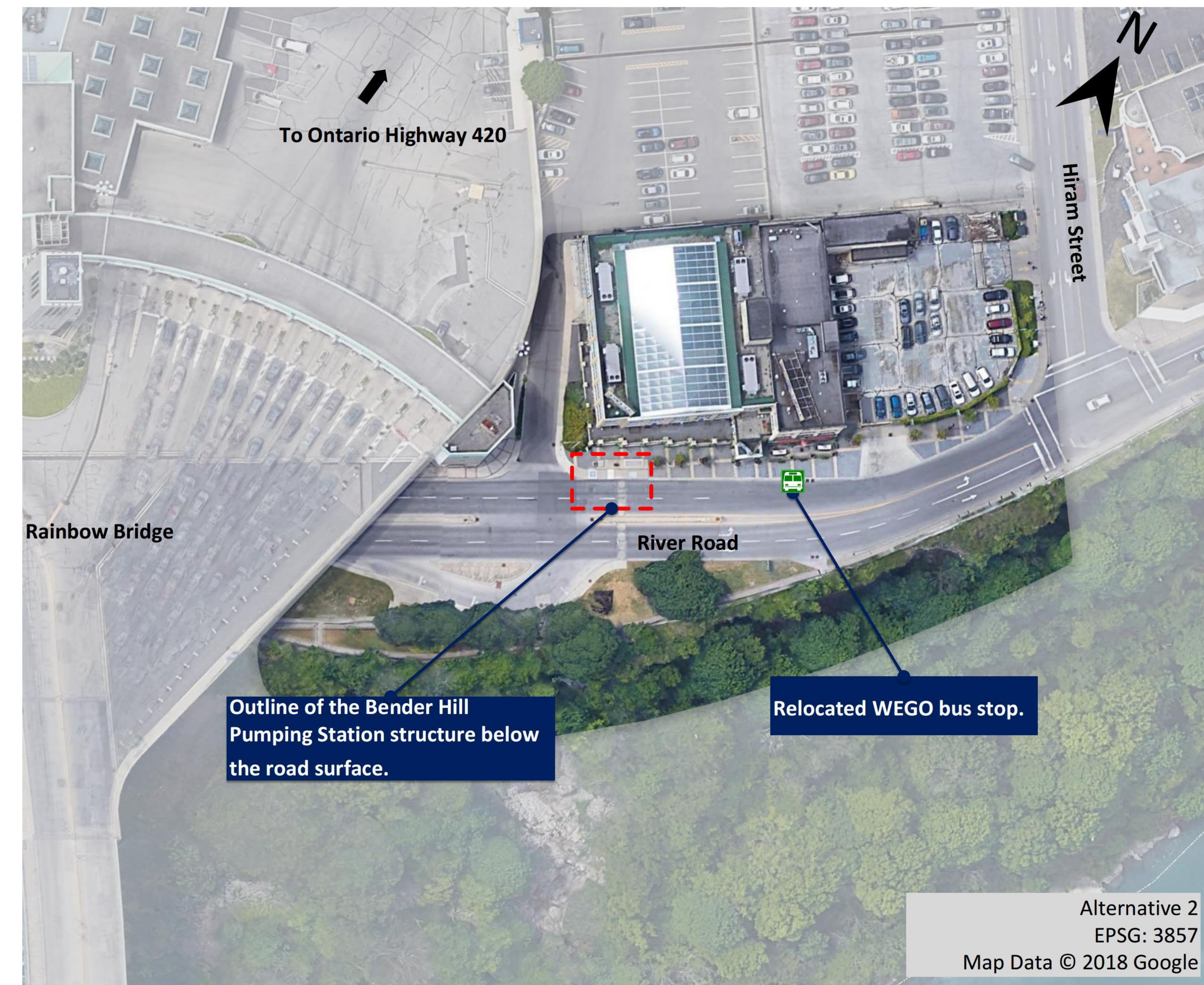
Continued safety risk for station operators



Continued station corrosion due to road salt

Alternative 2: Station Rehabilitation & Upgrades

Replacement of components and repairs to the existing station's structure with relocation of WEGO Bus Stop



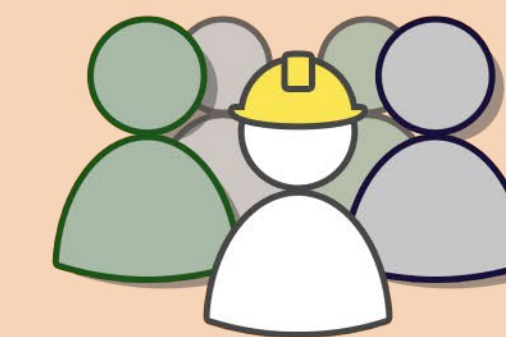
Increased station resiliency and protection for potential overflows



Pedestrian impact as existing station is within the sidewalk and road



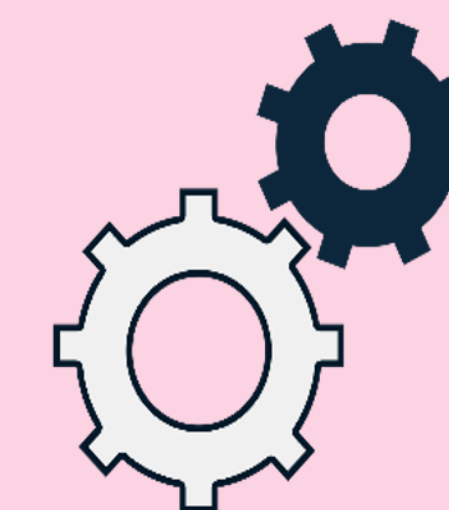
Station Access close to existing WEGO bus stop



Lengthy construction impact due to station location and site constraints



Low cost alternative



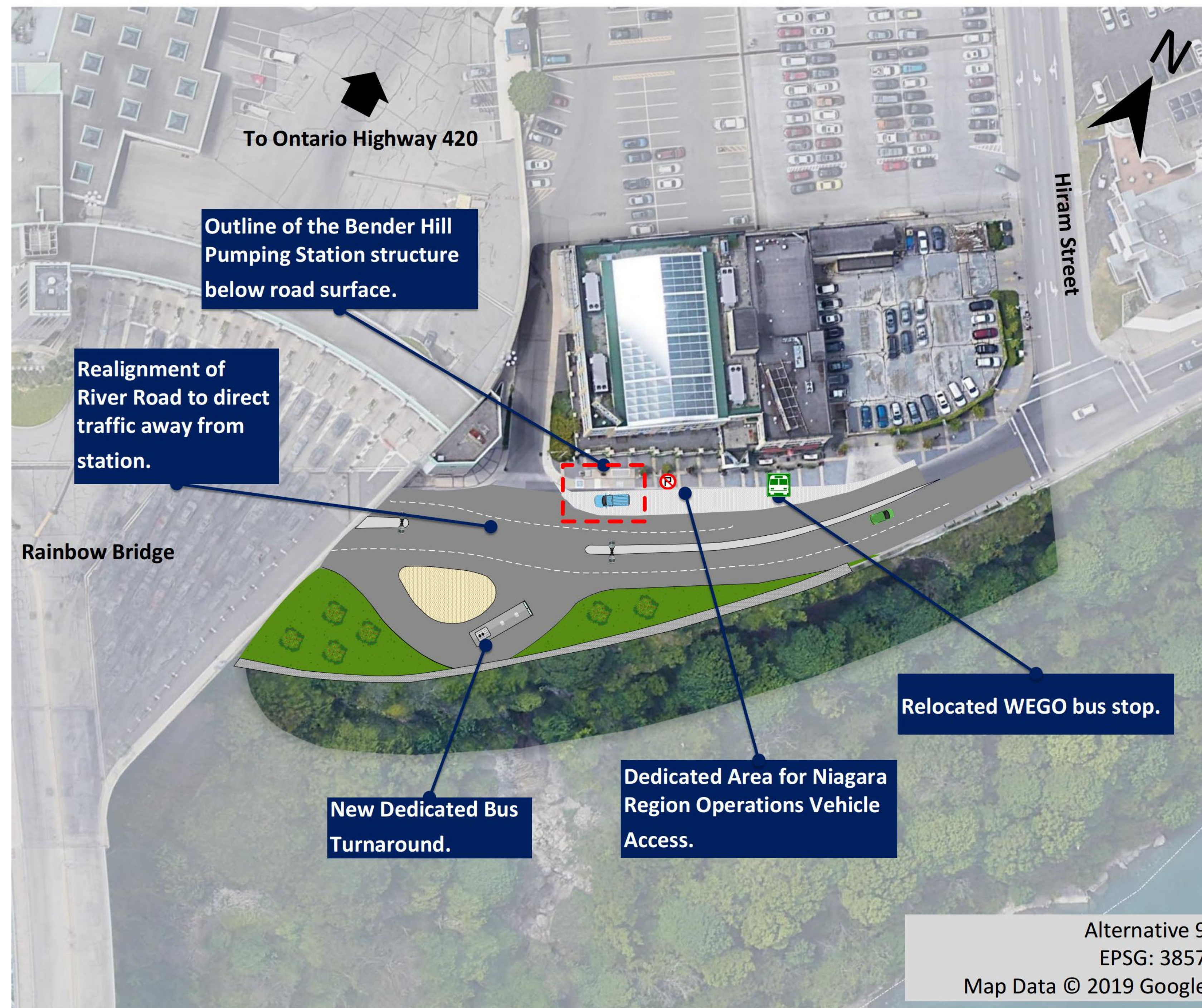
Continued safety risk for station operators



Reduction in salt corrosion as a result of the WEGO bus stop relocation

Alternative 9: Station Upgrades and Road Realignment

Replacement of components and structural repairs with realignment of River Rd. and relocation of WEGO Bus Stop



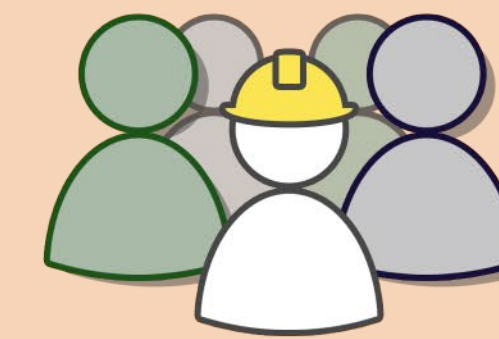
Reduced overflow frequency as a result of station capacity increase



Increased station resiliency due to upgrades



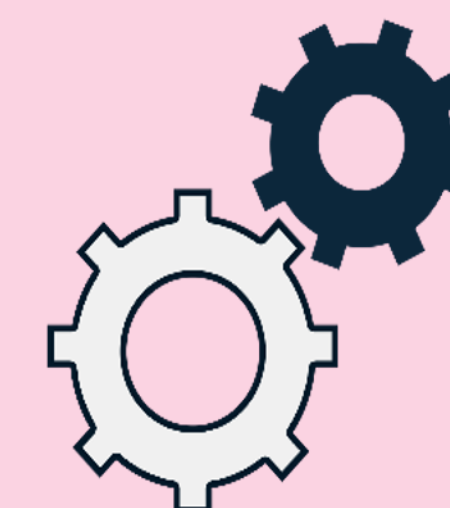
Improved public safety as the station access is no longer in an active lane of traffic, and is now further from the WEGO Bus Stop



Major temporary impact in the area during road realignment



Medium cost alternative



Increased equipment and structure service life



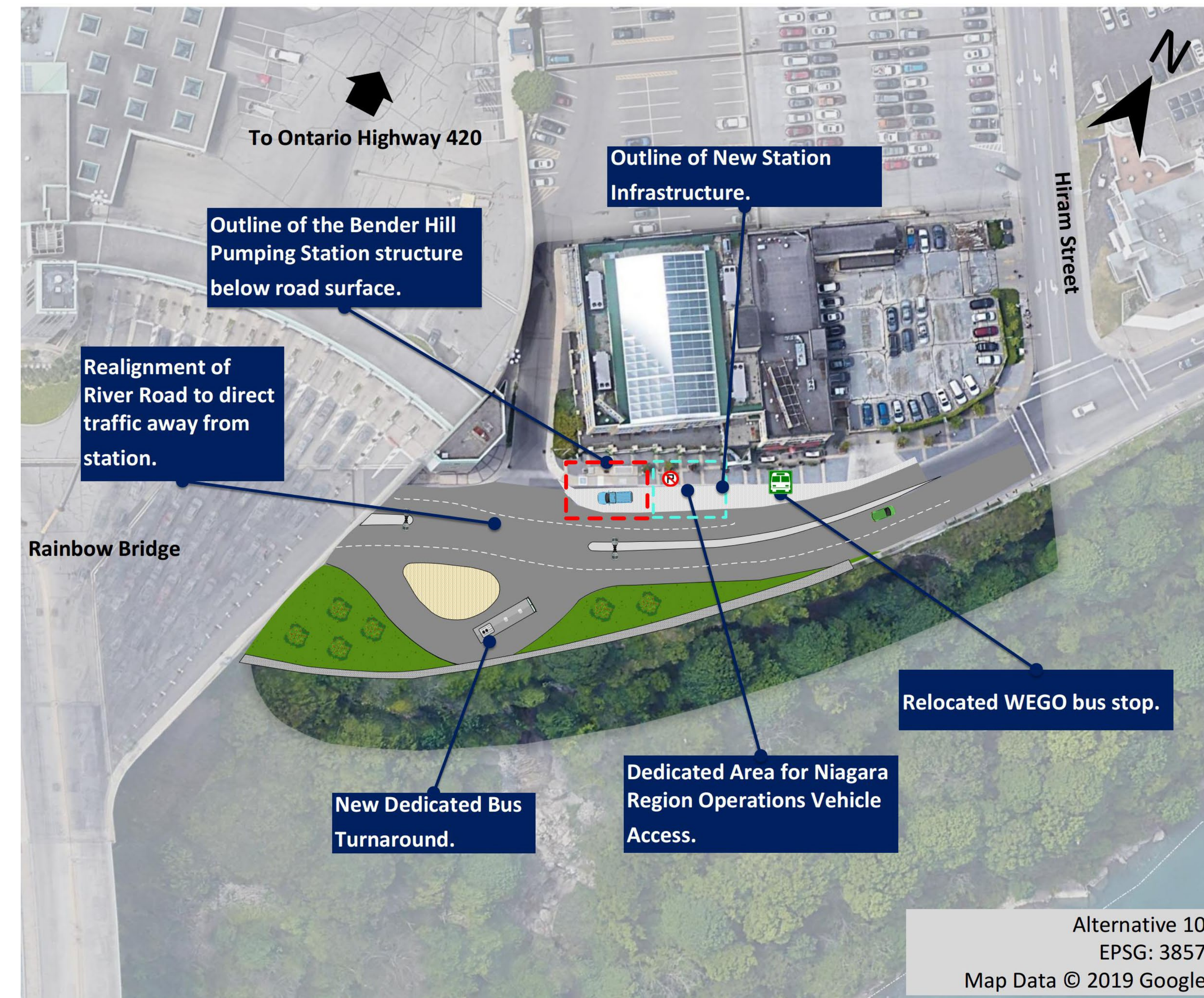
Increased operator safety



Reduced corrosion due to bus stop relocation

Alternative 10: Station Replacement and Road Realignment

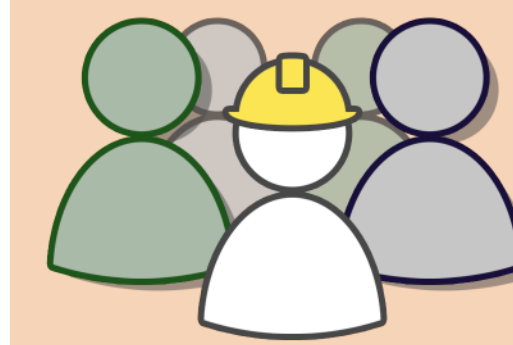
Replace station in the same location with realignment of River Rd. and relocation of WEGO Bus Stop



- ✓ Reduced overflow frequency as a result of station capacity increase
- ✗ Major impact due to rock excavation



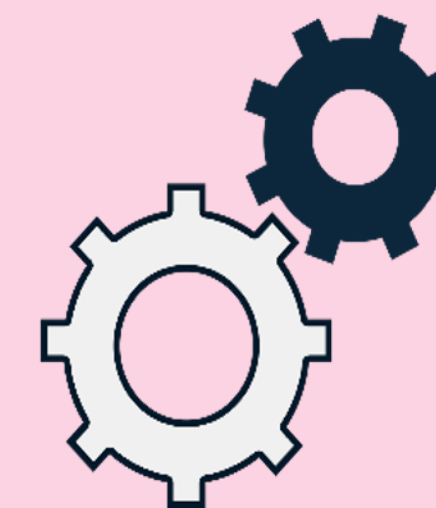
- ✓ Improved public safety as the station access is no longer in an active lane of traffic, and is now further from the WEGO Bus Stop



- ✗ Extended period of construction with major impact to surrounding businesses
- ✗ Major impact in for surrounding businesses as rock excavation is required



- ✗ High cost alternative



- ✓ Increased equipment and structure service life
- ✓ Increased operator safety
- ✓ Reduced corrosion as result of bus stop relocation

Short List of Alternative Evaluation Screening

Alternatives	Environmental (23%)	Social (20%)	Constructability (16%)	Financial (16%)	Operational (25%)	Summary Score
1 - Do Nothing						
2 - Station Rehabilitation & Upgrades						
9 - Station Upgrades and Road Realignment						
10 - Station Replacement and Road Realignment						

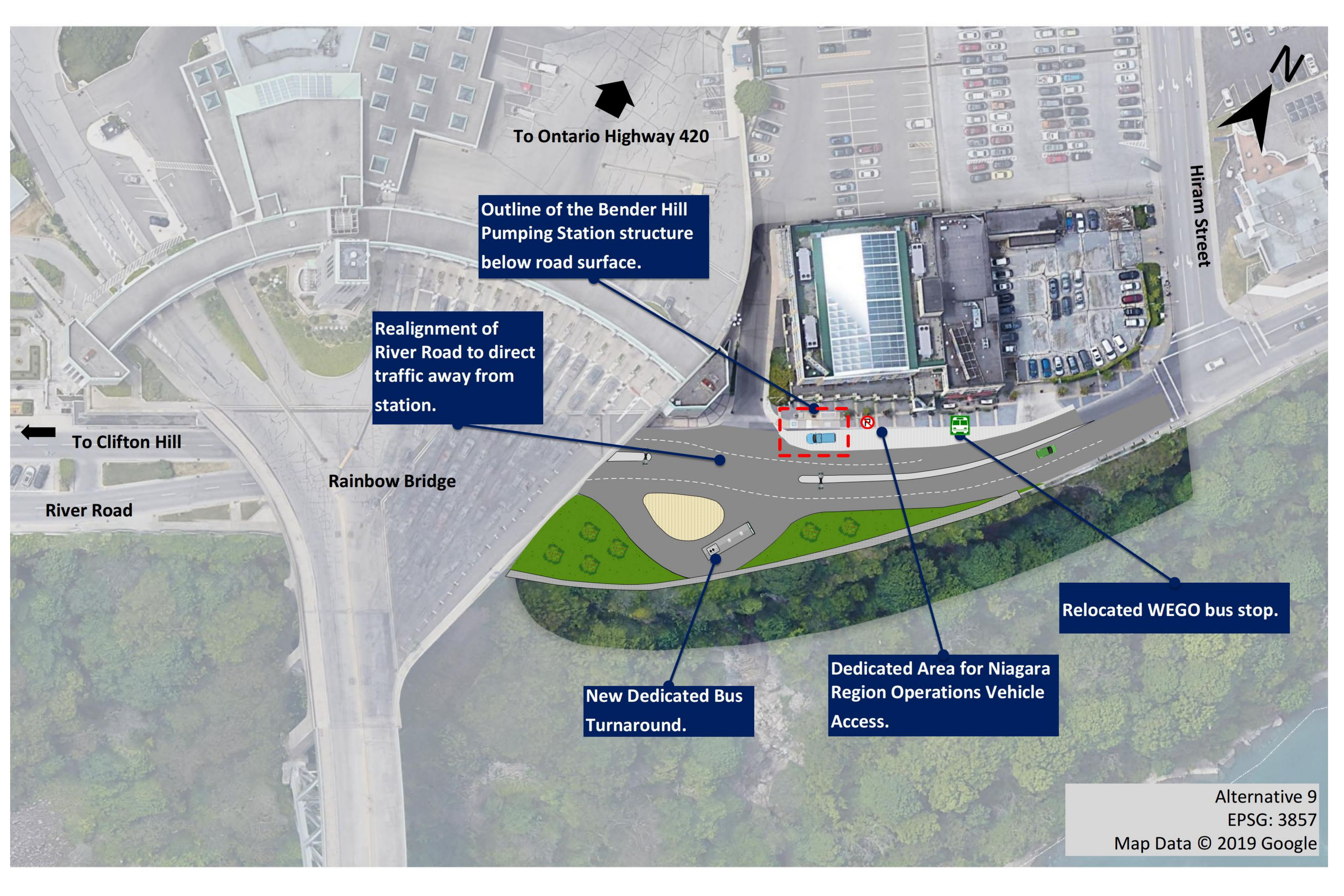
Legend of Impact per Category: Major Positive Minor Positive Neutral Negative

Following evaluation of the short-listed alternatives, the preferred solution is Alternative 9, replacement of components and repairs to station structure with realignment of River Rd.

- ✓ Allows for Increase to Station Capacity
- ✓ Increases Operator Safety as Station is off the Road
- ✓ Provides a dedicated Access Lane for Operations and Maintenance Work
- ✓ Reduces Entry of Corrosive Agents into Station
- ✓ Cost Effective Alternative
- ✓ Provides Additional Benefits to area due to relocation of road

PROBLEM STATEMENT OBJECTIVES:

- Increase station capacity to meet 2041 servicing needs
- Improve worker health and safety and accessibility
- Prevent the ingress of corrosive road salt to the station
- Replace aging infrastructure and equipment
- Provide a wider platform for pedestrian traffic and WE GO bus riders



To Ontario Highway 420

Outline of the Bender Hill Pumping Station structure below road surface.

Realignment of River Road to direct traffic away from station.

To Clifton Hill

River Road

Rainbow Bridge

Hiram Street

Relocated WEGO bus stop.

New Dedicated Bus Turnaround.

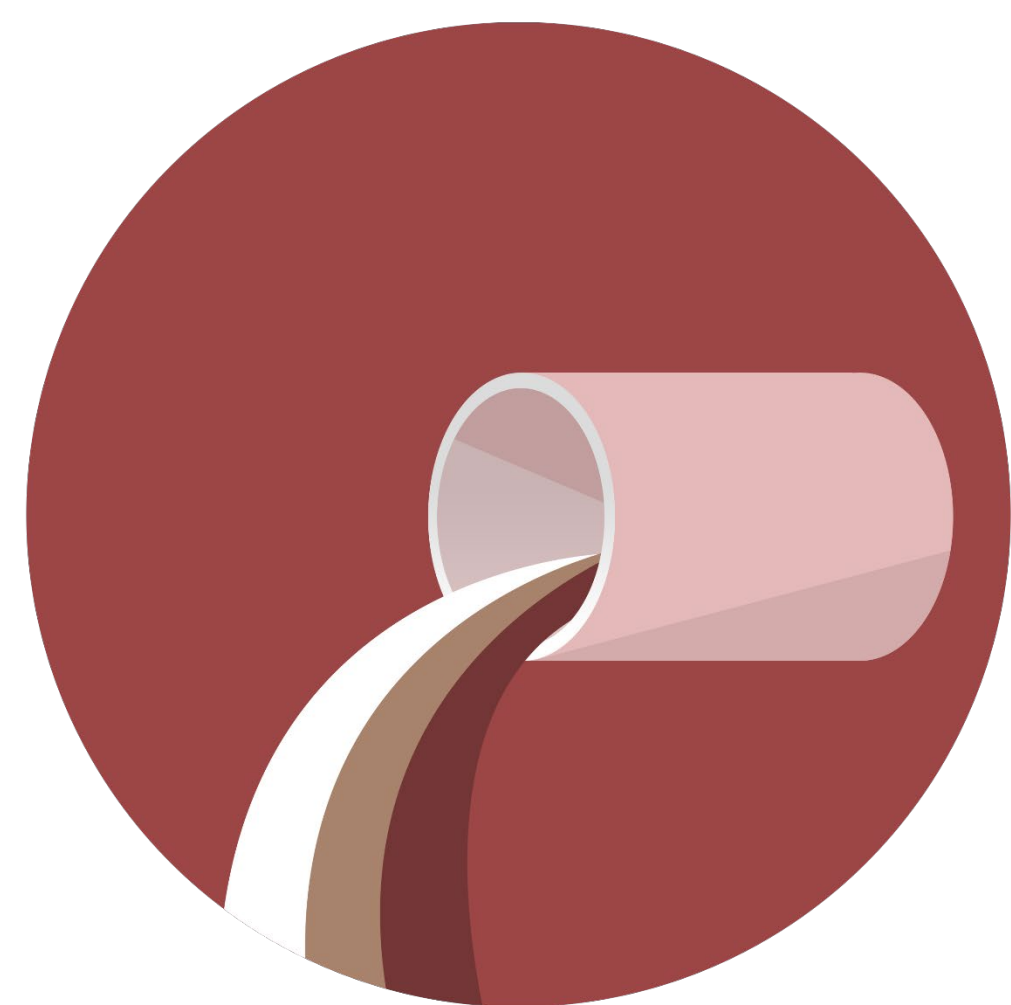
Dedicated Area for Niagara Region Operations Vehicle Access.

What is an Overflow?

- Overflow is the discharge of untreated wastewater to the natural environment, in the case of Bender Hill, the Niagara River
- Normally takes place during heavy rainfall and/or thaw events when clean water entering the collection system exceeds its capacity

Bender Hill's Existing Overflow Status:

- The overflow for the Bender Hill SPS discharges to the Niagara River, North of the Rainbow Bridge
- Occurs rarely at this location relative to other Regional facilities



Preferred Alternative Will Reduce the Station's Overflow Frequency:

- Increased station capacity is expected to assist in reducing the potential for overflows by conveying more flow to the Stanley Avenue Wastewater Treatment Plant

Site Considerations and Partnerships:

- ***Niagara Parks Commission***

The preferred alternative provides connectivity with the Queen's Park Master Plan in the following:

- Right of Way state of good repair completed under one construction project
- Streetscaping & Landscaping Improvements
- Opportunity for traffic improvements

The preferred alternative facilitates traffic improvements of WEGO bus services in this core tourist area with the implementation of a dedicated bus turnaround.

- ***City of Niagara Falls***

The preferred provides an opportunity for the improvement of underground infrastructure in the area.

COMBINED BENEFITS:

- Construction and Engineering Costs Savings
- Minimization of Customers and Businesses Impact through the replacement of infrastructure for all stakeholders under one project
- Increased Pedestrian Safety

Next Steps

Following this PIC, the project team will:

- Review and consider stakeholder input received during this PIC.
- Select the preferred alternative solution.



Thank you for Participating, Get Engaged!

We want to hear from you! Please let us know your thoughts by filling out a comment form.

Your feedback will be considered during the evaluation process.

How to Contact the Project Team

If you have any questions or comments, please contact the following:

A silver pushpin is pinned to the top of a white rectangular card.

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