MEMO

To:	Cam Elsby, P.Eng. (City of Ottawa)	From:	GEI Consultants Canada Ltd.
GEI Project:	2501074 – City of Ottawa Urban Expansion Area Hydraulic Assessments	Date:	March 31, 2025

South March Urban Expansion Area Assessment

1 Introduction

The City of Ottawa (the "City") has recently completed the new Official Plan (OP) and Infrastructure Master Plan (IMP). GEI Consultants Canada Limited (GEI, formerly GM BluePlan Engineering Limited) was previously retained to complete the Wastewater Master Plan (WWMP) as part of the IMP.

The Ministry of Municipal Affairs and Housing (MMAH) provided a set of urban expansion lands that were reviewed as part of the IMP. The IMP recommended system-level water and wastewater infrastructure to support these lands and to be ultimately incorporated into the urban boundary as part of the Province's final approval of the City's Official Plan. However, these expansion areas were subsequently removed from the Official Plan (and therefore from the IMP), with individual developers now eligible to apply to expand the urban area on an ad-hoc basis. Adding these expansion areas will have a system-level impact and the need for additional off-site system-level projects must be assessed on an applicant-basis.

The City has retained GEI to complete the "Sanitary Infrastructure Needs Assessments for Boundary Area Expansion Applications". To streamline the process, the OPA has been divided into Step 1 and Step 2, as described below:

Step 1 aims to establish the baseline capacity of the system as well as identify deficiencies in supporting the planned growth outlined in the boundary area expansion applications. The key output of Step 1 is a hydraulic model capacity assessment of existing infrastructure.

Step 2 will assess how to address potential capacity constraints in the study area through identifying servicing solutions and developing subsequent conceptual designs to determine feasibility and Class D cost estimates. The key outputs of Step 2 are the development of conceptual design information to inform the feasibility, and Class D cost estimates for required infrastructure.

2 Background

2.1 Study Area

The City has identified there will likely be impacts to the South March Pumping Station which will require a review of the extent and timing of projects needs identified in the recent Trunk Sewer Master Plan. The affected infrastructure downstream of the South March OPA boundary expansion area will require a conceptual design and Class D cost estimate for the required infrastructure improvements.

As part of the assessment, the area review consisted of the following:

- Capacity Review
    - Assess the capacity of the March Road Collector, the 450 mm sanitary sewer upstream of the Briar Ridge Pump Station, East March Collector, Briar Ridge PS, and March Lift Station to accommodate flows from the South March Cluster.
    - The IMP that included additional lands added by the province, confirmed sufficient trunk capacity in the East March Trunk. However, the recently constructed March Road Collector was found to be operating under surcharge conditions.
    - A project identified in the 2013 IMP aims to increase the capacity of the March Lift Station to 586 l/s, which would adequately serve the South March Cluster.
- Servicing Solutions
    - Flow Monitoring and Gating Policy: Implement a "gating" policy where flow monitoring is installed in the March Road Collector to confirm capacity availability for each phase of development in the South March Cluster.
    - Sanitary Overflow: Establish a new sanitary overflow at Shirley's Brook Drive and Sandhill Road to protect the facility and basements during a catastrophic failure at the March Lift Station.
    - Pump Station Upgrade: Expedite the planned upgrades to the March Lift Station to accommodate the South March Cluster.

The South March area is currently within the bounds of the Municipality of North Kanata, with the study area being predominantly residential. The site address is listed as 1221 March Road, with an estimated build-out population of 8,568 people allocated to these developments alone. No employment is currently planned. The total area of the assessment extents is 385.96 ha, with 152.46 ha from new developments.

It should be noted that:

- There are existing, unserviced residential properties in the area. An estimate of existing unserviced population was developed based on the City's design criteria, as it is anticipated that these households may receive servicing while building infrastructure for the proposed developments. The unserviced population area is shown in Table 1 and in Figure 2.
- While the total area is 385.96 ha, not all of this area will be developed. As such, areas that are not existing unserviced or part of the applicant group's developments, were not included in the analysis. The total serviced area in the table (296.6 ha) represents all the existing unserviced land, as well as all the applicants' holding lands.

The following table, Table 1, summarizes the population, unit counts and known phasing information.

Table 1: Summary of proposed development in study area

Development	Population	Area (ha)
Future		
Claridge	3616	64.35
Mattamy Homes	1326	23.59
Minto Communities	2056	36.58
Second Line Regional Inc	616	10.96
Kanata North	273	4.85
Uniform Urban Developments	682	12.13
Future Total	8568	152.46
Existing		
Unserviced[1]	473	144.10
Total	9041	296.56

[1] A population per unit rate of 3.4 for single detached households was used to estimate the unserviced population.

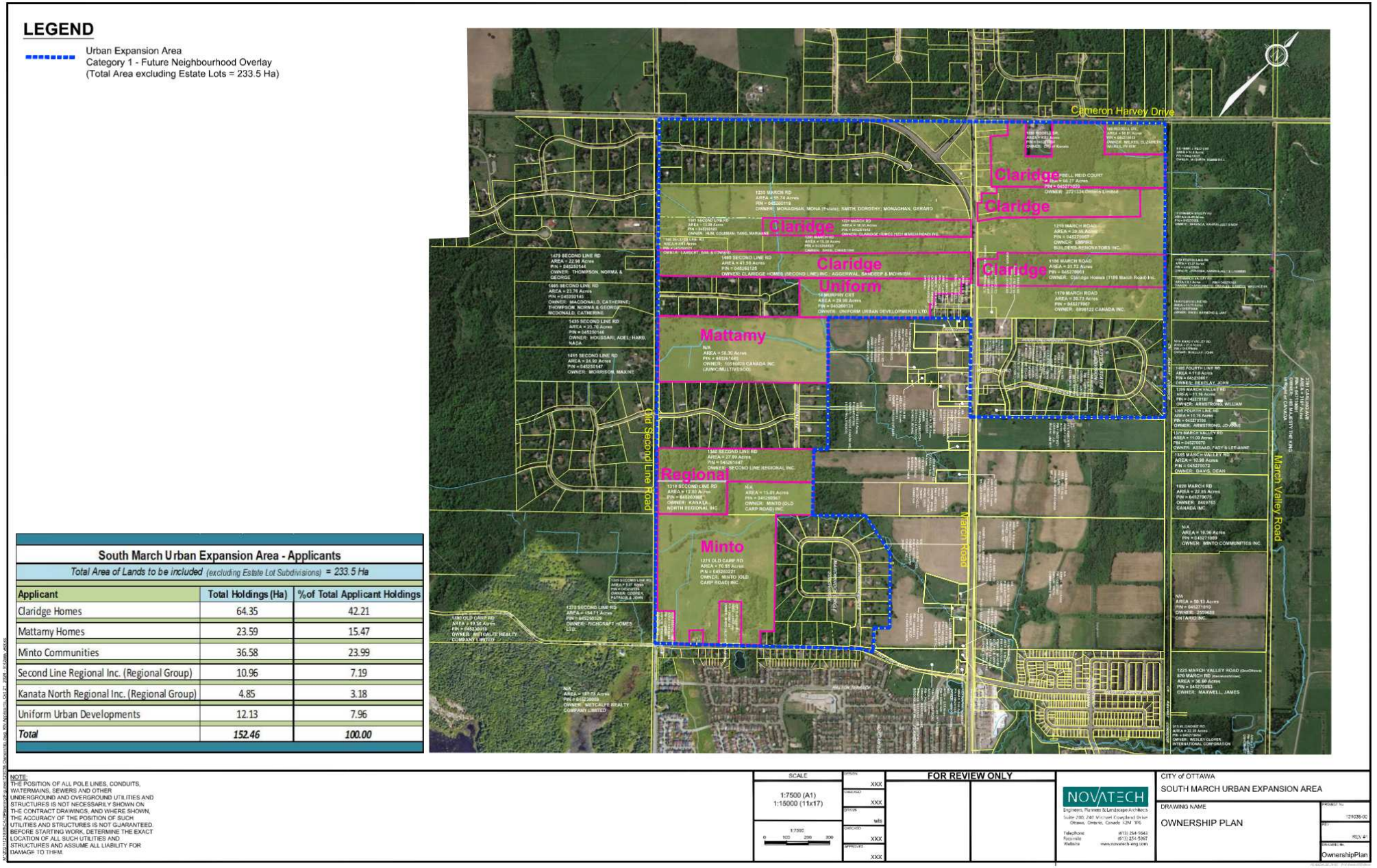


Figure 1: South March Urban Expansion Area Ownership Plan

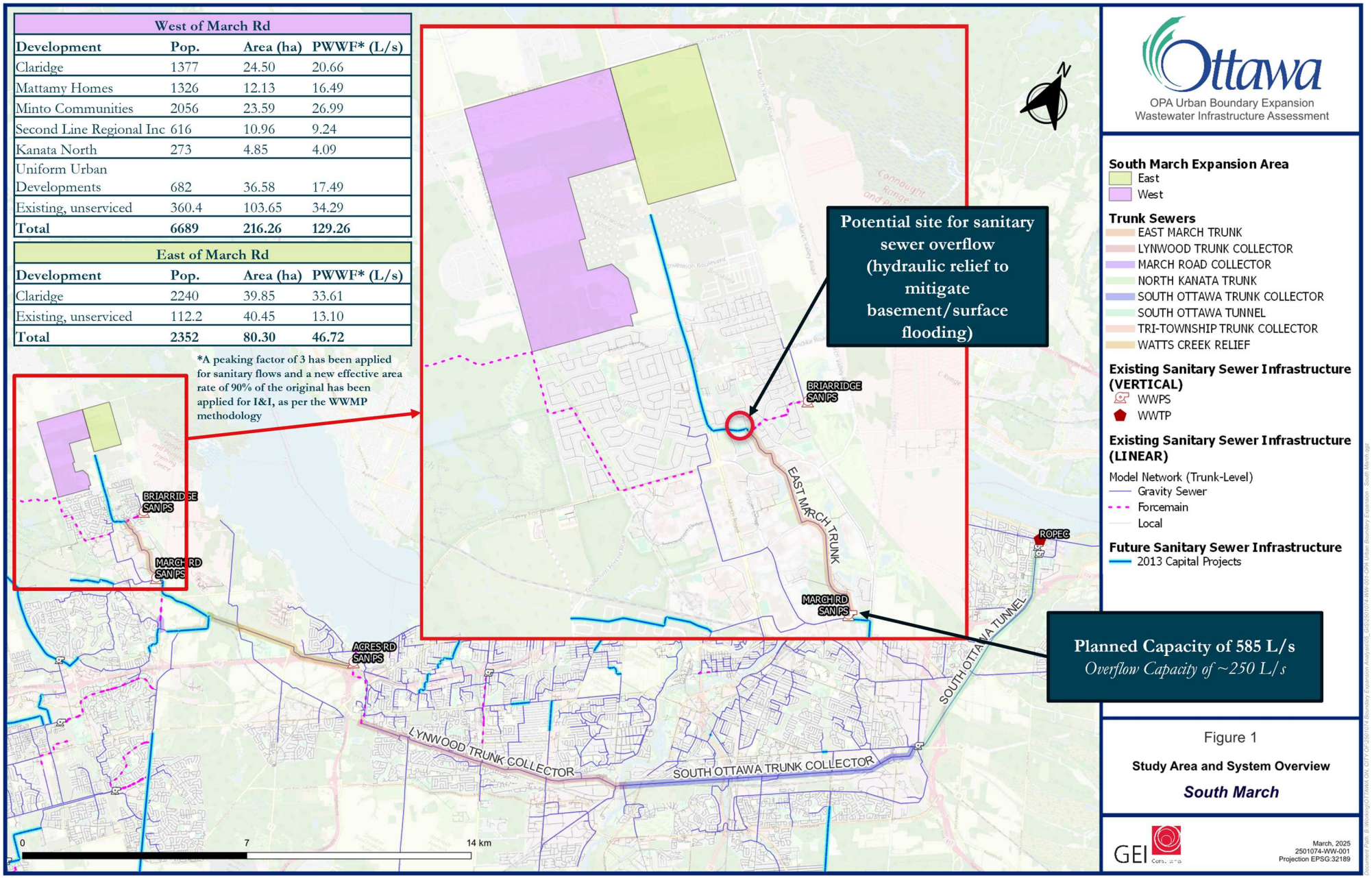


Figure 2: Study Area and System Overview

2.2 Background Information

To better understand the constraints of the study area, previous studies were reviewed. This includes the following studies:

- City of Ottawa 2024 Infrastructure Master Plan (IMP) (2024)
- Kanata North Community Design Plan Master Servicing Study (MSS) (2016)

Infrastructure Master Plan (IMP)

As part of the WWMP assessment, 2046 population growth projections were used to develop a future hydraulic model scenario, with the aim of assessing future collection system performance and identifying necessary infrastructure improvements to accommodate increased demands from population growth.

The 1-in-25-year and 1-in-100-year June 2014 events were the primary triggers to identify a future system capacity constraint. The hydraulic model results were reviewed to identify sewers within the same general location which showed capacity issues and served as the basis for comparison between existing system capacity issues and system capacity issues caused as a result of future growth.

South March was assessed as part of the West area, consisting of the West Urban Community west of the Greenbelt, including Carp, Richmond, Kanata, Stittsville, Munster, and Bell's Corners. The Watts Creek Relief sewer collects and conveys all flows from this area to the Acres Pump Station. Under existing conditions, surcharging was seen in the March Ridge Tri-Township Area, including the Watts Creek Relief pipe.

Similarly, under future conditions, results were consistent with what was seen in existing conditions: areas that were surcharging under existing conditions continued to surcharge under future conditions without mitigations in place. The IMP identified planned infrastructure improvements which resolve the surcharging already seen in existing conditions, including:

- Additional capacity expansions are required at March Lift Station to service future population.
- Flow monitoring is recommended on the East March trunk sewer, near Shirley's Brook Drive at Sandhill Road as this trunk sewer has a shallow depth near this location.

MMAH provided a set of provincial lands that were reviewed as part of the IMP, which were then incorporated into the analysis and model to ensure projects identified were able to handle the projected future population.

However, prior to the completion of the IMP these lands were removed from the analysis. While it was previously determined the projects identified had sufficient capacity to support these lands, the growth and future servicing identified for South March differs than what was previously

reviewed; as such, it is imperative to complete this assessment for the new South March lands to ensure the future projects identified in the IMP can support this additional expansion.

Kanata North Master Servicing Study (MSS)

A Master Servicing Study (MSS) was conducted as a component of the Community Design Plan (CDP) for Kanata North. The MSS provides functional design solutions for servicing the Kanata North Urban Expansion Area (KNUEA), including on-site storm drainage, wastewater collection and water distribution. South March is encapsulated within the KNUEA, with March PS acting as the wastewater outlet for the area.

KNUEA, originally designated as a "General Rural" area, was amended to an "Urban Expansion Study Area" when the City's Official Plan was reviewed in 2009. This amendment, along with other urban expansion areas, was done to support the projected population growth forecasted for 2031.

The MSS reviewed the existing conditions of the area, including the topography and geotechnical conditions. It's noted that there is a topographical ridge (approximately 9m high) located on the east side of the area, running in a north-south direction.

The MSS also reviewed various servicing options for the KNUEA. The preferred option noted in the report was the construction of a new gravity sewer along March Road to service the area west of March Road and west of the ridge. The area east of the ridge is planned to be serviced by the existing 375mm sewer terminating at the Briar Ridge Pump Station. This option requires the following upgrades to be feasible:

- An existing 375m diameter sanitary sewer along Shirley's Brook Drive will be required to be upgraded to a 600mm to accommodate increased flows from growth
- The current upgrades being implemented at Briar Ridge PS are required for this option to be feasible. Upgrades include adding larger impellers and the installation of a third pump to increase capacity to 175 L/s.

The report also reviews the best-suited trunk to service the development area, based on their elevation and current available capacity by 2031 (as per the project growth utilized in the 2009 OP amendment). As the Kanata Lakes Trunk Sewer is located farther from the development area, it is not considered suitable. Hines Road Trunk, Marchwood Trunk, and the East March Truck were reviewed as alternative.

2.3 Discussions with Stakeholders

To keep stakeholders informed of the recommendations being made for the area, the Technical Advisory Committee (TAC) was consulted in two meetings.

Discussions with the project team at City as well as the TAC included a summary of the current study area conditions, current plans of additional growth added to the area, and potential concerns with maintaining level of service while enabling development in the South March area to proceed. At the TAC, concerns about the location of the secondary sanitary sewer overflow for March Lift Station were raised; the likeliest location identified for this overflow would be at the stormwater management (SWM) pond located at the intersection of Shirley's Brook Drive and Sandhill Road. While the proposed outfall location was the most optimal, it is also the discharge point for the two forcemains from Briar Ridge PS. As such, this was taken into consideration when determining the most suitable existing maintenance hole to outlet into the SWM pond.

It was discussed and confirmed with the TAC that this secondary overflow site is to be designed for use during emergency conditions only (power or equipment failure) and is not intended for routine use during wet weather conditions.

2.4 Level of Service and Design Criteria

As part of the hydraulic analysis, level of service (LOS) was assessed based on a set of design criteria. For the purposes of this assessment, level of service is defined as the expected hydraulic performance that serviced residents and businessowners should expect to receive from the City's wastewater infrastructure. Methods to maintain the target level of service can include: infrastructure upgrades to resolve existing issues and support additional growth, basement and surface flooding prevention measures, inflow and infiltration reduction, etc. The criteria used in this assessment originated from the WWMP to ensure consistency when reviewing and comparing results.

Three main hydraulic models were reviewed as part of this assessment:

- Existing Conditions
- Future Conditions All-Projects (without the addition of South March)
- Future Conditions All-Projects (with the addition of South March)

The hydraulic models were simulated under various design storms to compare hydraulic performance. As part of the LOS Review, the following storms will be used:

- 1-in-5-year June 2014 rainfall event (free flow)
- 1-in-25-year June 2014 rainfall event (projects flagged if 2.1 m HGL is triggered)
- 1-in-100-year June 2014 rainfall event (climate scenario for assessing resiliency)

It should be noted that the discussion of results is specific to the 1-in-25-year June 2014 event. Results for the 1-in-5-year and 1-in-100-year Event can be found in Appendix A.

When reviewing the results, the flow conditions for sewers will be assessed as follows:

- A sewer is considered free flowing when depth to diameter ratio (d/D) is less than 0.8 and the peak flow to theoretical pipe capacity ratio (q/Q) is less than 1
- A sewer is considered to be approaching surcharging by depth when the depth to diameter ratio (d/D) is between 0.8 and 1, but the theoretical pipe capacity is not exceeded ($q/Q < 1$)
- A sewer is considered surcharged by depth when the depth to diameter ratio is greater than or equal to 1 ($d/D \geq 1$), but the theoretical pipe capacity is not exceeded ($q/Q < 1$)
- A sewer is considered surcharged by flow when the depth to diameter ratio is greater than or equal to 1 ($d/D \geq 1$), and the theoretical pipe capacity is also exceeded ($q/Q \geq 1$)

In addition to sewer conditions, maintenance holes are also reviewed to identify areas of basement flooding risk.

- When the HGL > 1.8m below ground level, the maintenance hole does not indicate basement flooding risk
- When the HGL ≤ 1.8m below ground level, the maintenance hole is flagged as at potential risk for basement flooding
    - Clusters of nodes where the HGL ≤ 2.4m below ground level were also flagged to identify an area of potential concern
- When the HGL is above ground level, the maintenance hole indicates surface breakout (flooding)

2.5 Wastewater Flow Generation

The South March OPA boundary expansion area would add over 9,000 additional people to be serviced by the City's sanitary system (473 of which are existing unserviced customers). An estimate of the peak wet weather flow (PWWF) has been added to Table 2.

Table 2: Summary of proposed development, with PWWF estimate

Development	Population	Area (ha)	PWWF[2] (L/s)
Future			
Claridge	3616	64.35	54.27
Mattamy Homes	1326	23.59	16.49
Minto Communities	2056	36.58	26.99
Second Line Regional Inc	616	10.96	9.24
Kanata North	273	4.85	4.09
Uniform Urban Developments	682	12.13	17.49
Future Total	8568	152.46	128.58
Existing			
Unserviced[1]	473	144.10	47.39
Total	9041	296.56	175.97

[1] A population per unit rate of 3.4 for single detached households was used to estimate the unserviced population.

[2] A peaking factor of 3 has been applied for sanitary flows and a new effective area rate of 90% of the original has been applied for I&I, as per the WWMP methodology

It is estimated that approximately 128 L/s will be generated from the new development within South March; however, if the City decides to service the existing population, then an additional 47 L/s would be added to the sewer system. This would result in a theoretical total of 175 L/s. It should be noted that this growth is also added alongside the 2046 projected population as represented in the IMP. The 2046 growth identified upstream of March PS in the IMP included 6,855 residents and 4,501 employees.

3 OPA Step 1 – Assessment of Existing and Planned Infrastructure Capacity

3.1 Capacity Analysis

Capacity at March PS and Briar Ridge PS were reviewed in several model scenarios. Table 3 summarizes the inflow to the pumping stations as well as remaining capacity for existing and future conditions.

Table 3: Summary of March PS Capacity

Model Scenario			1-in-5-year		1-in-25-year		1-in-100-year	
Facility Name	Condition	Rated Capacity	Peak Flow	Remaining Capacity	Peak Flow	Remaining Capacity	Peak Flow	Remaining Capacity
March PS								
March Pumping Station	Existing (2019)	**416**	252	164	305	111	354	62
March Lift Station	Interim (2025)	**256**	49	207	59	197	68	188
	Future (2046 Growth)	**586**	230	356	239	347	246	340
	Future (2046 Growth with South March)	**586**	370	216	377	209	377	209
Briar Ridge PS								
Briar Ridge PS	Existing (2019)	**55**	26	29	30	35	33	22
	Future (2046 Growth)	**175**	83	92	86	89	88	87
	Future (2046 Growth with South March)	**175**	95	80	98	77	100	75

It is noted that the existing conditions scenario represents 2019 conditions when the Marchwood trunk discharged into March PS. Under interim (and future) conditions, the Marchwood trunk no longer drains to March PS, instead discharging directly into the North Kanata Trunk. Once construction of the March Lift Station is completed in 2025, the interim capacity will be 256 L/s and collect flows only from the East March Collector. Based on the future 2046 flows assessed through the IMP (without the addition of South March), peak flows approach the interim capacity of 256 L/s (239 L/s for a 1-in-25-year design storm, and 246 L/s for a 1-in-100-year design storm). The currently planned ultimate capacity (currently planned at 586 L/s but subject to reevaluation) would therefore be necessary with the addition of South March.

It should also be noted that the capacity of Briar Ridge PS will be upgraded from 55 L/s to an ultimate rated capacity of 175 L/s. Construction at the station is currently ongoing as of this memo and the station will operate at the new capacity in 2025 or 2026.

Overall, it was found that the capacity of both stations was sufficient to handle the additional flow generated from South March under all conditions, with ample capacity for even a 1-in-100-year wet weather event.

3.2 Hydraulic Assessment

The following section discusses the hydraulic assessment completed under normal operating conditions. For existing conditions, two operating conditions were reviewed:

- March PS operating at its rated capacity
- March PS offline; the facility is shut down in the model for the duration of the simulation to represent the upstream hydraulic conditions during a power outage or mechanical failure

There is an existing sanitary sewer overflow located at March PS which can bypass up to approximately 250 L/s to the North Kanata trunk; this overflow would not be able to convey the full design flow from March PS in the event of a station shutdown. In the event that March PS is unable to pump incoming flow, it is imperative to assess an alternative location to relieve upstream flows. There is a history of basement flooding in the upstream sewer network around Shirley's Brook Drive and Sandhill Road, when the HGL within the trunk surpasses an elevation of approximately 73m.

During existing conditions under normal operating conditions, it was found that capacity within the sewer was sufficient within all storm events. When reviewing the East March Trunk, the average sewer capacity until March PS was approximately 25% full by depth. Some sewers in the system were flagged as bottlenecks. These were noted in the IMP as well, with projects recommended to alleviate the constraints in existing conditions. The profile of the East March Trunk can be seen in Figure 3, and the map view of the study area in Figure 9.

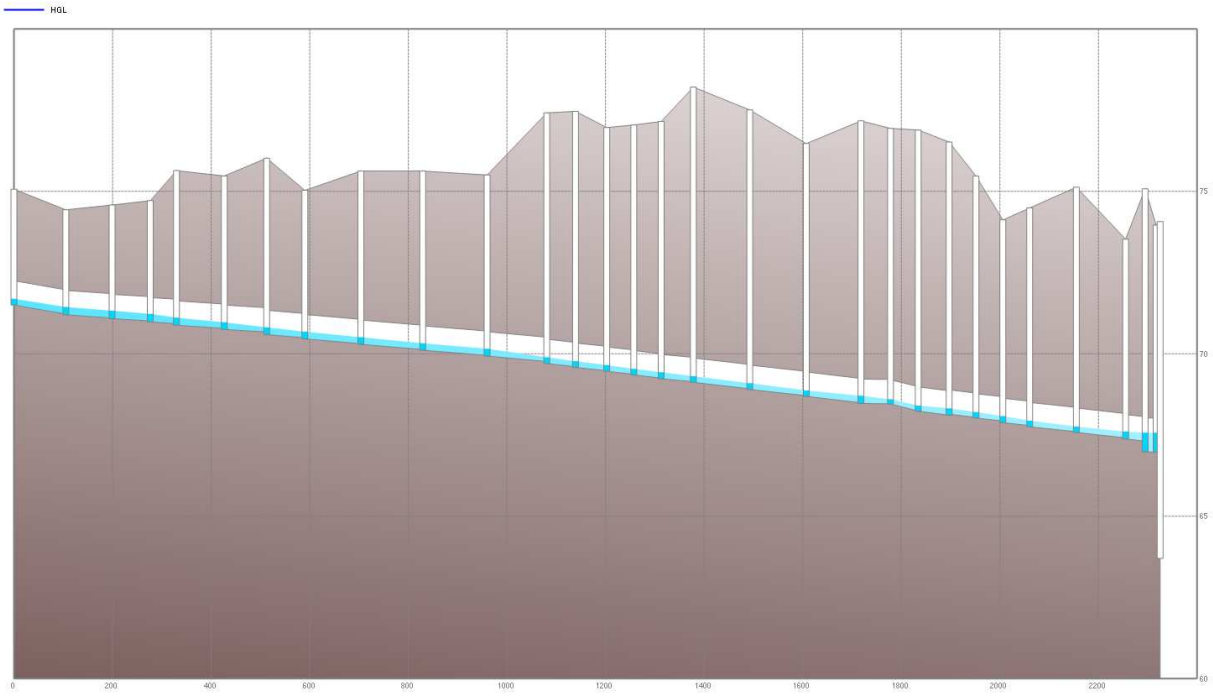


Figure 3: Profile view of East March Trunk under existing conditions

The sewer upstream of Briar Ridge PS is also seen to be free flowing, under both operating conditions.

The trunk has sufficient in-line capacity to capture all flows for at least a 24 hour period until March PS is able to be restored under existing conditions, with the HGL below 73m and reaches approximately 68 m. This can be seen in Figure 4.

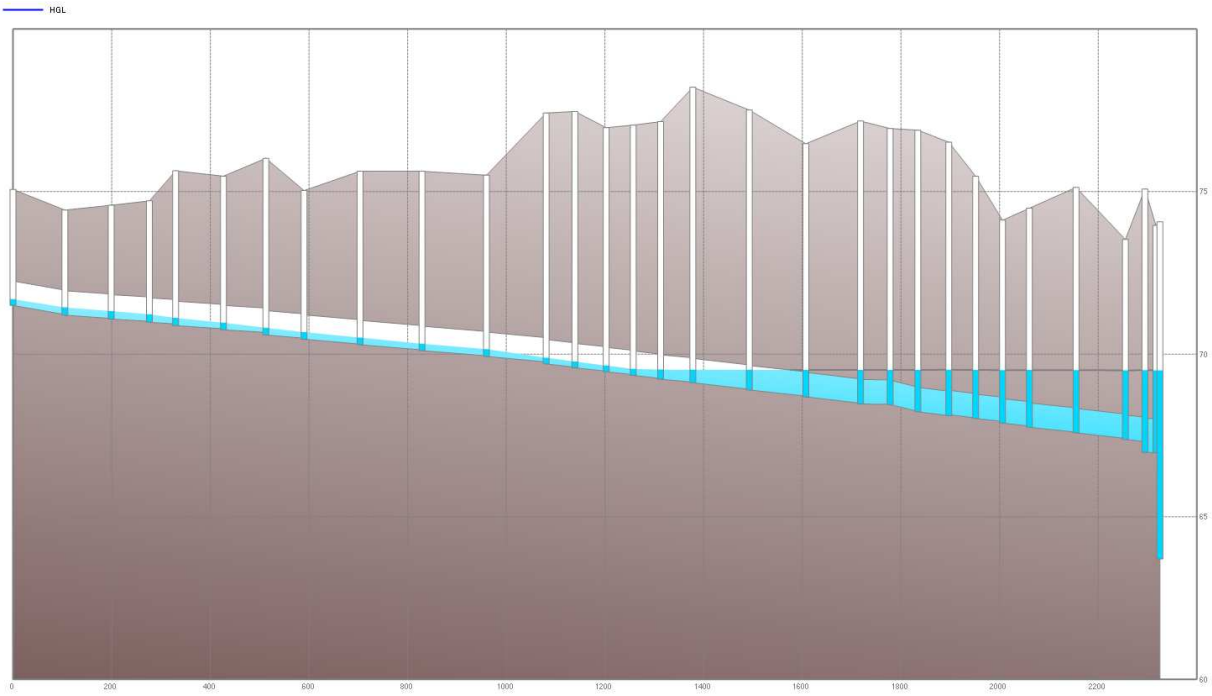


Figure 4: Profile view of East March Trunk under existing conditions, March PS offline

During future conditions under normal operating conditions, without the addition of South March, results were found to be similar to existing conditions. While sanitary flows increase in future conditions due to the addition of 2046 growth, the sewer is still free flowing, with a modelled peak flow of 239 L/s in a 1-in-25-year event. The average d/D for the trunk was approximately 0.47, with the maximum reaching 0.69. The profile of the trunk during future conditions can be seen in Figure 5, and the map view of the study area in Figure 10.

It should be noted that there is a known bottleneck in the system where a pipe is sized at 525mm due to accommodating an existing stormwater pipe crossing at Klondike Road.

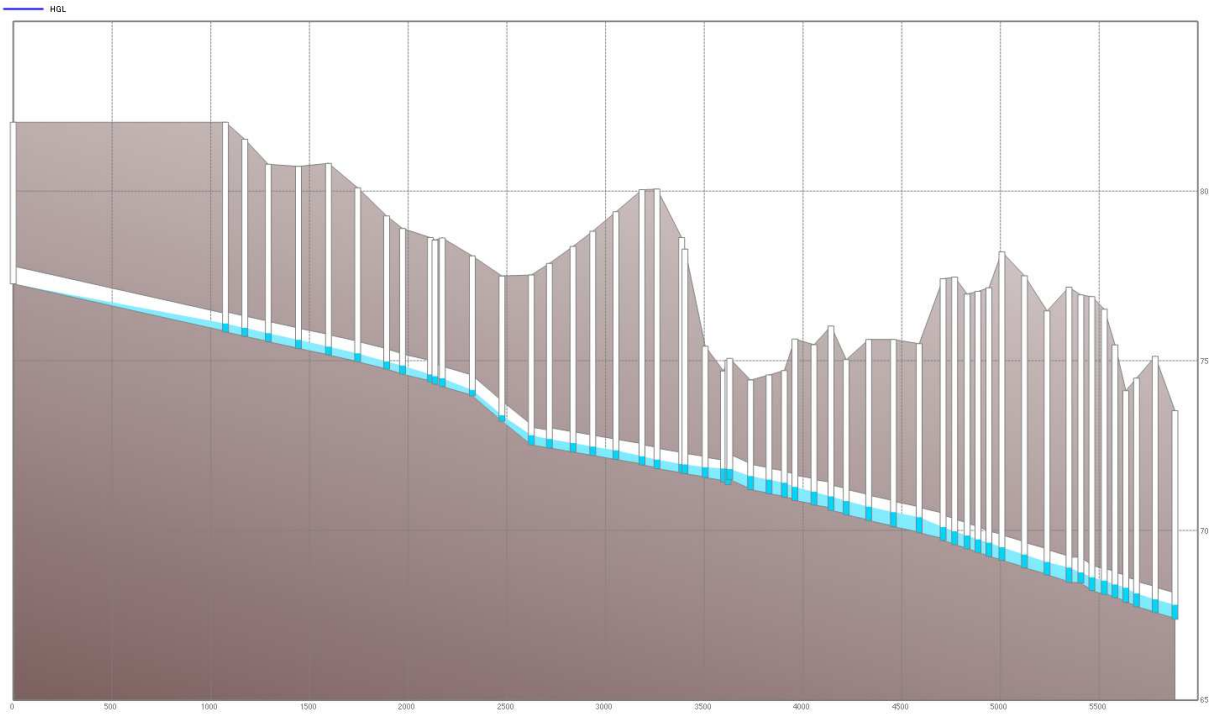


Figure 5: Profile view of East March Trunk under future conditions, no South March

With the addition of South March to the future conditions, the system is still able to sustain the flow generated from the area. Some pipes are surcharging, surpassing the threshold point of 0.8 full by depth. The average full by depth ratio for the East March Trunk is approximately 0.73.

Similar hydraulic conditions can be seen in the 450mm sewer leading to Briar Ridge PS. The sewer is also able to sustain the flow from the addition of growth east of March Rd, generated from the South March area. No sewers surpassed the threshold point of 0.8 in a 1-in-25-year scenario, with the highest full by depth ratio being 0.73 and an average ratio of 0.64.

Overall, under normal future conditions, the projects implemented are able to sustain the additional flow. The profile of the East March trunk during future conditions, with the South March cluster added, can be seen in Figure 6, and the map view of the study area in Figure 11. Similarly, the profile of the sewer upstream of Briar Ridge PS during future conditions, with the South March cluster added, can be seen in Figure 7.

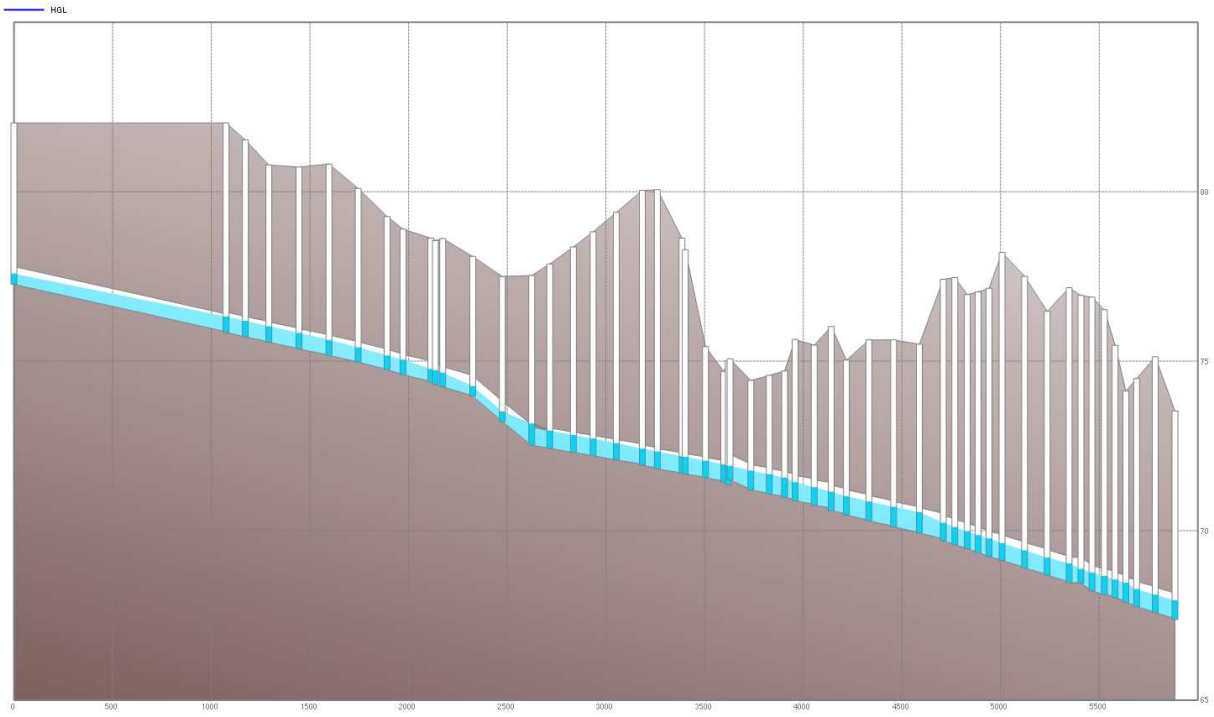


Figure 6: Profile view of East March Trunk under future conditions, with South March

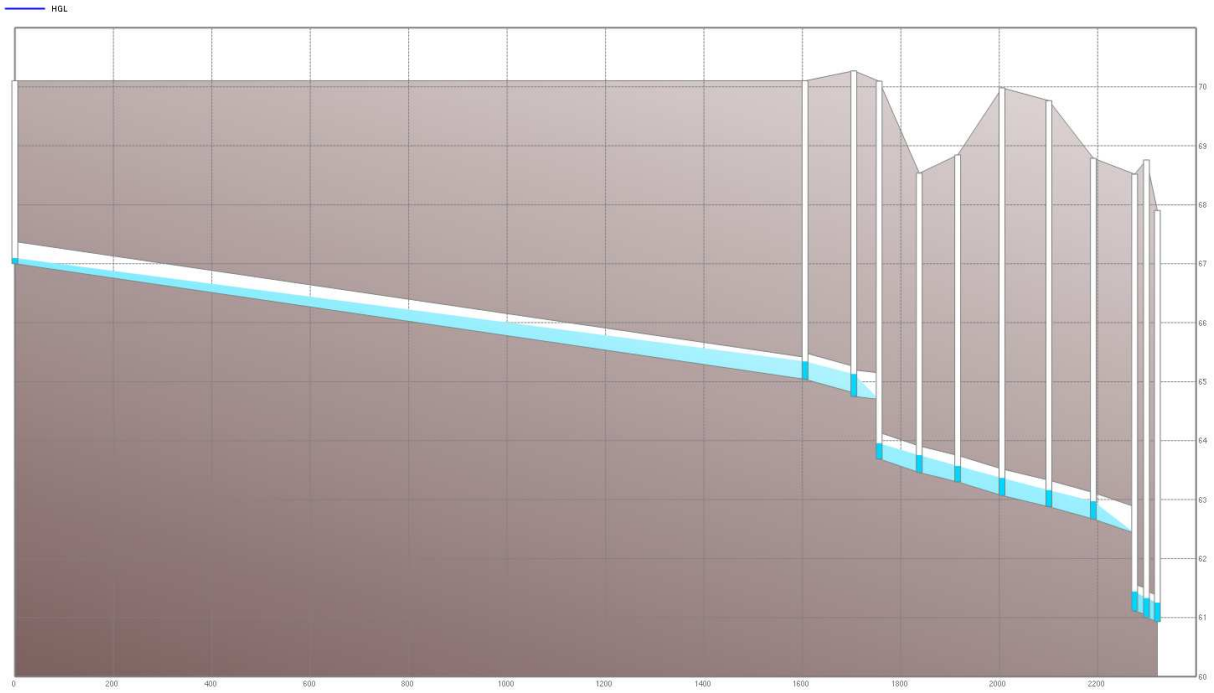


Figure 7: Profile view of sewer upstream of Briar Ridge PS under future conditions, with South March

However, as the incoming flow to the station exceeds this under peak wet weather, there is still a significant amount to convey elsewhere. With the addition of South March, if the station goes offline, the model indicates both the HGL rising past 73m, but as well as surface flooding. This can be seen in Figure 8 and the map view in Figure 12.

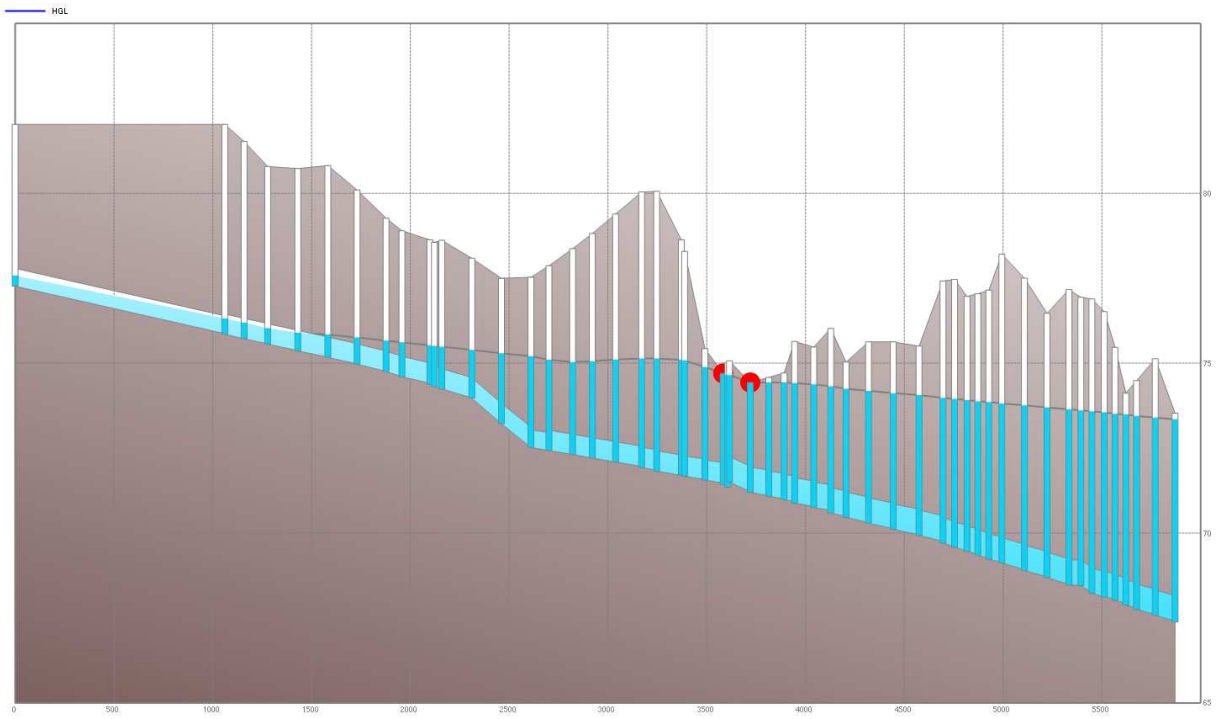


Figure 8: Profile view of East March Trunk under future conditions, March Lift Station offline

It should be noted that existing overflows at the Briar Ridge PS have capacity to accommodate the ultimate rated capacity of the station, in the event Briar Ridge PS was to go offline. As such, identifying servicing solutions for the facility is not required if the total flow entering Briar Ridge remains below 175 L/s. During the 1-in-25-year future conditions scenario with the addition of the South March area, the total flow entering was approximately 98 L/s. As such, identifying an additional overflow is not considered necessary.

3.3 Step 1 Conclusions & Recommendations

Overall, under existing and future conditions pipes are seen to be free flowing and no significant HGL or surcharging issues are seen upstream of March PS. There were some surcharged sewers identified along the North Kanata trunk during the existing conditions scenario; however, a 2013 IMP Project was identified to upgrade the trunk, which should address those concerns. This was also noted in the WWMP GEI completed in 2024. In addition, in the event March PS goes offline during current conditions, the trunk has sufficient in-line capacity to capture all flows for at least a 24 hour period until March PS is able to be restored under existing conditions. Under normal future conditions, both the current infrastructure and planned infrastructure are able to sustain the flows during future conditions. With the addition of South March and planned future upgrades, the March Road Collector trunk sewer reaches 80% full by depth but is still free flowing. Because the March Road Collector trunk sewer reaches 0.8 d/D, it would benefit from flow monitoring to continually assess hydraulic conditions and determine if and when future sewer upgrades are needed.

In addition to assessing March PS/March Lift Station, Briar Ridge PS was also reviewed under future conditions, with the addition of the South March cluster. Briar Ridge PS currently operates at 55 L/s with a planned upgrade of increasing its ultimate rated capacity to 175 L/s. The station can accommodate the portion of South March that lies east of March Road, as it is likely it will be conveyed to Briar Ridge PS as opposed to March Lift Station. Based on the analysis, no upsizing of the existing 450mm sewer is anticipated to support this additional flow, despite the sewer expected to operate at up to 73% full by depth. This is because of the peak flow from South March expected to be conveyed in this sewer is less than 80 L/s. As a result, the future sewer to service the eastern portion of the South March area is not DC eligible and has not been included in the recommendations of this study.

No additional infrastructure upgrades have been recommended beyond what has been proposed in the 2013 and 2024 IMPs.

In the event March PS goes offline during an emergency scenario under future conditions, there is still a significant amount to convey elsewhere. The capacity within the East March Trunk would not provide adequate in-line storage to capture flows in this scenario. With the addition of South March, if the station goes offline, the model indicates both the HGL elevation rising above 73m, as well as surface flooding at the most low-lying maintenance holes. As such, there is insufficient existing system capacity available for the South March lands to proceed with the proposed demands. It is important for the City to determine the best solution to maintain the area's level of service in the event March PS is unable to operate under emergency conditions. Step 2 will address the operating constraint at the March Lift Station by recommending servicing alternatives.

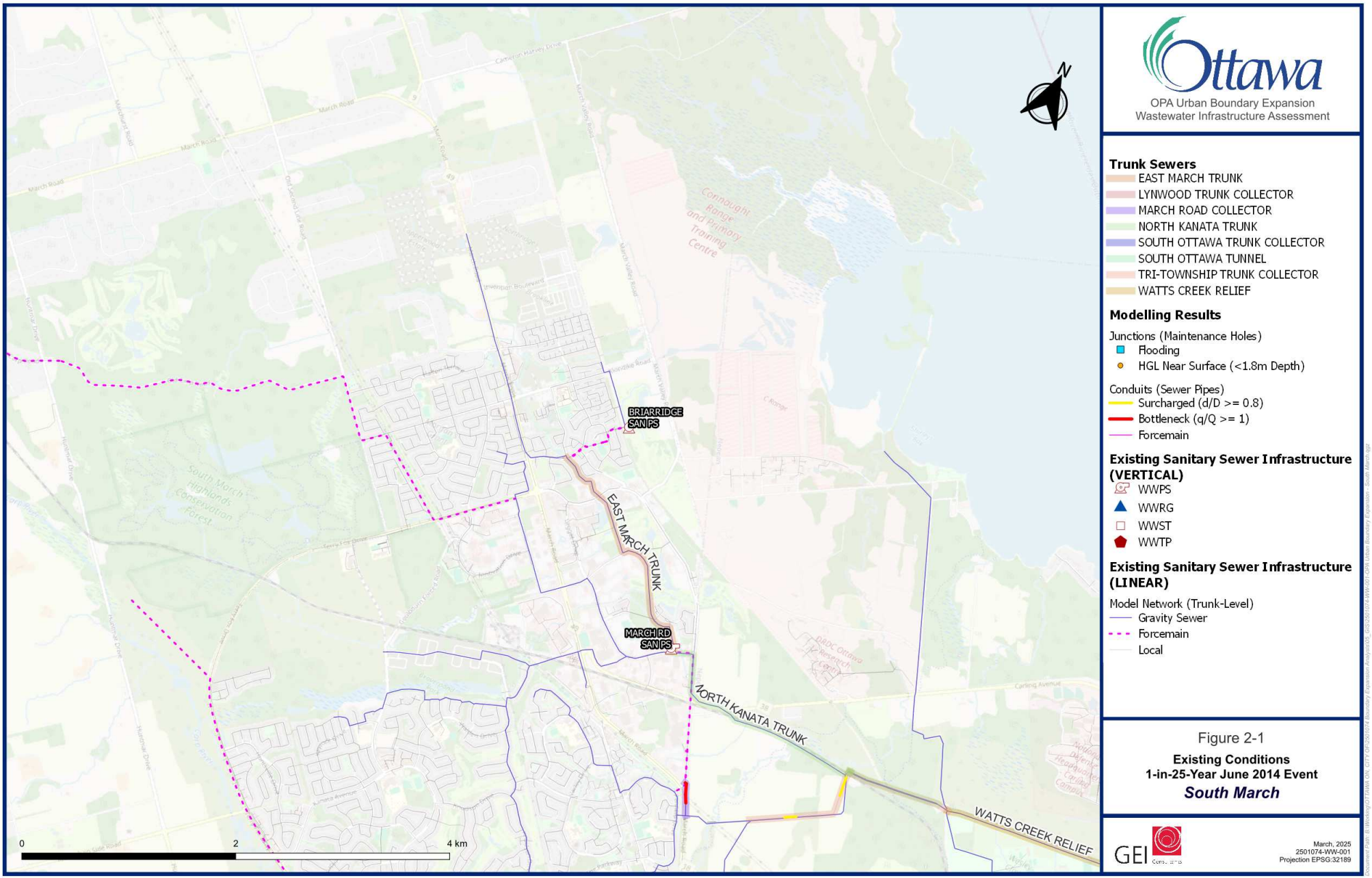


Figure 9: Map view of existing conditions

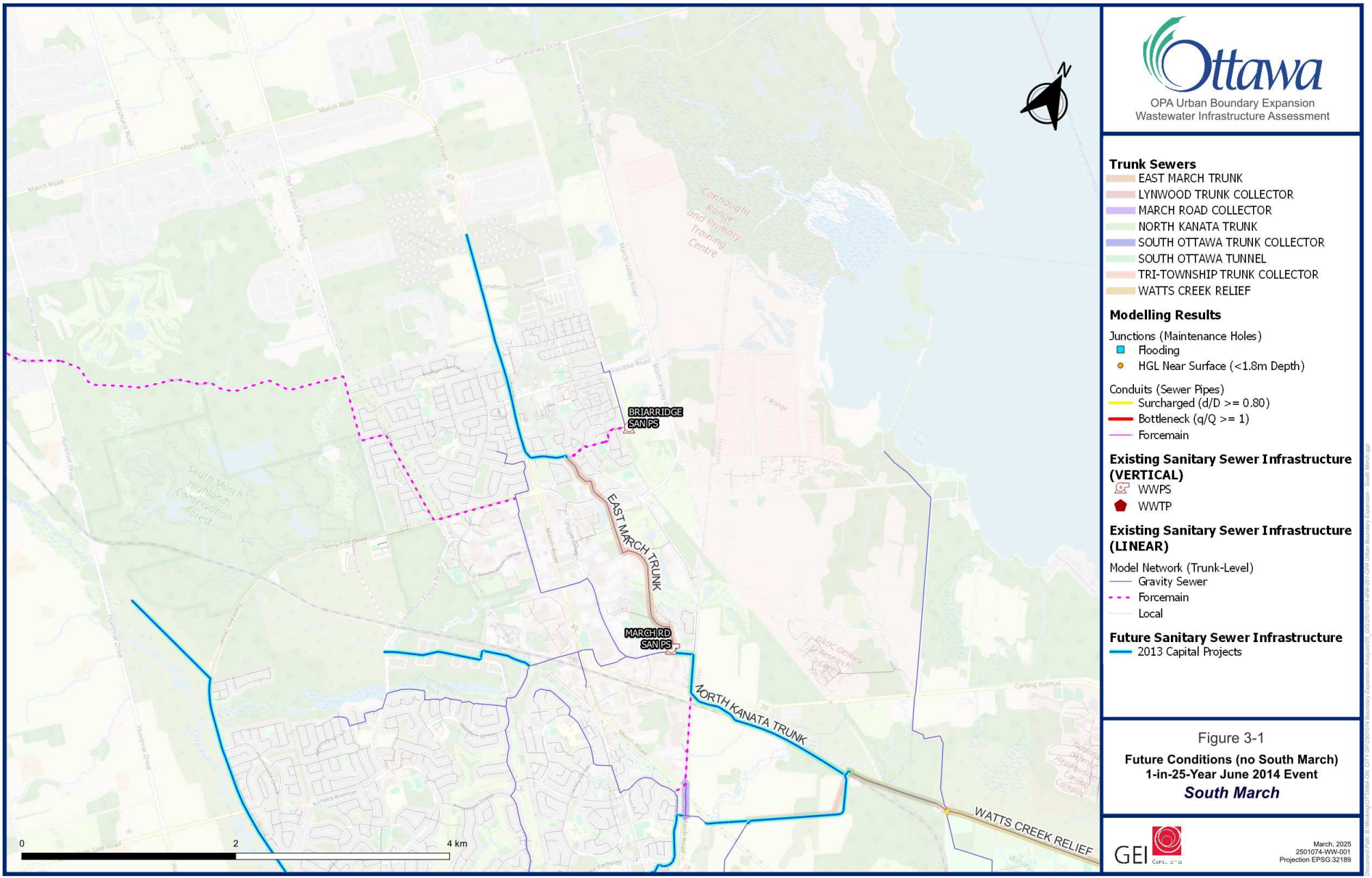


Figure 10: Map view of future conditions, no South March

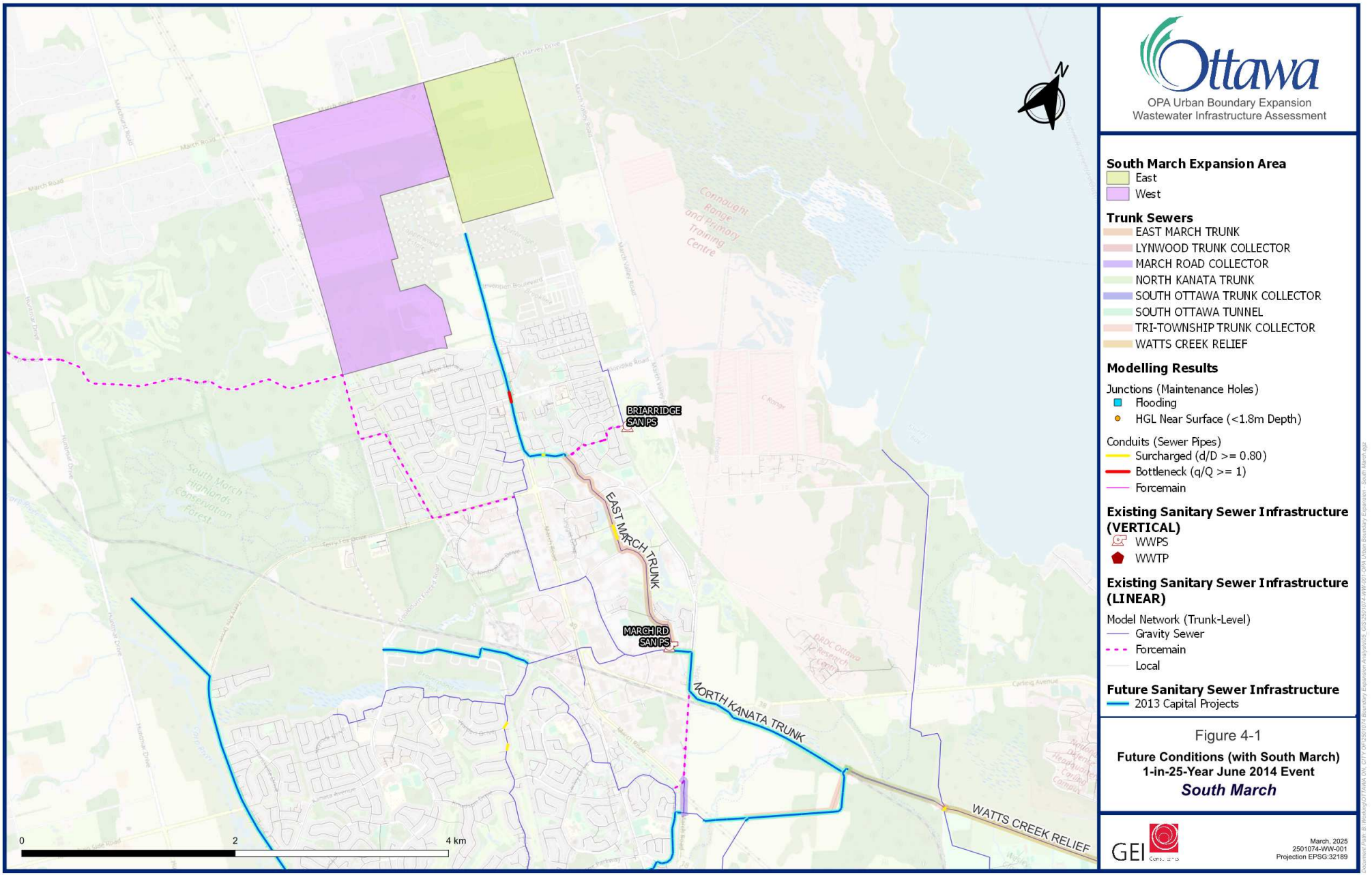


Figure 11: Map view of future conditions, with South March

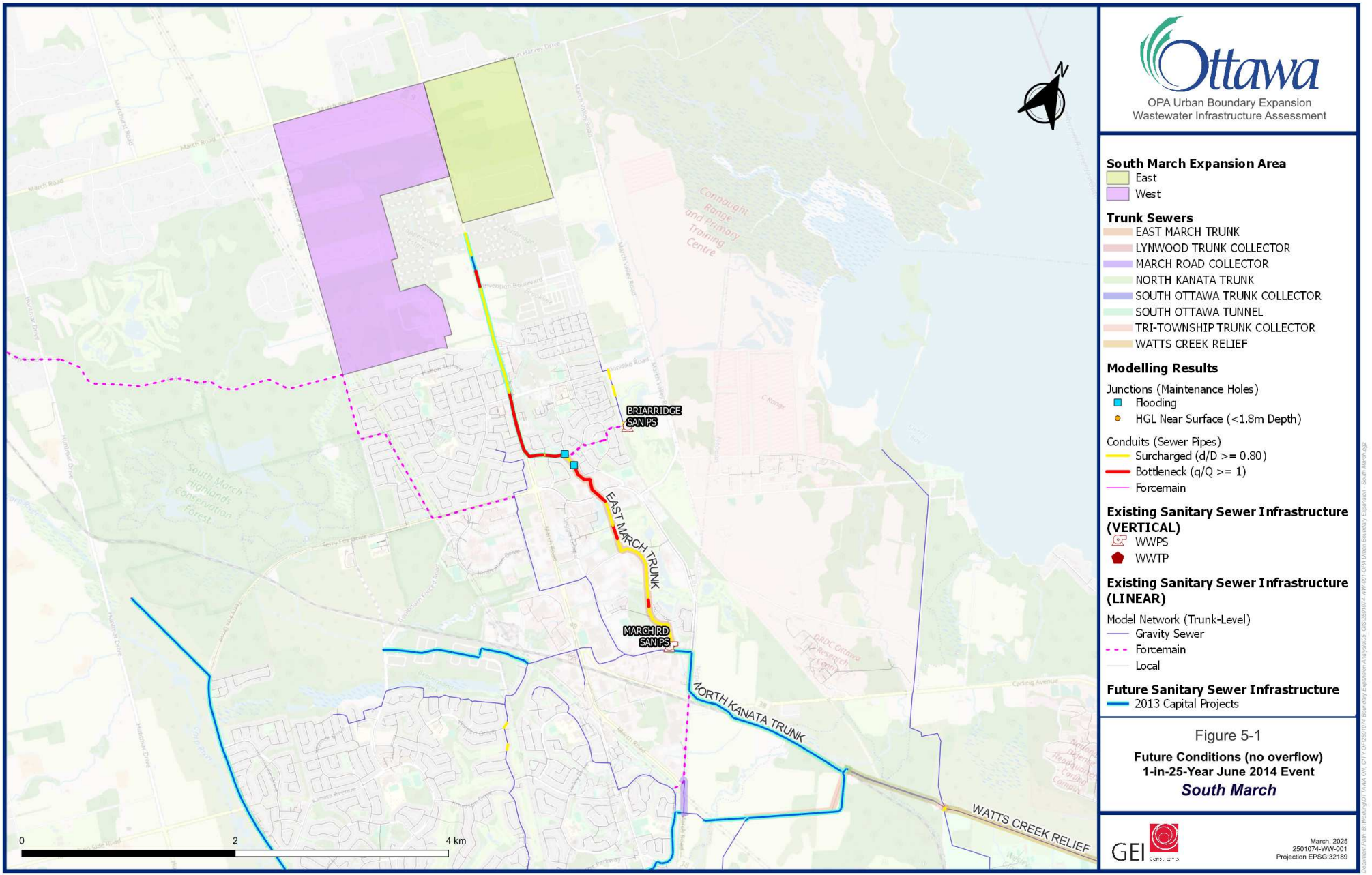


Figure 12: Map view of future conditions, March PS offline

4 OPA Step 2 – Identification & Assessment of Off-Site Infrastructure Needs

4.1 Servicing Alternatives

To ensure the area is able to maintain level of service outside of normal conditions, a secondary emergency overflow is required to relieve the HGL at the low point within the upstream system and ensure that houses near the low point of the trunk do not experience basement flooding. The current servicing alternative suggested is to implement an overflow pipe into the stormwater management (SWM) pond at Shirley's Brook Dr and Sandhill Road. The configuration in the model can be seen in Figure 13.

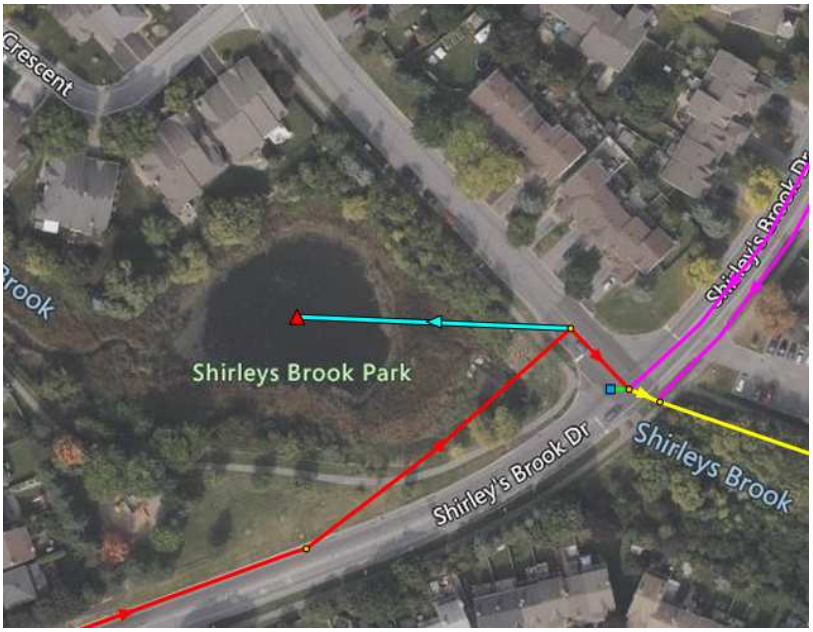


Figure 13: Emergency overflow as modelled in PCSWMM

Currently, the pipe is sized as a 450mm pipe with an inlet elevation of 73m, directly spilling to the SWM pond. It should be strongly noted that this overflow is not meant to be utilized as a regular overflow. This is only in the event of the station going offline, to ensure the City's target level of service provided to the area can be maintained.

It was found that under the 1-in-25-year event, the HGL within the trunk was able to be sustained near 73m at Shirley's Brook Drive and Sandhill Road. The emergency overflow sends approximately 250 L/s to the North Kanata trunk directly, with the remaining 207 L/s leaving the system to the SWM pond. The surface flooding seen before has been resolved and the HGL stabilizes at around 73m.

The profile view can be seen in Figure 14 and the map view in Figure 15.

For the construction of the overflow, it is recommended to connect to the existing maintenance hole MHSA76943. This is because it is located away from the road and is close to the bank of the SWM pond. A conceptual design can be seen in Figure 16.

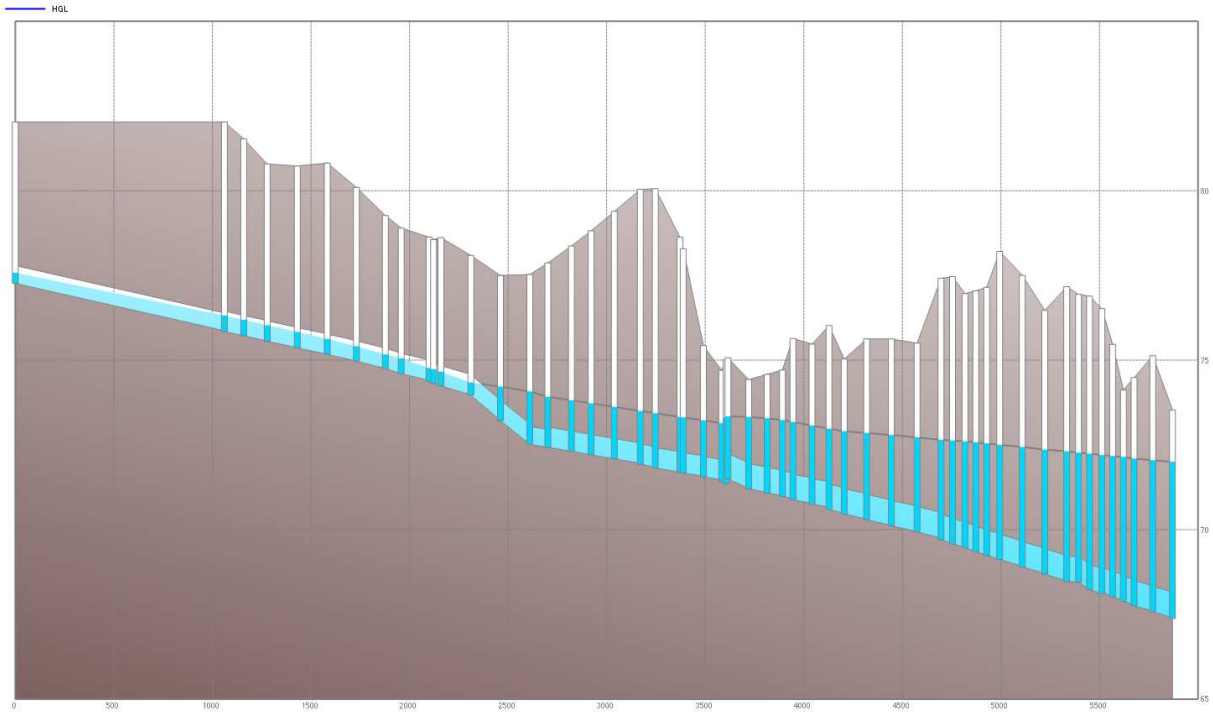


Figure 14: Future conditions, March PS offline and emergency outfall to SWM pond

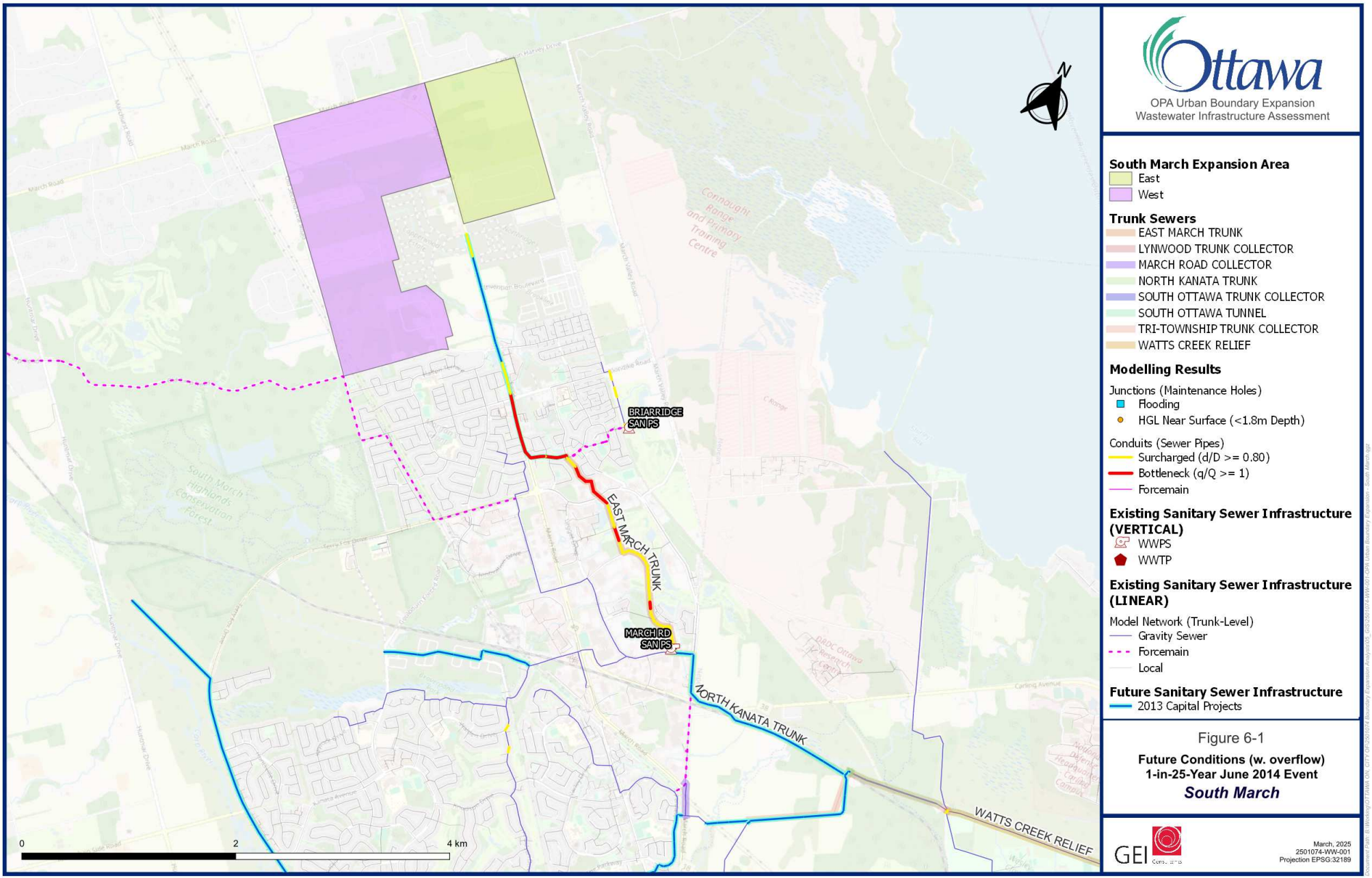


Figure 15: Map view of future conditions, March PS offline with emergency overflow to SWM pond

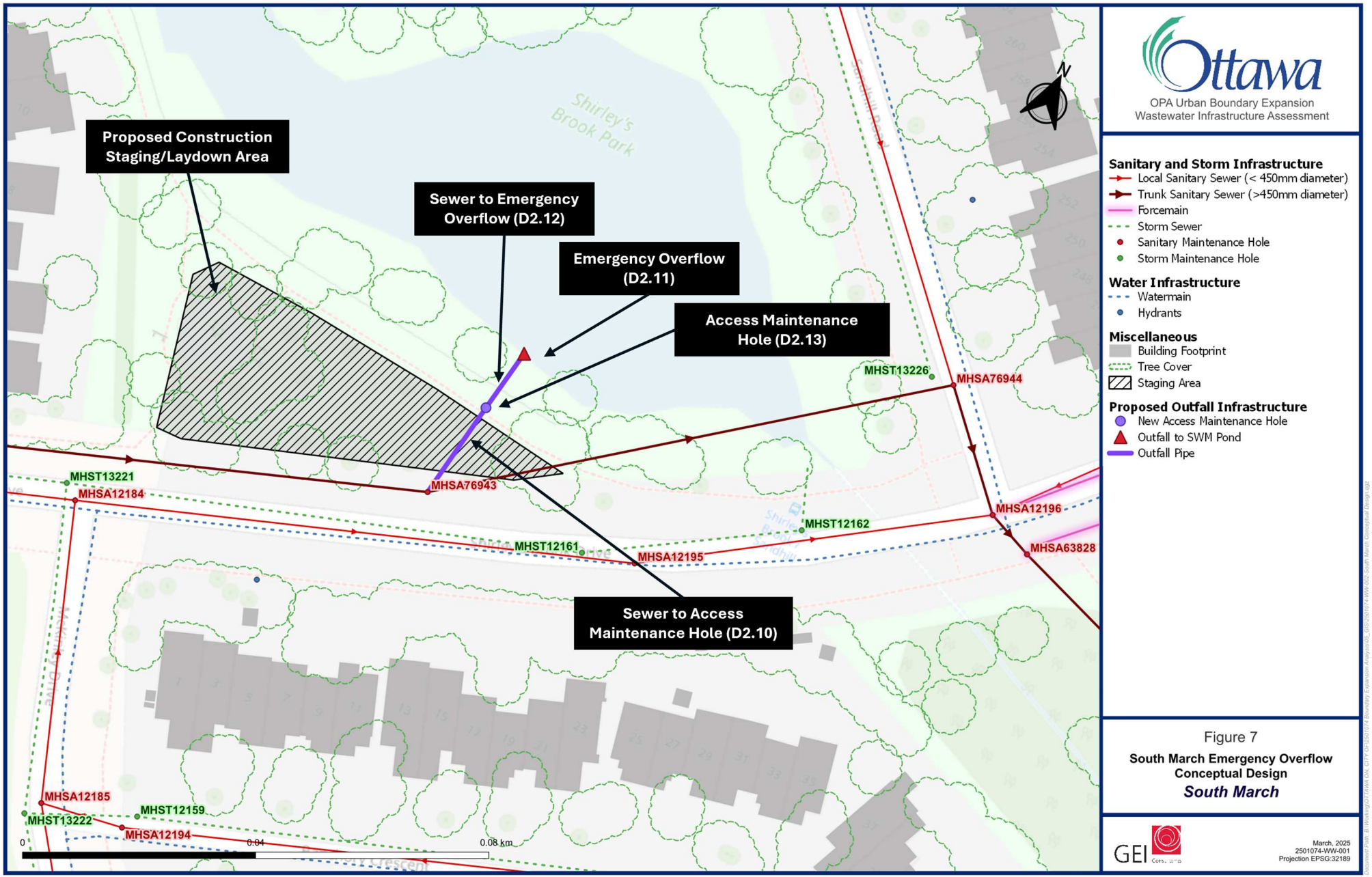


Figure 16: Conceptual design of overflow at Shirley's Brook and Sandhill

4.2 Servicing Recommendations

The following recommendations for servicing the South March area have been noted as the following:

1. **March PS Upgrade Phasing:** With the addition of South March, the phasing of March PS's upgrade needs to be updated to reflect the additional growth added. The IMP previously noted the March PS upgrade was required by 2044, with a modelled peak flow of 246 L/s by 2046. With the addition of South March, this peak flow would increase to 377 L/s. By applying an additional 15% contingency to this projected peak flow, the required phasing year was updated using an expected upgrade capacity of 435 L/s. With this higher projected flow by 2046, it is now recommended to complete the March PS upgrade by 2032.
2. **March PS Ultimate Capacity:** The capacity assessment conducted for both existing and future conditions (under normal operating conditions) indicates March PS is able to sustain additional flows from South March, with the proposed capacity of 586 L/s from the previous (2013) IMP being potentially excessive. The largest peak wet weather flow modelled was 377 L/s seen in the 1-in-100-year event; under future conditions with the addition of South March. Based on an ultimate capacity of 586 L/s at March Lift Station, this would leave a surplus capacity of 151 L/s.
3. **Emergency Overflow at Shirley's Brook:** An overflow to the SWM pond at Shirley's Brook Drive and Sandhill Road has been recommended in the event March PS goes offline. The overflow pipe is sized as a 450mm pipe, has an inlet elevation of 73m, and outlets from the existing maintenance hole MHSA76943. It is designed to directly spill to the SWM pond. It should be strongly noted that this overflow is not meant to be utilized routinely during wet weather flow conditions; it would only be activated during emergency conditions including power failure or equipment malfunction.
    - **Backflow Preventers:** In addition to the overflow, it is also recommended to install backflow preventers for properties not protected by the proposed emergency overflow. Properties that may be impacted are along Sandhill Road north of Shirley's Brook Drive, as well as properties along Shirley's Brook Drive and east of Sandhill Road.

4.2.1 Further Servicing Considerations

In addition to these recommendations, there is a likely need to extend the sewer upstream of Briar Ridge PS to the north depending on how wastewater flows from South March will ultimately be routed to the East March Trunk. The 2013 IMP already recommended an upgrade to the March Road Collector sewer, which also included an extension to service the west portion of the South March area. However, a project has not yet been identified for extending the sewer upstream of Briar Ridge (west of March Valley Road). As such, it is recommended to consider extending this sewer such that wastewater flows from future development and currently unserviced properties

east of March Road can be conveyed towards Briar Ridge PS. This is further supported by the model results seen for the future conditions scenario where the March Road Collector sewer (along Shirley's Brook Drive) reaches 80% full. Any additional growth beyond South March may result in hydraulic capacity restrictions within these sewers.

This sewer extension should be coordinated with future developments in the area upstream of Briar Ridge PS to take advantage of those opportunities to include a new sanitary sewer alignment as part of those works. The peak flow from South March is less than 80 L/s, making it ineligible for DC funding and therefore has not been included in the recommendations of this study.

4.3 Opinion of Probable Cost & Cost Allocation

The total cost of the recommended infrastructure projects required to service the South March OPA boundary expansion area is estimated to be $2.28M in 2025 dollars using annual inflation rates consistent with the 2024 IMP. The costing approach is the same as what was used for the IMP to ensure consistency.

The total estimated cost of the necessary infrastructure improvements has been summarized in Table 4. The cost estimates shown in Table 4 include additional factors such as land acquisition, geotechnical studies, risk factors, etc. As such it should be noted that the total costs as presented are conservative estimates for overall project cost.

The flow ratio approach from the 2024 IMP was used to determine the BTE (benefit to existing) of the addition of the proposed projects. As per the 2024 IMP, BTE is calculated as the ratio between the existing sewer flows and the existing plus proposed growth flows.

$$BTE = \frac{Existing\ Flow}{Growth\ Flow + Existing\ Flow}$$

From this, using the existing interim flow of 59 L/s and the expected growth flow (not including existing flow) of 318 L/s in a 1-in-25-year scenario, the BTE for the South March area from implementing these projects is a 1 to 6.4 existing to future ratio, or an expected 15% benefit to existing.

Detailed costing sheets can be found in Appendix B.

Table 4: Cost estimate to service the South March OPA boundary expansion area

Project	Cost (2025$)	Benefit to Existing (BTE)	Development Charge (DC)
Emergency Overflow at Shirley's Brook	$2.03M	$304K	$1.72M
Backflow Prevention Valve Program in Sandhill Road and Shirley's Brook area (including hydraulic modelling analysis, communications & coordination)	$250K	$250K	-
Total	**$2.28M**	**$554K**	**$1.72M**

Another option for resolving the emergency overflow limitation at March Lift Station would be the construction of a new emergency overflow (at Shirley's Brook), but instead of implementing backflow prevention valves in the affected properties, the City would instead construct an additional new sanitary sewer to collect wastewater flows from the low-lying properties upstream of March Lift Station which are affected by HGL concerns at the intersection of Sandhill Road and Shirley's Brook Drive. This new sanitary sewer would convey flows east toward Briar Ridge PS and would be considered during a future road renewal project along Sandhill Road and/or Shirley's Brook Drive.

4.4 Step 2 Conclusions & Recommendations

In the event March PS goes offline, the East March trunk and March Road Collector sewer will begin to experience surcharging and HGL issues, including basement and surface flooding. While there is an emergency overflow at March PS, modelling results indicate the sewers will continue back up as the diverted flow from the pumping station to the North Kanata trunk is hydraulically limited to approximately 250 L/s. With an expected peak flow of 377 L/s during a 1-in-25-year storm, this leaves approximately 127 L/s that will need to be relieved elsewhere or else present a risk of basement and/or surface flooding.

The IMP previously noted the March PS upgrade was required by 2044, with a modelled peak flow of 246 L/s by 2046. With the addition of South March, this peak flow would increase to 377 L/s. By applying the additional 15% contingency to this projected peak flow as noted in Section 4.2, the required phasing year has been shifted to an earlier year and is now recommended to complete the March PS upgrade by 2032.

As discussed in Step 1, the need for off-site infrastructure is required to maintain the level of service the City strives to provide. This overflow will redirect sanitary flow in the event of March PS going offline to the SWM pond. As such, an additional emergency overflow has been proposed at Shirley's Brook Drive and Sandhill Road to ensure the surrounding area receives servicing.

With the overflow implemented, the HGL would be reduced to approximately 73m, the same level as the SWM pond.

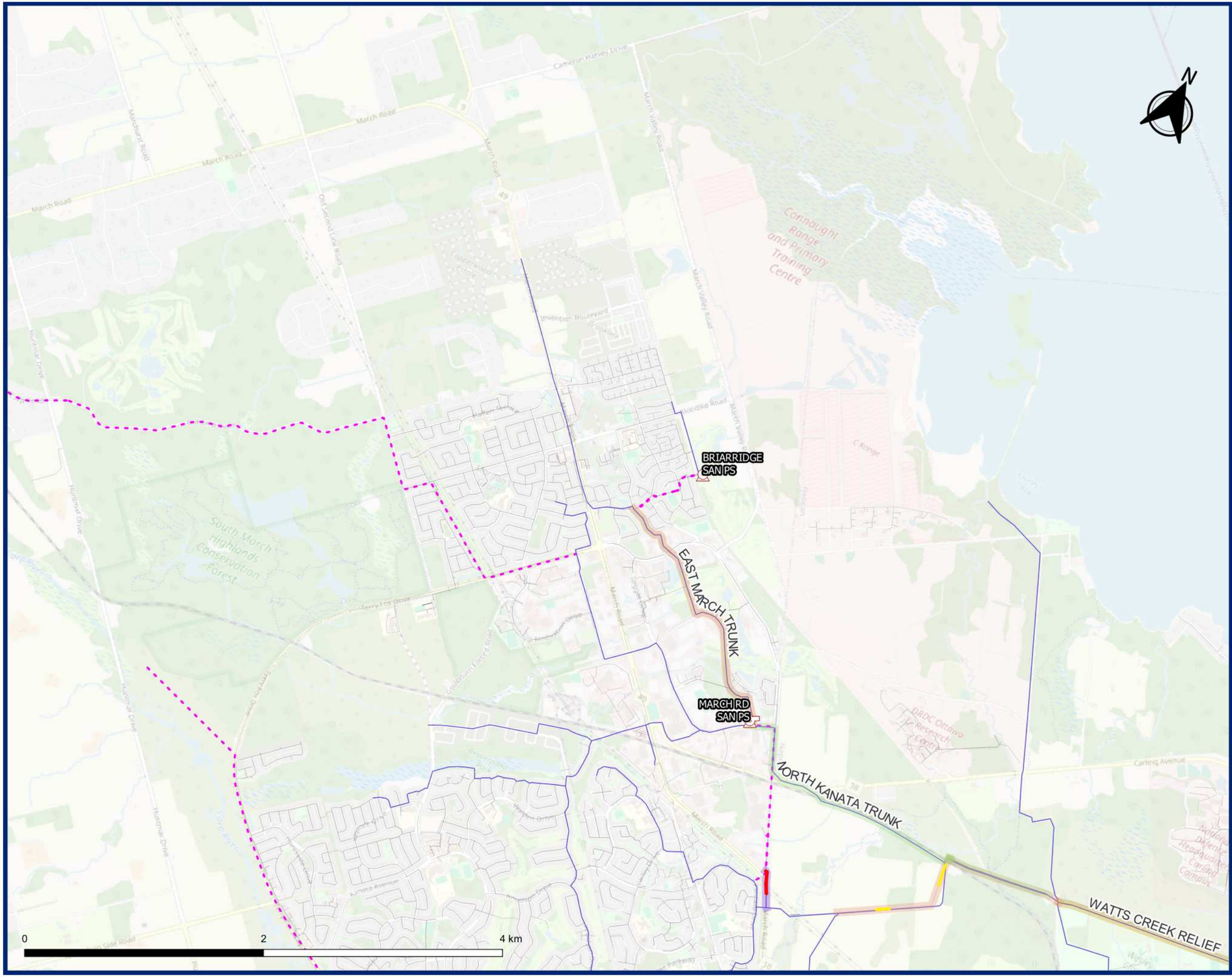
For the purposes of this deliverable, the proposed off-site servicing solution is only conceptual at a Class D level, similar to projects proposed under the 2024 IMP. As such, solutions are subject to change pending further studies, such as the completion of a functional design and/or master servicing study. At the time of this assessment, the details of the mechanisms to recuperate fees for the costs allocated to growth were unknown, as this assessment does not directly support an update to the Development Charges By-Law.

Some additional factors to consider through the design of the infrastructure improvements identified in Step 2 could include:

- Life cycle costs (in addition to capital expenditure) for operation and maintenance costs over the service life of each infrastructure asset
- Consideration for any other development potential in the areas adjacent to South March (additional sizing and capacity needs)
- Review of development phasing and design concepts for each individual development within South March

Appendix A

Modelling Results



Ottawa

OPA Urban Boundary Expansion
Wastewater Infrastructure Assessment

Trunk Sewers

- EAST MARCH TRUNK
- LYNWOOD TRUNK COLLECTOR
- MARCH ROAD COLLECTOR
- NORTH KANATA TRUNK
- SOUTH OTTAWA TRUNK COLLECTOR
- SOUTH OTTAWA TUNNEL
- TRI-TOWNSHIP TRUNK COLLECTOR
- WATTS CREEK RELIEF

Modelling Results

Junctions (Maintenance Holes)
- Flooding
- HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)
- Surcharged (d/D >= 0.8)
- Bottleneck (q/Q >= 1)
- Forcemain

Existing Sanitary Sewer Infrastructure (VERTICAL)
- WWPS
- WWRG
- WWST
- WWTP

Existing Sanitary Sewer Infrastructure (LINEAR)

Model Network (Trunk-Level)
- Gravity Sewer
- Forcemain
- Local

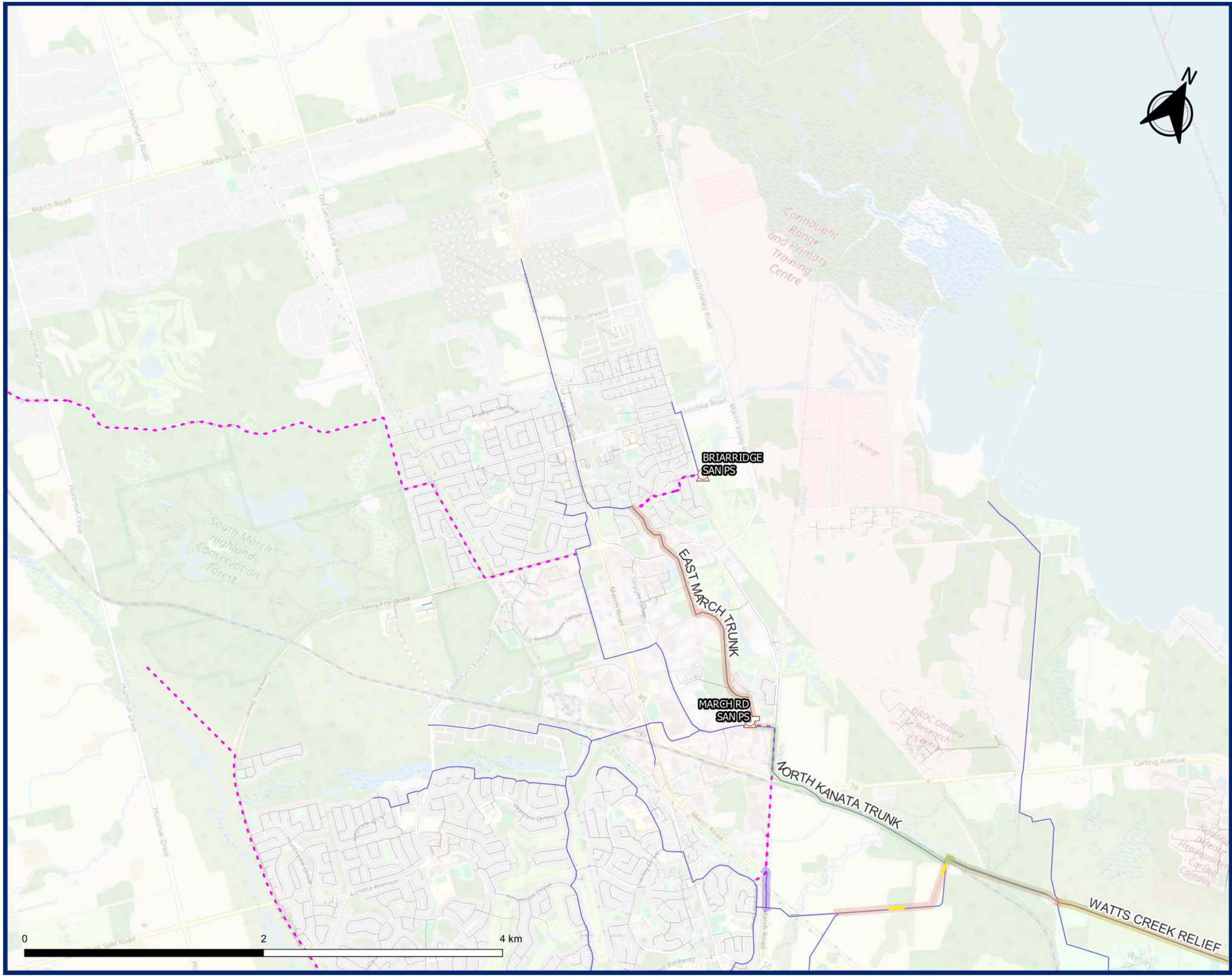
Figure 2-1

Existing Conditions
1-in-25-Year June 2014 Event
South March

GEI Consultants

March, 2025
2501074-WW-001
Projection EPSG:32189

Document Path: B:\Working\OTTAWA ON_CITY OF\2501074 Boundary Expansion Analysis\05_GIS\2501074-WW-001-OPA Urban Boundary Expansion - South March.qgz



OPA Urban Boundary Expansion
Wastewater Infrastructure Assessment

Trunk Sewers
- EAST MARCH TRUNK
- LYNWOOD TRUNK COLLECTOR
- MARCH ROAD COLLECTOR
- NORTH KANATA TRUNK
- SOUTH OTTAWA TRUNK COLLECTOR
- SOUTH OTTAWA TUNNEL
- TRI-TOWNSHIP TRUNK COLLECTOR
- WATTS CREEK RELIEF

Modelling Results

Junctions (Maintenance Holes)
- Flooding
- HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)
- Surcharged (d/D >= 0.8)
- Bottleneck (q/Q >= 1)
- Forcemain

Existing Sanitary Sewer Infrastructure (VERTICAL)
- WWPS
- WWRG
- WWST
- WWTP

Existing Sanitary Sewer Infrastructure (LINEAR)

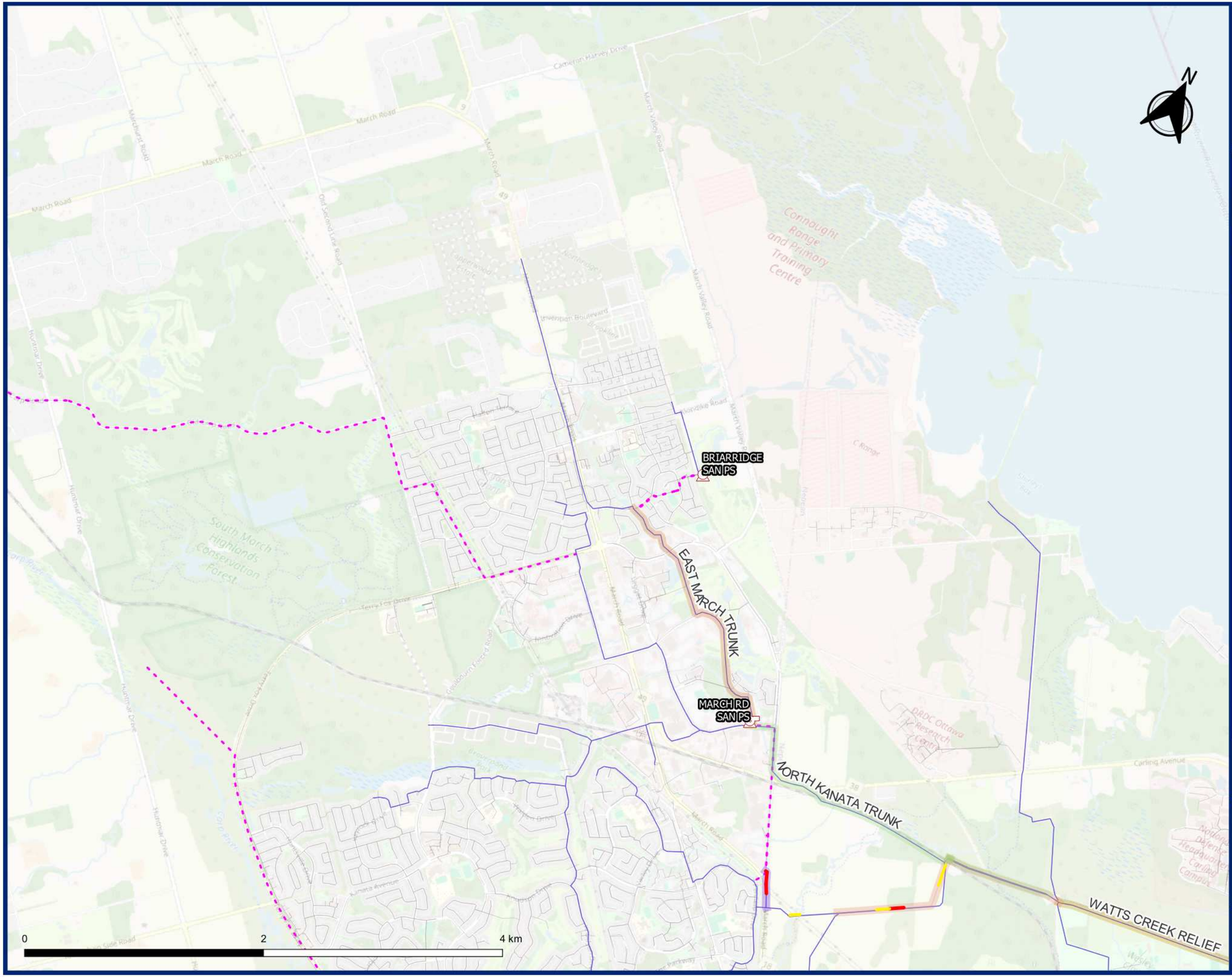
Model Network (Trunk-Level)
- Gravity Sewer
- Forcemain
- Local

Figure 2-2

Existing Conditions
1-in-5-Year June 2014 Event
South March

GEI Consultants

March, 2025
2501074-WW-001
Projection EPSG:32189



Ottawa

OPA Urban Boundary Expansion
Wastewater Infrastructure Assessment

Trunk Sewers

- EAST MARCH TRUNK
- LYNWOOD TRUNK COLLECTOR
- MARCH ROAD COLLECTOR
- NORTH KANATA TRUNK
- SOUTH OTTAWA TRUNK COLLECTOR
- SOUTH OTTAWA TUNNEL
- TRI-TOWNSHIP TRUNK COLLECTOR
- WATTS CREEK RELIEF

Modelling Results

Junctions (Maintenance Holes)
- Flooding
- HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)
- Surcharged (d/D >= 0.8)
- Bottleneck (q/Q >= 1)
- Forcemain

Existing Sanitary Sewer Infrastructure (VERTICAL)
- WWPS
- WWRG
- WWST
- WWTP

Existing Sanitary Sewer Infrastructure (LINEAR)

Model Network (Trunk-Level)
- Gravity Sewer
- Forcemain
- Local

Figure 2-3

Existing Conditions
1-in-100-Year June 2014 Event
South March

GEI Consultants

March, 2025
2501074-WW-001
Projection EPSG:32189

OPA Urban Boundary Expansion
Wastewater Infrastructure Assessment

Trunk Sewers
- EAST MARCH TRUNK
- LYNWOOD TRUNK COLLECTOR
- MARCH ROAD COLLECTOR
- NORTH KANATA TRUNK
- SOUTH OTTAWA TRUNK COLLECTOR
- SOUTH OTTAWA TUNNEL
- TRI-TOWNSHIP TRUNK COLLECTOR
- WATTS CREEK RELIEF

Modelling Results

Junctions (Maintenance Holes)
- Flooding
- HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)
- Surcharged (d/D >= 0.80)
- Bottleneck (q/Q >= 1)
- Forcemain

Existing Sanitary Sewer Infrastructure (VERTICAL)
- WWPS
- WWTP

Existing Sanitary Sewer Infrastructure (LINEAR)

Model Network (Trunk-Level)
- Gravity Sewer
- Forcemain
- Local

Future Sanitary Sewer Infrastructure
- 2013 Capital Projects

BRIARRIDGE SAN PS

MARCH RD SAN PS

EAST MARCH TRUNK

NORTH KANATA TRUNK

WATTS CREEK RELIEF

0 2 4 km

Figure 3-1

Future Conditions (no South March)
1-in-25-Year June 2014 Event
South March

GEI Consultants

March, 2025
2501074-WW-001
Projection EPSG:32189

Document Path: B:\Working\OTTAWA ON_CITY OF\2501074 Boundary Expansion Analysis\05_GIS\2501074-WW-001-OPA Urban Boundary Expansion - South March.qgz

OPA Urban Boundary Expansion
Wastewater Infrastructure Assessment

Trunk Sewers
- EAST MARCH TRUNK
- LYNWOOD TRUNK COLLECTOR
- MARCH ROAD COLLECTOR
- NORTH KANATA TRUNK
- SOUTH OTTAWA TRUNK COLLECTOR
- SOUTH OTTAWA TUNNEL
- TRI-TOWNSHIP TRUNK COLLECTOR
- WATTS CREEK RELIEF

Modelling Results

Junctions (Maintenance Holes)
- Flooding
- HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)
- Surcharged (d/D >= 0.80)
- Bottleneck (q/Q >= 1)
- Forcemain

Existing Sanitary Sewer Infrastructure (VERTICAL)
- WWPS
- WWTP

Existing Sanitary Sewer Infrastructure (LINEAR)

Model Network (Trunk-Level)
- Gravity Sewer
- Forcemain
- Local

Future Sanitary Sewer Infrastructure
- 2013 Capital Projects

BRIARRIDGE SAN PS

MARCH RD SAN PS

EAST MARCH TRUNK

NORTH KANATA TRUNK

WATTS CREEK RELIEF

0 2 4 km

Figure 3-2

Future Conditions (no South March)
1-in-5-Year June 2014 Event
South March

GEI Consultants

March, 2025
2501074-WW-001
Projection EPSG:32189

Document Path: B:\Working\OTTAWA ON_CITY OF\2501074 Boundary Expansion Analysis\05_GIS\2501074-WW-001-OPA Urban Boundary Expansion - South March.qgz

OPA Urban Boundary Expansion
Wastewater Infrastructure Assessment

Trunk Sewers
- EAST MARCH TRUNK
- LYNWOOD TRUNK COLLECTOR
- MARCH ROAD COLLECTOR
- NORTH KANATA TRUNK
- SOUTH OTTAWA TRUNK COLLECTOR
- SOUTH OTTAWA TUNNEL
- TRI-TOWNSHIP TRUNK COLLECTOR
- WATTS CREEK RELIEF

Modelling Results

Junctions (Maintenance Holes)
- Flooding
- HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)
- Surcharged (d/D >= 0.80)
- Bottleneck (q/Q >= 1)
- Forcemain

Existing Sanitary Sewer Infrastructure (VERTICAL)
- WWPS
- WWTP

Existing Sanitary Sewer Infrastructure (LINEAR)

Model Network (Trunk-Level)
- Gravity Sewer
- Forcemain
- Local

Future Sanitary Sewer Infrastructure
- 2013 Capital Projects

BRIARRIDGE SAN PS

MARCH RD SAN PS

EAST MARCH TRUNK

NORTH KANATA TRUNK

WATTS CREEK RELIEF

0 2 4 km

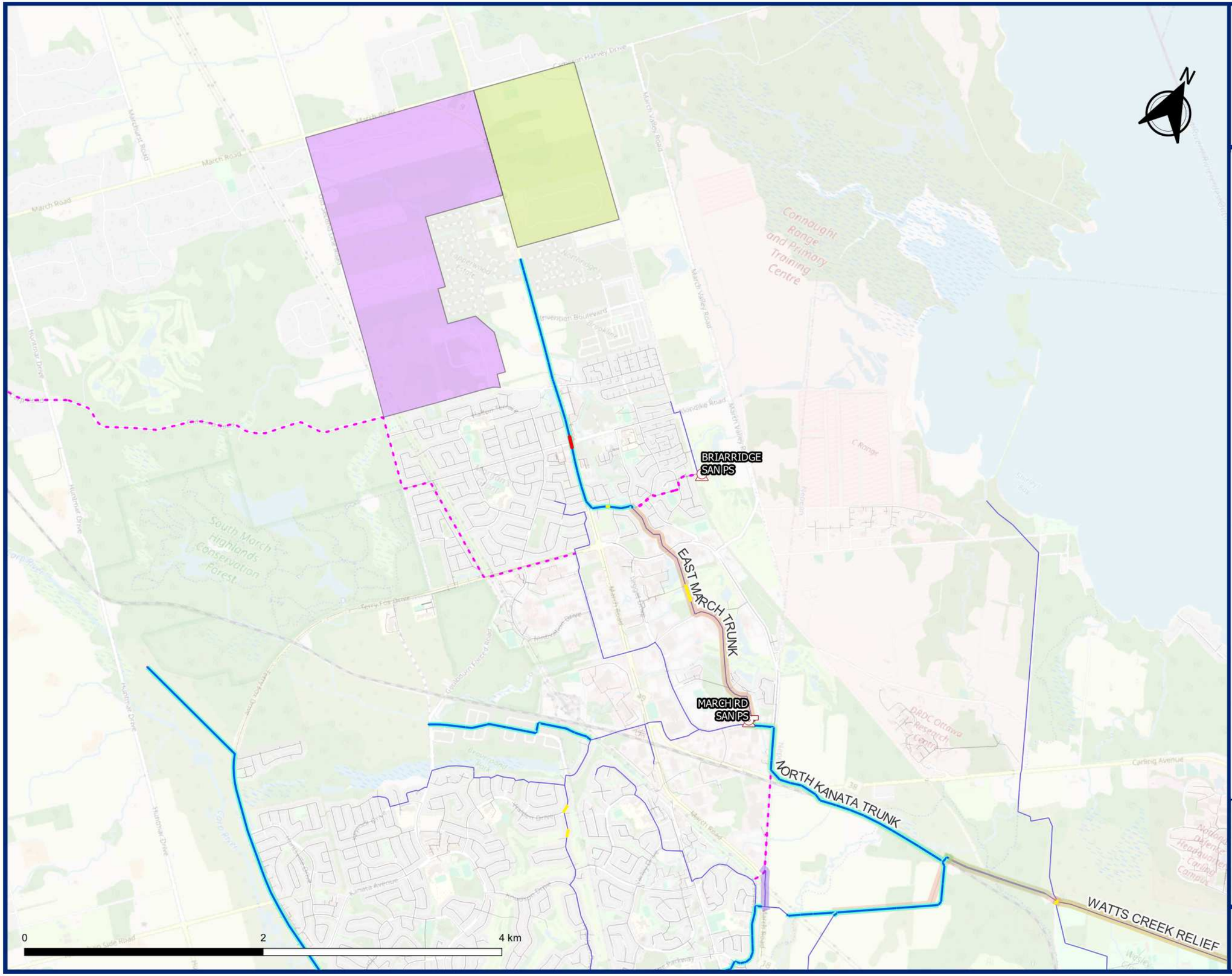
Figure 3-3

Future Conditions (no South March)
1-in-100-Year June 2014 Event
South March

GEI Consultants

March, 2025
2501074-WW-001
Projection EPSG:32189

Document Path: B:\Working\OTTAWA ON_CITY OF\2501074 Boundary Expansion Analysis\05_GIS\2501074-WW-001-OPA Urban Boundary Expansion - South March.qgz



Ottawa

OPA Urban Boundary Expansion
Wastewater Infrastructure Assessment

South March Expansion Area
- East
- West

Trunk Sewers
- EAST MARCH TRUNK
- LYNWOOD TRUNK COLLECTOR
- MARCH ROAD COLLECTOR
- NORTH KANATA TRUNK
- SOUTH OTTAWA TRUNK COLLECTOR
- SOUTH OTTAWA TUNNEL
- TRI-TOWNSHIP TRUNK COLLECTOR
- WATTS CREEK RELIEF

Modelling Results

Junctions (Maintenance Holes)
- Flooding
- HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)
- Surcharged (d/D >= 0.80)
- Bottleneck (q/Q >= 1)
- Forcemain

Existing Sanitary Sewer Infrastructure (VERTICAL)
- WWPS
- WWTP

Existing Sanitary Sewer Infrastructure (LINEAR)

Model Network (Trunk-Level)
- Gravity Sewer
- Forcemain
- Local

Future Sanitary Sewer Infrastructure
- 2013 Capital Projects

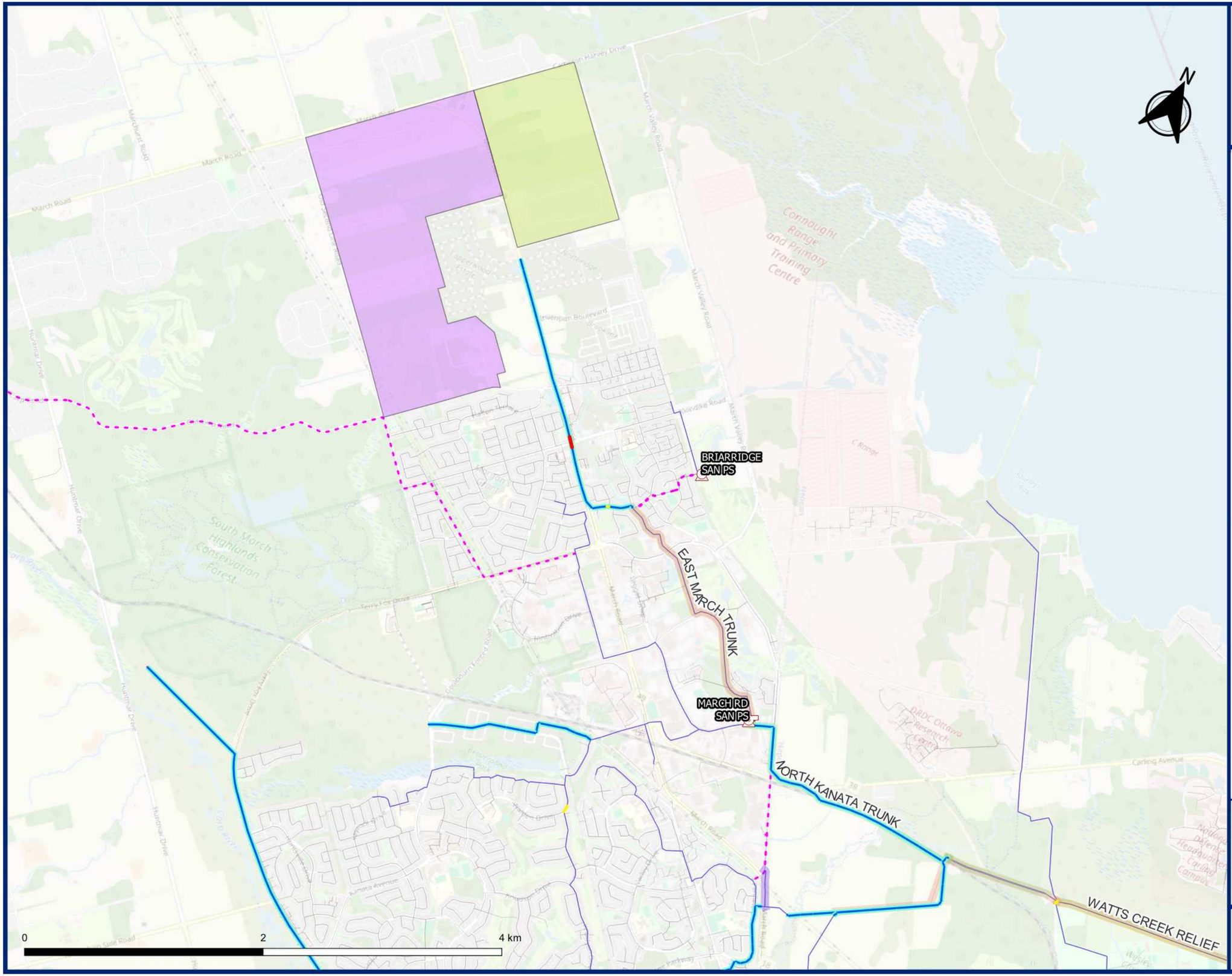
Figure 4-1

Future Conditions (with South March)
1-in-25-Year June 2014 Event

South March

GEI Consultants

March, 2025
2501074-WW-001
Projection EPSG:32189



Ottawa

OPA Urban Boundary Expansion
Wastewater Infrastructure Assessment

South March Expansion Area
- East
- West

Trunk Sewers
- EAST MARCH TRUNK
- LYNWOOD TRUNK COLLECTOR
- MARCH ROAD COLLECTOR
- NORTH KANATA TRUNK
- SOUTH OTTAWA TRUNK COLLECTOR
- SOUTH OTTAWA TUNNEL
- TRI-TOWNSHIP TRUNK COLLECTOR
- WATTS CREEK RELIEF

Modelling Results

Junctions (Maintenance Holes)
- Flooding
- HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)
- Surcharged (d/D >= 0.80)
- Bottleneck (q/Q >= 1)
- Forcemain

Existing Sanitary Sewer Infrastructure (VERTICAL)
- WWPS
- WWTP

Existing Sanitary Sewer Infrastructure (LINEAR)

Model Network (Trunk-Level)
- Gravity Sewer
- Forcemain
- Local

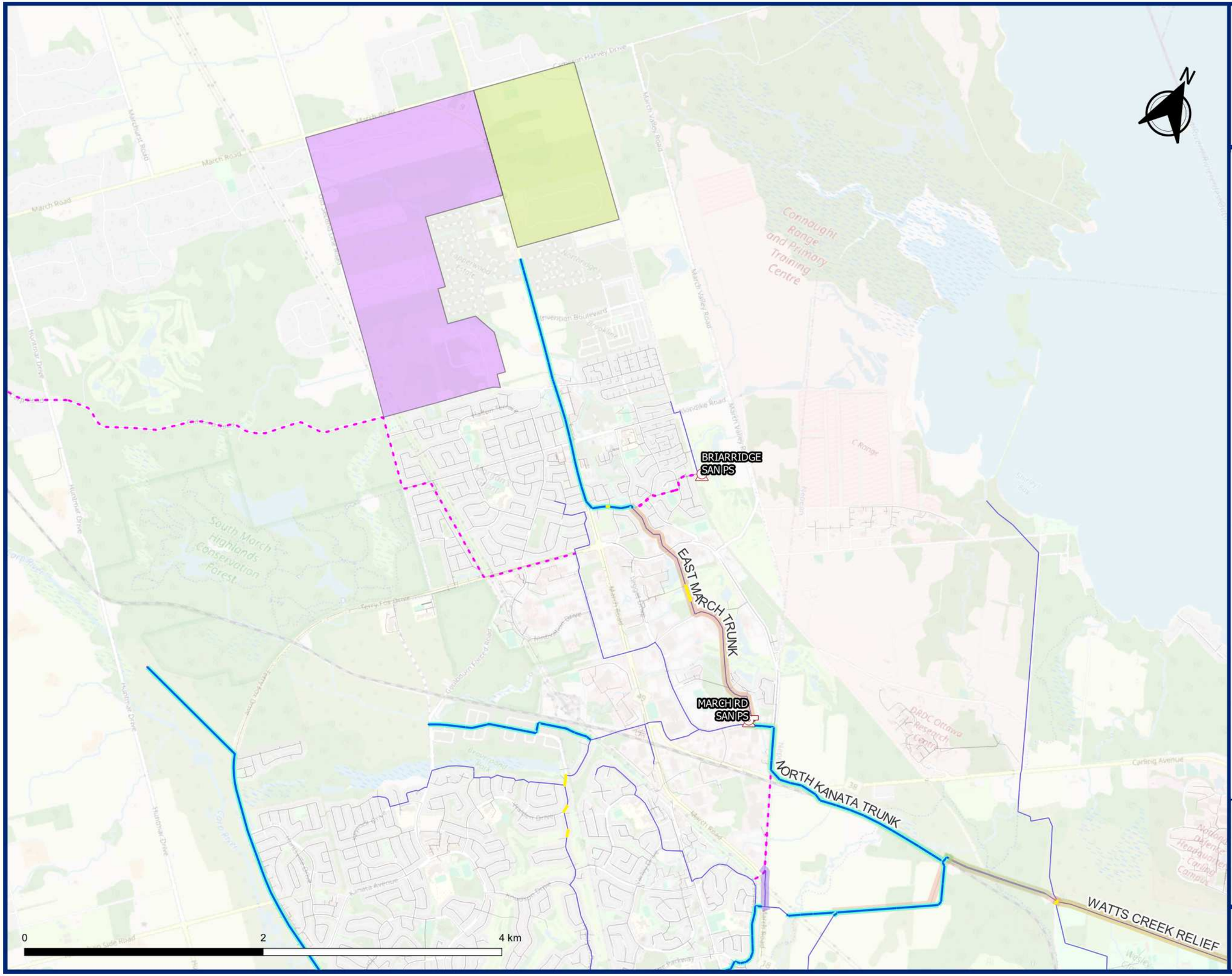
Future Sanitary Sewer Infrastructure
- 2013 Capital Projects

Figure 4-2

Future Conditions (with South March)
1-in-5-Year June 2014 Event
South March

GEI Consultants

March, 2025
2501074-WW-001
Projection EPSG:32189



Ottawa

OPA Urban Boundary Expansion
Wastewater Infrastructure Assessment

South March Expansion Area
- East
- West

Trunk Sewers
- EAST MARCH TRUNK
- LYNWOOD TRUNK COLLECTOR
- MARCH ROAD COLLECTOR
- NORTH KANATA TRUNK
- SOUTH OTTAWA TRUNK COLLECTOR
- SOUTH OTTAWA TUNNEL
- TRI-TOWNSHIP TRUNK COLLECTOR
- WATTS CREEK RELIEF

Modelling Results

Junctions (Maintenance Holes)
- Flooding
- HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)
- Surcharged (d/D >= 0.80)
- Bottleneck (q/Q >= 1)
- Forcemain

Existing Sanitary Sewer Infrastructure (VERTICAL)
- WWPS
- WWTP

Existing Sanitary Sewer Infrastructure (LINEAR)

Model Network (Trunk-Level)
- Gravity Sewer
- Forcemain
- Local

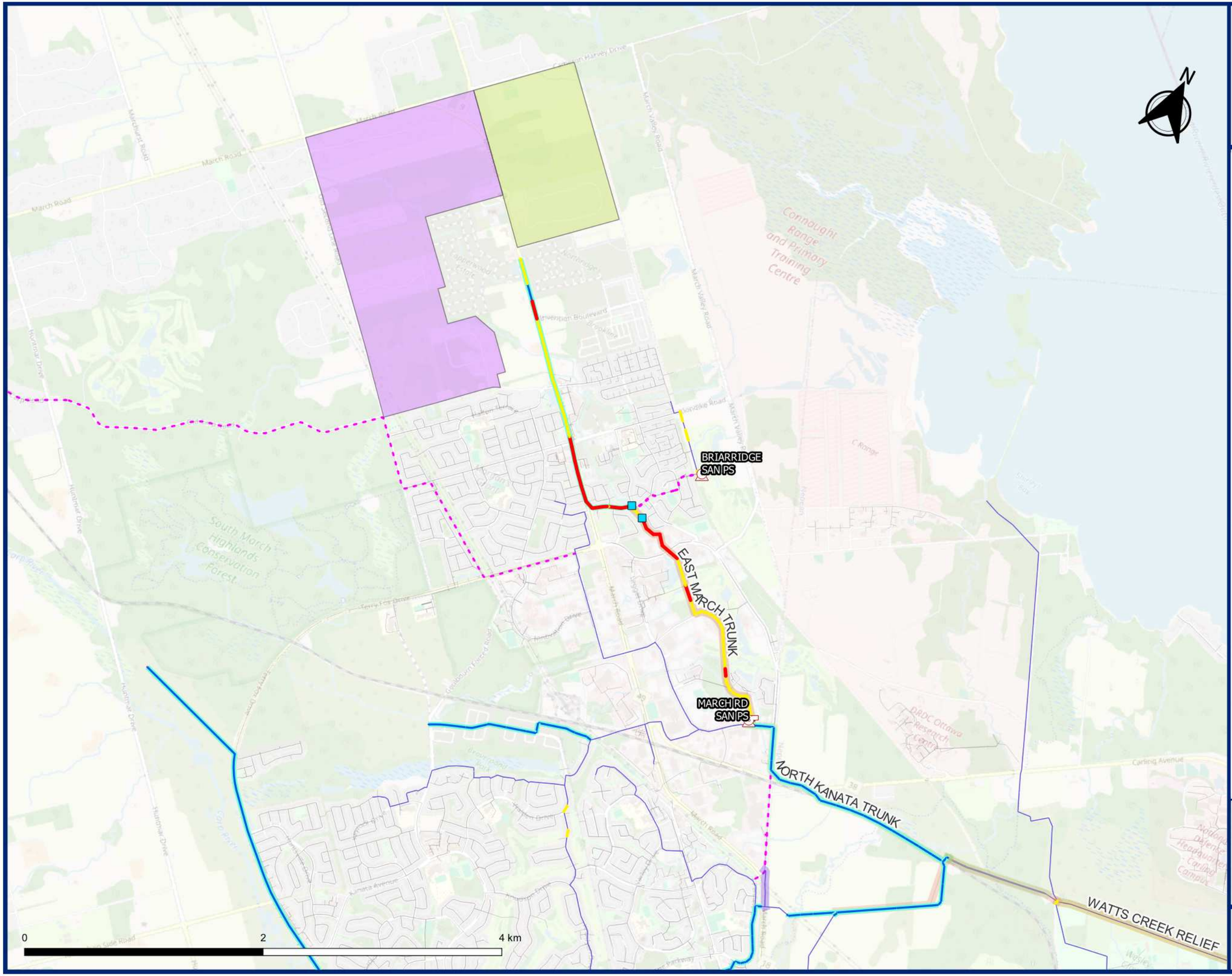
Future Sanitary Sewer Infrastructure
- 2013 Capital Projects

Figure 4-3

Future Conditions (with South March)
1-in-100-Year June 2014 Event
South March

GEI Consultants

March, 2025
2501074-WW-001
Projection EPSG:32189



OPA Urban Boundary Expansion
Wastewater Infrastructure Assessment

South March Expansion Area
- East
- West

Trunk Sewers
- EAST MARCH TRUNK
- LYNWOOD TRUNK COLLECTOR
- MARCH ROAD COLLECTOR
- NORTH KANATA TRUNK
- SOUTH OTTAWA TRUNK COLLECTOR
- SOUTH OTTAWA TUNNEL
- TRI-TOWNSHIP TRUNK COLLECTOR
- WATTS CREEK RELIEF

Modelling Results

Junctions (Maintenance Holes)
- Flooding
- HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)
- Surcharged (d/D >= 0.80)
- Bottleneck (q/Q >= 1)
- Forcemain

Existing Sanitary Sewer Infrastructure (VERTICAL)
- WWPS
- WWTP

Existing Sanitary Sewer Infrastructure (LINEAR)

Model Network (Trunk-Level)
- Gravity Sewer
- Forcemain
- Local

Future Sanitary Sewer Infrastructure
- 2013 Capital Projects

Figure 5-1

Future Conditions (no overflow)
1-in-25-Year June 2014 Event
South March

GEI Consultants

March, 2025
2501074-WW-001
Projection EPSG:32189

OPA Urban Boundary Expansion
Wastewater Infrastructure Assessment

South March Expansion Area
- East
- West

Trunk Sewers
- EAST MARCH TRUNK
- LYNWOOD TRUNK COLLECTOR
- MARCH ROAD COLLECTOR
- NORTH KANATA TRUNK
- SOUTH OTTAWA TRUNK COLLECTOR
- SOUTH OTTAWA TUNNEL
- TRI-TOWNSHIP TRUNK COLLECTOR
- WATTS CREEK RELIEF

Modelling Results

Junctions (Maintenance Holes)
- Flooding
- HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)
- Surcharged (d/D >= 0.80)
- Bottleneck (q/Q >= 1)
- Forcemain

Existing Sanitary Sewer Infrastructure (VERTICAL)
- WWPS
- WWTP

Existing Sanitary Sewer Infrastructure (LINEAR)

Model Network (Trunk-Level)
- Gravity Sewer
- Forcemain
- Local

Future Sanitary Sewer Infrastructure
- 2013 Capital Projects

BRIARRIDGE SAN PS

MARCH RD SAN PS

EAST MARCH TRUNK

NORTH KANATA TRUNK

WATTS CREEK RELIEF

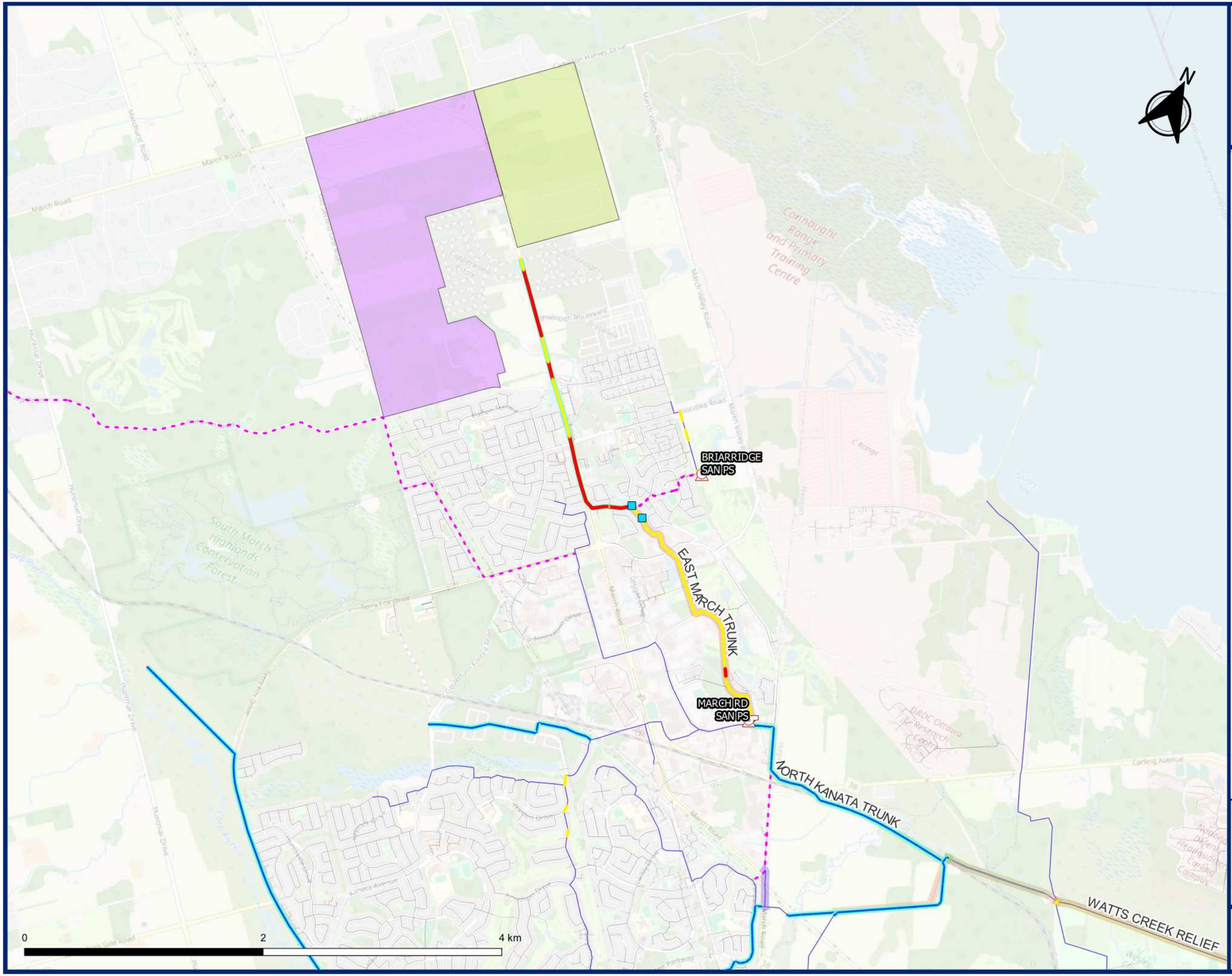
0 2 4 km

Figure 5-2

Future Conditions (no overflow)
1-in-5-Year June 2014 Event
South March

GEI Consultants

March, 2025
2501074-WW-001
Projection EPSG:32189



OPA Urban Boundary Expansion
Wastewater Infrastructure Assessment

South March Expansion Area
- East
- West

Trunk Sewers
- EAST MARCH TRUNK
- LYNWOOD TRUNK COLLECTOR
- MARCH ROAD COLLECTOR
- NORTH KANATA TRUNK
- SOUTH OTTAWA TRUNK COLLECTOR
- SOUTH OTTAWA TUNNEL
- TRI-TOWNSHIP TRUNK COLLECTOR
- WATTS CREEK RELIEF

Modelling Results

Junctions (Maintenance Holes)
- Flooding
- HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)
- Surcharged (d/D >= 0.80)
- Bottleneck (q/Q >= 1)
- Forcemain

Existing Sanitary Sewer Infrastructure (VERTICAL)
- WWPS
- WWTP

Existing Sanitary Sewer Infrastructure (LINEAR)

Model Network (Trunk-Level)
- Gravity Sewer
- Forcemain
- Local

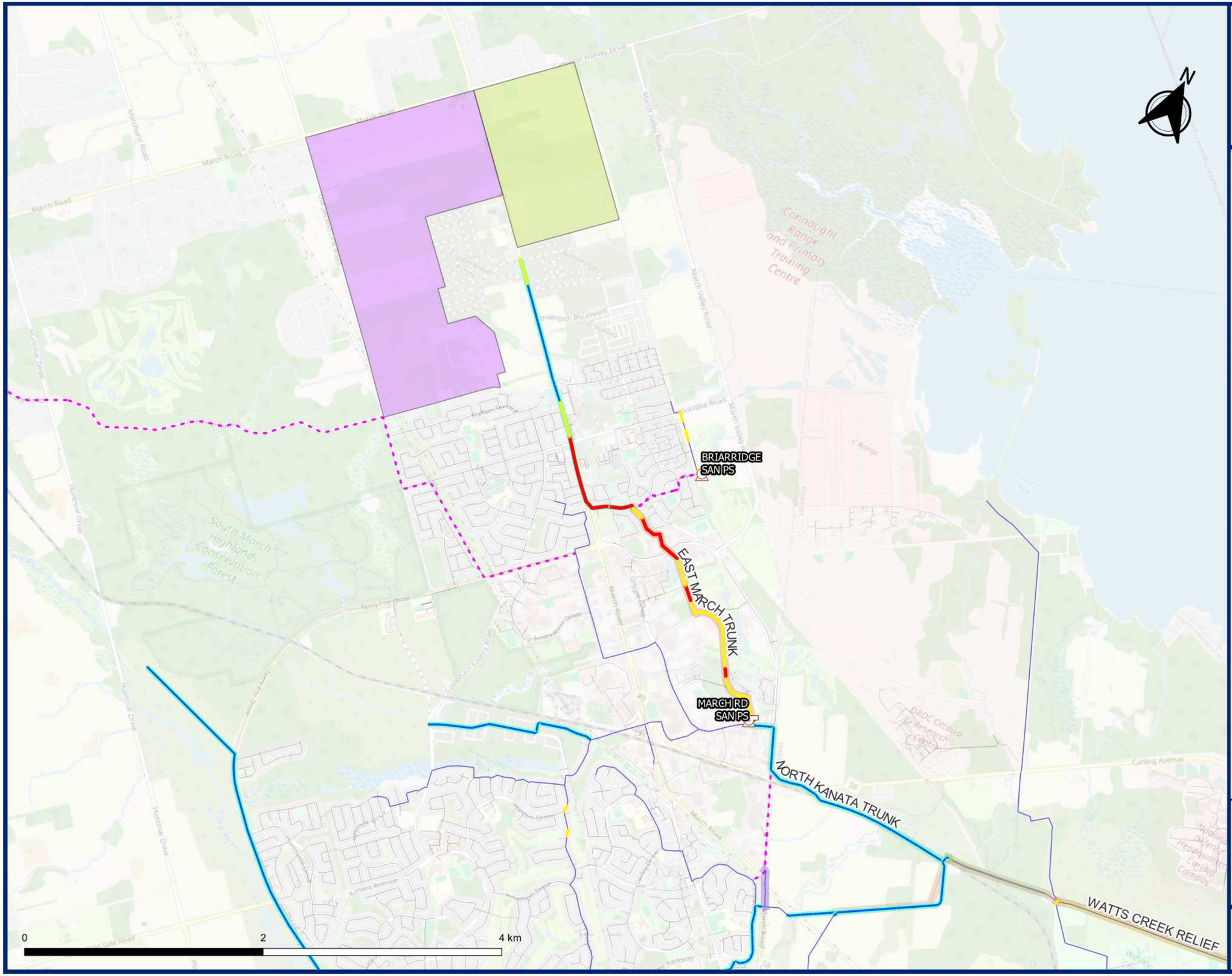
Future Sanitary Sewer Infrastructure
- 2013 Capital Projects

Figure 5-3

Future Conditions (no overflow)
1-in-100-Year June 2014 Event
South March

GEI

March, 2025
2501074-WW-001
Projection EPSG:32189



OPA Urban Boundary Expansion
Wastewater Infrastructure Assessment

South March Expansion Area
- East
- West

Trunk Sewers
- EAST MARCH TRUNK
- LYNWOOD TRUNK COLLECTOR
- MARCH ROAD COLLECTOR
- NORTH KANATA TRUNK
- SOUTH OTTAWA TRUNK COLLECTOR
- SOUTH OTTAWA TUNNEL
- TRI-TOWNSHIP TRUNK COLLECTOR
- WATTS CREEK RELIEF

Modelling Results

Junctions (Maintenance Holes)
- Flooding
- HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)
- Surcharged (d/D >= 0.80)
- Bottleneck (q/Q >= 1)
- Forcemain

Existing Sanitary Sewer Infrastructure (VERTICAL)
- WWPS
- WWTP

Existing Sanitary Sewer Infrastructure (LINEAR)

Model Network (Trunk-Level)
- Gravity Sewer
- Forcemain
- Local

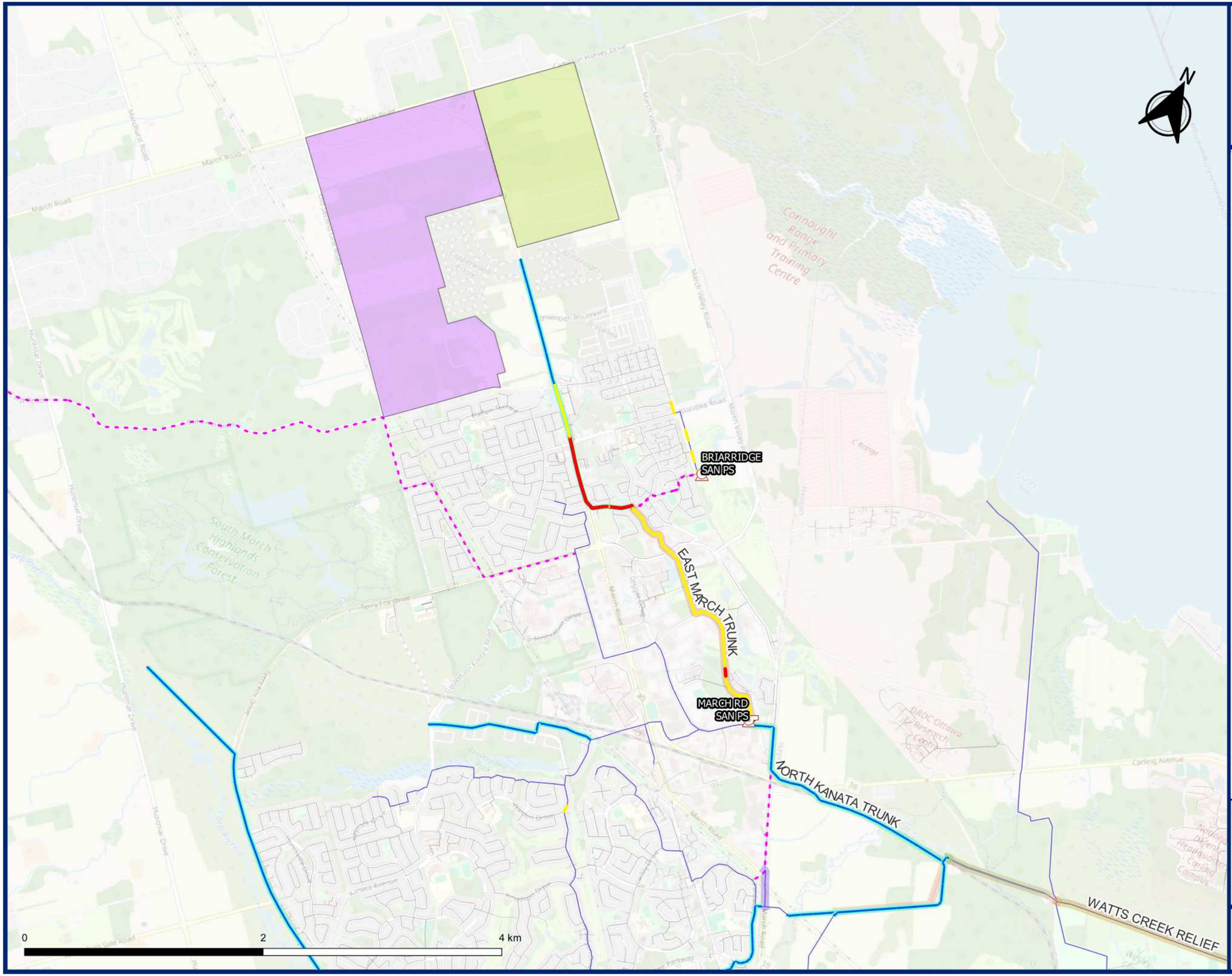
Future Sanitary Sewer Infrastructure
- 2013 Capital Projects

Figure 6-1

Future Conditions (w. overflow)
1-in-25-Year June 2014 Event
South March

GEI Consultants

March, 2025
2501074-WW-001
Projection EPSG:32189



OPA Urban Boundary Expansion
Wastewater Infrastructure Assessment

South March Expansion Area
- East
- West

Trunk Sewers
- EAST MARCH TRUNK
- LYNWOOD TRUNK COLLECTOR
- MARCH ROAD COLLECTOR
- NORTH KANATA TRUNK
- SOUTH OTTAWA TRUNK COLLECTOR
- SOUTH OTTAWA TUNNEL
- TRI-TOWNSHIP TRUNK COLLECTOR
- WATTS CREEK RELIEF

Modelling Results

Junctions (Maintenance Holes)
- Flooding
- HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)
- Surcharged (d/D >= 0.80)
- Bottleneck (q/Q >= 1)
- Forcemain

Existing Sanitary Sewer Infrastructure (VERTICAL)
- WWPS
- WWTP

Existing Sanitary Sewer Infrastructure (LINEAR)

Model Network (Trunk-Level)
- Gravity Sewer
- Forcemain
- Local

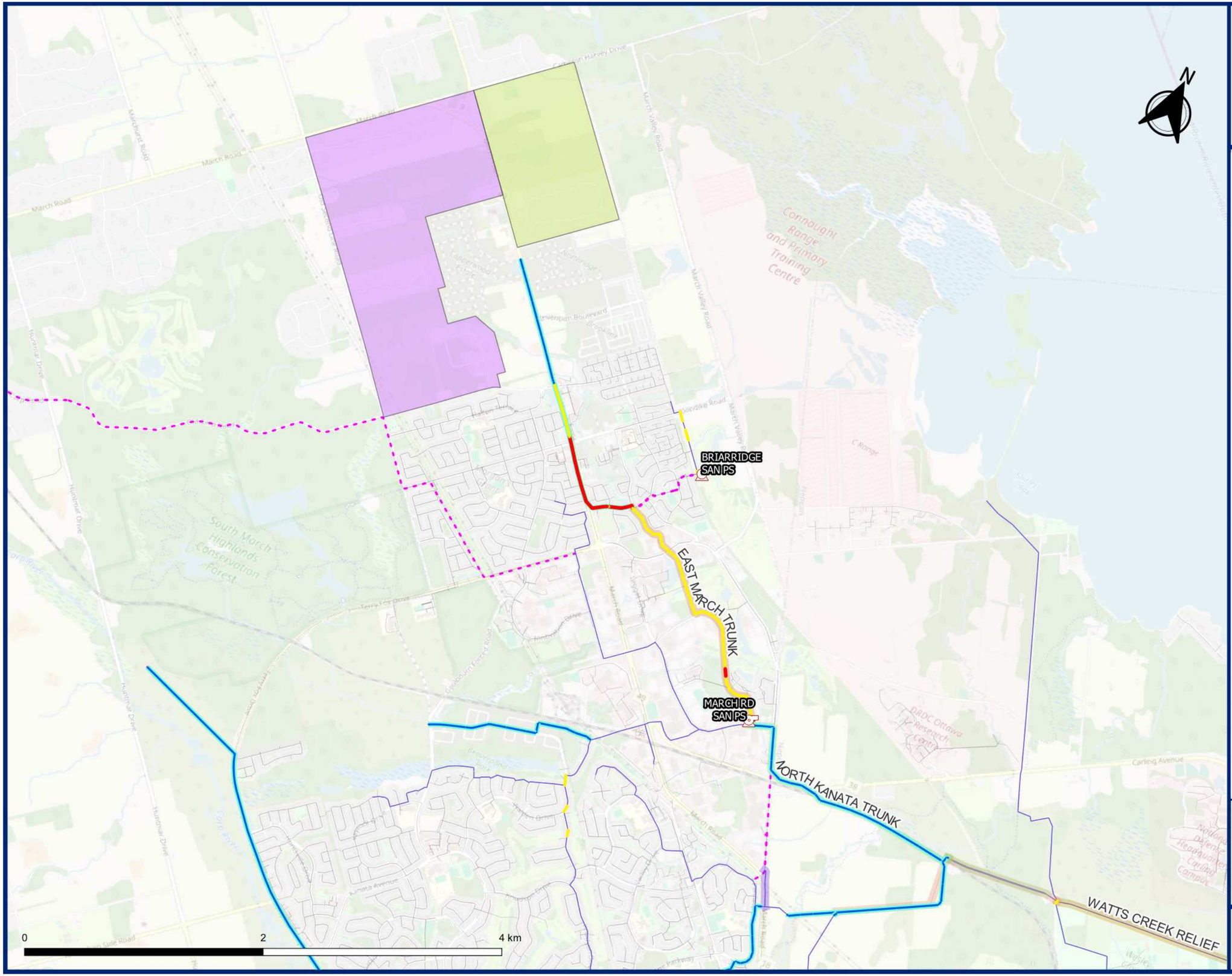
Future Sanitary Sewer Infrastructure
- 2013 Capital Projects

Figure 6-2

Future Conditions (w. overflow)
1-in-5-Year June 2014 Event
South March

GEI Consultants

March, 2025
2501074-WW-001
Projection EPSG:32189



OPA Urban Boundary Expansion
Wastewater Infrastructure Assessment

South March Expansion Area
- East
- West

Trunk Sewers
- EAST MARCH TRUNK
- LYNWOOD TRUNK COLLECTOR
- MARCH ROAD COLLECTOR
- NORTH KANATA TRUNK
- SOUTH OTTAWA TRUNK COLLECTOR
- SOUTH OTTAWA TUNNEL
- TRI-TOWNSHIP TRUNK COLLECTOR
- WATTS CREEK RELIEF

Modelling Results

Junctions (Maintenance Holes)
- Flooding
- HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)
- Surcharged (d/D >= 0.80)
- Bottleneck (q/Q >= 1)
- Forcemain

Existing Sanitary Sewer Infrastructure (VERTICAL)
- WWPS
- WWTP

Existing Sanitary Sewer Infrastructure (LINEAR)

Model Network (Trunk-Level)
- Gravity Sewer
- Forcemain
- Local

Future Sanitary Sewer Infrastructure
- 2013 Capital Projects

Figure 6-3

Future Conditions (w. overflow)
1-in-100-Year June 2014 Event
South March

GEI Consultants

March, 2025
2501074-WW-001
Projection EPSG:32189

Appendix B

Detailed Costing Sheets

Date: 4/3/2025

Asset Management

Infrastructure Planning Unit

Infrastructure Category:	**Linear Wastewater**
Project Type:	**New Emergency Overflow at Shirley's Brook Drive and Sandhill Road**
Project Title:	Official Plan Amendment - South March Expansion Area
Project Phase:	**Conceptual Design**
Project Location:	Shirley's Brook Drive at Sandhill Road

FINAL - CLASS D- ESTIMATED CONSTRUCTION COSTS (No HST):			**$635,440**
Class D Capital Cost Components and Risk Factors			
Item	**Percentage**	**Yes/No = 1/0**	**Estimated Cost**
Capital Cost Components*		**Change as Required**	
Engineering - Design, Contract Adm. (15% - 25%)	20.0%	1	$127,088
Utilities (5% - 20%)	5.0%	1	$31,772
Property - REPDO Estimate (1% - 10%)	1.0%	1	$6,354
City Internal Costs (7% - 10%)	8.5%	1	$54,012
Misc. Soft Costs - Permit, Public Art, etc. (5%)	5.0%	1	$31,772
Risk Factors**			
Excess Soil Management (1% - 10%)	10.0%	1	$63,544
Geo-Tech issues - Bedrock (1% - 5%)	5.0%	1	$31,772
Geo-Tech Issues - Grey Silty Clay (1% - 10%)	10.0%	0	$0
Special Hydro-Geo Conditions (1% - 10%)	5.0%	1	$31,772
Change in Design Standards (1% - 5%)	1.0%	1	$6,354
Construction Contract Duration (2% per year)	2.0%	1	$12,709
Species at Risk and Project Mitigation (1% - 5%)	1.0%	0	$0
Planning, Design and Land use Approvals (5% - 10%)	5.0%	1	$31,772
Provincial and Federal Environmental Assessments (5% - 10%)	5.0%	0	$0
CONSTRUCTION and CAPITAL COST COMPONENTS SUBTOTAL:			**$886,439**
RISK FACTORS SUBTOTAL:			**$177,923**
OVERALL CLASS D CONTINGENCY (40%-50%) * **	**40%**		**$354,576**
FINAL - CLASS D - ESTIMATED TOTAL CAPITAL COST (NO HST):			**$1,418,938**

* Capital Cost Components Percenatge Allowance Range as per City 2013 PDR

** Risk Factors Percentage Allowance to be Applied Based on the Project Complexity

*** Overall Contingency is Applied to Estimated Construction, Cost Components and Risk Factors

Project Related Comments:

10 YEAR COST INFLATION CHART		
Year	**Inflation % per Year**	**Yearly Construction Cost Projection**
2021	**17%**	**$1,662,995**
2022	**10%**	**$1,827,631**
2023	**5%**	**$1,909,875**
2024	**3.0%**	**$1,967,171**
2025	**3.0%**	**$2,026,186**
2026	**3.0%**	**$2,086,972**
2027	**3.0%**	**$2,149,581**
2028	**3.0%**	**$2,214,068**
2029	**3.0%**	**$2,280,490**
2030	**3.0%**	**$2,348,905**
2031	**3.0%**	**$2,419,372**