

February 9, 2022

South Niagara Falls Wastewater Solutions Schedule C Class Environmental Assessment

Public Information Centre No. 4

Recommendations and Preliminary Preferred
Design Concepts

Foundation for this Study: The Niagara Region Water and Wastewater Master Servicing Plan Update (MSP 2017)

Key issues addressed by the MSP (2017):

- Accommodating growth,
- Improving and increasing capacity in the existing sanitary and combined stormwater systems, and,
- Managing wet weather flows.

Preferred Solution from the MSP (2017):

- Build a new wastewater treatment plant in South Niagara Falls, and,
- Improve the existing sewer system and connect it to the new plant.

The Master Servicing Plan Update was adopted by Niagara Region Council in 2017.

The purpose of the South Niagara Falls Wastewater Solutions Class EA is to determine:

- Where to locate the new wastewater treatment plant in South Niagara Falls,
- Which body of water will receive the clean, treated water from the new plant, and,
- How best to integrate the wastewater network to address growth, make the system as efficient as possible, and manage wet weather.

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

Key Dates

February 9, 2022:

New information posted to project website and live presentation (6-7pm)

February 10, 2022:

Recorded presentation available on the project website

February 9 to February 23, 2022:

Submit questions or comments to the Niagara Region Project Manager via the project website



Present recommendations and preliminary preferred design concepts for key study components.



Provide clarity on the Municipal Class Environmental Assessment process and results.

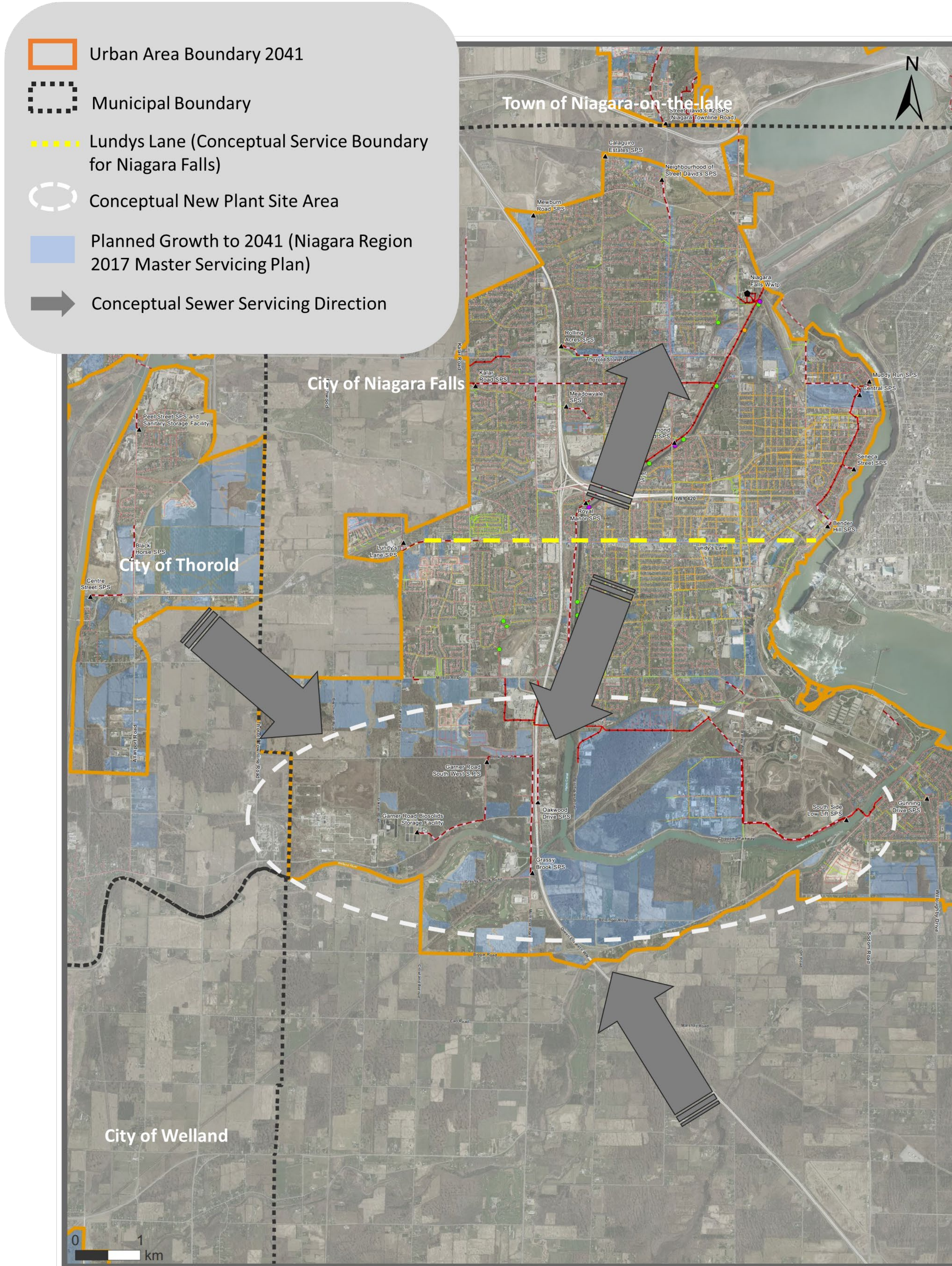


Identify next steps and study commitments.



Receive feedback on the preliminary preferred design concepts.

This is the fourth and final PIC for this study.



Growth and Flow Projections

TODAY

2041

Total City of Niagara Falls

130,837

People and Jobs

185,310

People and Jobs

New Wastewater Treatment Plant

53,467

People and Jobs

85,292

People and Jobs

Approximate Average Daily Flow Projections

11 MLD

21 MLD*



Planned Wastewater Treatment Plant Capacity**

* Initial planned capacity will address growth needs beyond 20 years as well as firm capacity for all treatment processes.

** Wastewater Treatment Plant site planning will consider future expansion to 60 MLD for post 2041 growth.

1. Protect the environment:

- Reduce pollution into rivers and the environment
- Minimize flooding (i.e., overflows, basements)

2. Provide flexibility for the future:

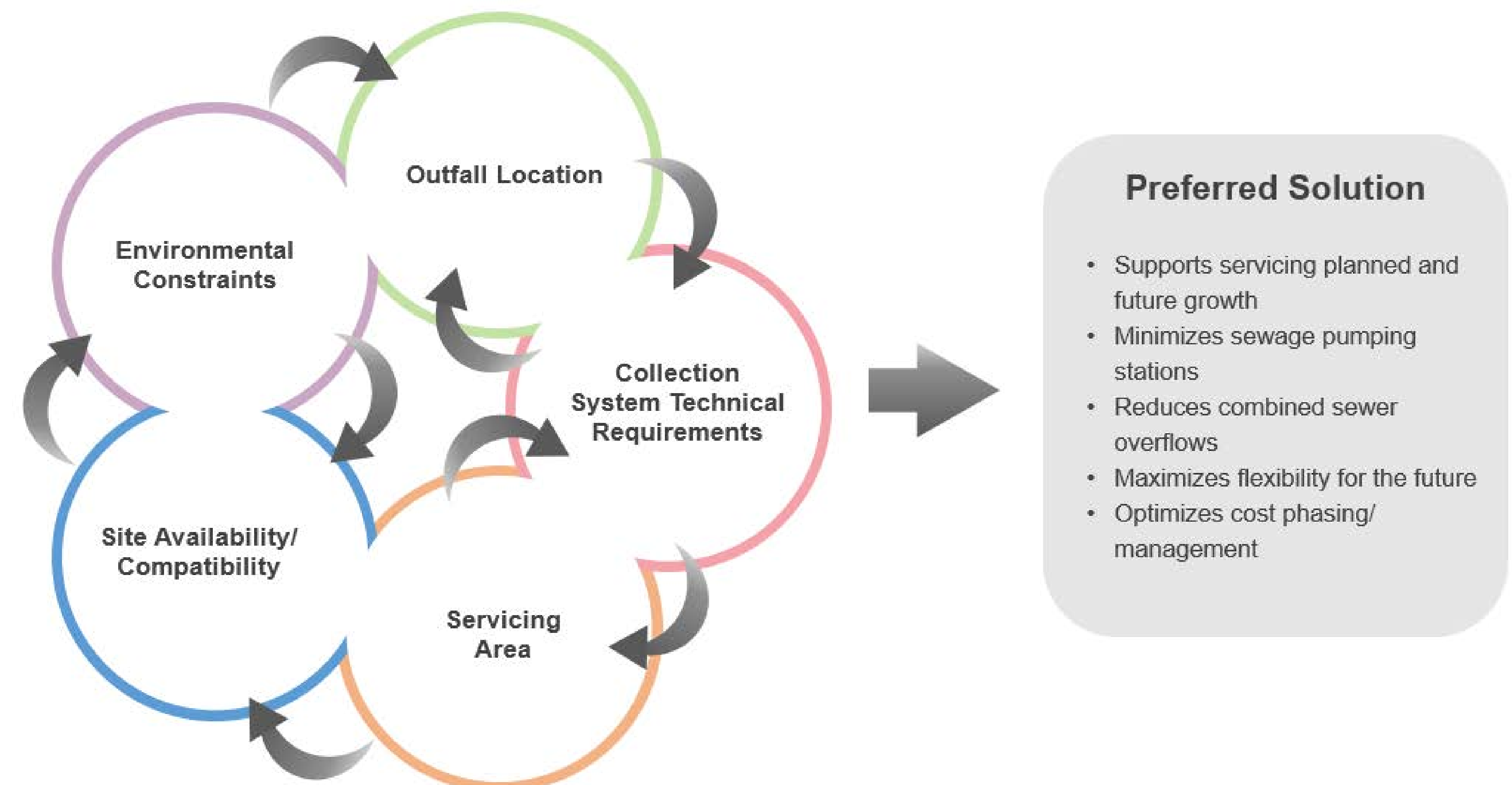
- Ensure the facility has ability to respond to changing regulations and needs
- Free up capacity in existing infrastructure

3. Accommodate growth:

- Increase system capacity
- Support economic development

4. Establish the new WWTP as a community asset:

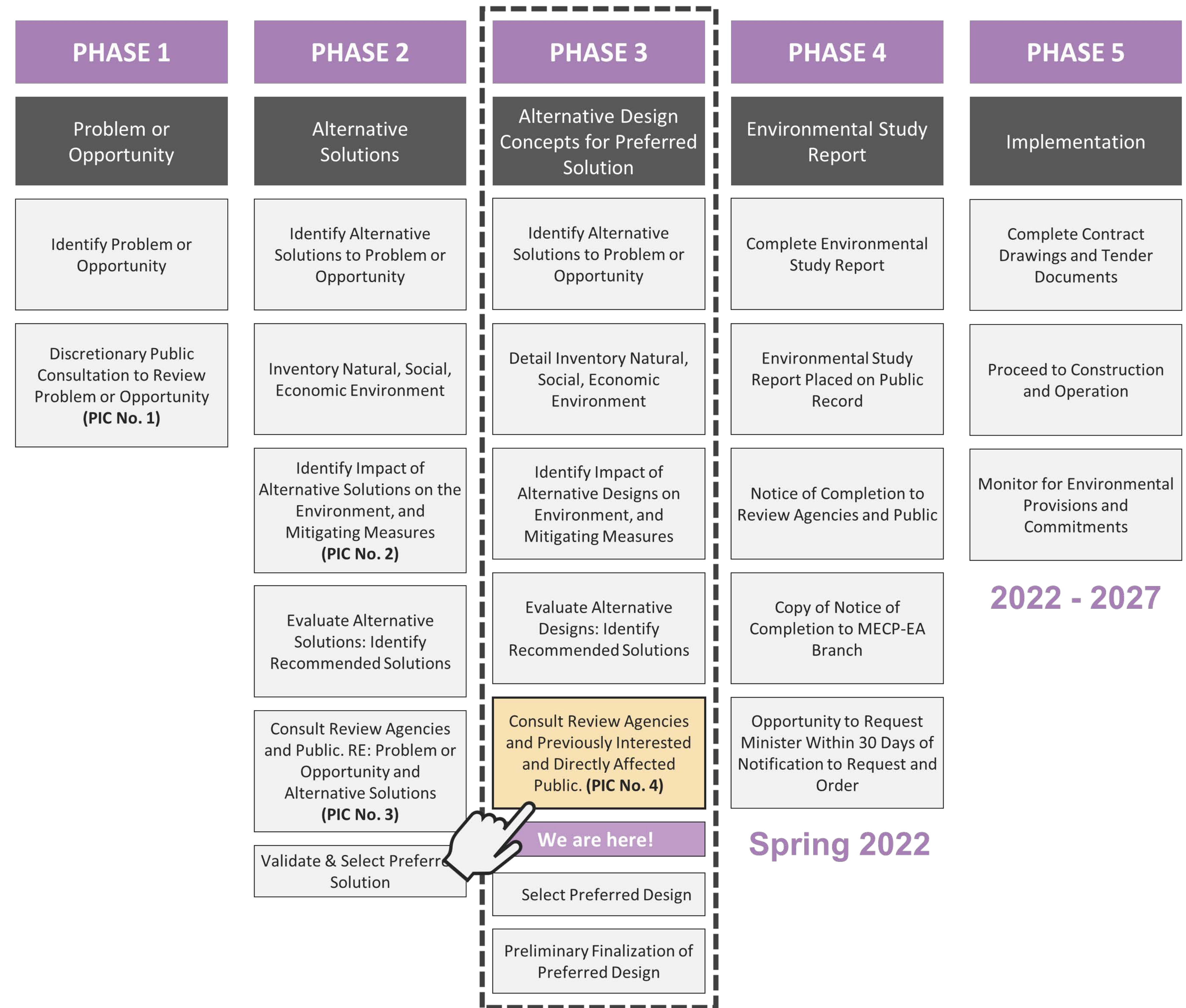
- Mitigate and manage issues such as odour, noise, and traffic



Where are we in the Study Process?

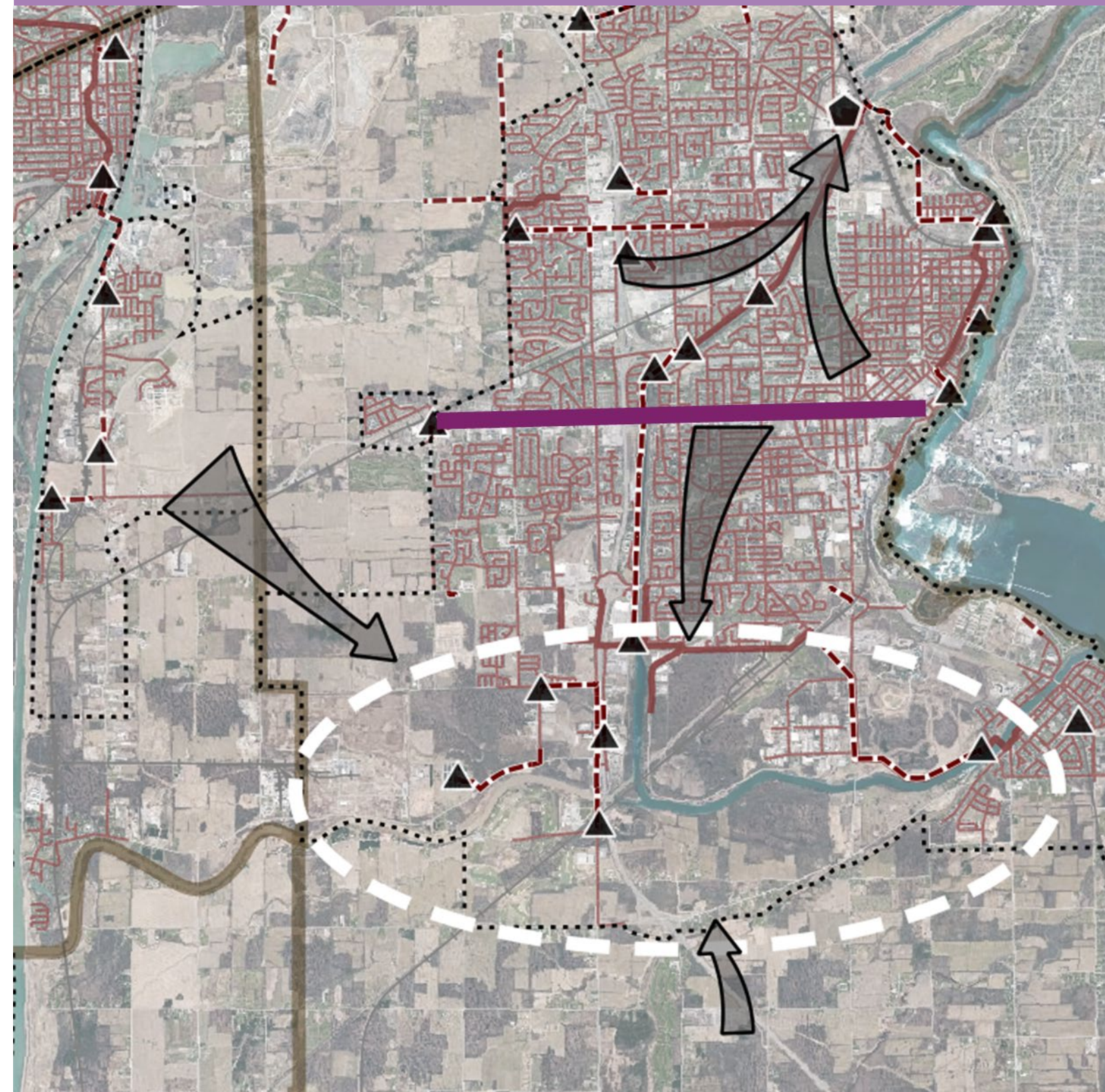
Municipal Class EA (MCEA) Process:

- This study will satisfy Phases 1 to 4 of the MCEA Process
- The current Phase 3 process will:
 - Identify design concept alternatives
 - Prepare detailed solution inventory
 - Evaluate comprehensive design concept alternatives
 - Select the preliminary preferred design concepts and technologies
 - Identify impacts and how to address them
 - **Public Information Centre No. 4**
 - Confirm the preferred design concepts and technologies



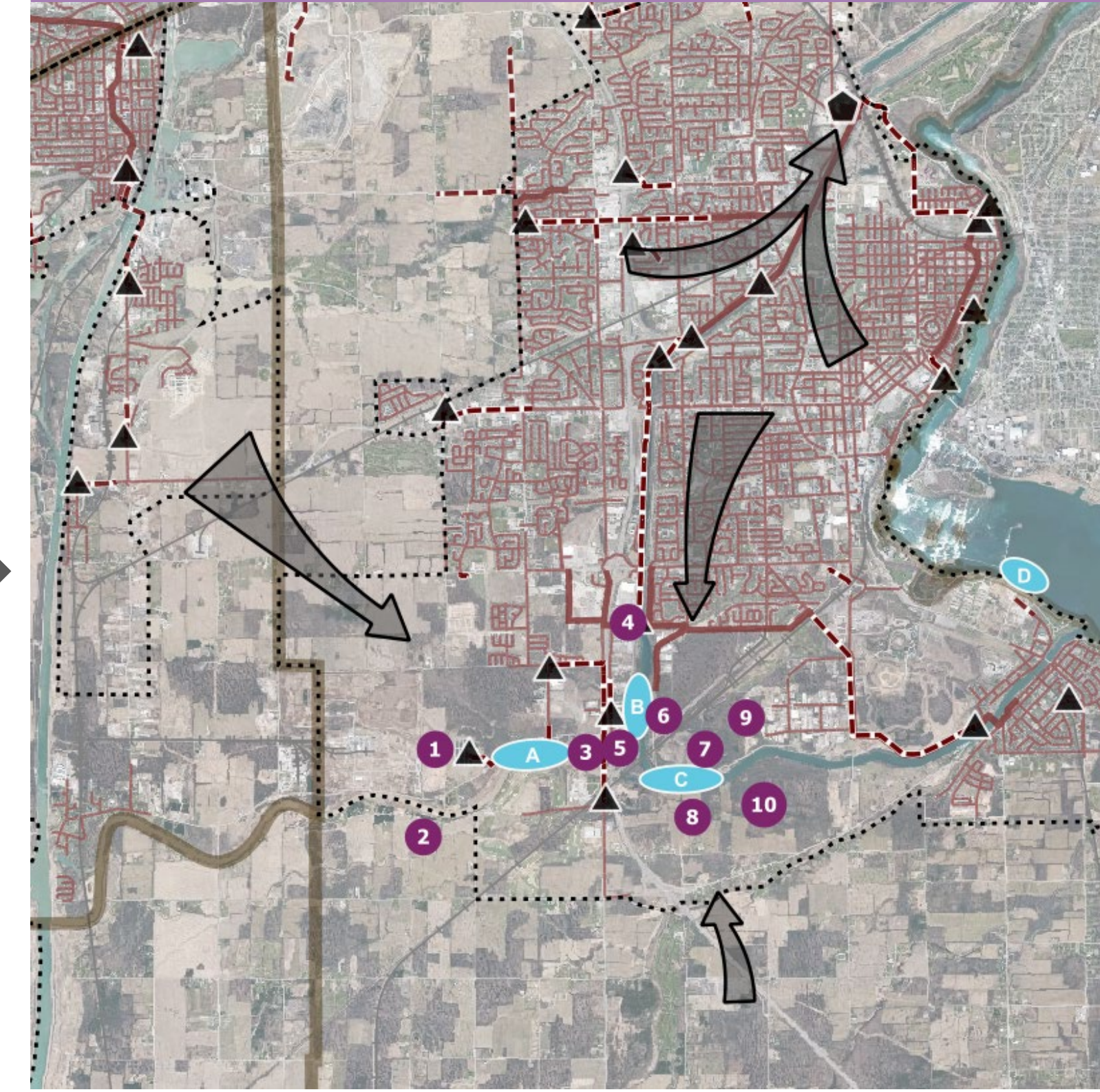
MEA Mandated Requirements:
<https://municipalclassea.ca/manual/page10.html>

1 – Problem / Opportunity



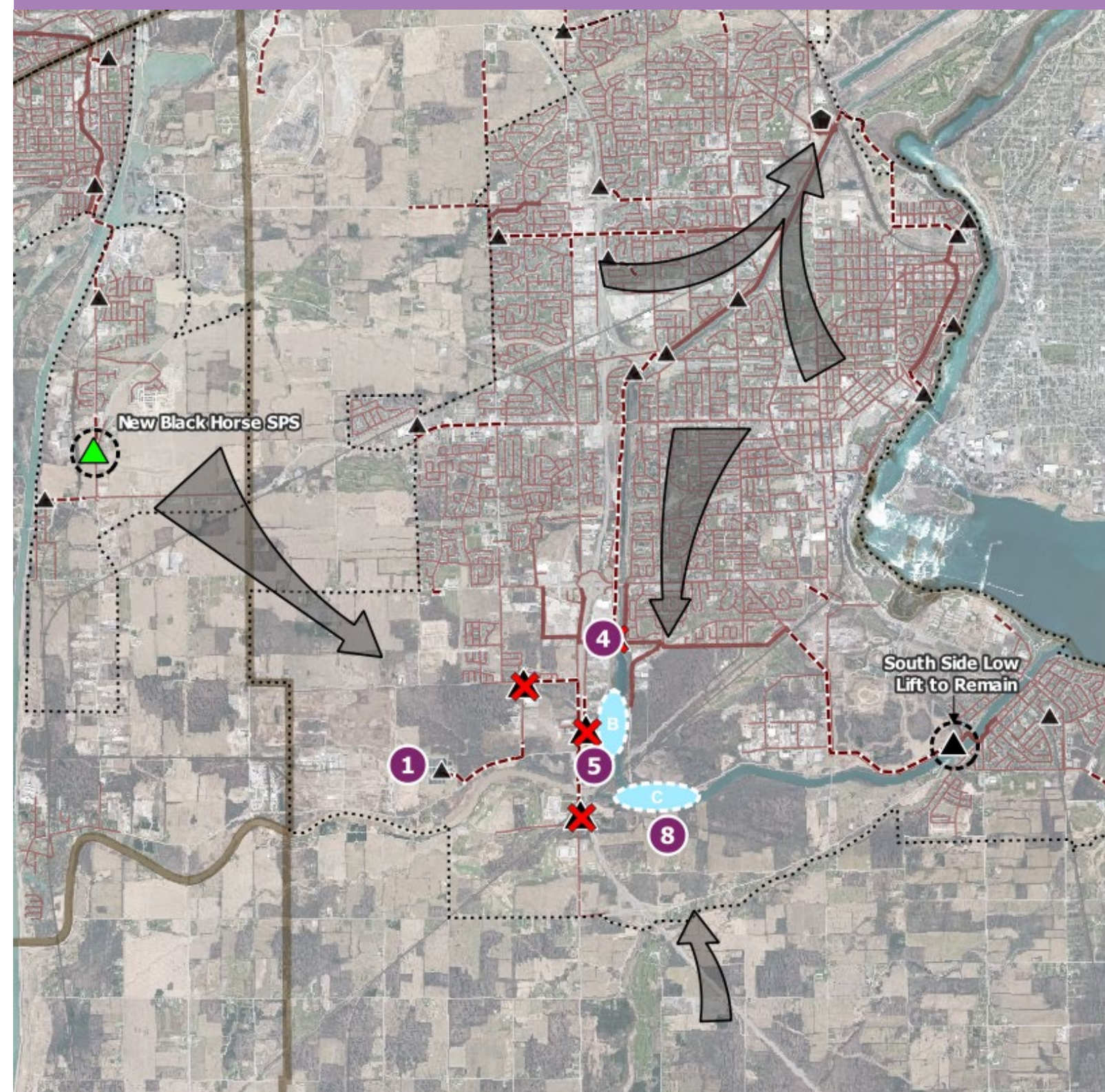
- Study need and objectives confirmed
- Wastewater servicing boundary defined for existing and new Wastewater Treatment Plant (WWTP)
- General new WWTP siting area selected
- Baseline study area investigations completed
- Presented at PIC No.1 on May 29, 2019

2 – Develop Long List of Alternatives



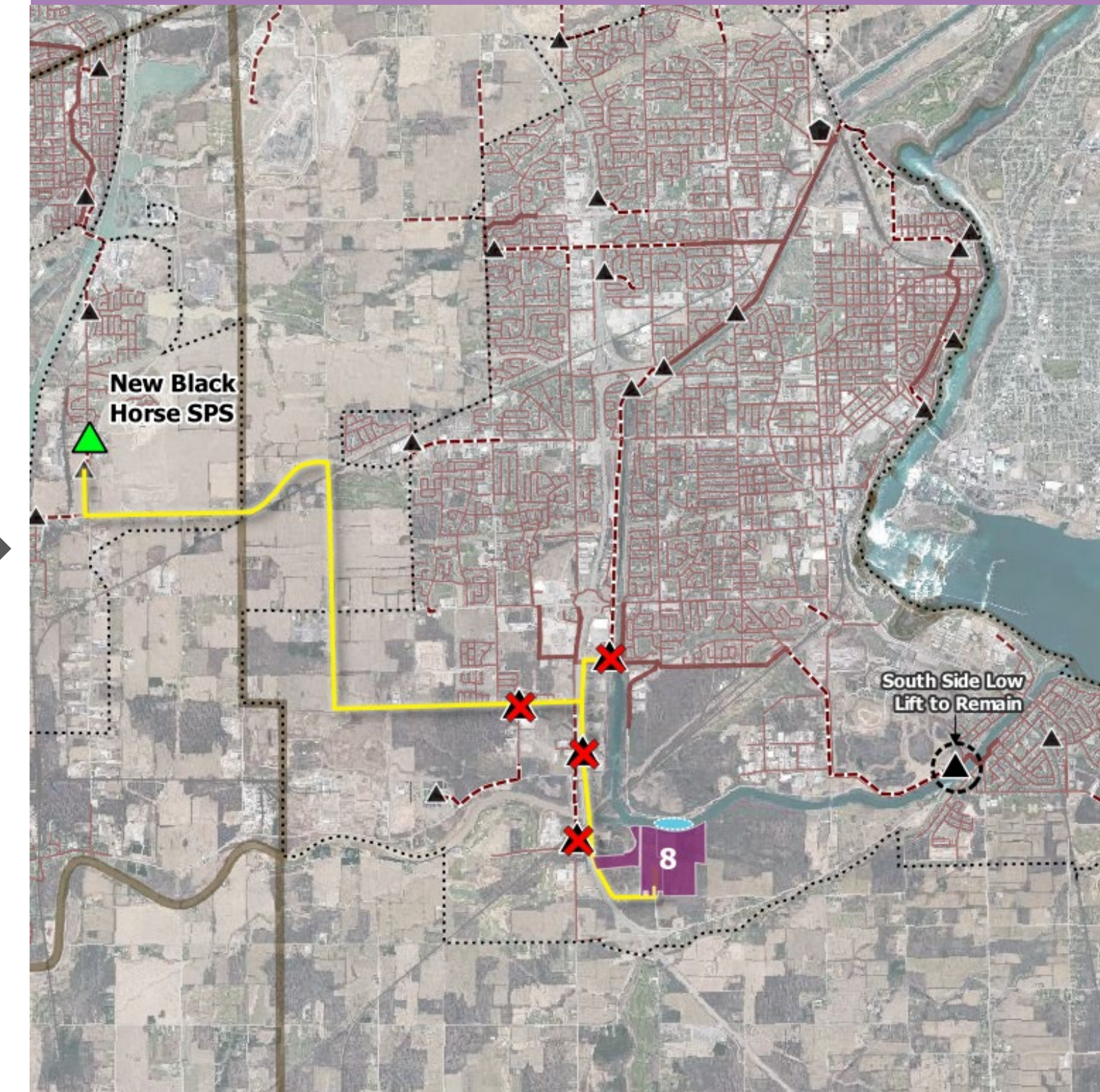
- Study area reviewed for suitable WWTP sites and plant outfall receiving waterbodies
- Long list of alternatives selected:
 - ❖ 10 WWTP sites
 - ❖ 4 outfall locations
- Additional site and outfall investigations completed
- Conceptual review of wastewater servicing routes to all long list alternatives
- Evaluation of long list alternatives completed to select short list
- Presented at PIC No.2 on Nov 20, 2019

3 – Screening Short List of Alternatives



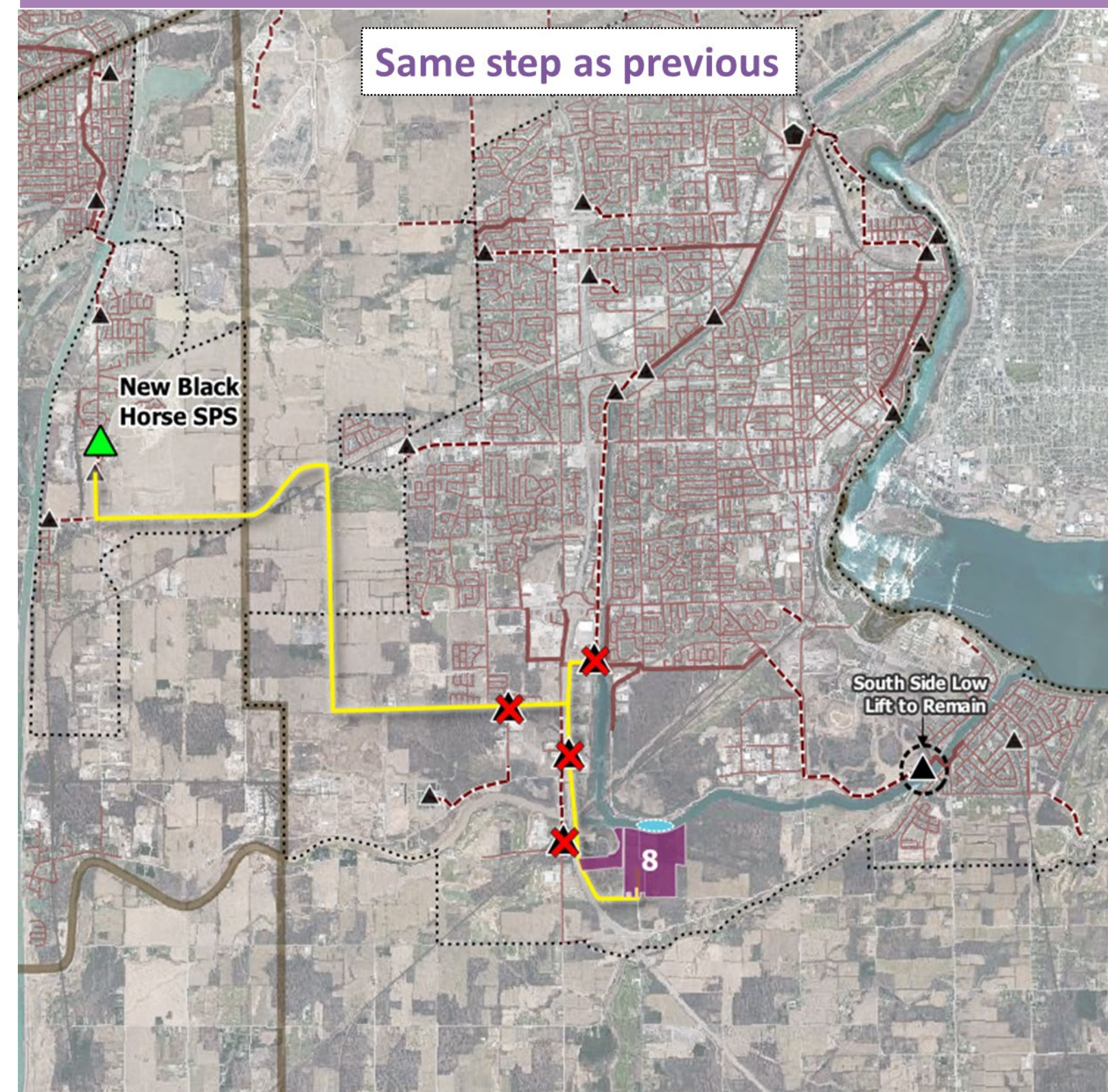
- Short list of alternatives selected:
 - ❖ 4 WWTP sites
 - ❖ 2 outfall locations
- Confirmed future storage needs for local Sewage Pumping Stations (SPS):
 - ❖ 1 new Thorold SPS (Black Horse)
 - ❖ 3 or 4 SPSs have opportunity to decommission
- Additional site and outfall investigations completed to support selection of the preliminary preferred solution
- Presented at PIC No.2 on Nov 20, 2019

4 – Preliminary Preferred Solution

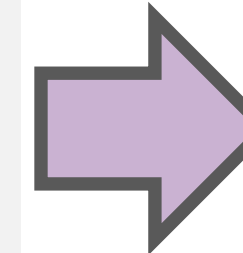


- Preliminary preferred solution selected:
 - ❖ 1 WWTP site (Option #8)
 - ❖ 1 outfall location at Welland River East (Chippawa Creek)
 - ❖ Conceptual trunk sewer from High Lift SPS to WWTP site
 - ❖ Conceptual Thorold South servicing alignment selected
 - ❖ 1 new Thorold SPS site selected
- WWTP site boundary includes 6811 and 7047 Reixinger Road pending further investigations and siting evaluation
- Outfall location boundary refined following assimilative capacity study (water quality investigation) results
- Presented at PIC No.3 on Mar 11, 2020

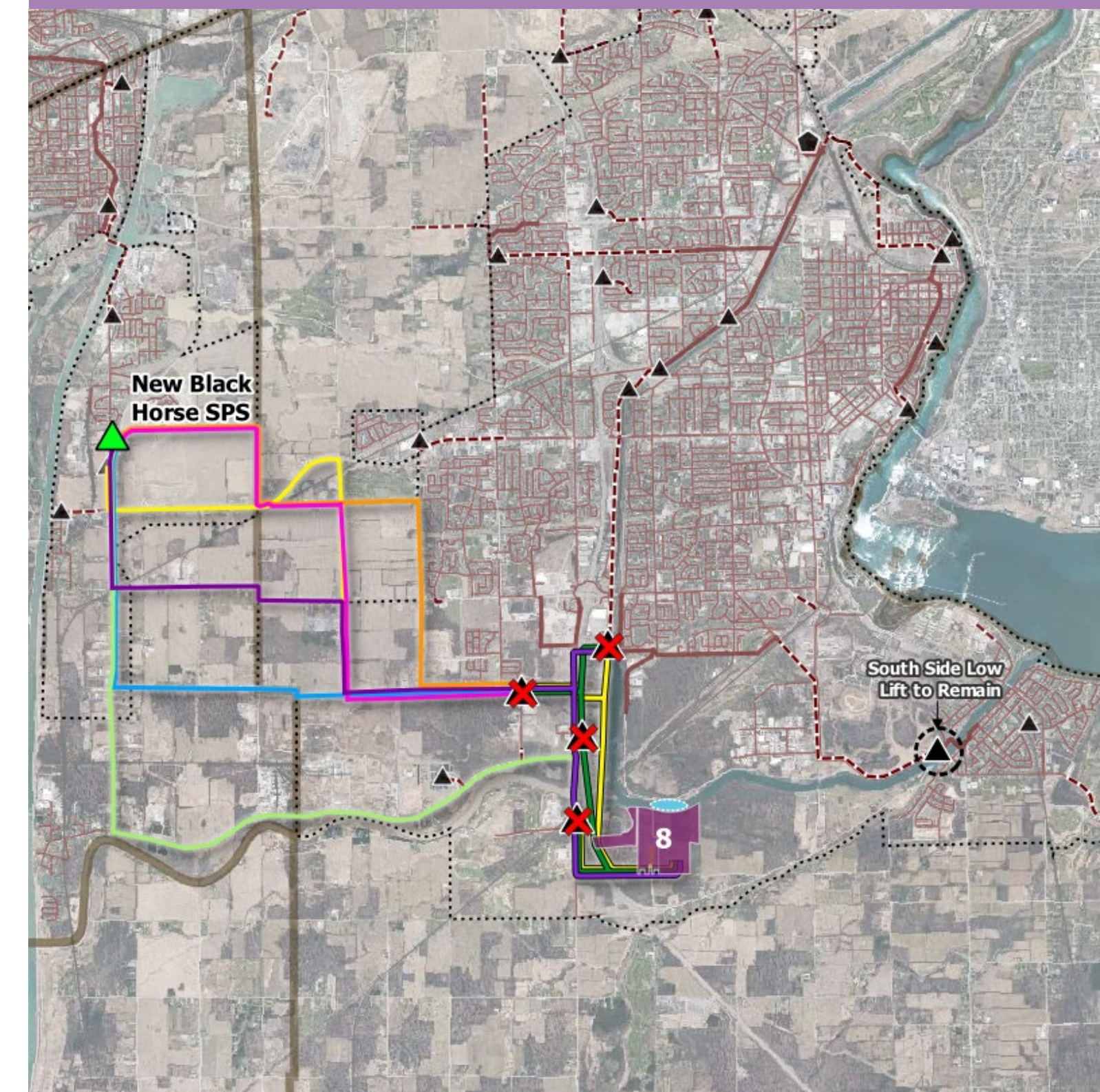
4 – Preliminary Preferred Solution



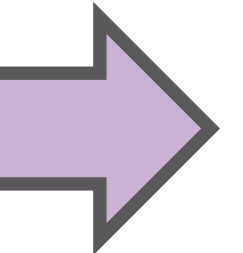
- Preliminary preferred solution selected:
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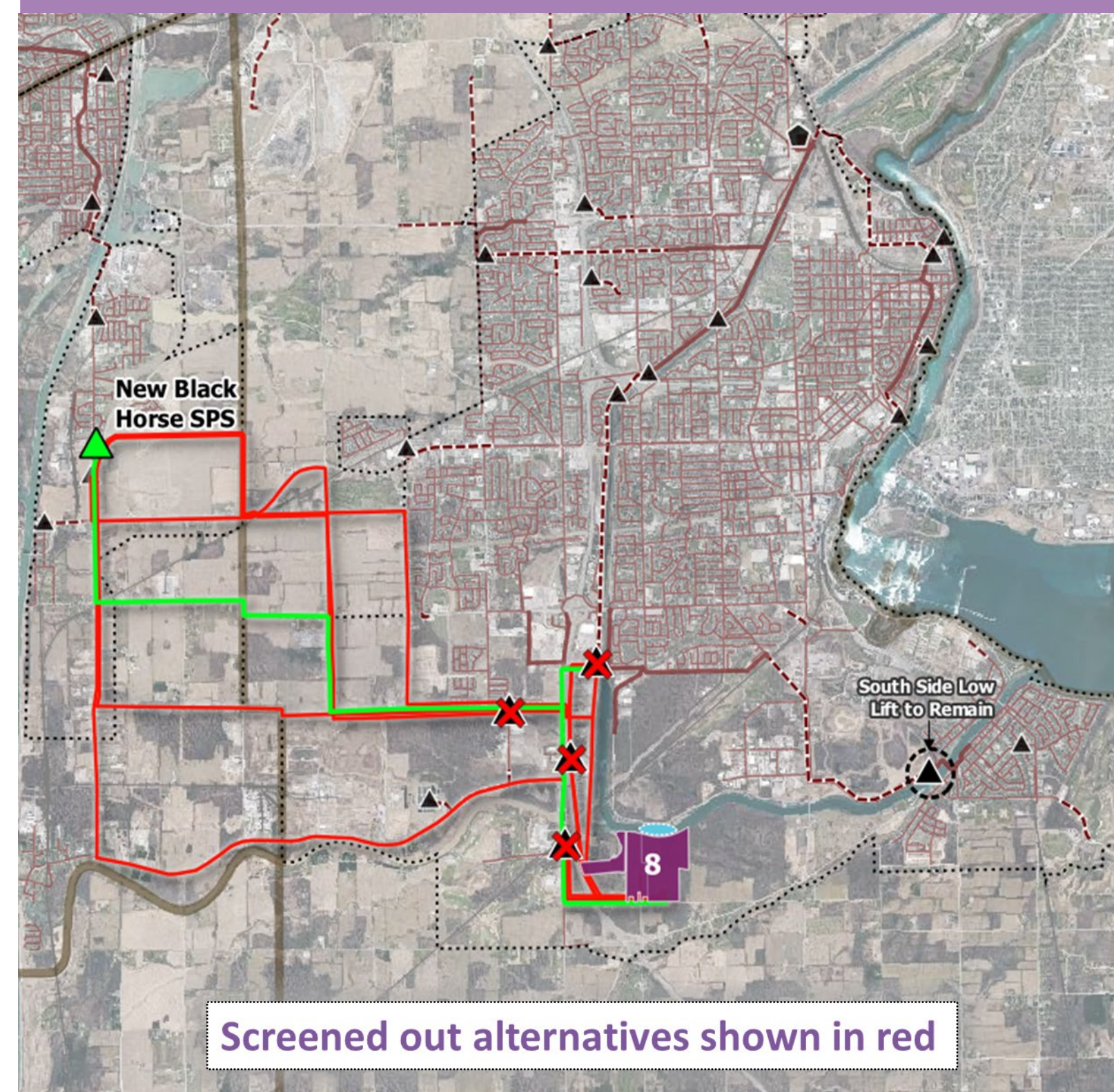
5 – Development of Alternative Alignments



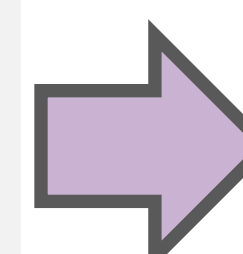
- Detailed Thorold South alignment investigations completed to validate the preliminary preferred solution
- New information for PIC No.4



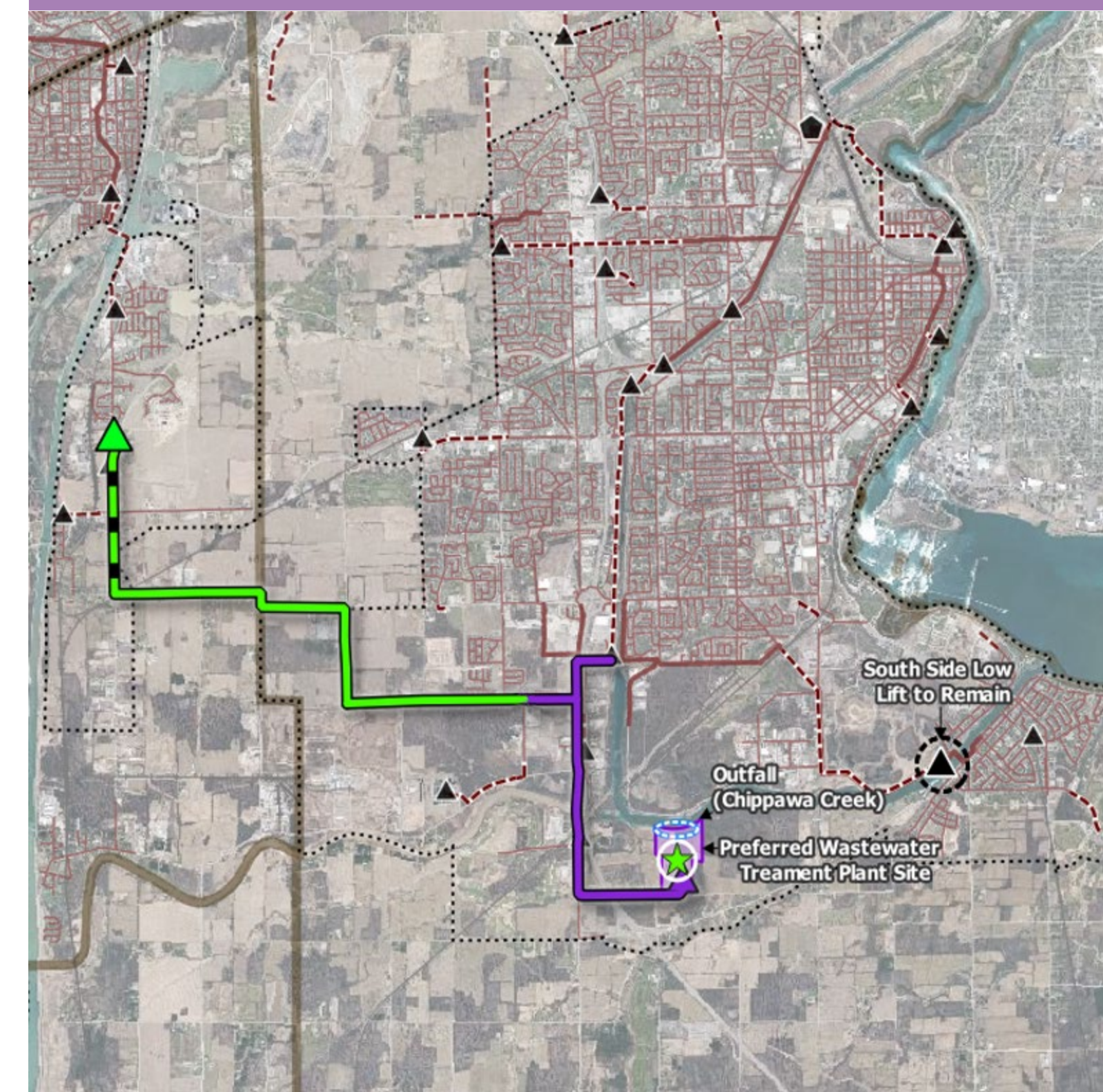
6 – Detailed Evaluation of Alternative Alignments



- Secondary evaluation completed to capture new environmental, social/cultural, technical, legal, and financial considerations following detailed investigations
- WWTP Site #8 alternative layouts explored on 6811 and 7047 Reixinger Road
- Outfall to Chippawa Creek confirmed
- New Montrose Road trunk sewer alignment selected
- New Black Horse SPS site confirmed
- New Thorold South sewer alignment selected
- New information for PIC No.4

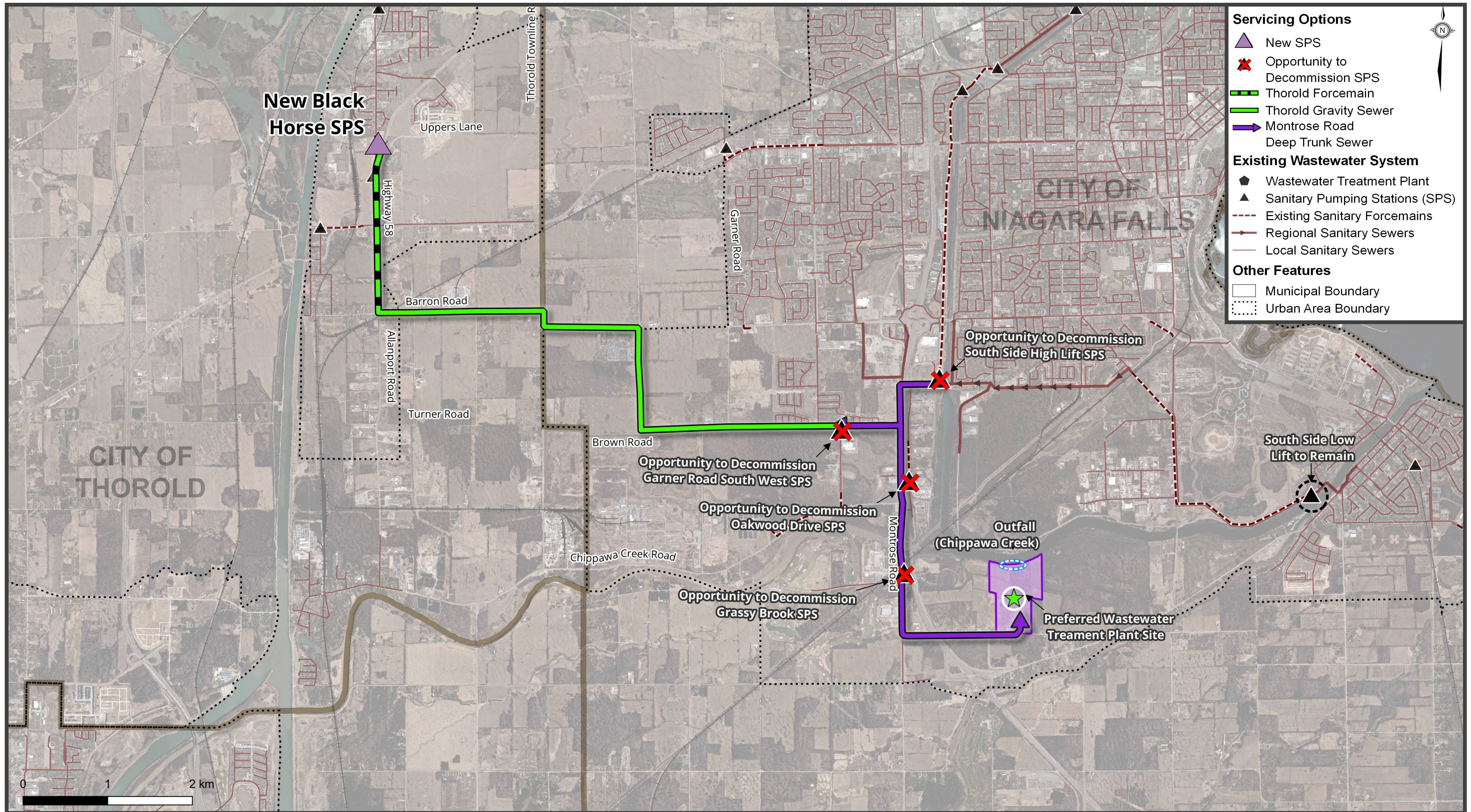


7 – Validated Preferred Solution



- Preferred solution validated
 - ❖ WWTP site refined to only include 6811 Reixinger Road, Niagara Falls ON
 - ❖ Outfall to Chippawa Creek confirmed
 - ❖ Trunk sewer alignment refined to Montrose Road
 - ❖ New Black Horse SPS site confirmed
- New sewer servicing provides opportunities to decommission the following SPSs:
 - ❖ High Lift SPS
 - ❖ Garner Road SPS
 - ❖ Oakwood Drive SPS
 - ❖ Grassy Brook SPS
- New information for PIC No.4

Step 7: Validated Phase 2 Class EA Solution



Wastewater Treatment Plant and Plant Outfall Location

Preferred WWTP Site Rationale:

- In the heart of the future growth areas
- Strategic location to maximize gravity servicing to the new WWTP – cost effective collection system strategy
- Expansion flexibility, supports 2051 and beyond growth areas
- Supportive location with MECP for outfall discharge to Chippawa Creek
- Sufficient site area to work within environmental and archaeological constraints
- Manageable property costs
- Site location and sewer alignment provides for:
 - SPS decommissioning and reduced long term operating costs
 - Significant wet weather overflow reductions



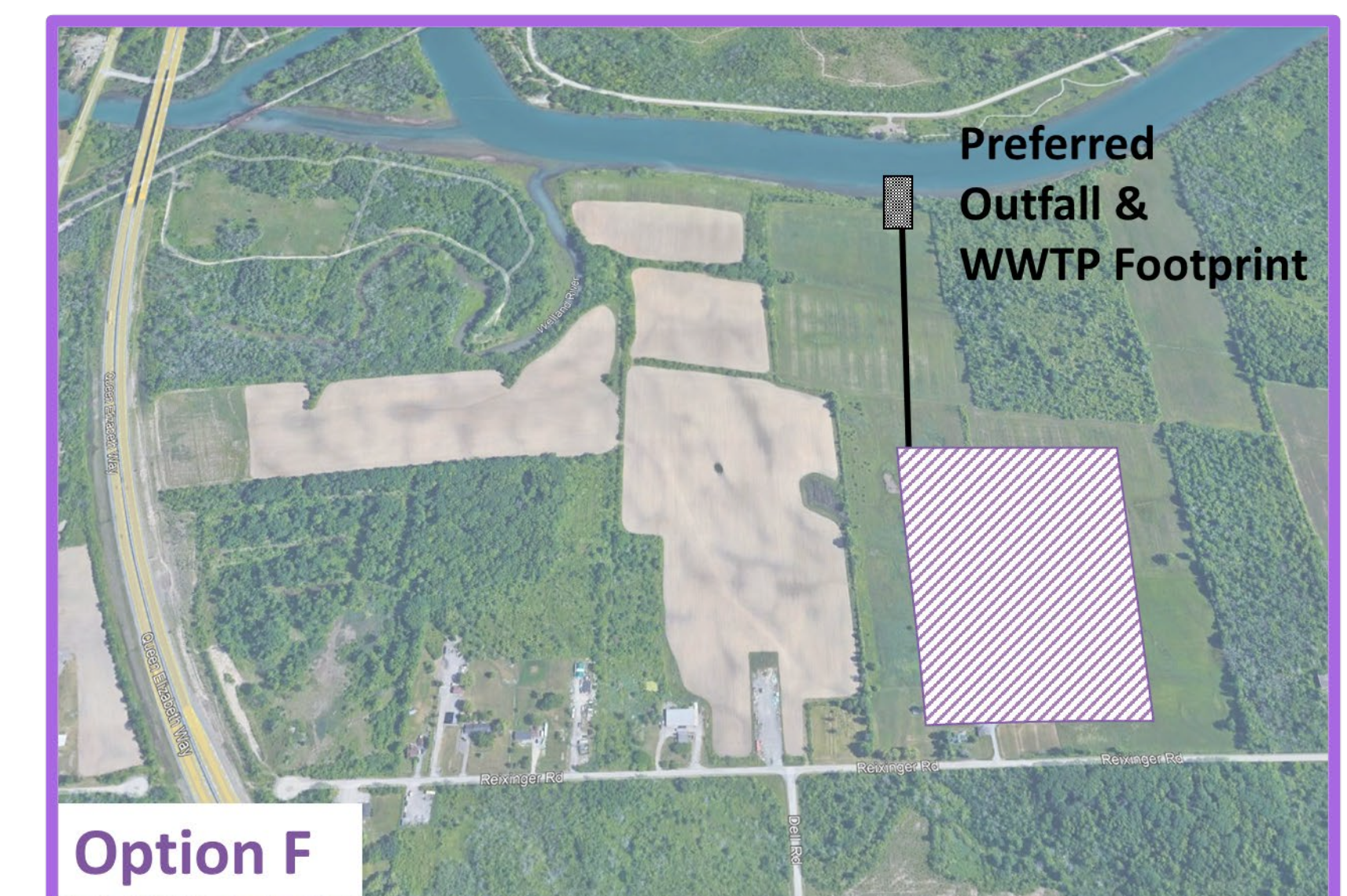
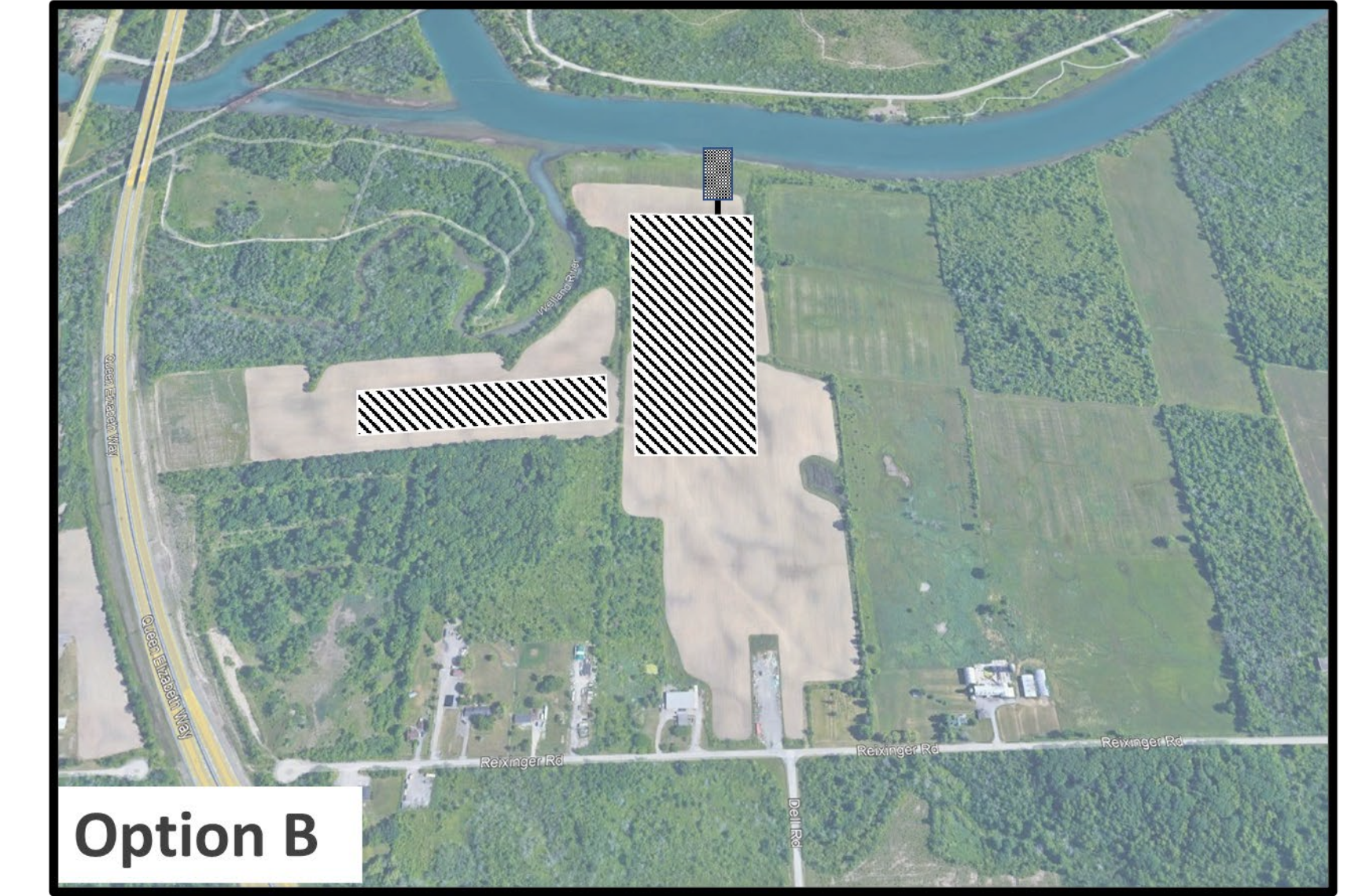
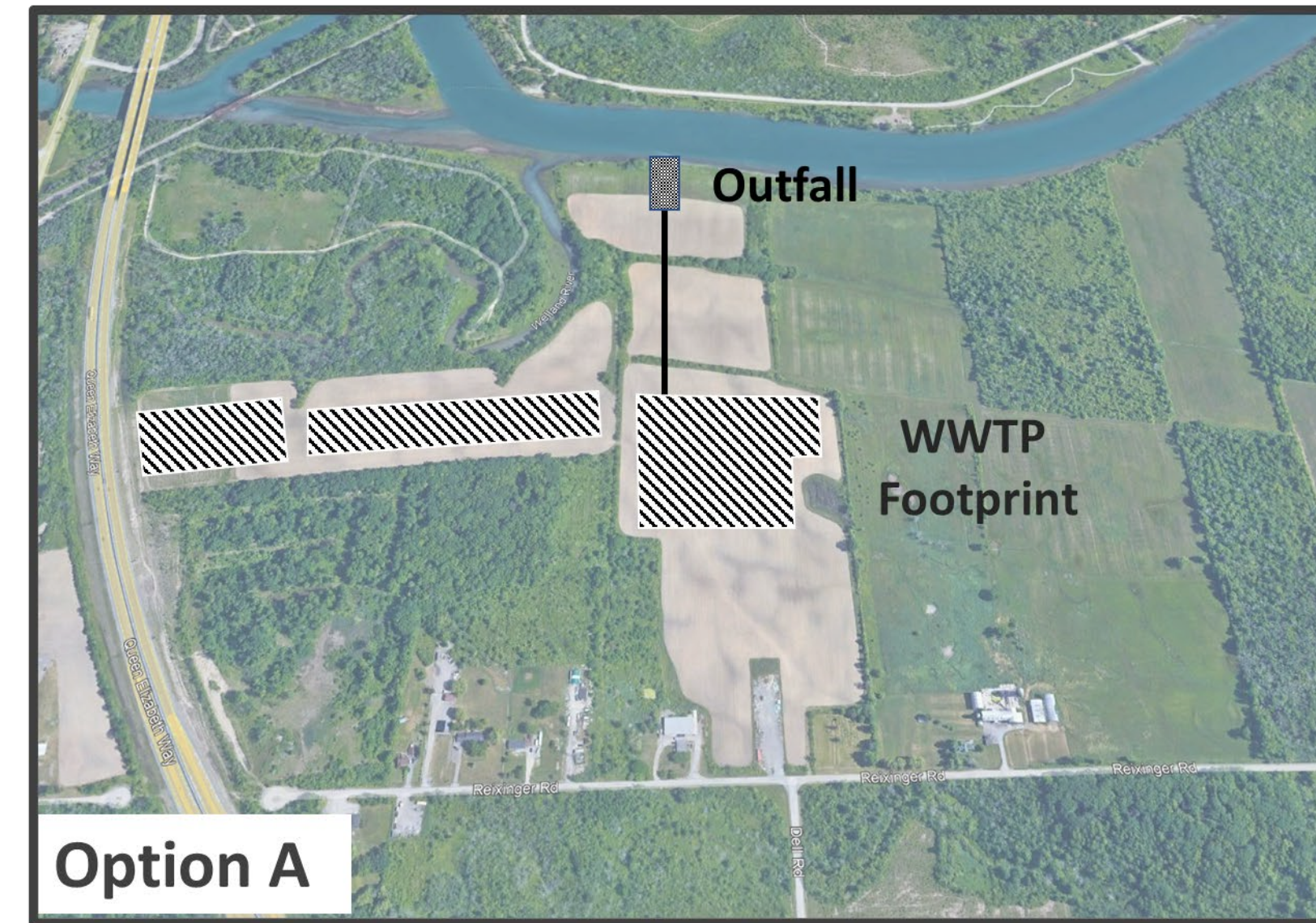
South facing view of the preferred site from George Bukator Park along Welland River East (Chippawa Creek).

Google Earth, 2018

The following WWTP site and outfall investigations were completed to support the evaluation of alternative design concepts:

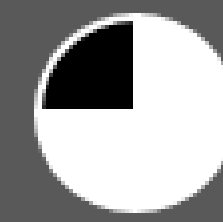
WWTP Site & Outfall Investigations	Purpose	Report(s)
Natural Environment	<ul style="list-style-type: none"> Avoid/minimize impacts to sensitive features (i.e., provincially significant wetlands, protect woodlots, etc.) during site and outfall construction 	<ul style="list-style-type: none"> Impact Assessment
Environmental Site Assessment (ESA)	<ul style="list-style-type: none"> Avoid known sources of soil or groundwater contamination 	<ul style="list-style-type: none"> Phase 1 ESA Phase 2 ESA
Archaeological Assessment (AA)	<ul style="list-style-type: none"> Avoid/mitigate on-land or in-water findings or impacts during site and outfall construction 	<ul style="list-style-type: none"> Stage 1 AA (land & water) Stage 2 AA (completed on 7047 Reixinger Road and portions of 6811 Reixinger Road)
Cultural Heritage	<ul style="list-style-type: none"> Confirm significance of site features to remove/mitigate impact 	<ul style="list-style-type: none"> Impact Assessment Assessment Report Evaluation Report
Assimilative Capacity Study	<ul style="list-style-type: none"> Confirm treatment needs to meet all regulatory standards and requirements 	<ul style="list-style-type: none"> Impact Assessment
Air, Odour, and Noise	<ul style="list-style-type: none"> Confirm sensitive receptors to avoid/mitigate impacts to surrounding environments 	<ul style="list-style-type: none"> Impact Assessment
Agricultural	<ul style="list-style-type: none"> Confirm existing and future land use to remove/mitigate potential agricultural impact 	<ul style="list-style-type: none"> Screening Assessment
Geotechnical & Hydrogeological	<ul style="list-style-type: none"> Confirm solution meets technical needs through subsurface (soil, bedrock, and groundwater) investigations 	<ul style="list-style-type: none"> Preliminary Assessment

- Alternative layouts were considered within the preferred site (6811 & 7047 Reixinger Road)
- Options A-F show conceptual WWTP facility footprints and related outfall alignments
- Key siting considerations include:
 - Ministry setbacks/guidelines
 - Environmental features
 - Air, odour, noise impacts
 - Archaeological potential
 - Cultural heritage significance
 - Site access for operations and maintenance
 - Future flexibility for expansion and technology needs

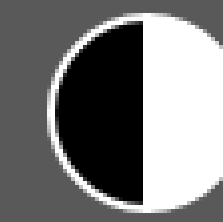


WWTP & Outfall Evaluation

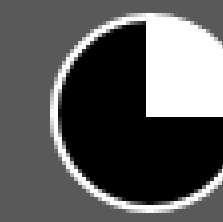
Preferability



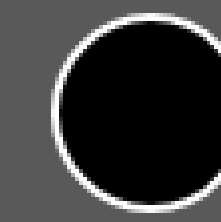
Low



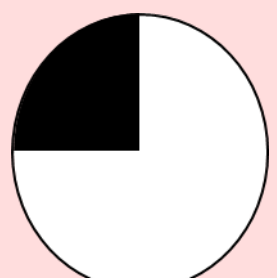
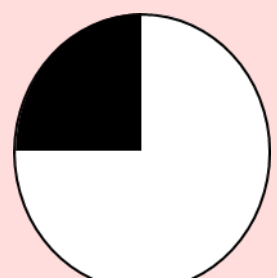
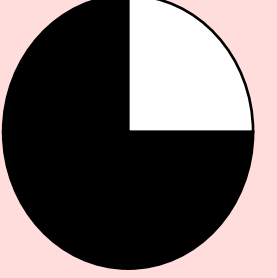
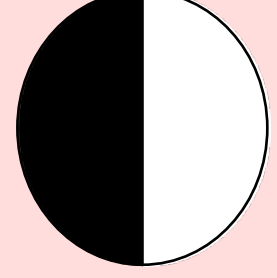
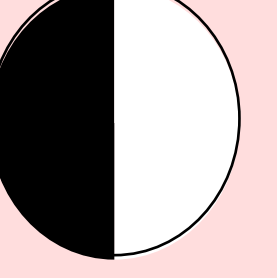
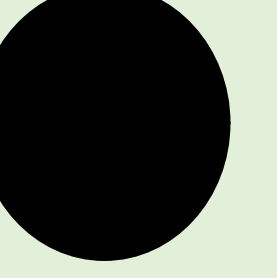
Moderate



High



Very High

Option A	Option B	Option C	Option D	Option E	Option F
<ul style="list-style-type: none"> Requires additional investigations and significant resources to clear known archaeological sites (financial and schedule implications) Does not meet Ministry approval setbacks from sensitive environmental features Good distance and screening from existing residential with low potential for air, odour, and noise impacts (natural buffers) No anticipated impacts from cultural heritage or contaminated soils Less efficient site layout with limited flexibility for future expansion Requires new access road adjacent to the QEW 	<ul style="list-style-type: none"> Requires additional investigations and significant resources to clear known archaeological sites (financial and schedule implications) Does not meet Ministry approval setbacks from sensitive environmental features Good distance and screening from existing residential with low potential for air, odour, and noise impacts (natural buffers) No anticipated impacts from cultural heritage or contaminated soils Less efficient site layout with limited flexibility for future expansion 	<ul style="list-style-type: none"> No anticipated archaeological impacts based on previously completed Stage 2 Assessment Closest alternative to existing residential from air, odour, and noise perspective (potential conflict with Ministry setbacks) Strategy requires purchasing multiple Reixinger fronting properties to meet Ministry setback guidelines and provide sufficient site access for plant operations No anticipated impacts from cultural heritage or contaminated soils Less efficient site layout with limited flexibility for future expansion 	<ul style="list-style-type: none"> Requires additional investigations to clear known archaeological sites in northern extent Land surrounding WWTP footprint is limited by sensitive environmental and known archaeological findings (potential conflict with Ministry setbacks) Good distance from existing residential with low potential for air, odour, and noise impacts (natural buffers) No anticipated impacts from cultural heritage or contaminated soils Strategy requires the purchase of two (2) properties for siting needs Requires the purchase of both properties now to secure land for future expansion 	<ul style="list-style-type: none"> Requires additional investigations and significant resources to clear known archaeological sites (financial and schedule implications) Requires removal of significant wooded area and increases impact to surrounding environment Furthest removed from existing residential with low potential for air, odour, and noise impacts No anticipated impacts from cultural heritage or contaminated soils Would still need additional property for flexibility of future expansion 	<ul style="list-style-type: none"> Select areas require additional investigations to clear archaeological potential No anticipated impacts to sensitive environmental features Good distance from existing residential with low potential for air, odour, and noise impacts (natural buffers) No anticipated impacts from cultural heritage or contaminated soils Requires removal of one (1) residential house and barn Provides direct sewer connection and site access for maintenance and operations from Reixinger Road Strategy requires the purchase of one (1) property only for current and future siting needs Provides greatest flexibility for future expansion
<p>Least Preferred</p> 	<p>Least Preferred</p> 	<p>Less Preferred</p> 	<p>Less Preferred</p> 	<p>Less Preferred</p> 	<p>Preferred</p> 

➤ Refined WWTP Property Needs:

- Requires one (1) property acquisition (6811 Reixinger Road, Niagara Falls, ON)
- Site supports Phase 1 (30 MLD) WWTP and provides flexibility for future expansion

➤ WWTP Footprint:

- Avoids sensitive environmental features & setbacks
- Distanced from existing residential to mitigate potential air, odour, & noise impacts
- Cultural heritage potential removed through site investigations
- Removed from known archaeological sites. Prior to construction, further investigations will be required to confirm potential mitigation
- Provides direct access from Reixinger Road

➤ Outfall:

- Receiving waterbody (Chippawa Creek) meets Ministry approval requirements
- Alignment requires river edge work for installation and isolated environmental considerations
- Additional archaeological work will be required for the outfall corridor



Refined WWTP Site Boundary

TYPICAL WASTEWATER TREATMENT IN NIAGARA REGION



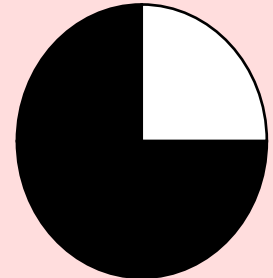
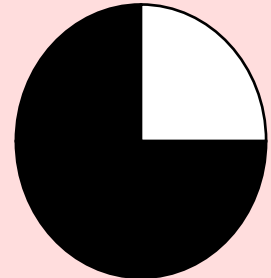
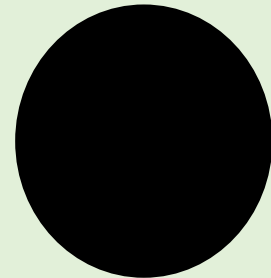
1. Wastewater from our sinks, tubs and toilets drains through sewers to a wastewater treatment plant.
2. Screens remove materials such as branches, plastics, rags and other untreatable debris.
3. The wastewater flows into clarifiers, which allow remaining solids to settle or float to the surface over several hours.
4. These solids are pumped to a set of digesters where they are further broken down before being sent to a biosolids storage facility for fertilizer production. Bio-gas is produced during the digestion process and used within the plant.
5. Liquid wastewater flows from the clarifiers into aeration tanks where air is added and bacteria "eat" any dissolved solids.
6. Ferric chloride is added to remove phosphorus from the wastewater. Too much phosphorous can promote algae growth in our lakes and rivers.
7. The wastewater is sent to the final clarifiers where the wastewater and bacteria-mixture separates.
8. Chlorine is added to disinfect the wastewater, killing bacteria and viruses. The chlorine is removed before being safely returned to the nearest lake or river.

Preliminary Treatment	Primary Treatment	Solids Treatment	Secondary Treatment	Disinfection
Mechanical screens and vortex grit removal remove larger debris from the wastewater	Conventional primary clarifier with separate waste activated sludge thickening	Separate thickening of solids to remove some water prior to being broken down in anaerobic digesters	Conventional activated sludge (CAS) process with aeration tanks and secondary clarifiers	Chlorination to remove pathogens and dechlorination to remove residual chlorine before the clean water is discharged to the river

TECHNOLOGIES WERE REVIEWED AND RECOMMENDATIONS WERE MADE FOR EACH PROCESS COMPONENT



Three (3) key treatment technologies were evaluated for the new WWTP. These alternatives all meet wastewater treatment requirements but have varied infrastructure needs, costs, and future flexibility.

Option 1 Biological Aerated Filter (BAF)	Option 2 Biological Nutrient Removal (BNR)	Option 3 Conventional Activated Sludge (CAS)
<ul style="list-style-type: none"> Process eliminates the need for secondary clarifiers Requires additional areas for effluent storage and backwash water storage tanks To meet Phase 1 WWTP capacity of 30 MLD (and future effluent quality requirements), the following components are required: <ul style="list-style-type: none"> ➤ Construct BAF tanks ➤ Install primary effluent pumps ➤ Install screens upstream of the BAF tanks ➤ Install secondary effluent/backwash water storage tank and backwash pumps 	<ul style="list-style-type: none"> To meet Phase 1 WWTP capacity of 30 MLD (and future effluent quality requirements), the following components are required: <ul style="list-style-type: none"> ➤ Construct two (2) plug flow bioreactors. Each baffled into three (3) separate zones: anaerobic, anoxic and aerobic ➤ Add recycle pumps within the bioreactors to allow for internal mixed recycling ➤ Construct two (2) secondary clarifiers, complete with waste activated sludge (WAS) and return activated sludge (RAS) pumping BNR technology will require significantly more infrastructure construction (e.g., creation of anaerobic/anoxic selector zones) and larger bioreactor volume, compared to CAS (Option 3). 	<ul style="list-style-type: none"> To meet Phase 1 WWTP capacity of 30 MLD (and future effluent quality requirements), the following components are required: <ul style="list-style-type: none"> ➤ Construct two (2) plug flow aeration tanks ➤ Aeration tanks will be up to 6m deep depending on geotechnical conditions ➤ Construct two (2) secondary clarifiers, complete with WAS and RAS pumping <p>Key Benefits:</p> <ul style="list-style-type: none"> ➤ Proven technology ➤ Lowest overall life-cycle cost ➤ Easy operation and maintenance ➤ Familiar to Region staff ➤ Ability to incorporate new technologies in the future
<p style="text-align: center;">Less Preferred</p> 	<p style="text-align: center;">Less Preferred</p> 	<p style="text-align: center;">Preferred</p> 

Key Design Considerations:

1. Odour Control
2. Aesthetics
3. Energy Recovery Potential
4. Future flexibility
5. Traffic Impact

Rendering of the new WWTP from Reixinger Road (north-east facing).



Preferred WWTP Layout (6811 Reixinger Road)

Odour Control:

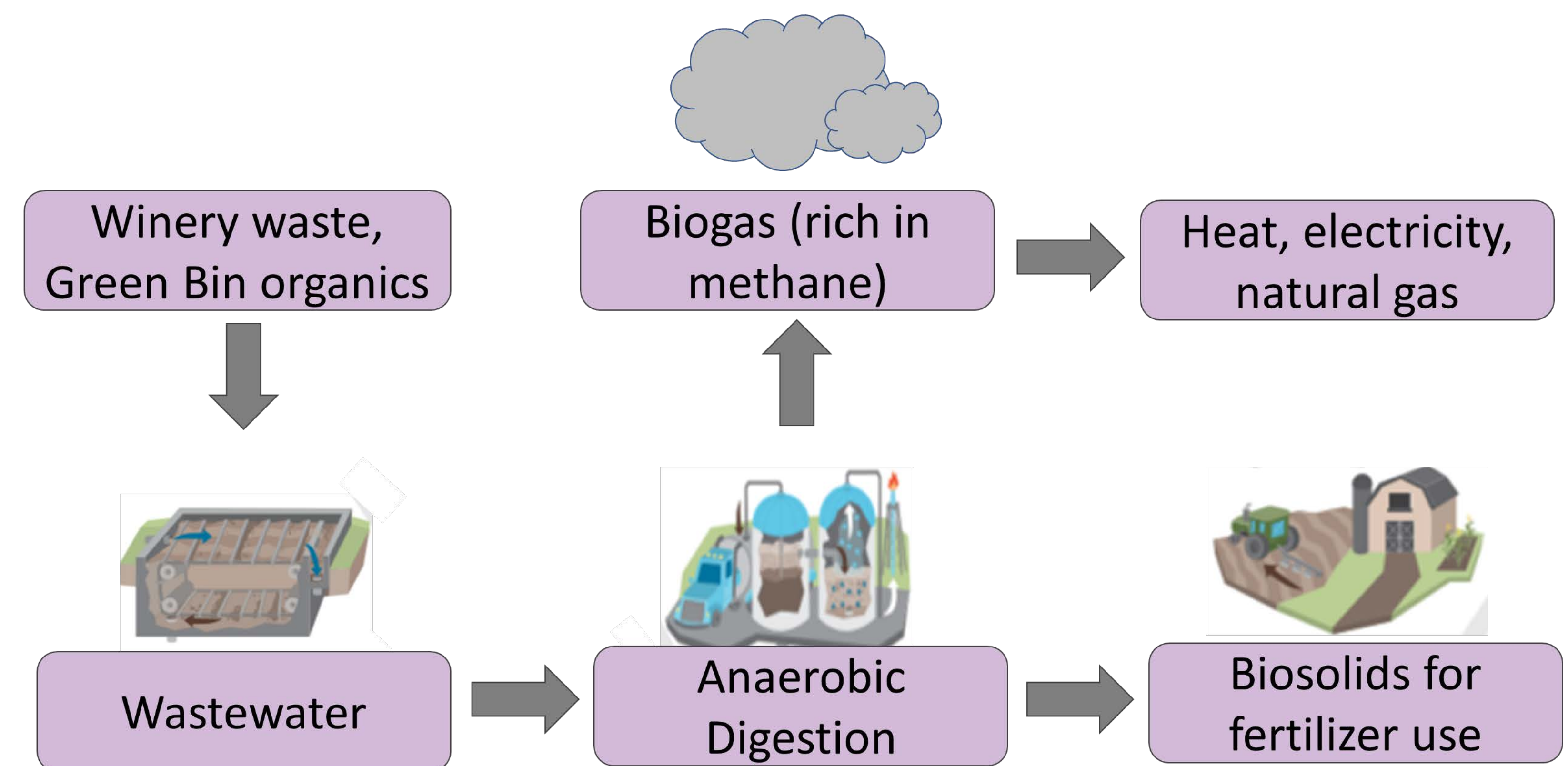
- Leverage the right equipment for odour management
- Ensure odours generated are collected and treated



Example Odour Control Facility

Energy Recovery Potential:

- Anaerobic digesters sized for future energy recovery opportunities
- Potential to accept winery waste or green bin organics in the future and leverage these materials to generate additional energy



Most Developed Technology Available:

Conventional Activated Sludge Technology

- Proven, reliable high level of treatment to meet and exceed effluent quality requirements
- Provides greatest flexibility to implement future enhancements for energy reduction and intensification



Example Conventional activated sludge aeration tanks

Hydraulics Optimized for the Future:

- Eliminates the need for future pumping to accommodate enhanced treatment technologies
- Improves resiliency and minimizes energy costs associated with additional pumping



Flexibility for future treatment areas and increased level of treatment

Preferred Outfall Location:

- Proposed construction methodology
 - Mainly on-land construction
 - Outfall will sink to Chippawa Creek bottom
 - Minor in-water construction process (~2 days)
- Plant discharge meets MECP regulatory water quality standards and approvals
- No anticipated long-term impacts to recreational water users or aquatic life (no surface level infrastructure)
- No potential impact to marine archaeology discovered during investigations
- Associated on-land construction area may require further archaeological investigations
- Alignment will minimize impact to natural environment features

Conceptual Outfall Profile



What is an Assimilative Capacity Study (ACS)?

- Defines a waterbody's ability to receive treated wastewater without negatively impacting aquatic or human life

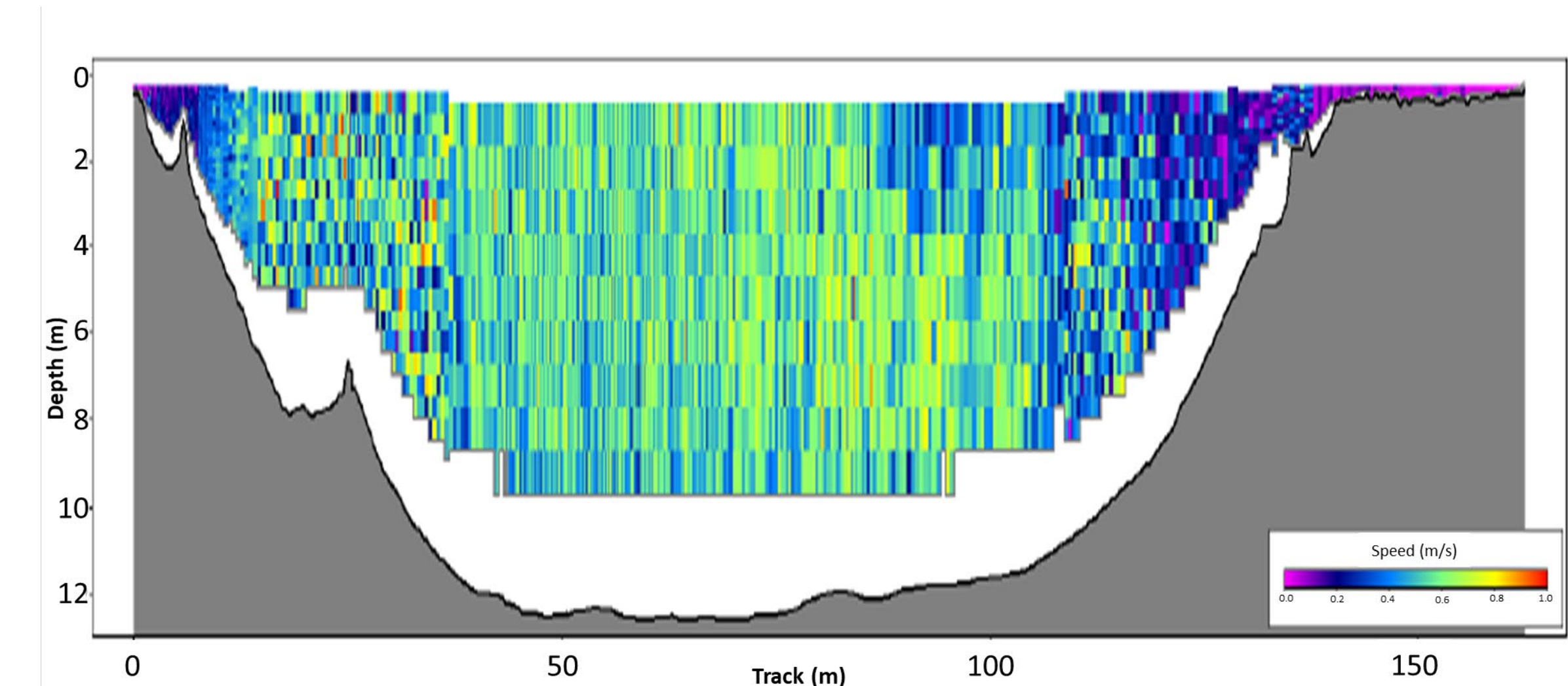
What were the results?

- Recommended treated water criteria were agreed to with MECP. Niagara Region will monitor water quality to ensure no negative effects to aquatic or human life

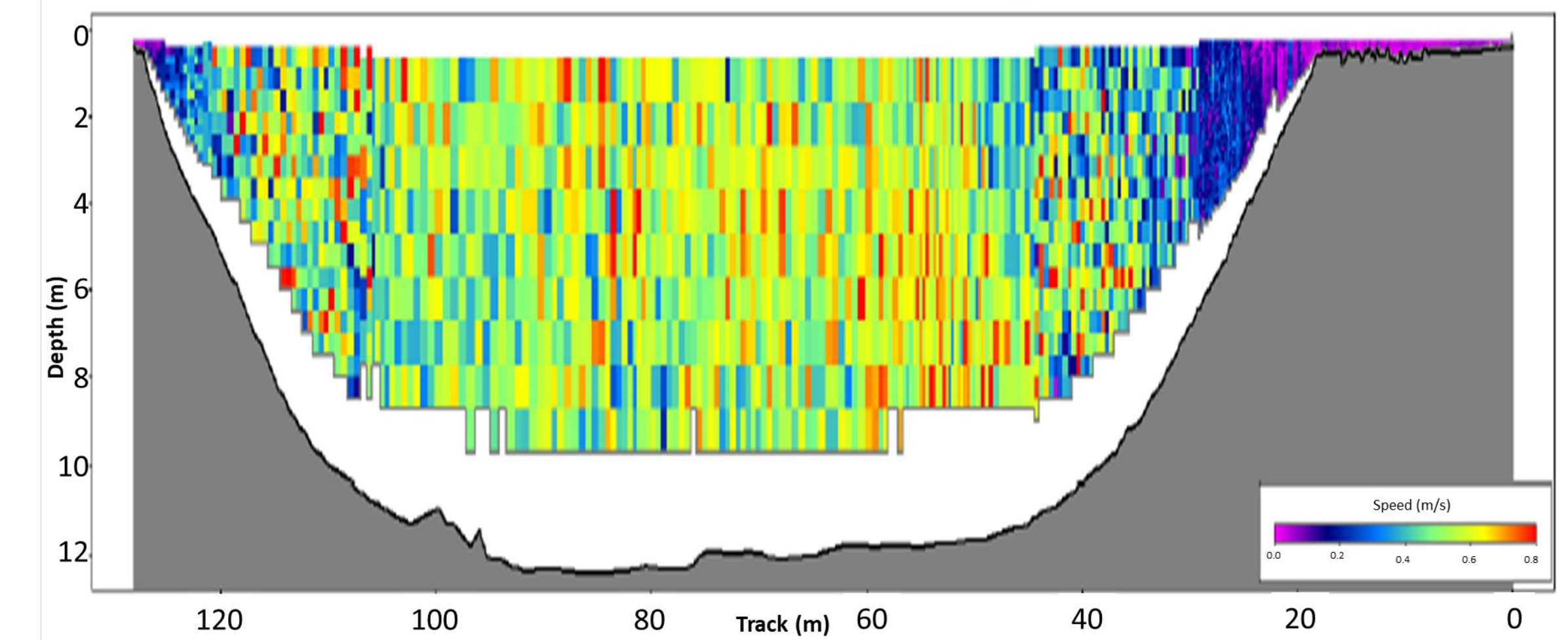
Parameters	Effluent Objectives (mg/L) ⁽¹⁾	Effluent Limits (mg/L) ⁽¹⁾
Carbonaceous Biochemical Oxygen Demand (CBOD ₅)	15	25
Total Suspended Solids (TSS)	15	25
Total Phosphorus (TP)	0.5	0.75
Total Ammonia Nitrogen (TAN)		
May to October	6.5	8.8
November to April	12.0	15.0
E. Coli (CFU/ 100 mL) ⁽²⁾	200	200

Notes:

1. Based on monthly average concentrations.
2. Based on monthly geometric means.

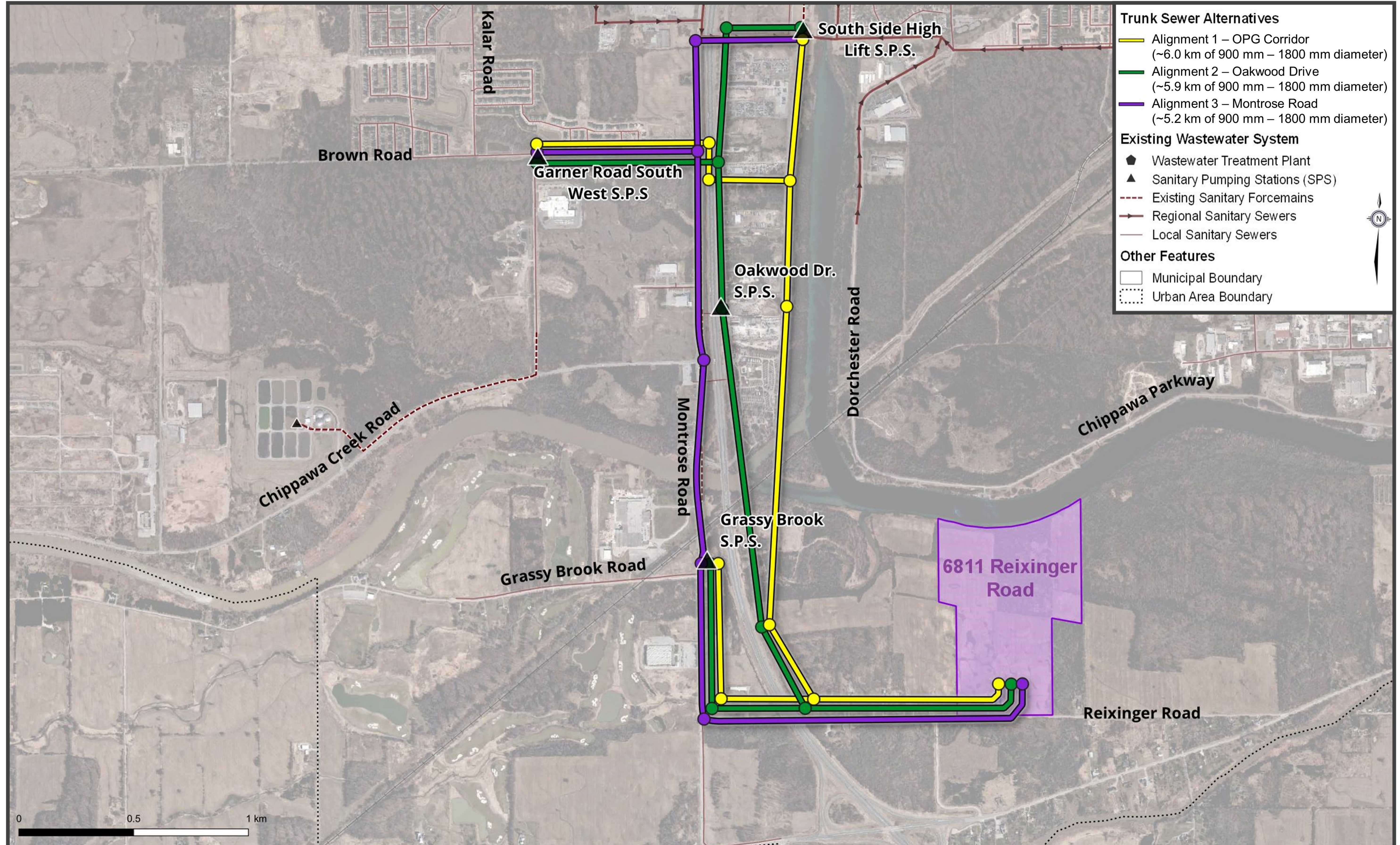


Welland River East (Chippawa Creek)
Water Profile Example



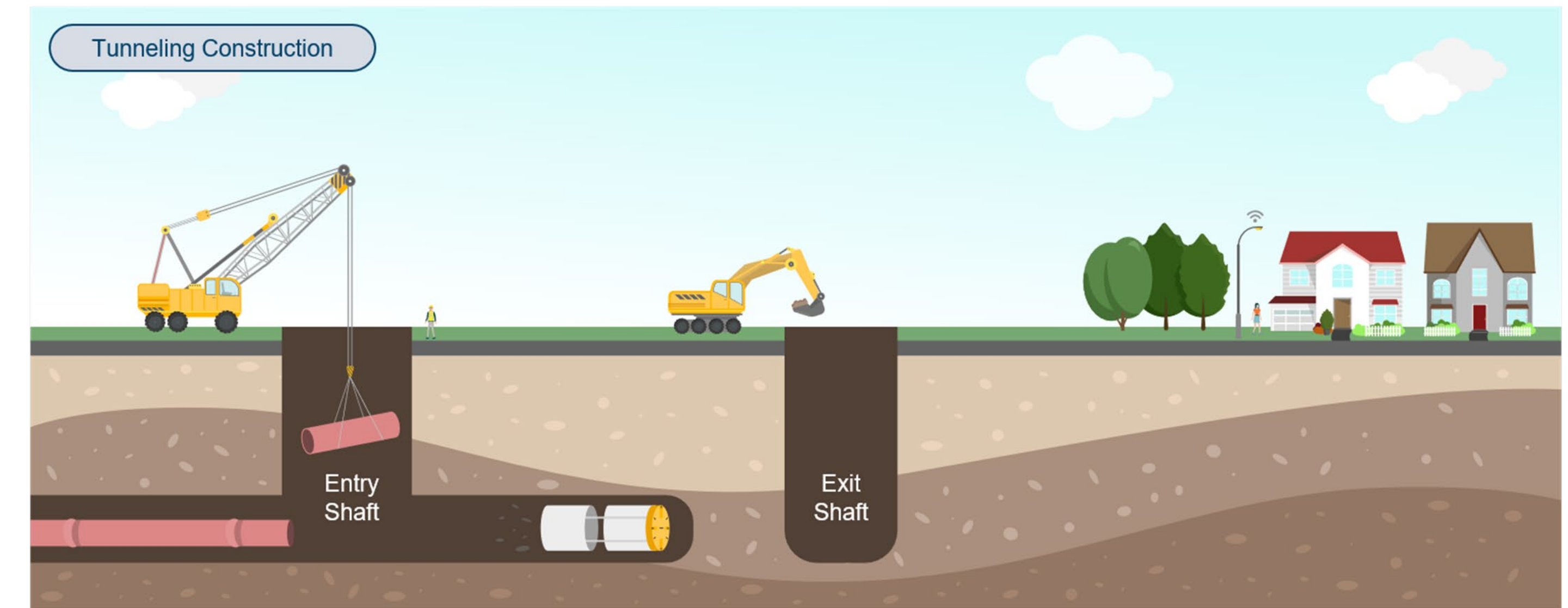
Wastewater Collection System – Trunk Sewer

Trunk Sewer Alternatives



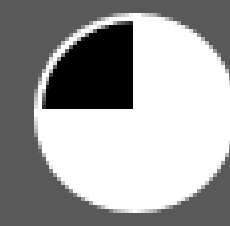
The following trunk sewer investigations and/or reports were completed to support the evaluation of alternative design concepts:

Trunk Sewer Investigations	Purpose	Report(s)
Natural Environment	<ul style="list-style-type: none"> Avoid/minimize impacts to sensitive features (i.e., wetlands, protect woodlots, etc.) at shaft locations and during construction Mitigate impact at Welland River crossing 	<ul style="list-style-type: none"> Impact Assessment
Environmental Site Assessment (ESA)	<ul style="list-style-type: none"> Avoid known sources of contamination (soil or groundwater) 	<ul style="list-style-type: none"> Phase 1 ESA Phase 2 ESA
Archaeological Assessment (AA)	<ul style="list-style-type: none"> Avoid/mitigate on-land impacts at shaft locations or along alignment 	<ul style="list-style-type: none"> Stage 1 AA (on-land)
Cultural Heritage	<ul style="list-style-type: none"> Confirm any significance at shaft locations or along trunk sewer alignment to remove/mitigate impact 	<ul style="list-style-type: none"> Impact Assessment Assessment Report
Geotechnical & Hydrogeological	<ul style="list-style-type: none"> Confirm solution meets technical needs through subsurface (soil, bedrock, and groundwater) investigations 	<ul style="list-style-type: none"> Preliminary Assessment

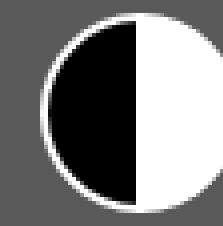


Proposed construction methods will consider minimized socio-economic impacts with tunnelled solutions.

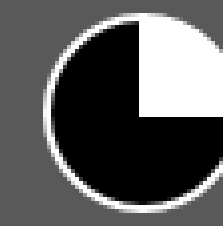
Preferability



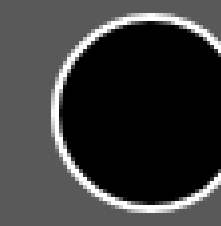
Low



Moderate

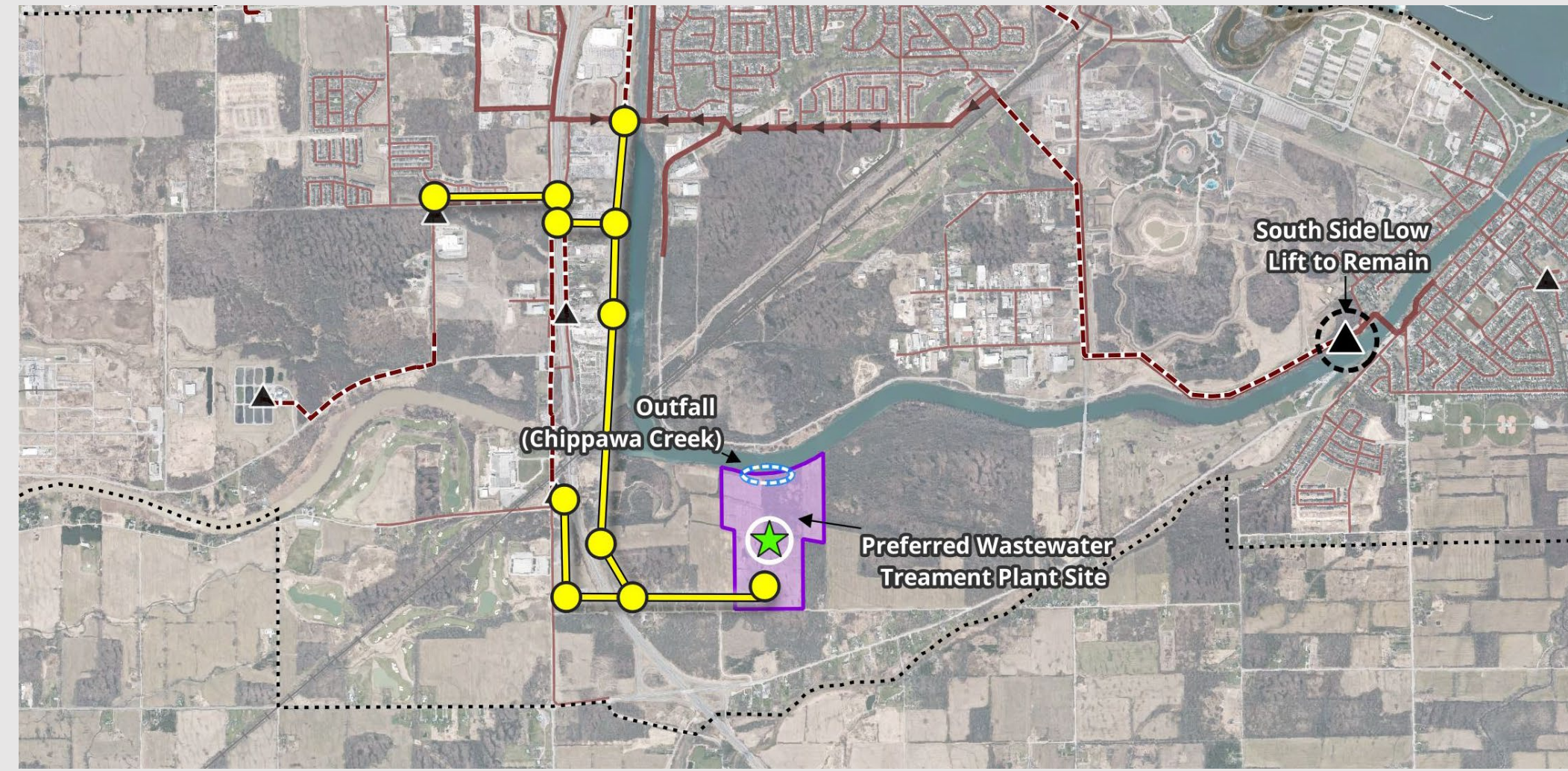


High



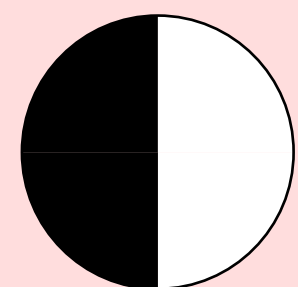
Very High

Option – OPG Corridor

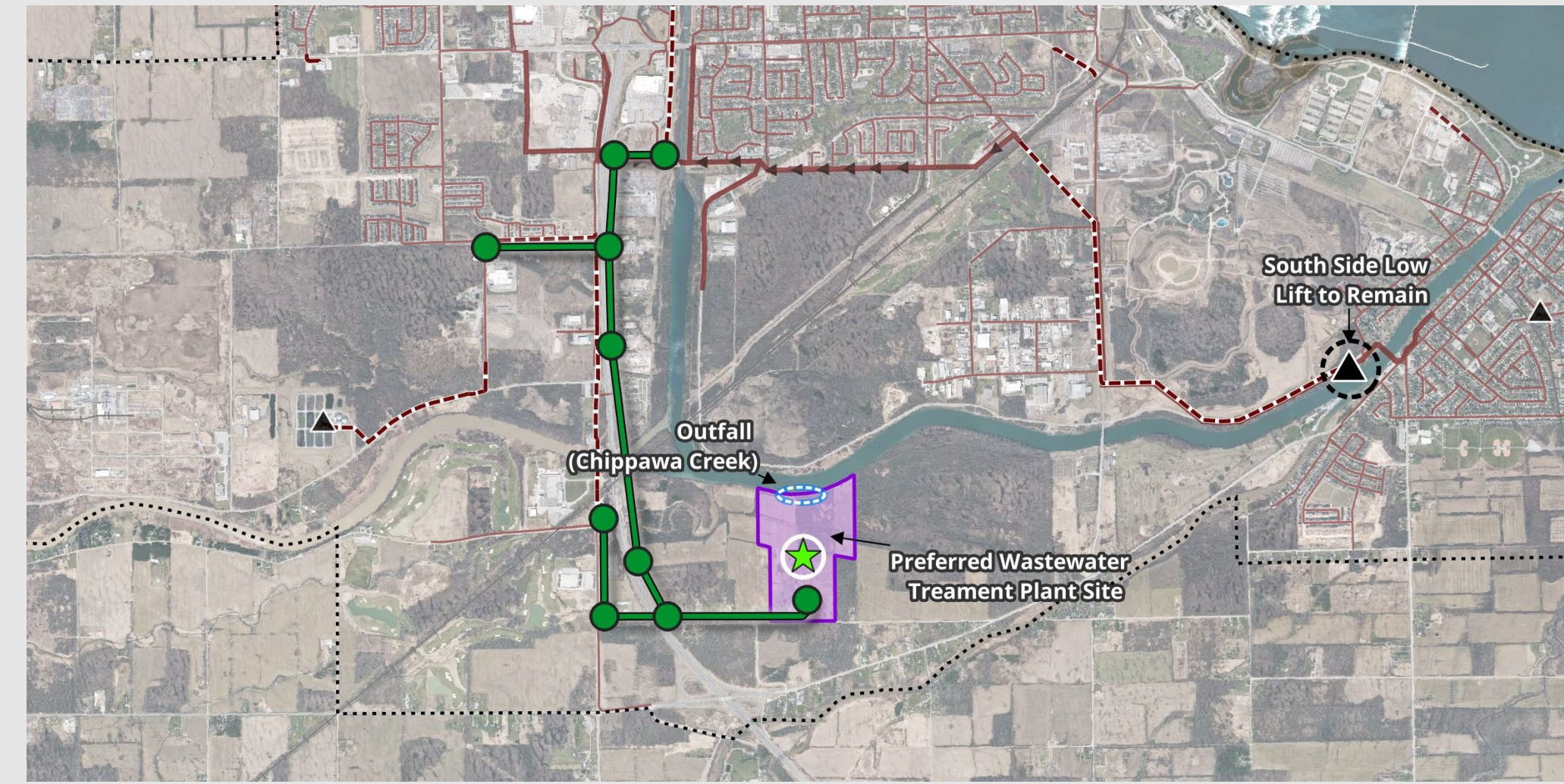


- Increased environmental impact with proximity to Hydro Canal (north alignment) and construction through Grassy Brook Park (south alignment)
- Requires significant water crossing of the Welland River and rail line to reach WWTP site
- Construction minimized within road right-of-way (ROW) reducing traffic impacts and local disruption
- Sewer length: ~6.0km of 900mm dia. to 1800mm dia. tunnelled sewer (longest alternative)
- Shaft locations: 11 - 12 Total (including inlet Pumping Station)
- Preliminary cost estimates (consistent for all alternatives): Each shaft ranges from \$10,000 - 12,000/m and tunnelled sewers from \$7,000 - \$11,000/m
- No conflicts with Ministry of Transportation Ontario (MTO) setbacks
- Minimal conflicts with existing utilities
- Most expensive alternative

Least Preferred

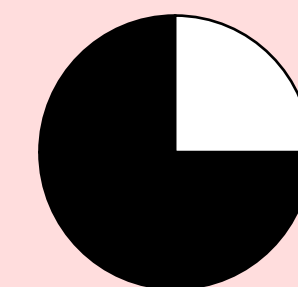


Option 2 – Oakwood Drive

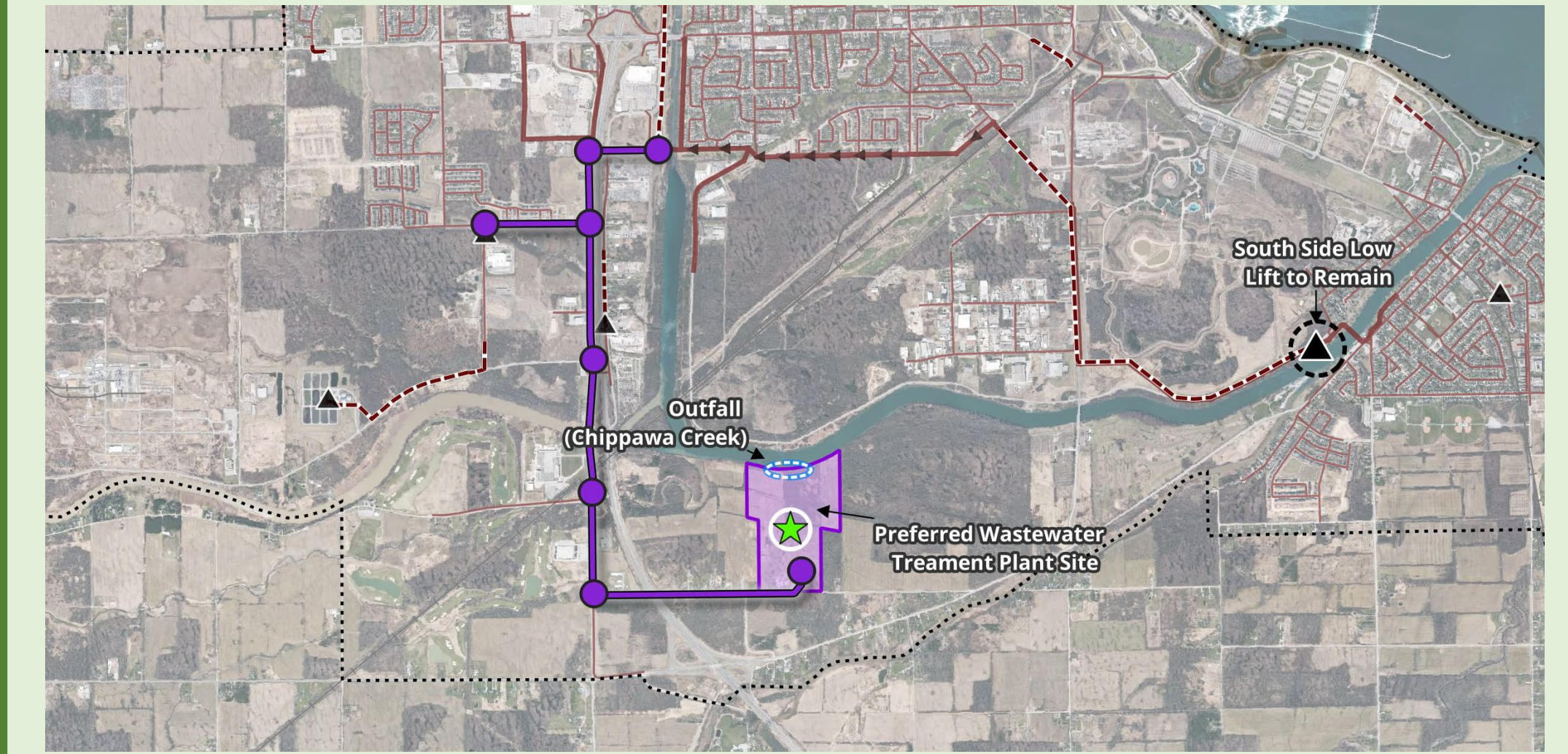


- Moderate environmental impact with south crossing of Grassy Brook Park to reach WWTP site. North alignments have minimal impact within road ROW
- Requires local road closure of Oakwood Drive for construction
- Sewer length: ~5.9km of 900mm dia. to 1800mm dia. tunnelled sewer
- Shaft locations: 9 - 10 Total (including inlet PS)
- Potential conflicts with overhead hydro and existing utilities along Oakwood Drive
- Significant section of Oakwood Drive encroaches with MTO's required setback
- Crossing near Oakwood Drive and new bridge structure – outside of MTO's preferred 14m setback from property line
- Additional sewer along Montrose from Grassy Brook SPS is required to service future growth and hospital needs
- Second-most expensive alternative

Less Preferred

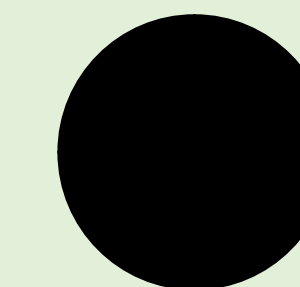


Option 3 – Montrose Road



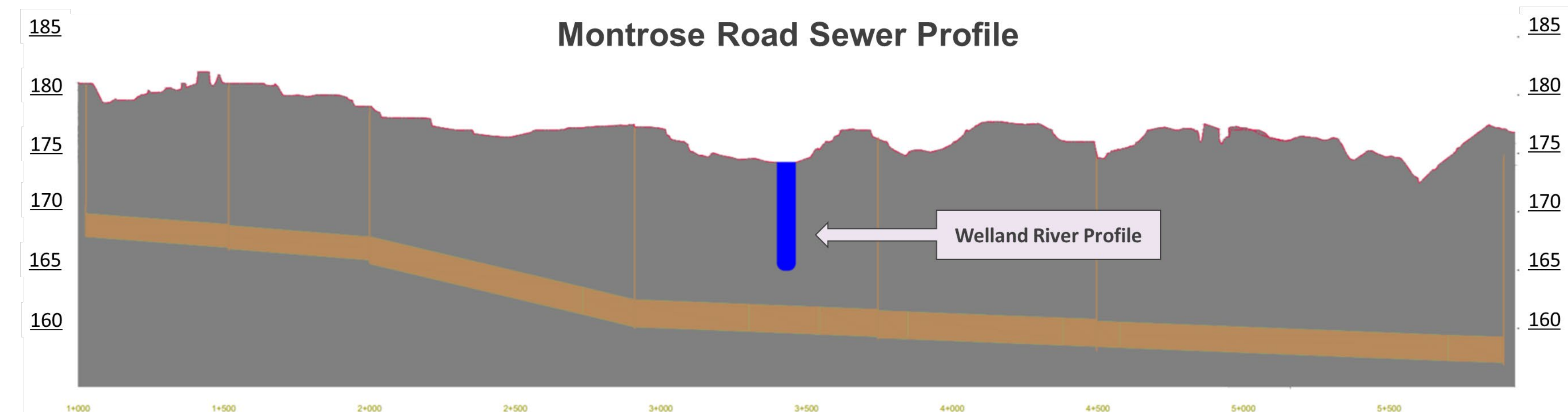
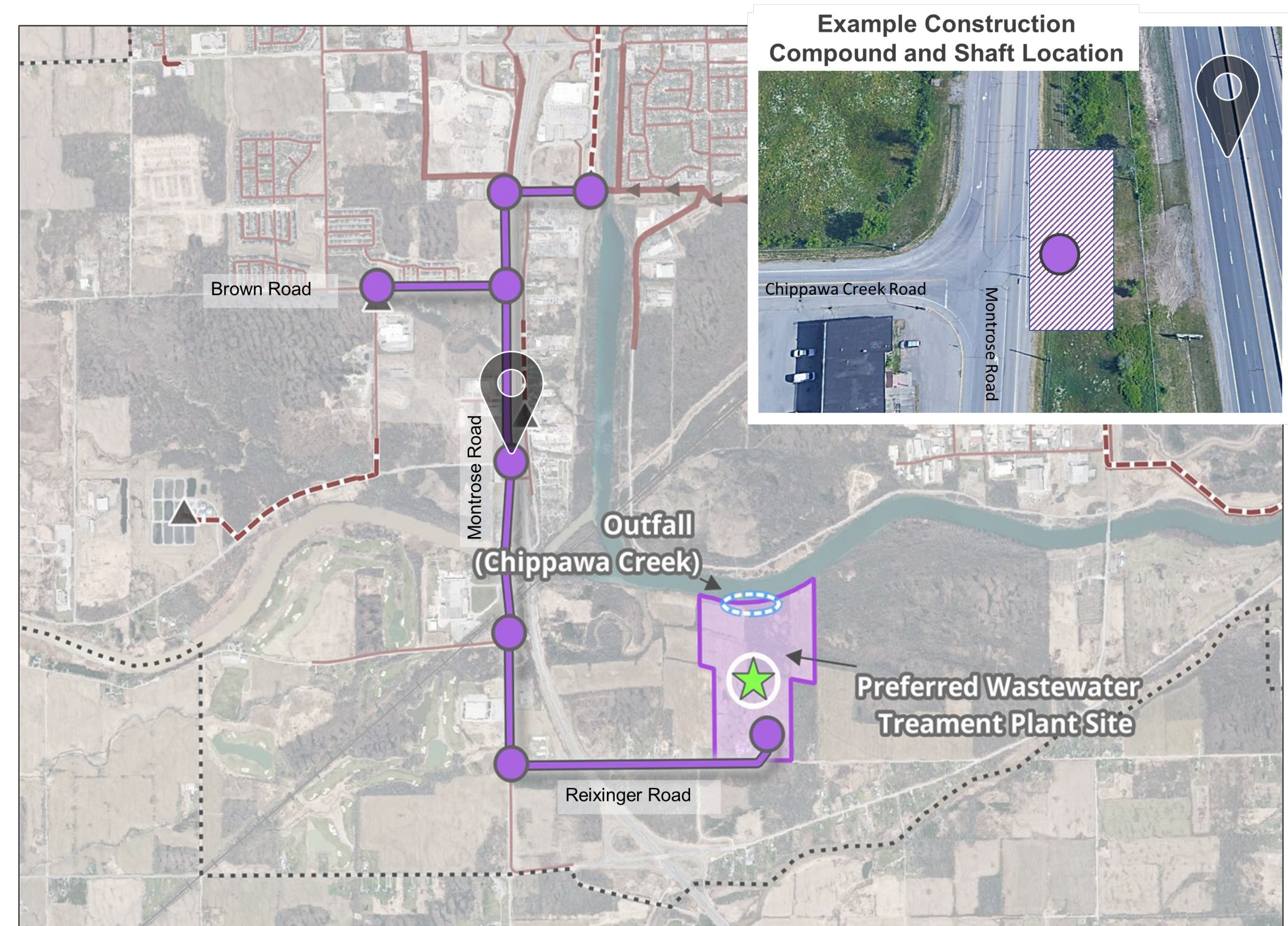
- Majority of alignment will be constructed within existing Road ROW limiting the need to purchase additional properties
- Traffic control will be required along Montrose Road (more businesses and traffic compared to Oakwood Drive)
- No conflict with MTO
- Sewer length: ~5.2 km of 900mm dia. to 1800mm dia. tunnelled sewer (shortest alternative)
- Shaft locations: 8 - 9 Total (including inlet PS)
- Welland River crossing drives depth at Reixinger with opportunity to provide gravity sewer solution
- ROW has conflicting underground and overhead utilities that requires more coordination with stakeholders
- Provides deep connections at Chippawa Creek Road and Blackburn Parkway to accommodate future growth
- Least expensive alternative

Preferred



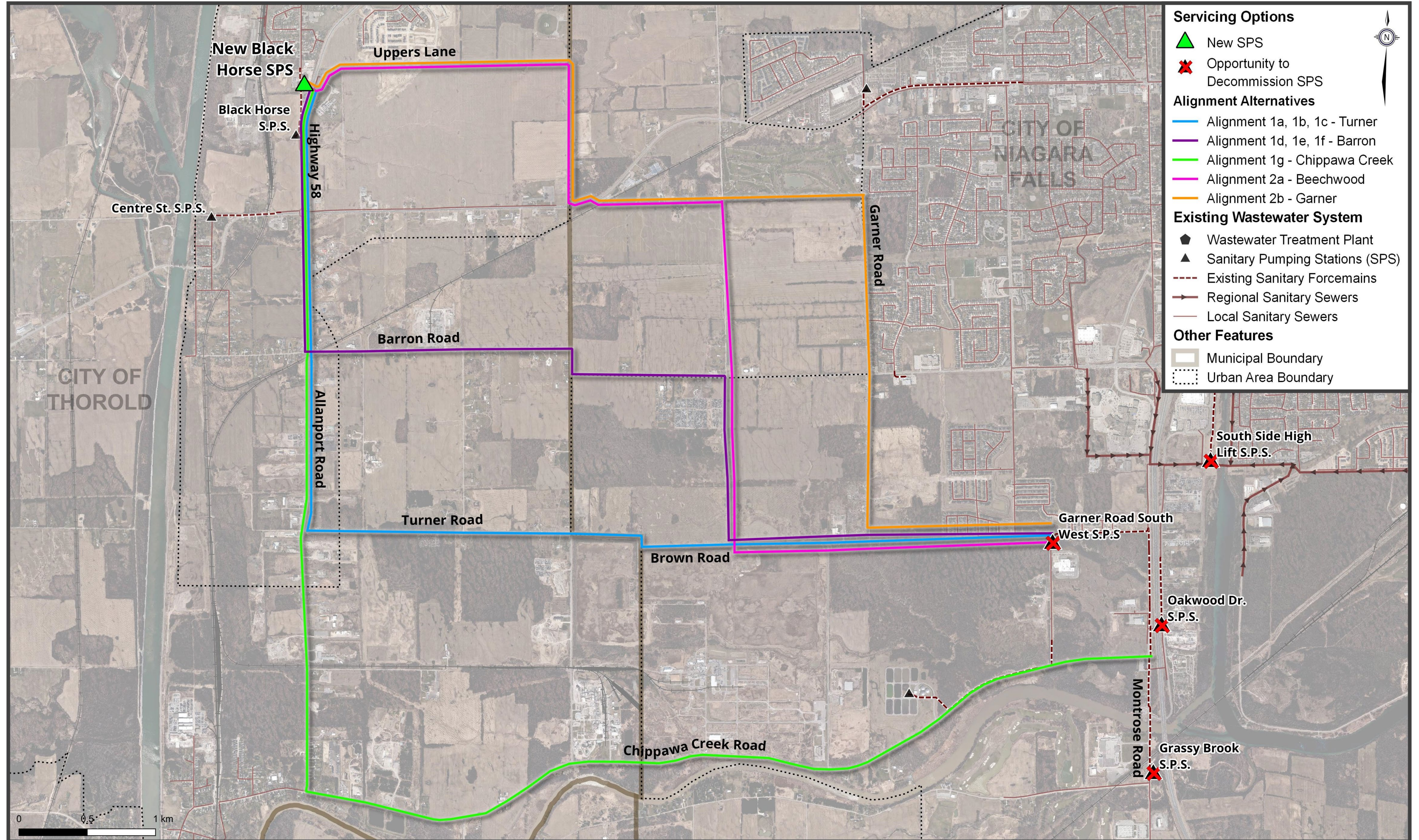
Preferred Trunk Sewer - Montrose Road Design Concept

- Sewer alignments within road right of way
 - Temporary road closures:
 - Brown Road and Montrose Road
 - Reixinger Road and Montrose Road
- 7 Shaft locations required (+1 inlet at WWTP site)
 - Sewer diameters: 900-1800mm
 - Sewer lengths: 470-1370m
 - Shaft depths: 10-18m
- Construction Methodology
 - Tunnelled sewer (incl. under Welland River)
 - Minimize surface level impacts
 - Construction activities focused to shaft locations only



Wastewater Collection System – Thorold Servicing Strategy

Thorold South Servicing – Alternatives

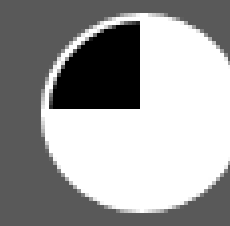


The following Thorold South investigations and/or reports were completed to support the evaluation of alternative design concepts:

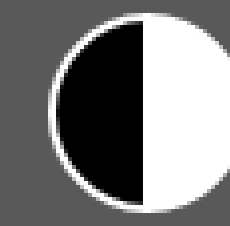
Thorold South Servicing Investigations	Purpose	Report(s)
Natural Environment	<ul style="list-style-type: none"> Avoid/mitigate impacts to sensitive features (i.e., significant wetlands, protect woodlands, etc.) at new SPS site, shaft locations and sewer alignments (outside of road right of way) 	<ul style="list-style-type: none"> Impact Assessment
Environmental Site Assessment (ESA)	<ul style="list-style-type: none"> Ability to avoid sources of contamination (soil or groundwater) if identified at new SPS site or outside road ROW 	<ul style="list-style-type: none"> Phase 1 ESA
Archaeological Assessment (AA)	<ul style="list-style-type: none"> Avoid/mitigate on-land impacts if identified at new SPS site or outside road ROW 	<ul style="list-style-type: none"> Stage 1 AA Stage 2 AA (new SPS site only)
Cultural Heritage	<ul style="list-style-type: none"> Confirm any significance along sewer alignment to remove/mitigate impact 	<ul style="list-style-type: none"> Impact Assessment Assessment Report
Geotechnical & Hydrogeological	<ul style="list-style-type: none"> Ensure sewer solution meets technical constructability needs (tunnelled or open-cut alternatives) through subsurface (soil, bedrock and groundwater) investigations 	<ul style="list-style-type: none"> Preliminary Assessment
Flow & Growth Projections	<ul style="list-style-type: none"> Confirm strategy with Cities of Niagara Falls and Thorold to support future anticipated servicing needs Resilience to changing environment 	<ul style="list-style-type: none"> Technical Memorandums Baseline Assessment

Thorold Servicing – Evaluation

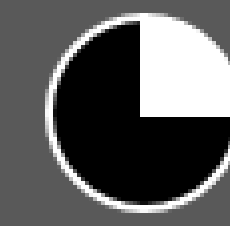
Preferability



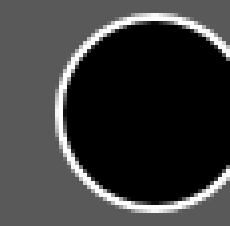
Low



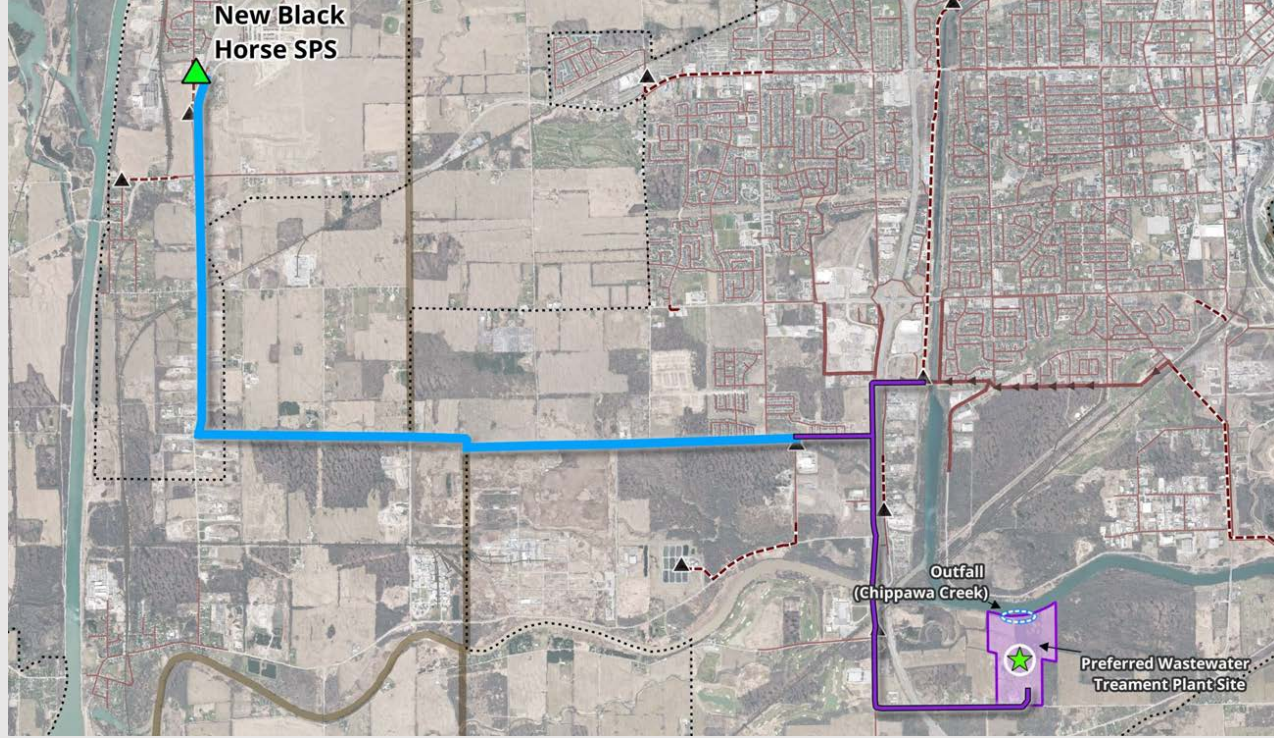
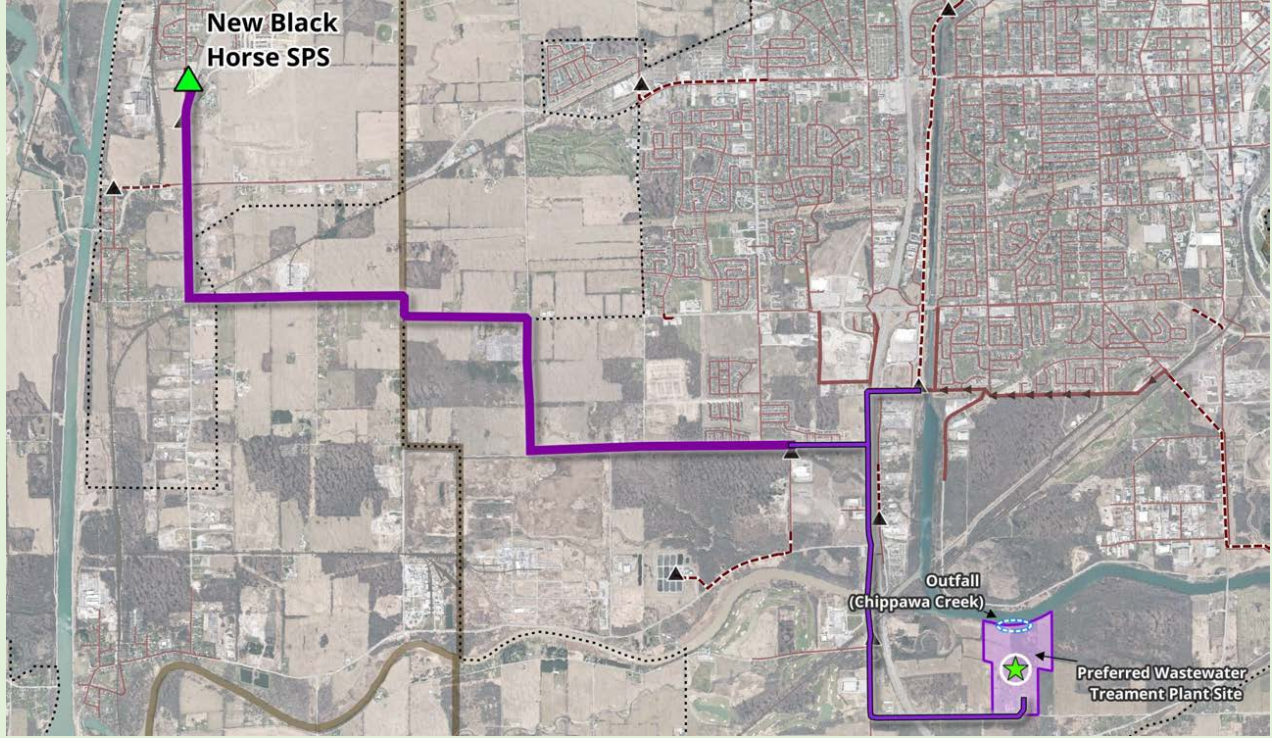
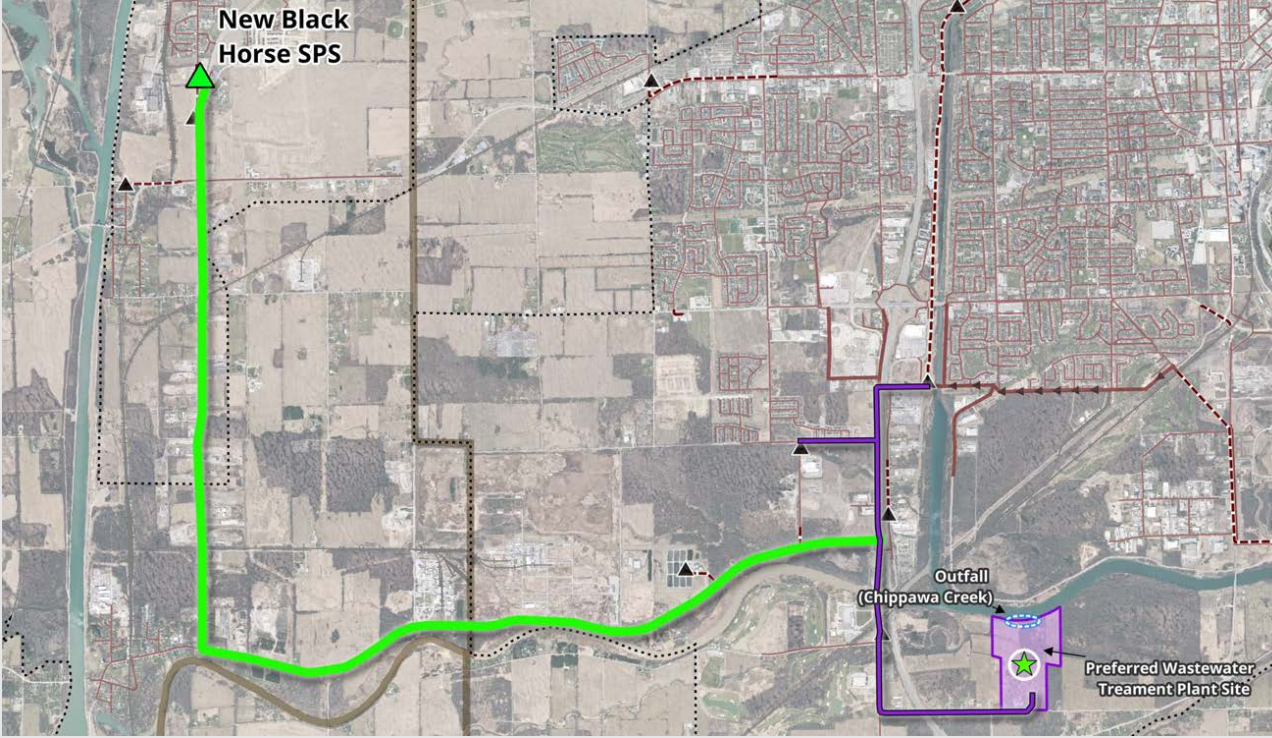
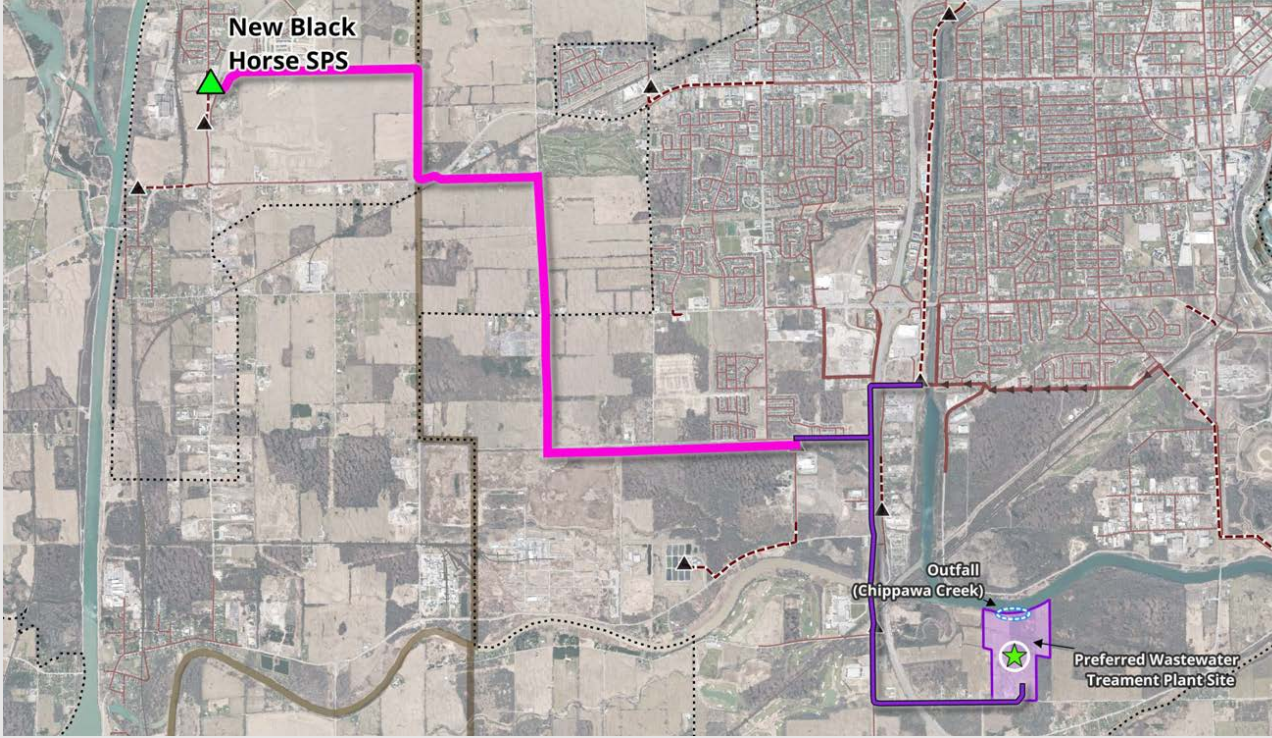
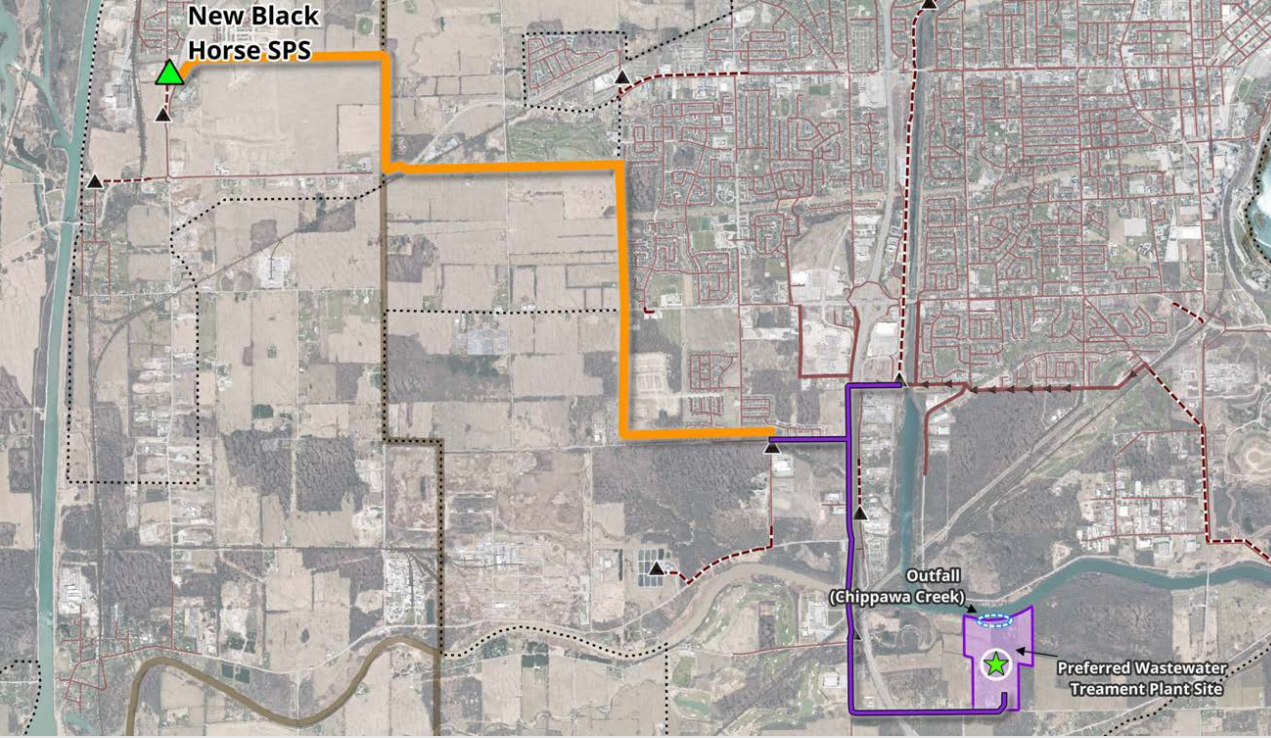
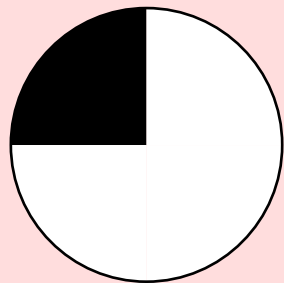
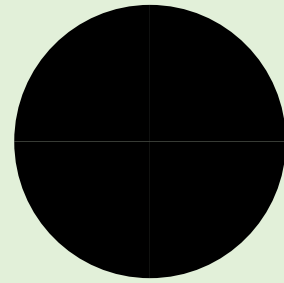
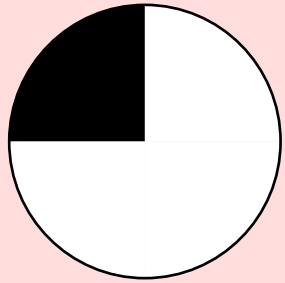
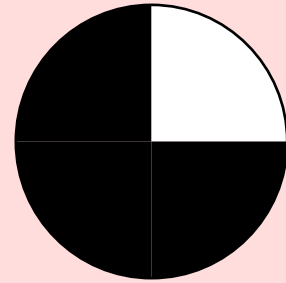
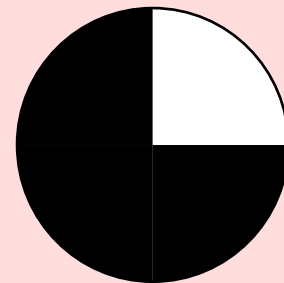
Moderate



High

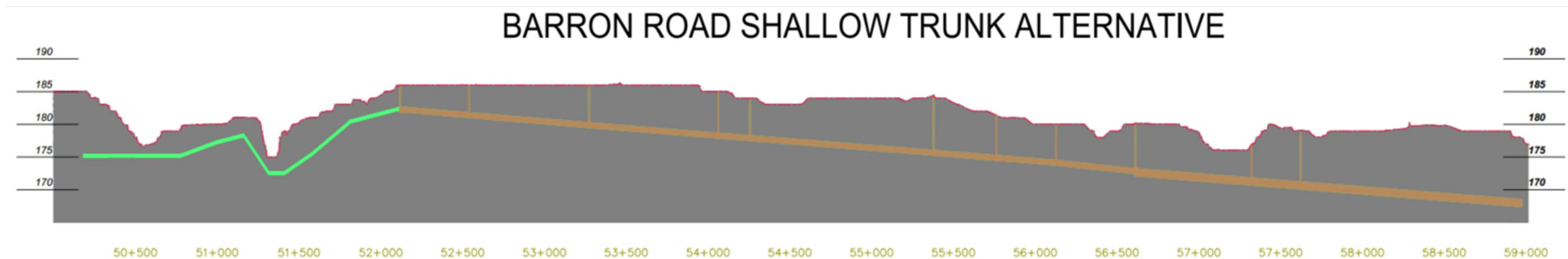
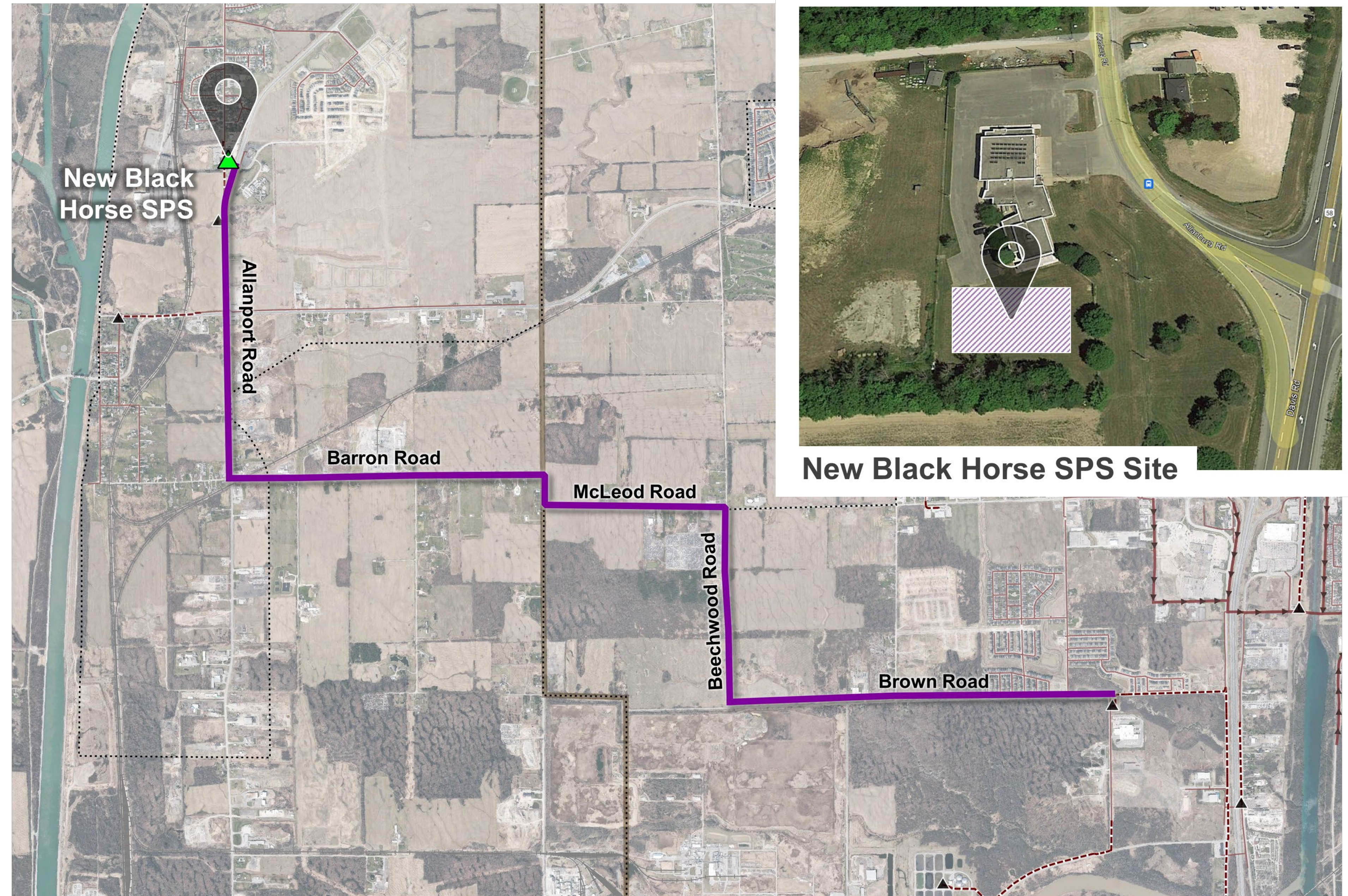


Very High

<p>Option 1A/B/C Turner Road</p> 	<p>Option 1D/E/F Barron Road</p> 	<p>Option 1G Chippawa Creek Road</p> 	<p>Option 2A Beechwood</p> 	<p>Option 2B Garner</p> 
<p>Pros:</p> <ul style="list-style-type: none"> • Supports servicing existing and future land use south of Lundy's Lane • Brown Road alignment supports future servicing areas in Niagara Falls <p>Cons:</p> <ul style="list-style-type: none"> • Most significant impact to environmental features (Provincially Significant Wetland and additional creek crossings) • Alternative requires additional environmental approvals. If approved, would require significant mitigation on Turner Road • Additional easement and forcemain costs • Requires Highway 58 servicing easement • Requires longer alignment and longer deep trunk on Turner Road 	<p>Pros:</p> <ul style="list-style-type: none"> • No major environmental impact • Avoids wetland approval requirements • Facilitates servicing of existing and future land use south of Lundy's Lane • Brown Road alignment supports future servicing areas in Niagara Falls • Deep sewer along Barron Road supports future servicing <p>Cons:</p> <ul style="list-style-type: none"> • Shallow Barron Road sewer reduces gravity servicing of Allanport South area • Additional easement costs • Requires Highway 58 servicing easement • Forcemain requires air release and drain • Requires longer alignment and longer deep trunk on Turner Road 	<p>Pros:</p> <ul style="list-style-type: none"> • Supports servicing existing and future land use south of Lundy's Lane and near Port Robinson <p>Cons:</p> <ul style="list-style-type: none"> • Potential environmental impact with proximity to Welland River • Chippawa Creek Road provides minimal servicing benefits to Niagara Falls areas • Requires Highway 58 servicing easement • Forcemain will require air release and drain • Additional easement costs • Requires longer alignment and longer trunk on Chippawa Creek Road (increased risk of dewatering) • Higher costs 	<p>Pros:</p> <ul style="list-style-type: none"> • No major environmental impact • Beechwood alignment facilitates future servicing for areas of Niagara Falls • Brown Road alignment and depth supports future servicing for south limits of Thorold South • Alignment is mostly greenfield and rural road construction • Direct and shorter alignment route <p>Cons:</p> <ul style="list-style-type: none"> • Does not benefit servicing Allanport Road area in Thorold South • Requires coordination of Uppers Lane alignment and Lundy Lane crossing 	<p>Pros:</p> <ul style="list-style-type: none"> • No major environmental impact • Garner Road alignment supports future Niagara Falls servicing • Alignment is mostly greenfield and rural road construction • Direct and shorter alignment route <p>Cons:</p> <ul style="list-style-type: none"> • Does not benefit servicing Allanport Road area in Thorold South • Requires construction along recently serviced and paved Garner Road • Infrastructure and urban conflicts present on Garner Road • Brown Road alignment is less supportive for future servicing • Requires advanced coordination for Uppers Lane alignment and Lundy Lane crossing
<p>Least Preferred</p> 	<p>Preferred</p> 	<p>Least Preferred</p> 	<p>Less Preferred</p> 	<p>Less Preferred</p> 

Preferred Thorold South Servicing

- Servicing alignment supports future growth areas in Cities of Niagara Falls and Thorold
- New Black Horse SPS site selected at 701 Allanburg Road, Thorold (south of existing fire station)
- Alignment anticipated within Road right-of-way (with exception of Allanport Road north of Hwy 20 which has MTO ownership)
- Infrastructure will mainly be constructed by open-cut. Trenchless construction will be considered for crossings (watercourse and utilities) and due to depths along Brown Road near Montrose Road
- Traffic impacts can be minimized through construction practices



Project Components	Revised Estimates
South Niagara Falls Wastewater Treatment Plant	\$247.66 million
New South-West Trunk Sewer – South Niagara Falls	\$107.82 million
New South-West Trunk Sewer	\$19.61 million
Black Horse Sanitary Pumping Station (SPS)	\$5.91 million
New South Niagara Falls Outfall	\$5.74 million
Black Horse Forcemain	\$3.32 million
Peel Street SPS Upgrades and Forcemain	\$5.92 million
South Side High Lift SPS Decommissioning	\$0.63 million
Garner, Oakwood, Grassy Brook SPS Decommissioning	\$1.14 million
McLeod Road Overflow Diversion	\$1.89 million

\$399.64 million
Total

Approved by Council in September 2021

Cost impacts following Phase 3 investigations:

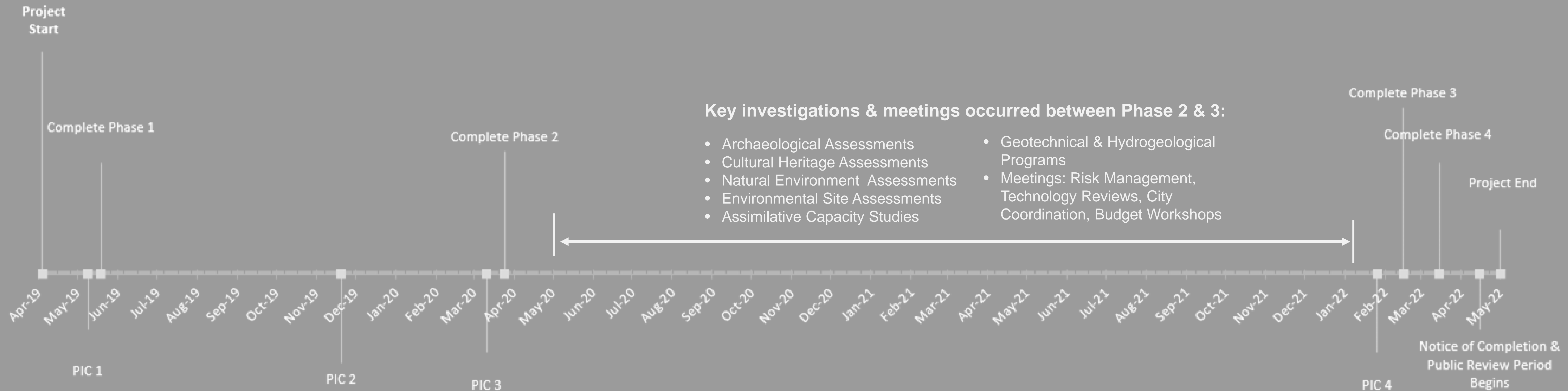
- Geotechnical conditions (soils) at the WWTP site and along trunk sewer alignment
 - Prevalent across the study area
 - Impacts WWTP foundation – requires piles
 - Impacts trunk sewer tunnelling constructability
- Property Impacts
- Archaeological Impacts

South Niagara Falls Wastewater Solutions provides recommendations that will:

- Minimize impacts to environmental and archaeological features
 - Maximize buffer from existing and future neighbouring properties
 - Meet MECP setback requirements
 - Optimize Wastewater Treatment Plant with flexibility for future treatment technology, expansions, and changing environment
-
- Key investigations required for detailed design:
 - Stage 2 Archaeological Assessment (AA) for sewer shaft locations and portions of the Wastewater Treatment Plant site
 - Stage 3 AA for plant outfall construction areas (as required)
 - Natural Environment Monitoring (to reduce potential construction impacts)
 - Advanced Geotechnical and Hydrogeological investigations
 - Traffic Impact Assessment / coordination with Cities of Niagara Falls and Thorold

- Program Components:
 - New Wastewater Treatment Plant and outfall,
 - New Montrose Trunk Sewer, and,
 - New Thorold South Servicing.
- Addresses 2041 growth needs plus 2051 growth needs with flexibility for long term capacity requirements.
- Ability to phase in capacity at the WWTP in the future.
- Provides significant environmental benefits through optimizing wet weather management:
 - Captures peak flows and provides conveyance storage,
 - Minimizes overflows and flooding events across the study area, and,
 - Future connectivity and flexibility supports additional servicing and benefits.
- Current infrastructure planning and technology principles help the Region respond to changing regulations and needs.

Project Timeline and Phase 3 Tasks



- Study commencement
- Agency & stakeholder pre-consultation workshops
- Review of baseline data & information
- Define problem & opportunity statement
- **Public Information Centre No. 1**

- Prepare natural, hydrogeological, social, cultural, archaeological & economic inventory
- Identify potential impacts and how to address them
- Supporting technical analysis and studies
- Identify key factors and considerations
- Determine detailed criteria for overall strategy
- Identify alternative solutions
- **Public Information Centre No. 2**

- Evaluate alternative solutions
- Select preliminary preferred plant site
- Select preliminary preferred plant outfall location
- Select preliminary preferred sewer alignments
- **Public Information Centre No. 3**

- Validate preferred solution
- Identify design concept alternatives
- Prepare detailed inventory
- Identify impacts and how to address them
- Select preliminary preferred conceptual design and technologies
- **Public Information Centre No. 4**

- Confirm preferred design concepts and technologies
- Finalize Environmental Study Report
- Notice of study completion
- Finalize conceptual design
- File study report
- Public review period

Phase 1



Phase 2



Phase 3



Phase 4

We want to hear from you!

- **Visit our website:**
www.niagararegion.ca/projects/south-niagara-falls-treatment-plant
- **Provide PIC No. 4 feedback** on the website from February 9 to 23, 2022
- **Sign-up to receive study notifications** on the website, including notice of study completion when the final report is available for public review

For any Class EA questions, please contact the Project Manager:

Lisa Vespi, P.Eng., PMP

new.treatment.plant@niagararegion.ca

Next Steps:

