



**City of Windsor**  
**PONTIAC PUMPING STATION UPGRADES**

**PUBLIC INFORMATION CENTER**  
**WELCOME**

**Municipal Class Environmental Assessment**  
**(Class EA)**

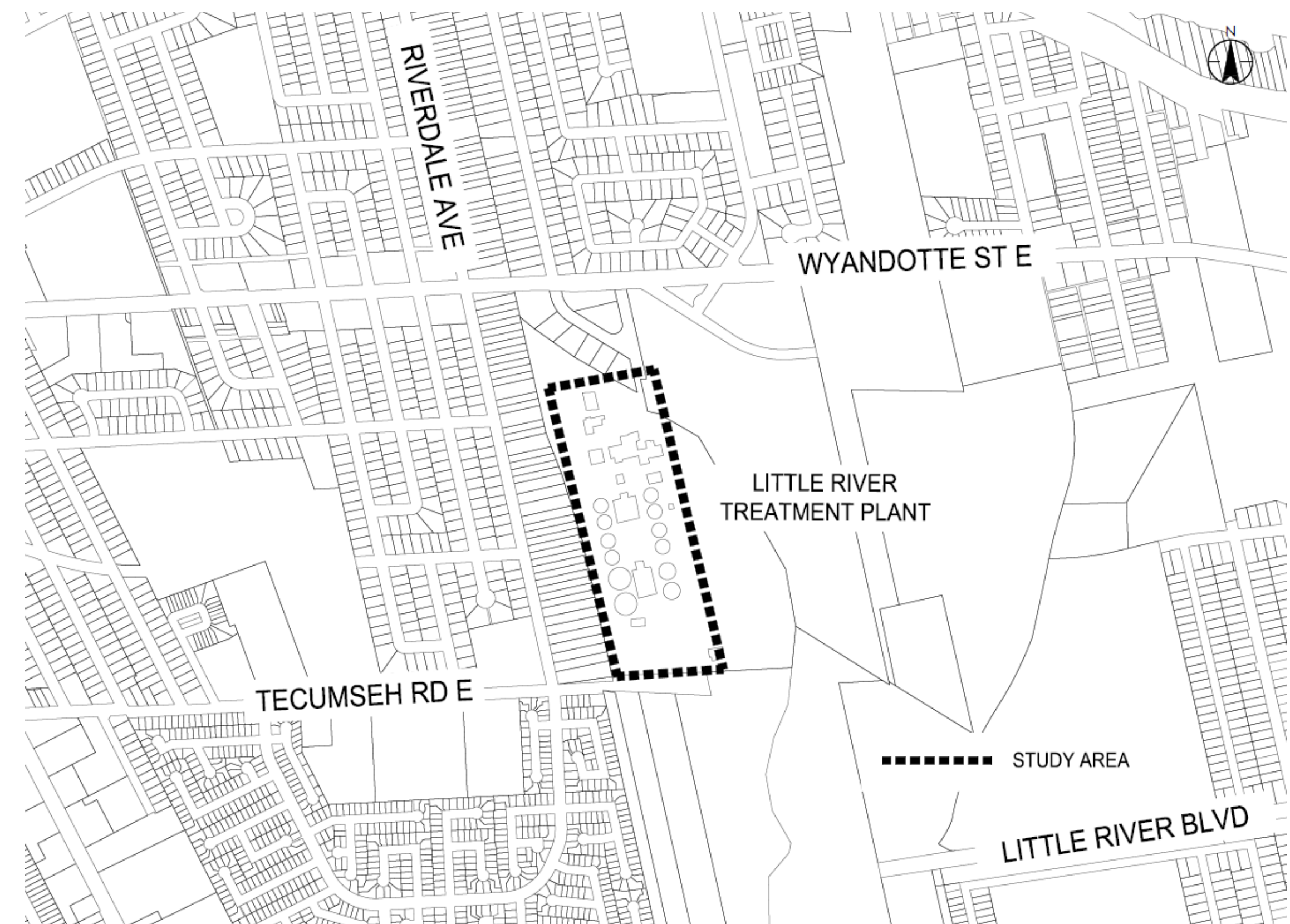
**July 13<sup>th</sup>, 2022**

# Study Overview

**The purpose of this study is to determine the preferred layout and design for the Pontiac Pumping Station.**

The purpose of this Public Information Center (PIC) is to:

- Present an evaluation of alternative design concepts for the Pontiac Pumping Station
- Obtain public feedback on the preferred design concepts for the proposed Pontiac Pumping Station



# Background

## Flooding in the City of Windsor

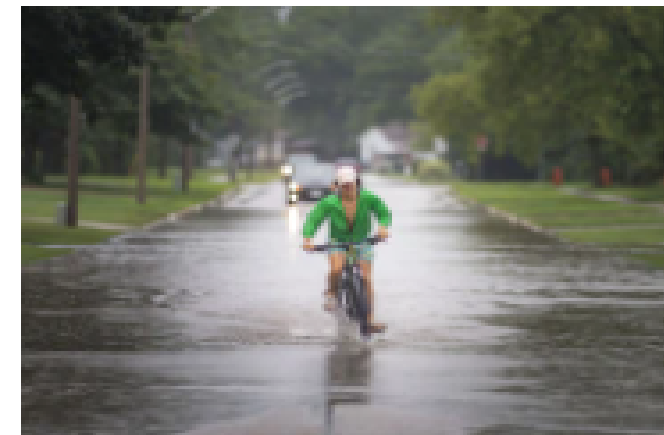
The City of Windsor has experienced several significant storm events in recent years that have resulted in widespread flooding.

WINDSOR STAR

### Rainfall 'deluge' triggers flooding, road closures

With widespread reports of flooding and roads being under water, the city on Friday was urging residents to stay off...

July 16, 2021 [Local News](#)



WINDSOR STAR

### Residents, municipalities deal with flooding aftermath

Craig Weir spent his weekend tearing apart the soggy remains of a sewage-soaked basement that took months to finish but only hours t...

with Video

July 20, 2021 [Local News](#)



To address these issues the City carried out the Sewer & Coastal Flood Protection Master Plan (SMP). The purpose of this study was to:

- Understand the causes of flooding
- Identify locations of basement, surface, and coastal flooding
- Evaluate alternative solutions
- Complete high-level design and cost estimates for proposed improvements
- Provide an implementation strategy for the recommended solutions

# Background

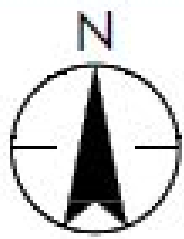
## Problem Statement

The SMP identified:

- The Pontiac Pumping Station at the Little River Pollution Control Plant (LRPCP) does not have the hydraulic capacity to service wet weather flows during severe storm events
- This results in an increased risk of basement and surface flooding in the Pontiac drainage area, which is consistent with observed and reported data during severe storm events
- Failure to have adequate infrastructure in place will negatively impact the community and may cause damage to infrastructure, properties, and local transportation networks

# Background

## The Pontiac Drainage Area



**LEGEND**

--- PONTIAC DRAINAGE AREA



CITY OF WINDSOR

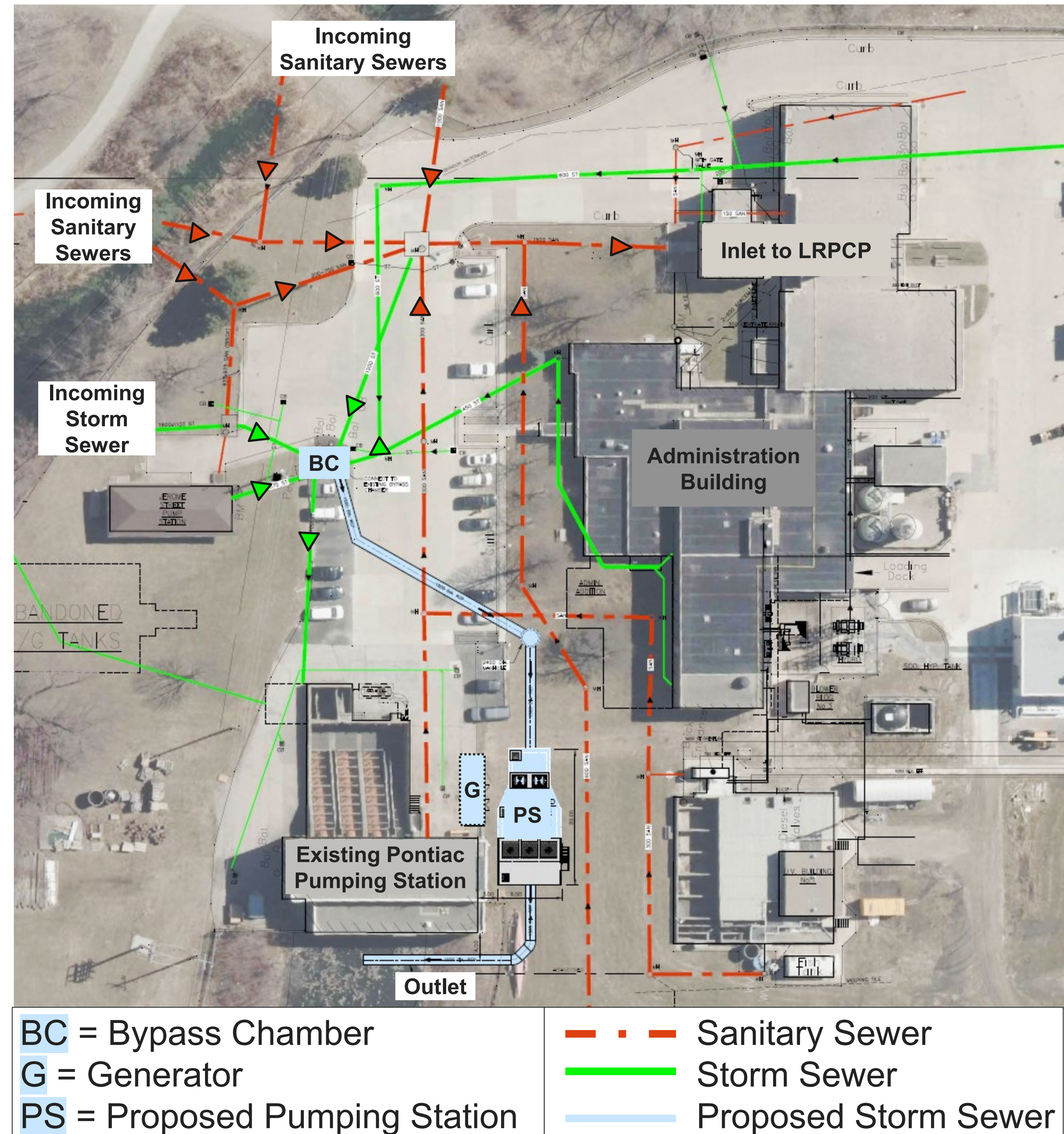
PONTIAC DRAINAGE AREA



# Background

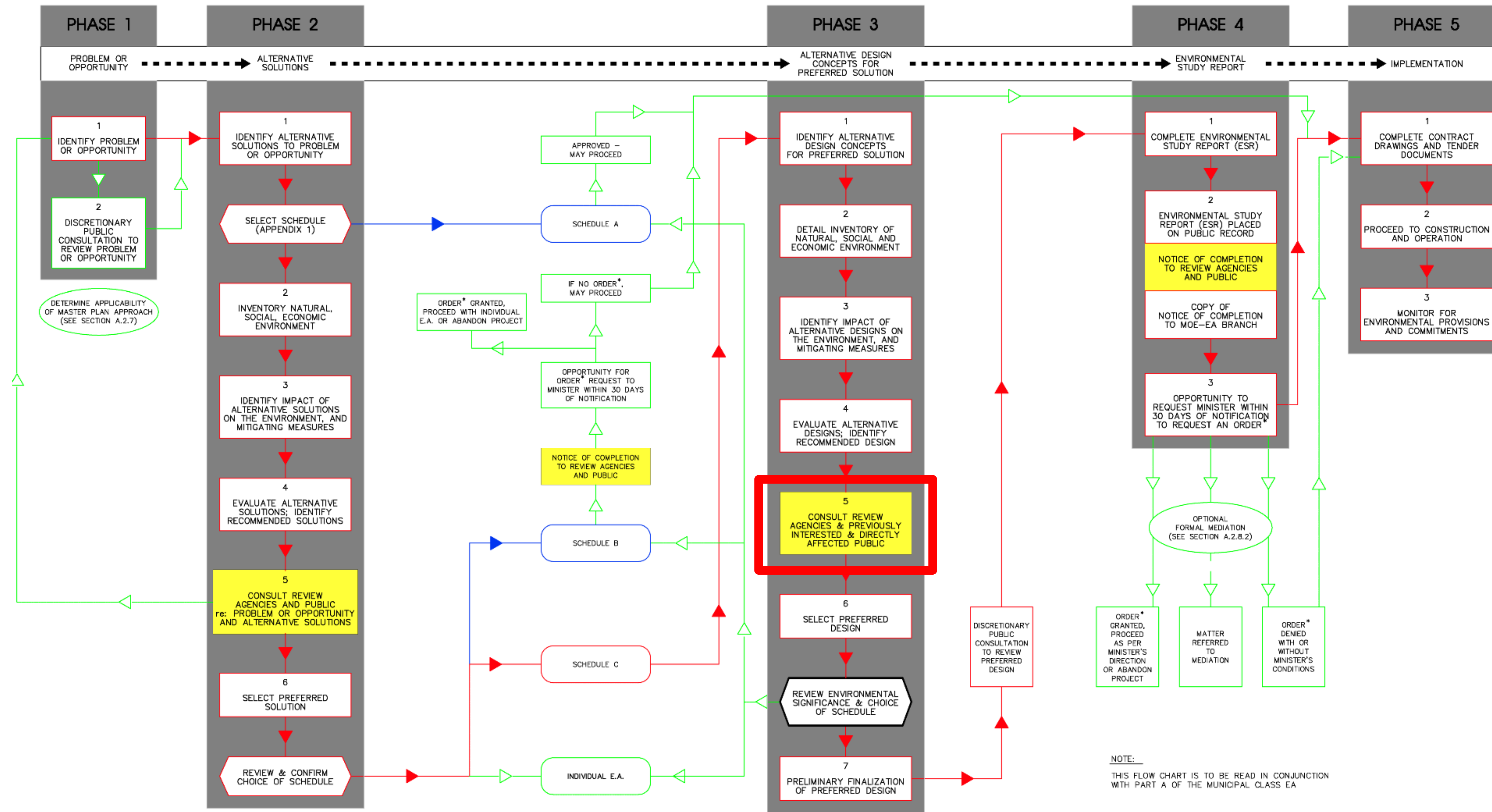
## The Pontiac Pumping Station

- Pontiac Pumping Station is primarily a stormwater pumping station which provides flood relief to the Pontiac drainage area
- In a severe storm event, where the capacity of the LRPCP is exceeded, the Pontiac Pumping Station acts as an emergency bypass for wet weather flows to prevent basement flooding
- However, the existing pumping station does not have the hydraulic capacity to meet the required level of service and reduce the risk of basement flooding



# Background

## Overview of the Class EA Process



- ▶ INDICATES MANDATORY EVENTS
- ▶ INDICATES POSSIBLE EVENTS
- ▶ INDICATES PROBABLE EVENTS
- MANDATORY PUBLIC CONTACT POINTS (SEE SECTION A.3 CONSULTATION)
- OPTIONAL
- DECISION POINTS ON CHOICE OF SCHEDULE
- ◻ INDICATES CURRENT STEP
- \* PART II ORDER (SEE SECTION A.2.8)

# Background

## Key Features of the Class EA Process

The project is being conducted in accordance with the Class EA requirements for ‘Schedule C Projects’:

<b>Municipal Class EA Phases</b>	
<i>Phase 1 – Review and identify problem or opportunity</i>	SMP
<i>Phase 2 – Alternative solutions to problem</i>	SMP
<i>Phase 3 – Alternative design concepts for the preferred solution</i>	This EA Study
<i>Phase 4 – Environmental Study Report</i>	This EA Study
<i>Phase 5 – Implementation of the preferred design</i>	Future Work



# Background

## Phase 1 and 2 of the Class EA – Completed

Phase 1 and 2 of the Class EA process were completed as a part of the SMP.

The SMP identified the following objectives for the Pontiac drainage area:

- Provide an enhanced level of service to mitigate the risk of basement and surface level flooding during severe storm events
- Improve flood resiliency for the Pontiac drainage area in the case of the 1 in 100-year storm event

To meet these objectives the following solution was identified:

- **Increase the hydraulic capacity of the existing Pontiac Pumping Station**
- **Expand the existing pumping station by adding a new wet well structure to house three (3) 1.25 m<sup>3</sup>/s pumps**

# Background

## Phase 1 and 2 of the Class EA – Completed

<b>Design Basis Flows</b>			
	<b>Existing Capacity</b>	<b>Additional Capacity</b>	<b>Upgraded Capacity</b>
<b>Firm Capacity (m<sup>3</sup>/s)</b>	<b>4.8</b> 3 large pumps – 2.12 m <sup>3</sup> /s 1 small pump – 0.57 m <sup>3</sup> /s	<b>2.5</b> 3 new pumps – 1.25 m <sup>3</sup> /s	<b>7.3</b>
<b>Total Capacity (m<sup>3</sup>/s)</b>	<b>6.9</b> 3 large pumps – 2.12 m <sup>3</sup> /s 1 small pump – 0.57 m <sup>3</sup> /s	<b>3.75</b> 3 new pumps – 1.25 m <sup>3</sup> /s	<b>10.7</b>

# Background

## Phase 3 and 4 of the Class EA – Ongoing

Phase 3 of the Class EA process for this study will include:

- Evaluation and selection of the recommended design for the proposed Pontiac Pumping Station
- **This open house is being held to obtain comments and public input on the preferred design concepts**

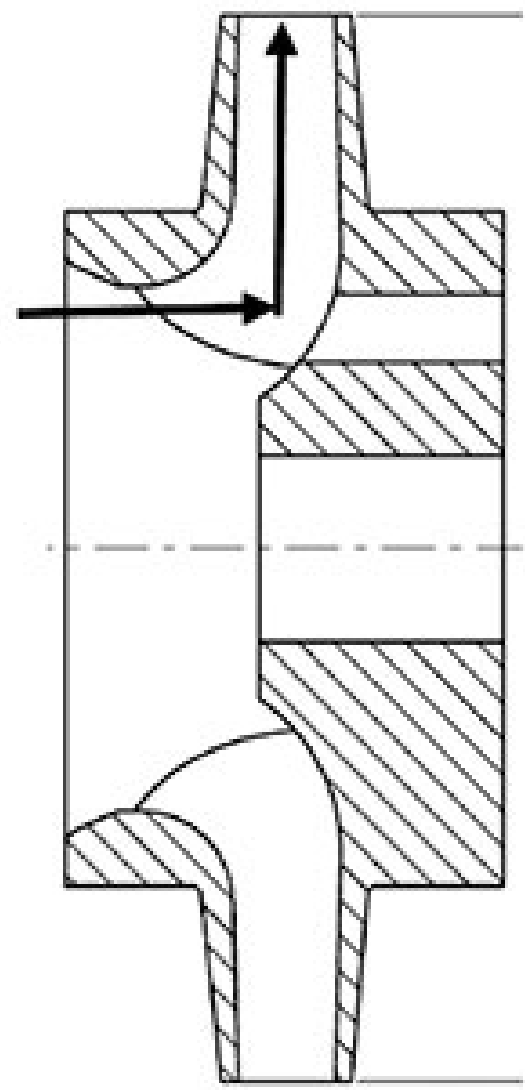
Phase 4 of the Class EA process for this study will include:

- Preparation and submission of an Environmental Study Report

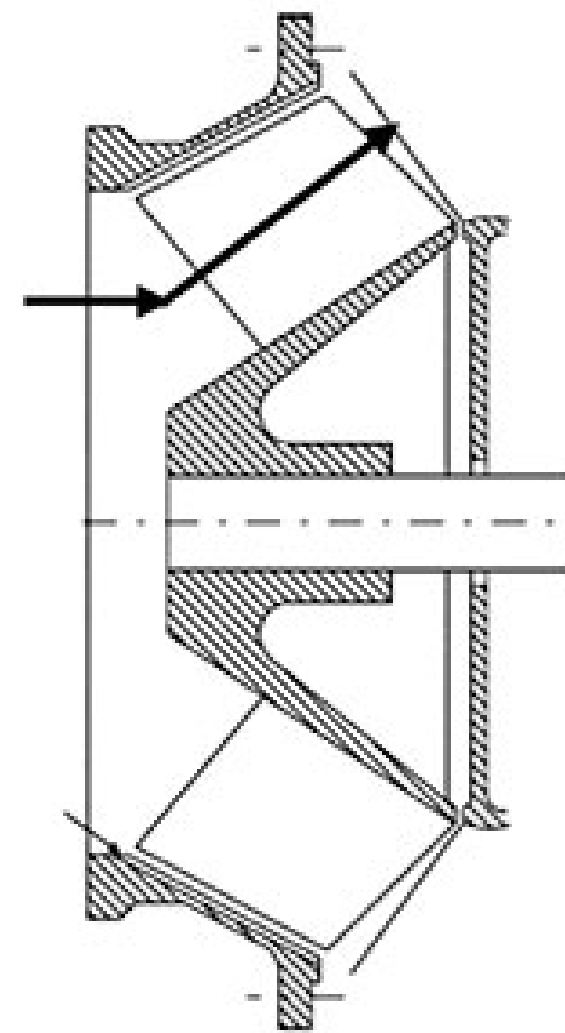
# Design Alternatives

## Pumping Technology

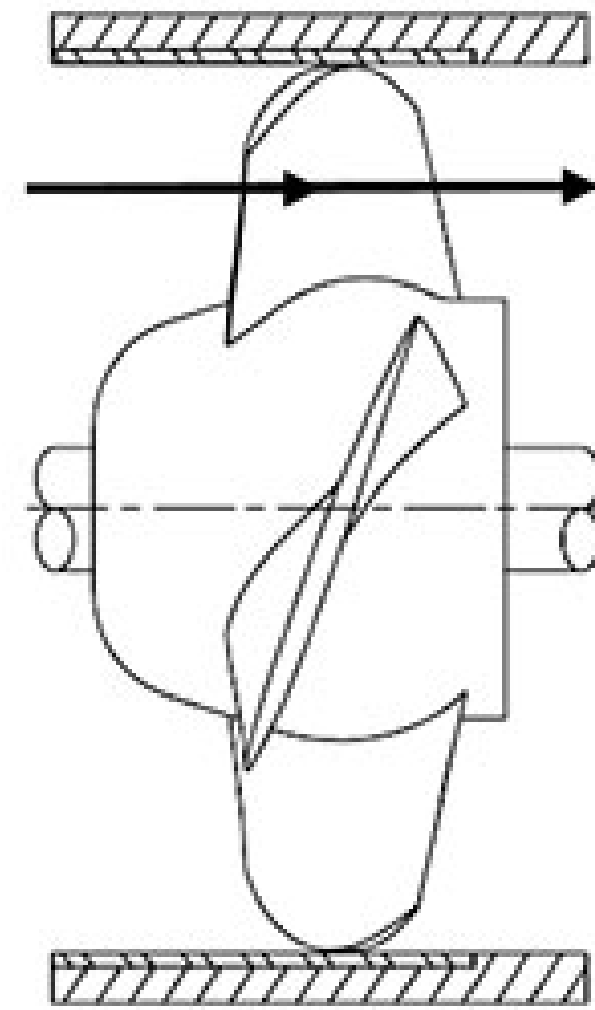
The four most common pump types for flood control applications:



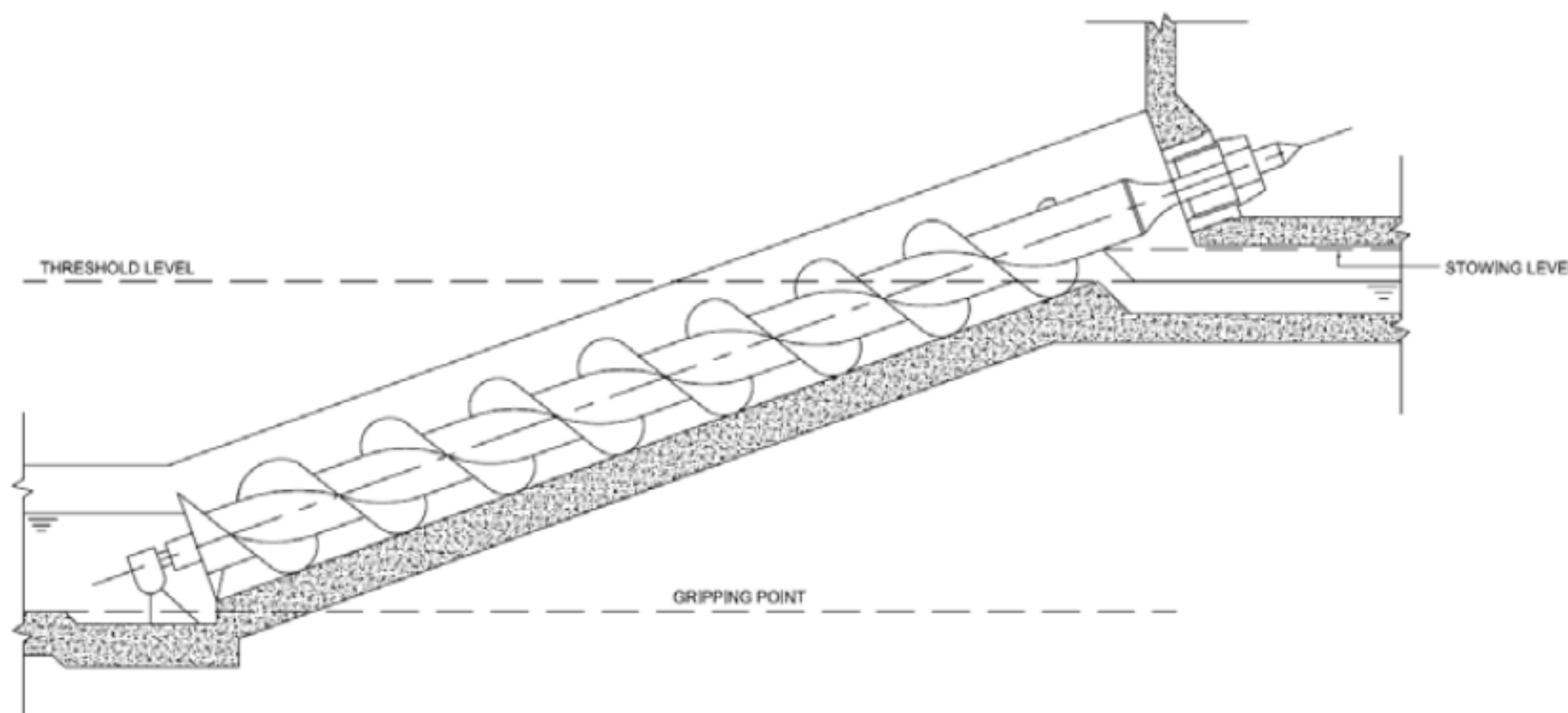
Centrifugal Flow



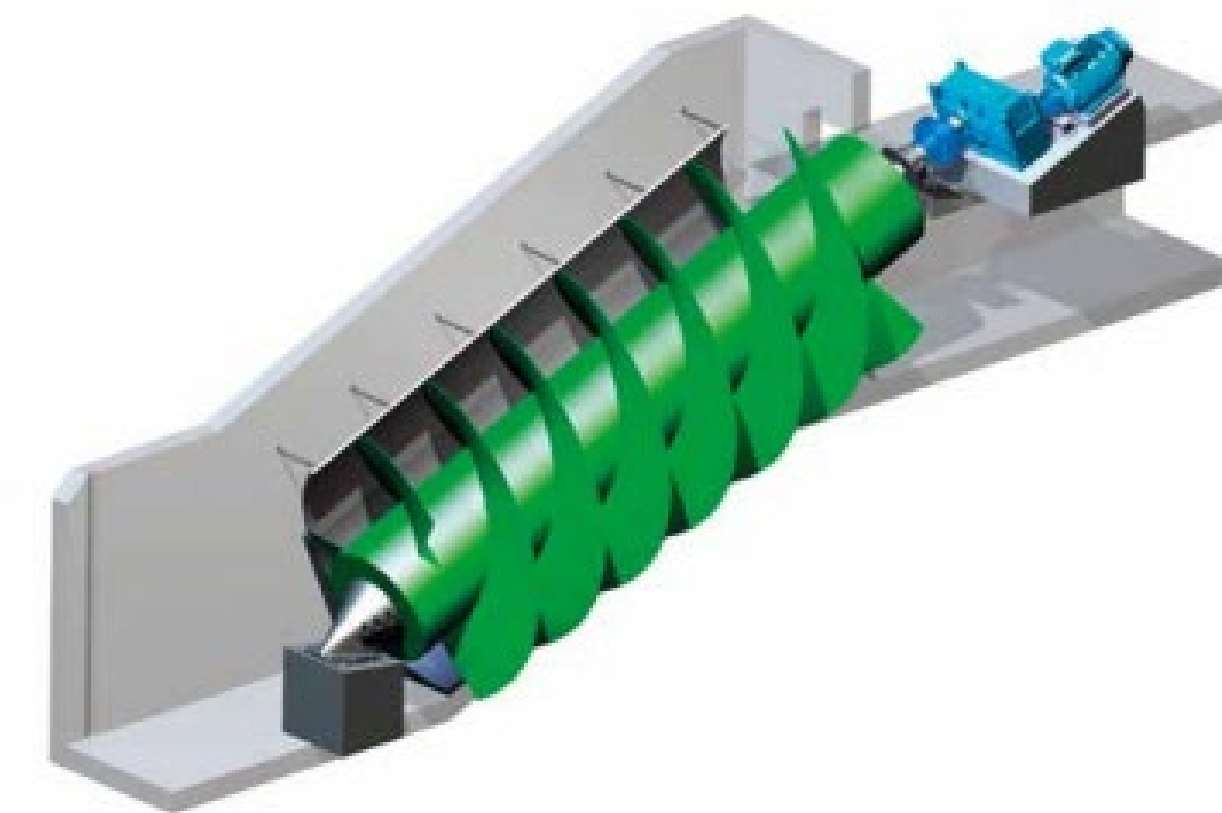
Mixed Flow



Axial Flow



Screw



# Design Alternatives

## Pumping Technology

<b>Centrifugal Flow Pumps</b>	<ul style="list-style-type: none"><li>• Centrifugal flow pumps are used to meet a wide range of head and flow requirements.</li></ul>
<b>Axial Flow Pumps</b>	<ul style="list-style-type: none"><li>• Axial-flow pumps are high-capacity pumps that are typically used for low head, high flow applications such as stormwater pumping stations.</li></ul>
<b>Mixed Flow Pumps</b>	<ul style="list-style-type: none"><li>• The mixed-flow type has impellers with vanes which are shaped such that the pump functions as a compromise between axial flow pumps and centrifugal pumps. Mixed-flow pumps are able to operate at higher head than axial-flow pumps while delivering higher flow rates than centrifugal-flow pumps.</li></ul>
<b>Screw Pumps</b>	<ul style="list-style-type: none"><li>• Screw pumps are positive displacement pumps based on the Archimedes principle of a rotating shaft. Screw pumps can provide constant flow rates and pressures and have a relatively high tolerance for solids entering the flow stream.</li><li>• Commonly used when low heads are required (less than ten meters).</li></ul>

# Design Alternatives

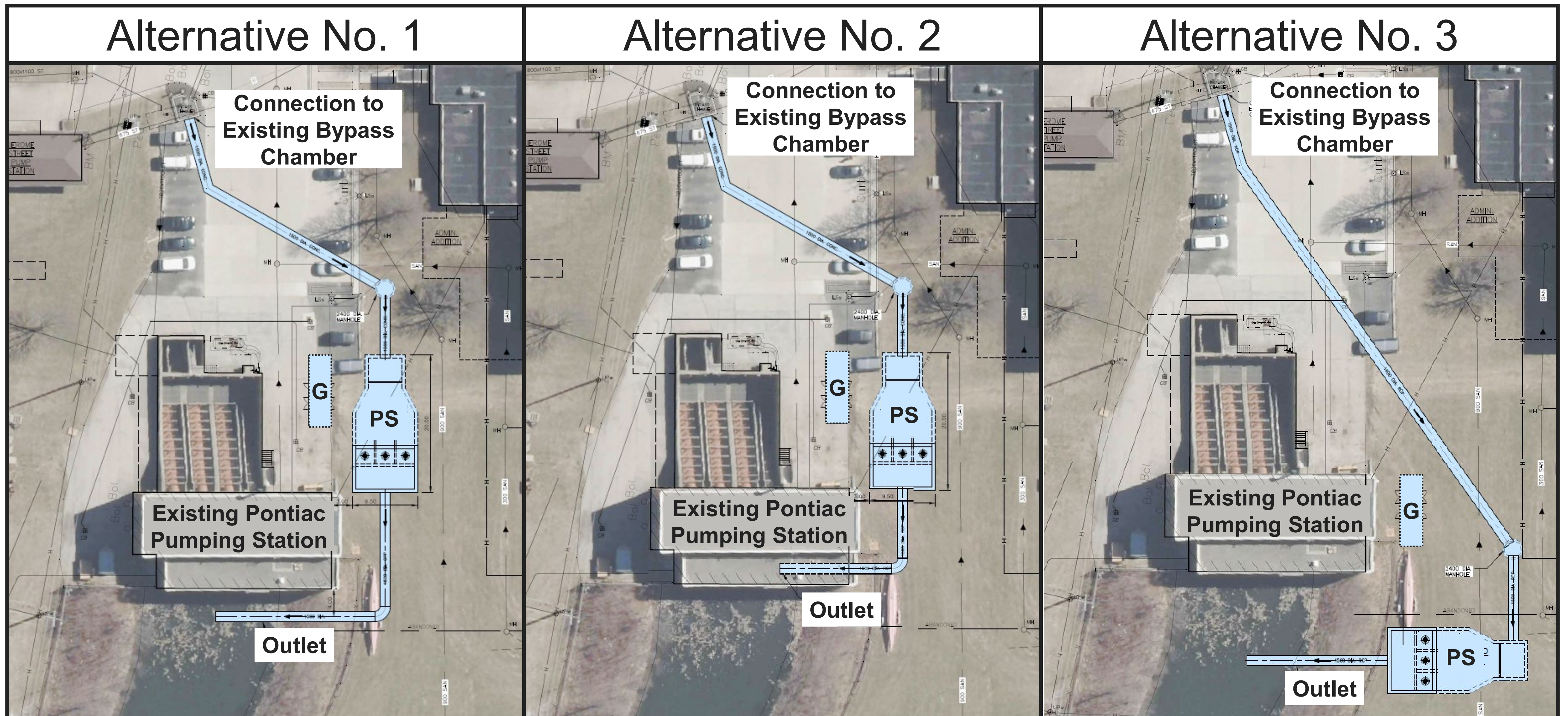
## Pumping Technology

Criteria	Centrifugal- Flow Pump	Axial-Flow Pump	Mixed-Flow Pump	Screw Pump
<b>Performance &amp; Effectiveness</b>	<ul style="list-style-type: none"> <li>Lower efficiency, shorter lifetimes</li> </ul>	<ul style="list-style-type: none"> <li>Very efficient in high flow, low head applications</li> </ul>	<ul style="list-style-type: none"> <li>Efficient in high flow, low head applications.</li> </ul>	<ul style="list-style-type: none"> <li>Wide range of flow, Difficult to increase head.</li> </ul>
<b>Space Required</b>	<ul style="list-style-type: none"> <li>Low space requirements</li> </ul>	<ul style="list-style-type: none"> <li>Low space requirements</li> </ul>	<ul style="list-style-type: none"> <li>Low space requirements</li> </ul>	<ul style="list-style-type: none"> <li>Relatively high space requirements.</li> </ul>
<b>Capital/ Construction Cost</b>	<ul style="list-style-type: none"> <li>Relatively low to medium</li> </ul>	<ul style="list-style-type: none"> <li>Relatively low to medium</li> </ul>	<ul style="list-style-type: none"> <li>Relatively low to medium</li> </ul>	<ul style="list-style-type: none"> <li>Relatively low to medium</li> </ul>
<b>O&amp;M Requirements</b>	<ul style="list-style-type: none"> <li>Low to medium O&amp;M requirements</li> </ul>	<ul style="list-style-type: none"> <li>Low O&amp;M requirements</li> </ul>	<ul style="list-style-type: none"> <li>Low to medium O&amp;M requirements</li> </ul>	<ul style="list-style-type: none"> <li>Medium O&amp;M requirements</li> </ul>
<b>General Concerns</b>	<ul style="list-style-type: none"> <li>Loss of efficiency should solids enter the flow.</li> </ul>	<ul style="list-style-type: none"> <li>Performance is very dependent upon providing good inlet flow, Loss of efficiency should solids enter the flow</li> </ul>	<ul style="list-style-type: none"> <li>Performance is very dependent upon providing good inlet flow, Loss of efficiency should solids enter the flow</li> </ul>	<ul style="list-style-type: none"> <li>Difficult to modify, Requires enclosing.</li> </ul>

**Axial – Flow Pump is recommended based on the high efficiency, low space requirements, and low O&M requirements**

# Design Alternatives

## Site Layout



PS = New Pumping Station  
 G = Generator

Note: Preliminary layouts presented on this slide are for display purpose and may be subject to change during the detailed design phase. In the detailed design phase, a flow monitor will be included to ensure accurate reporting of bypass events.

# Design Alternatives

## Site Layout

	Alternative No. 1	Alternative No. 2	Alternative No. 3
<b>Ease of Construction</b>	<ul style="list-style-type: none"> <li>• <b>Moderately complex</b></li> <li>• No utility relocations</li> <li>• Requires in-water construction work</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Moderately complex</b></li> <li>• Requires modifications to the existing PS</li> <li>• No utility relocations</li> <li>• No in-water work</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Most complex</b></li> <li>• Requires relocation of existing sanitary sewer</li> <li>• Requires in-water construction work</li> </ul>
<b>Space Requirements</b>	<ul style="list-style-type: none"> <li>• <b>Low space requirements</b></li> <li>• Close existing PS</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Low space requirements</b></li> <li>• Close existing PS</li> </ul>	<ul style="list-style-type: none"> <li>• <b>High space requirements</b></li> <li>• Limits access over the grass to the disinfection chambers</li> </ul>
<b>Work in-Water Permitting</b>	<ul style="list-style-type: none"> <li>• <b>Required</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Not required</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Required</b></li> </ul>
<b>Technical Suitability</b>	<ul style="list-style-type: none"> <li>• Both site layout alternatives will be able to meet flood mitigation objectives and provide an enhanced level of service for the Pontiac drainage area</li> <li>• Comparable O &amp; M requirements with access to generator and pumping chambers</li> </ul>		
<b>General Concerns</b>	<p>The social, natural environmental, and economic impacts of the proposed pumping station is anticipated to be similar for each site layout alternative.</p>		

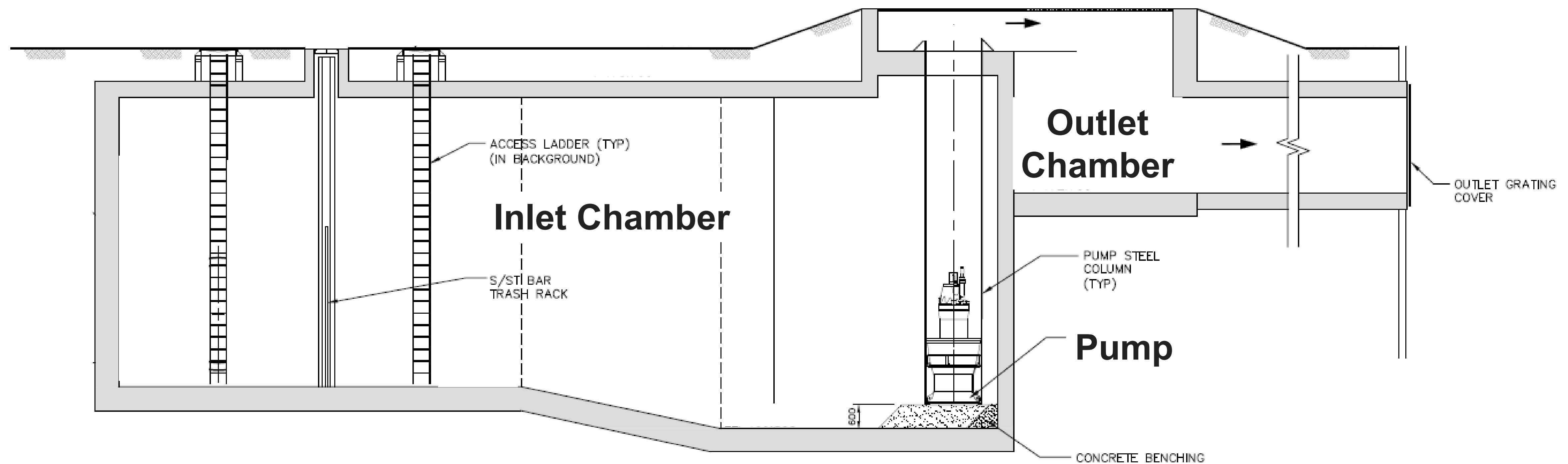
**Layout Alternative No. 2 is recommended based on the ease of construction, work in-water permitting, and low space requirements.**



# Summary of Selected Design

## Preliminary Hydraulic Profile

This figure shows the conceptual sectional view of the proposed pumping station:



Note: Preliminary design presented on this slide is for display purpose and may be subject to change during the detailed design phase.

# Summary of Selected Design Opinion of Probable Cost

<b>Item</b>	
<b>Pumping Station and Outlet Structure</b>	<b>\$5,500,000</b>
<b>Contingency Allowance</b>	<b>\$1,500,000</b>
<b>Engineering Allowance</b>	<b>\$950,000</b>
<b>Total Capital Cost:</b>	<b>\$7,950,000</b>

Note: The opinion of probable cost presented on this slide is an approximation and may be subject to change in the implementation phase (detailed design).

## Next Steps

<b>Project Component</b>	<b>Date</b>
<b>Environmental Study Report</b>	Summer 2022
<b>Council Presentation</b>	Fall 2022
<b>Notice of Completion</b>	Winter 2022

# Thank You

*Please visit the City of Windsor's project website to submit a feedback form.*

[Pontiac Pumping Station Upgrades at the Little River Pollution Control Plant - Environmental Assessment \(citywindsor.ca\)](https://www.citywindsor.ca)