



WHRM - Windsor Flood Study

Council Meeting - February 11, 2025



Agenda / Outline

1 ■ Past Storm Events

2 ■ Data Collection and Modelling

3 ■ How the System Operates

4 ■ Areas of Concern

5 ■ Phase 2 Option Development

6 ■ Albert Street

7 ■ Stannus Street

8 ■ Full System

Why are we doing this?

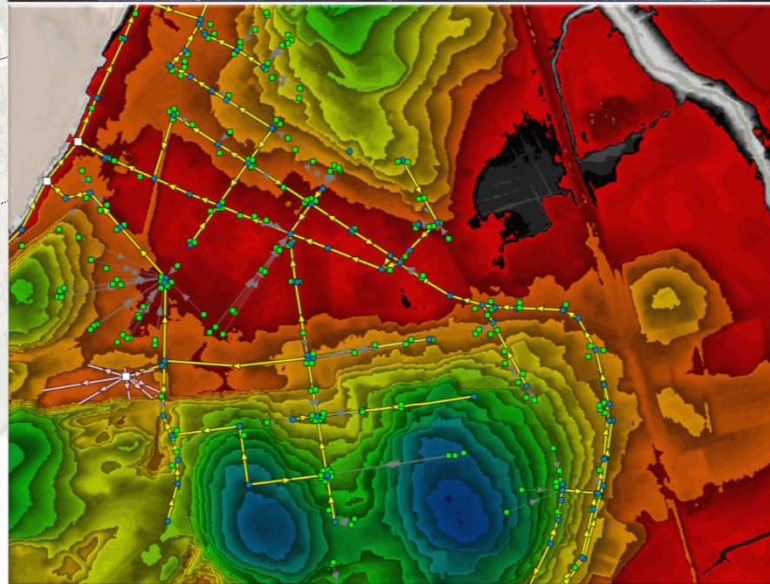
- Increased frequency of large storms and flooding in the areas between Stannus Street and Gray Street.
- July 2021 Storm
 - 48.5 mm in 1.5 hr
 - 1hr&2hr rain intensity was equal to the 1:100-year storm
- July 2023 Storm
 - 208mm of rain over a 24hr period
 - Classified as 1:100-year storm





Data Collection & Model Development

Data Collection & Model Building



SURVEY

- Review of existing drawings & GIS data
- Gap analysis
- Field data collection

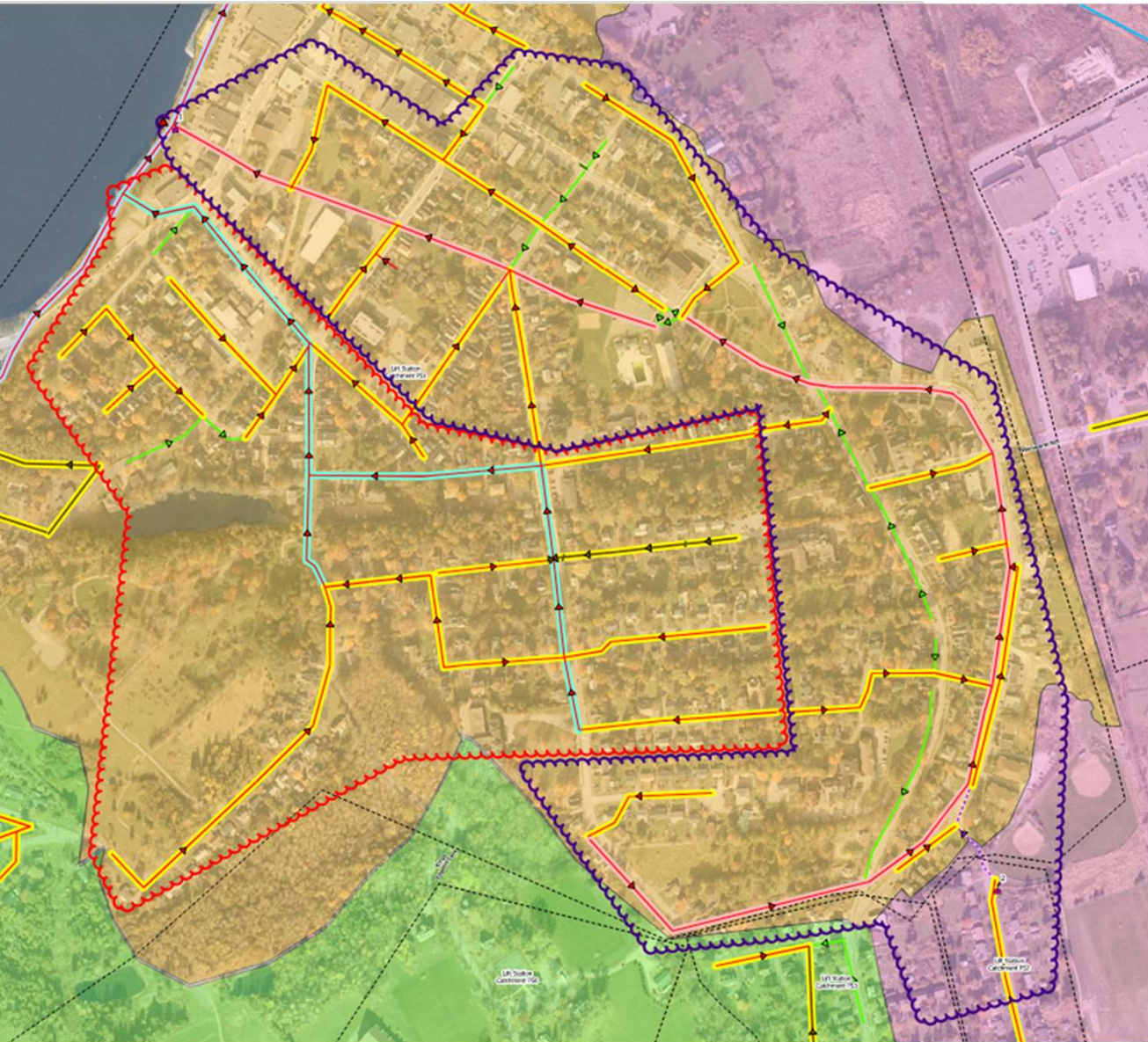
FLOW MONITORING

- Programs in 2022 and 2024
- April 12, 2024, used for calibration

MODELLING

- **1D & 2D Models**
- Over 100 models developed, with 12 primary scenarios

How the System Operates



Downtown Windsor

Stormwater System

MINOR – PIPES

Typically designed for a 1:5-year storm.

MAJOR - OVERLAND

The street ROW transports large storms to a receiving water body

Combined Sewer System

These systems were designed to transports sanitary sewer and stormwater flows.

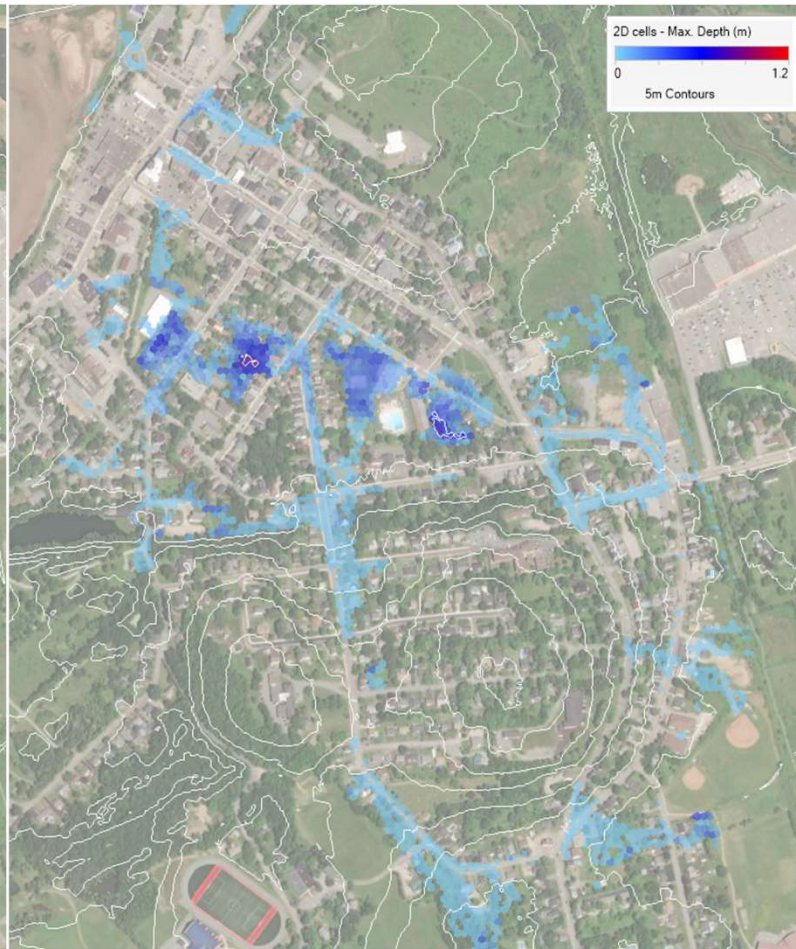
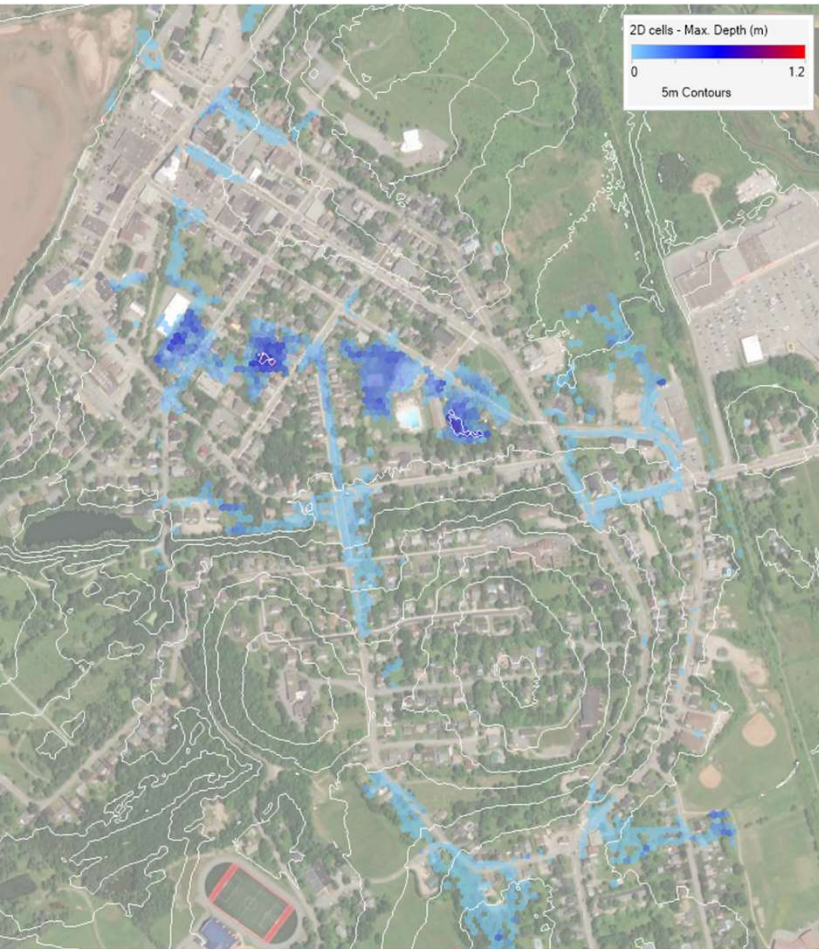
When a combined sewer overflows the water can contain waste

Areas of Concern

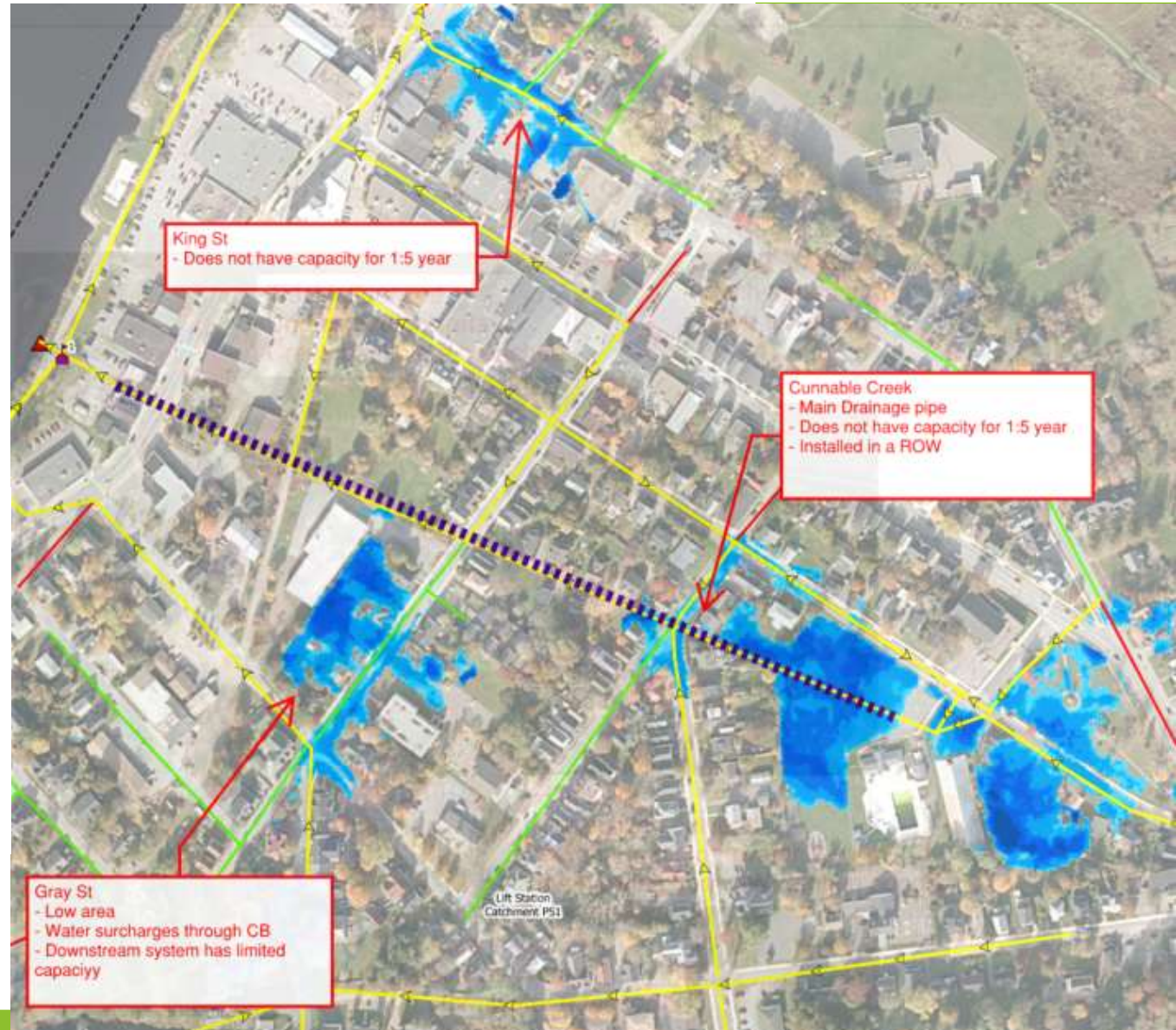
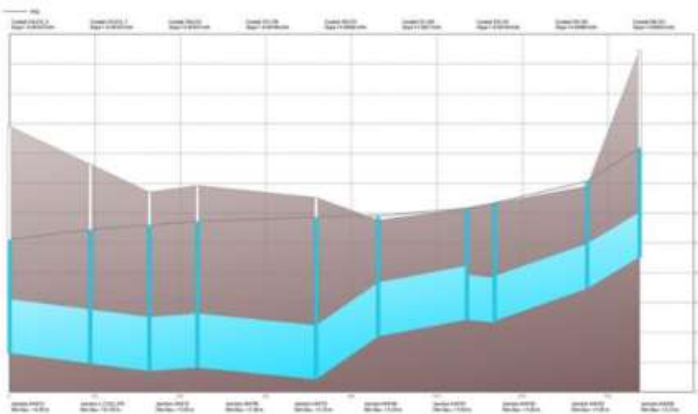
Windsor Downtown Flooding

July 27 Event

1:5 Event



Downtown Trouble Areas



Preferred Option Review

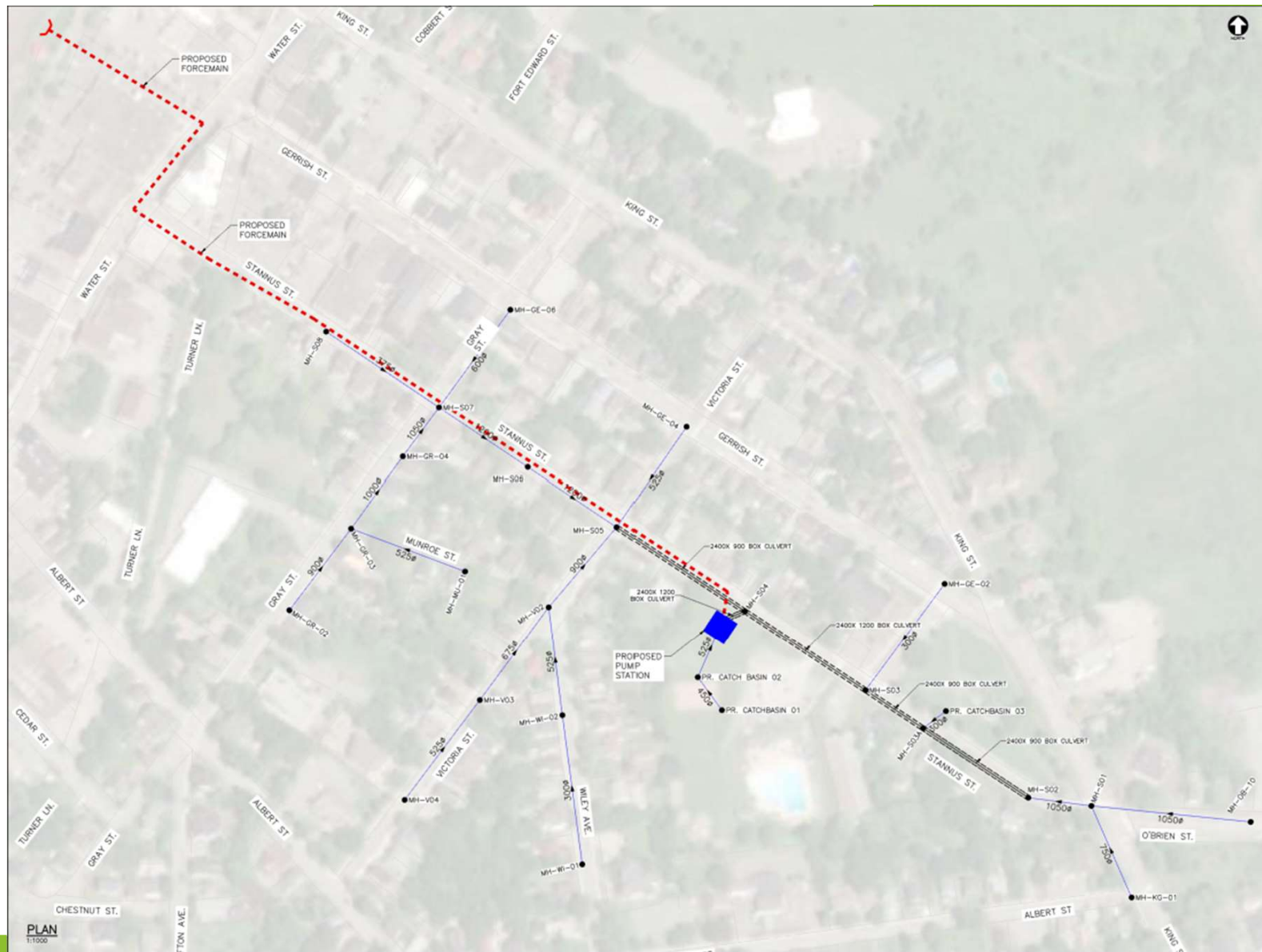
Stannus St Pumping and Storage

Pumping
 $10\text{m}^3/\text{s}$

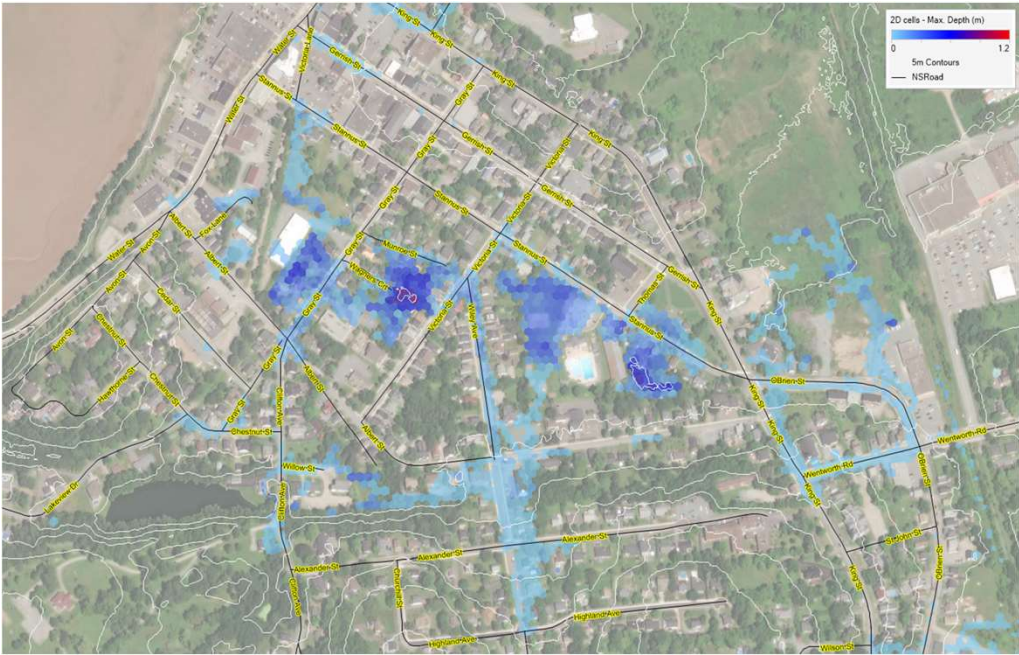
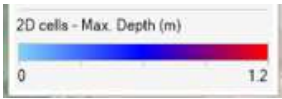
Storage
 600m^3

Force Main
1800mm

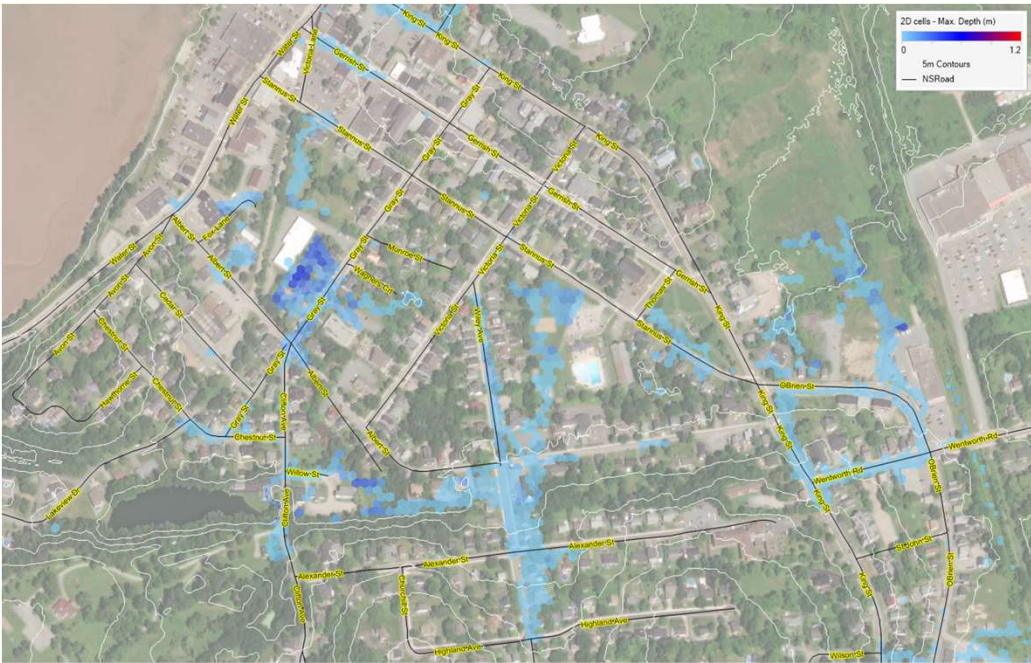
Gravity Pipes
2400x1200 Box



Storage & Pumping on Stannus St

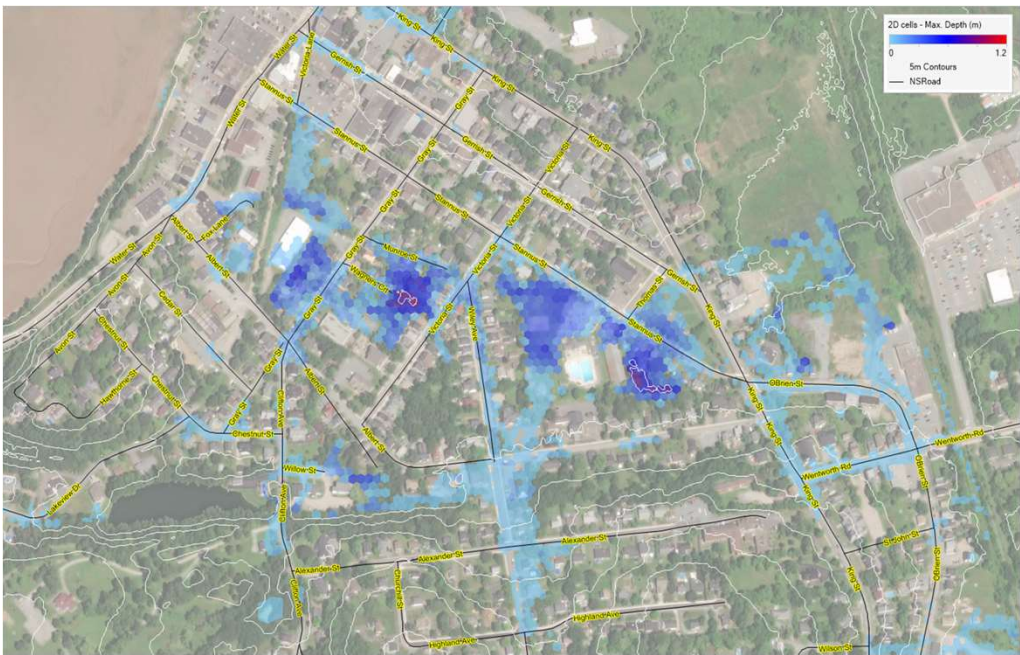
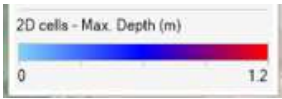


1:5 Existing

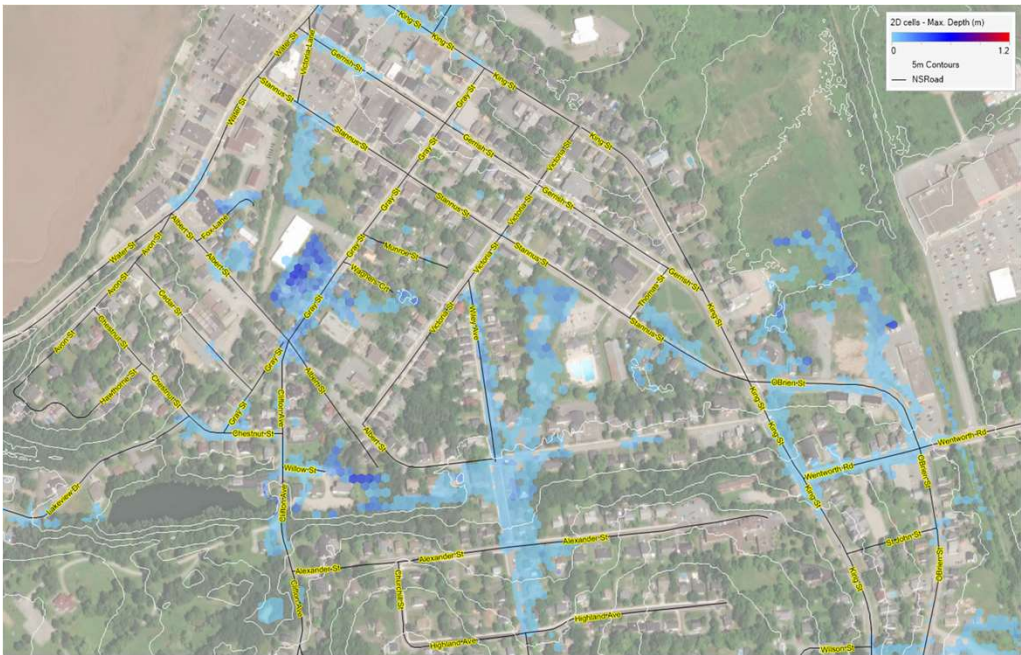


With Upgrades

Storage & Pumping on Stannus St

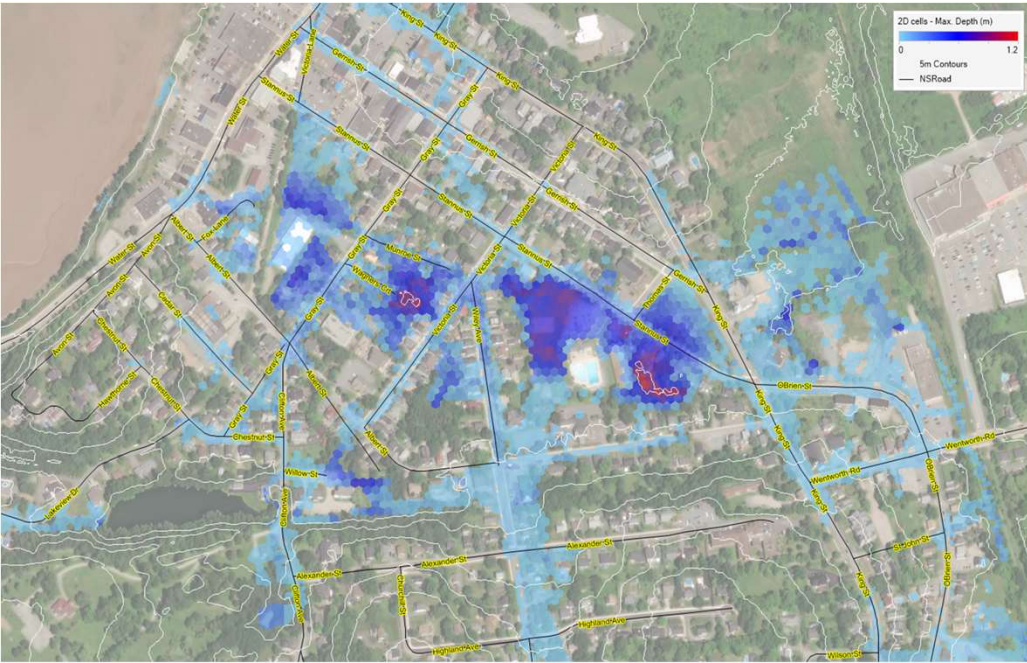


1:10 Existing

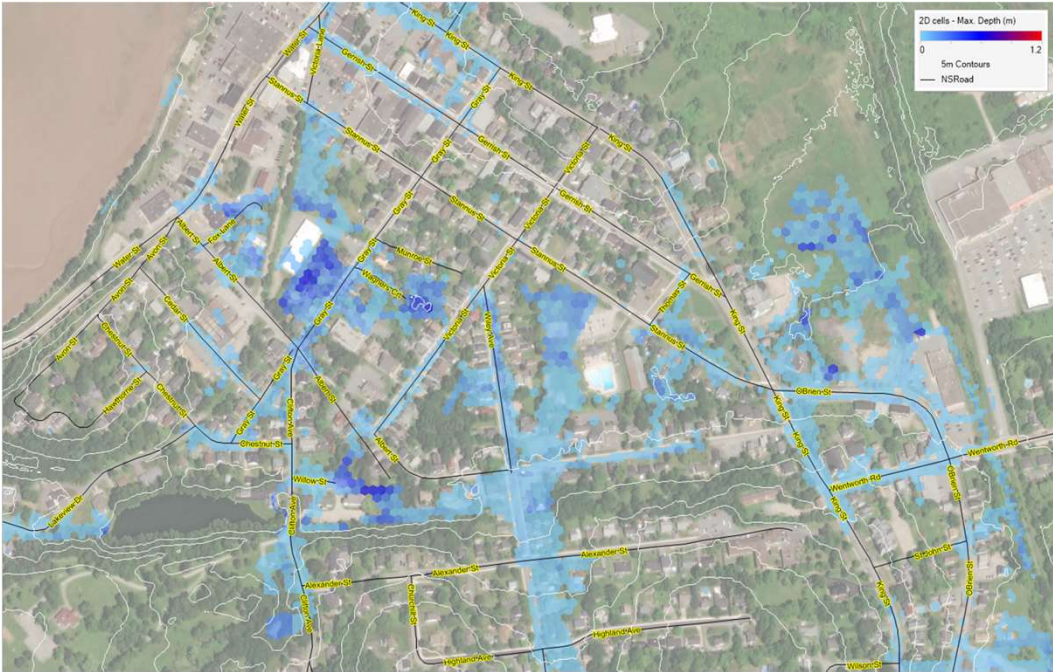


With Upgrades

Storage & Pumping on Stannus St



1:100 Existing

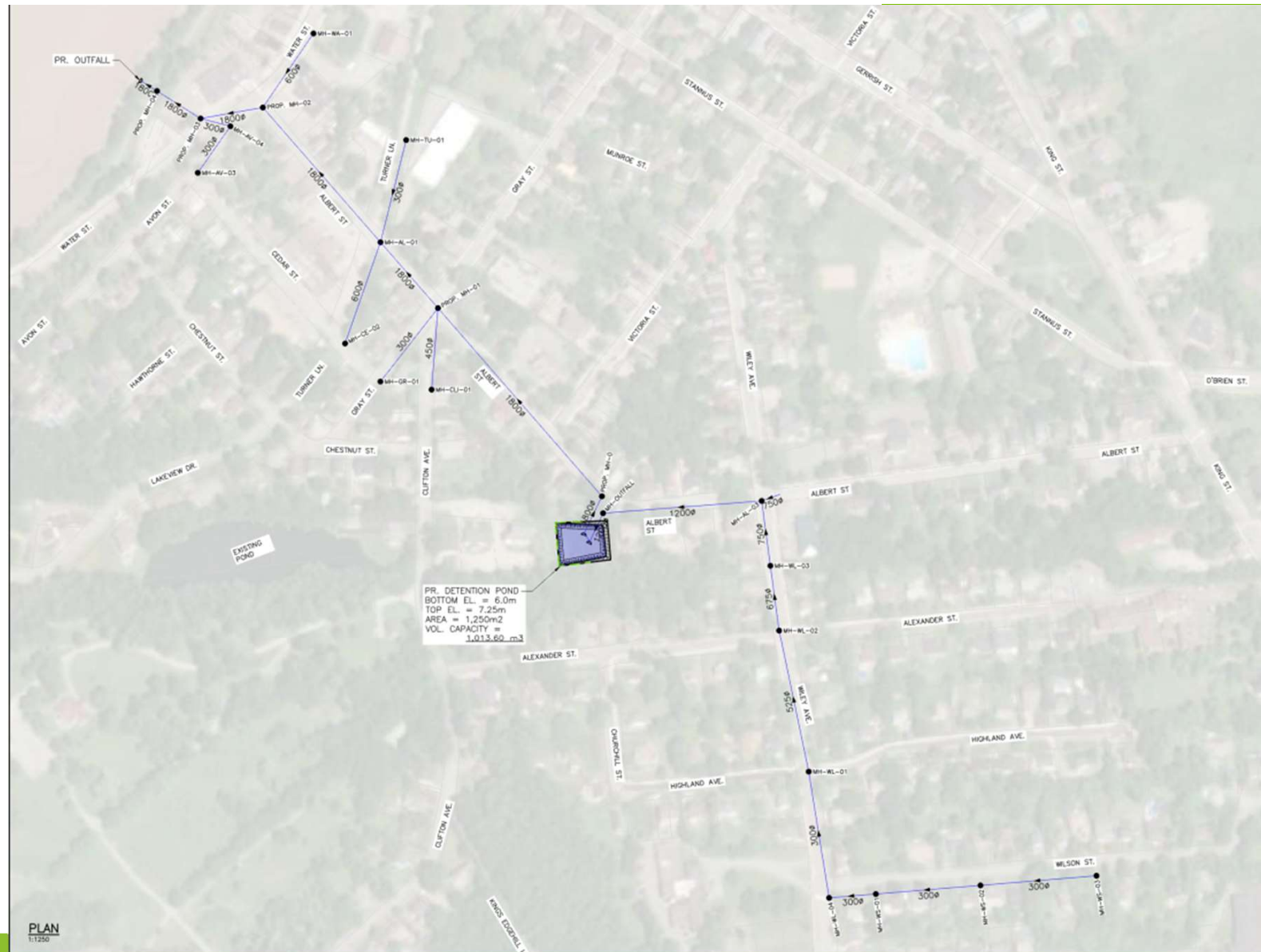


With Upgrades

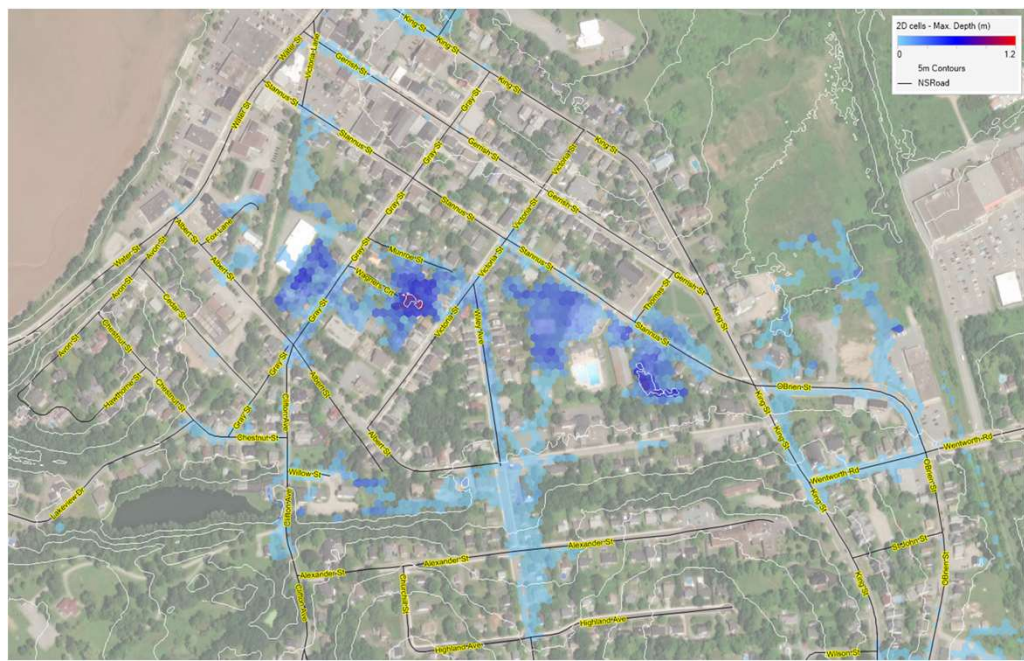
Albert St Diversion

Storage
~1000m³

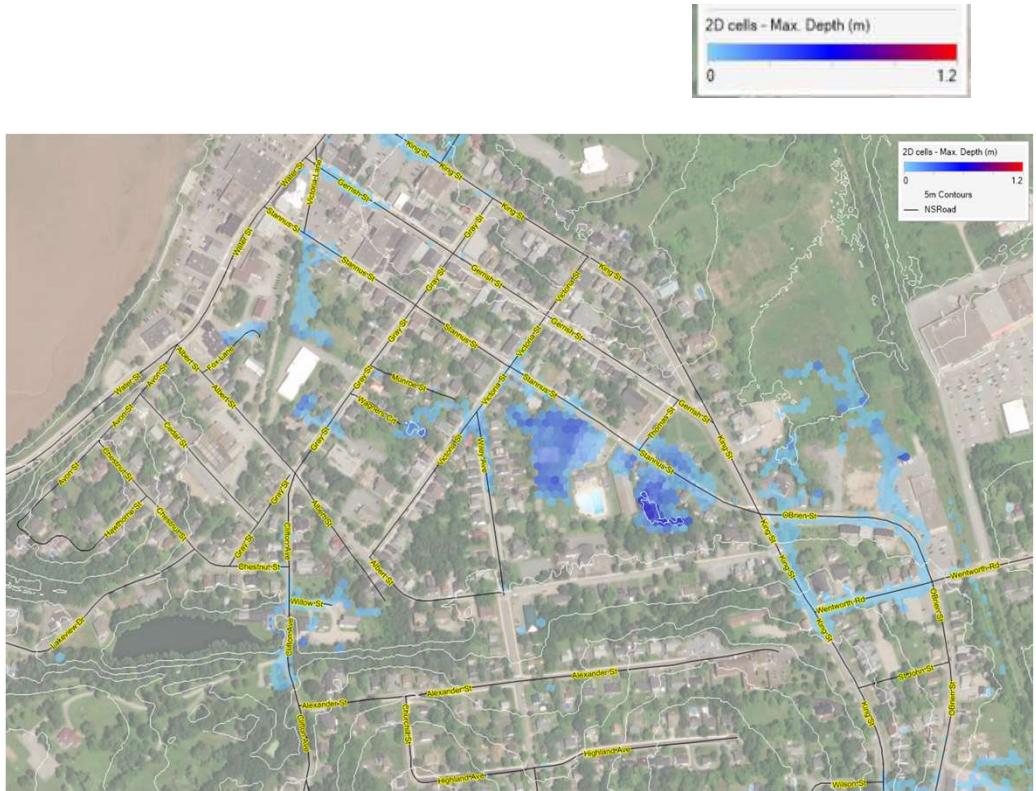
Gravity Pipes
1800mm



Albert St Diversion

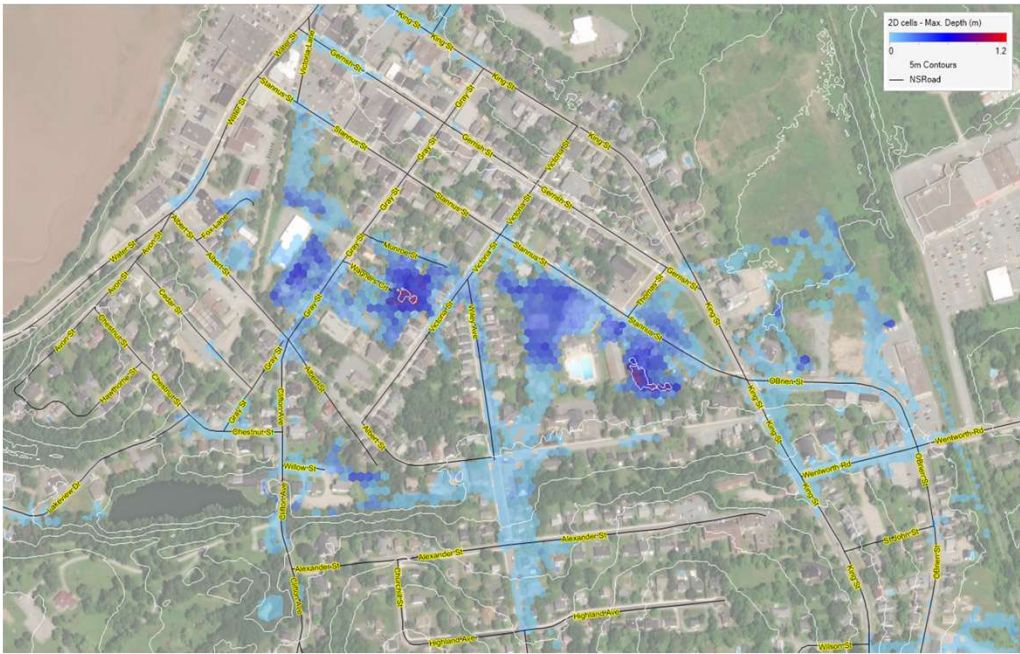


1:5 Existing

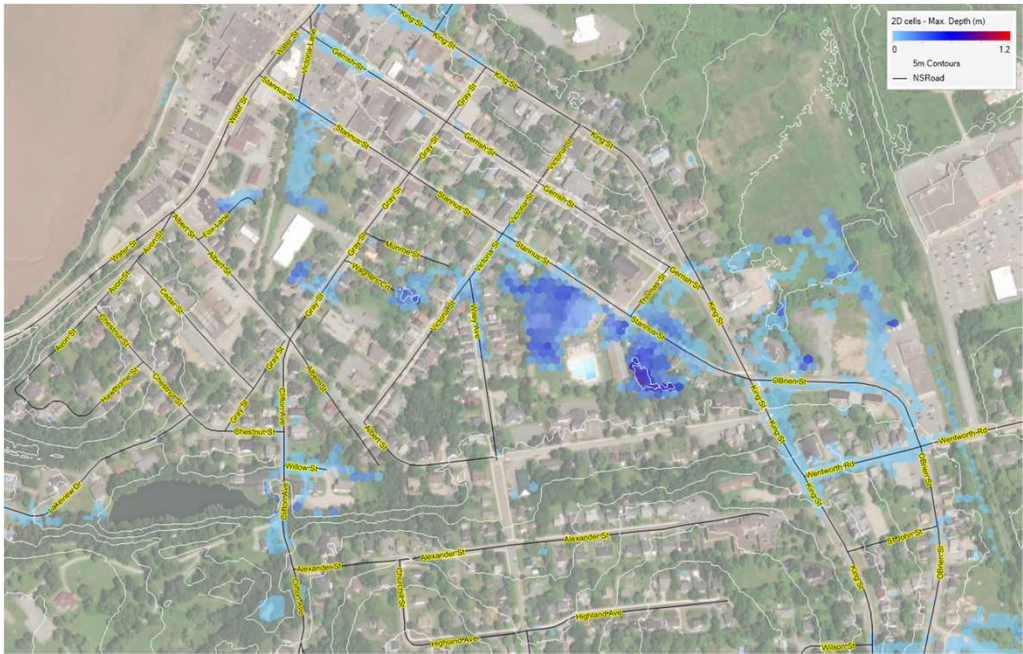


With Upgrades

Albert St Diversion

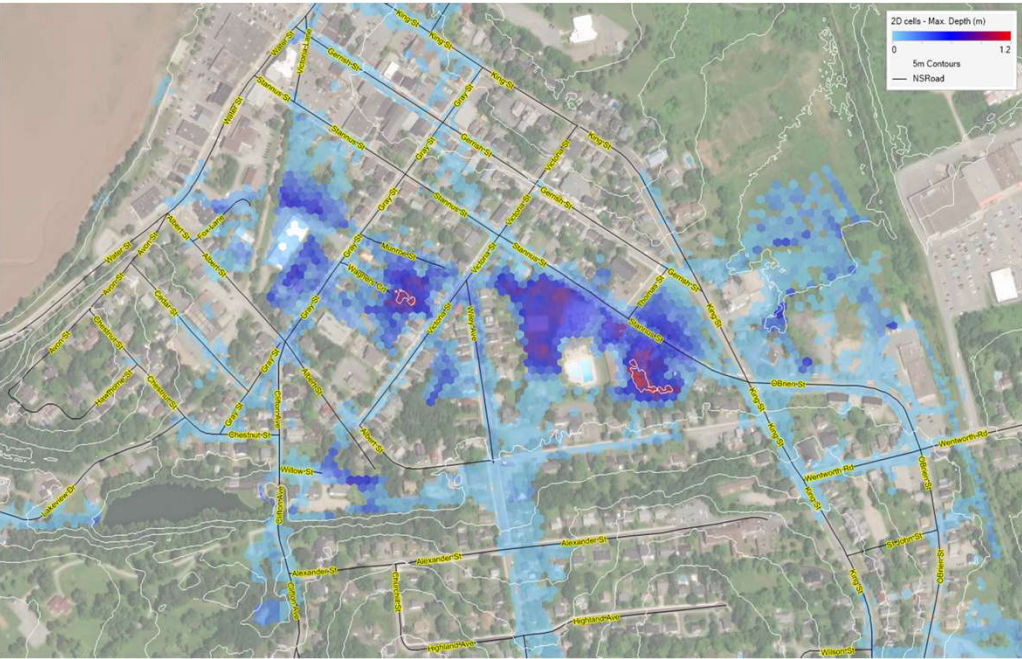


1:10 Existing

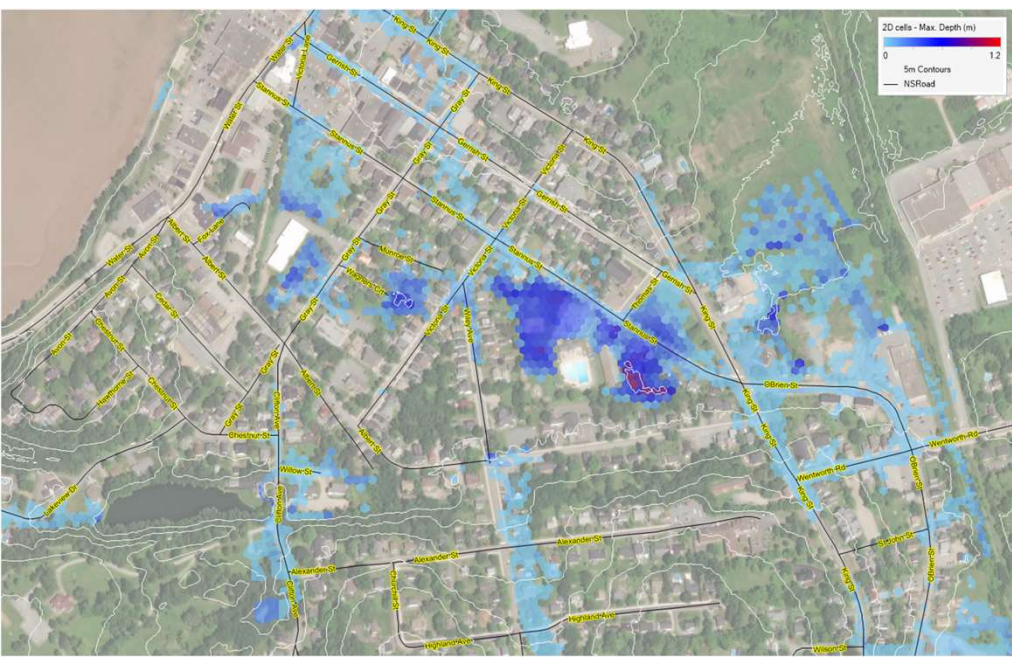


With Upgrades

Albert St Diversion

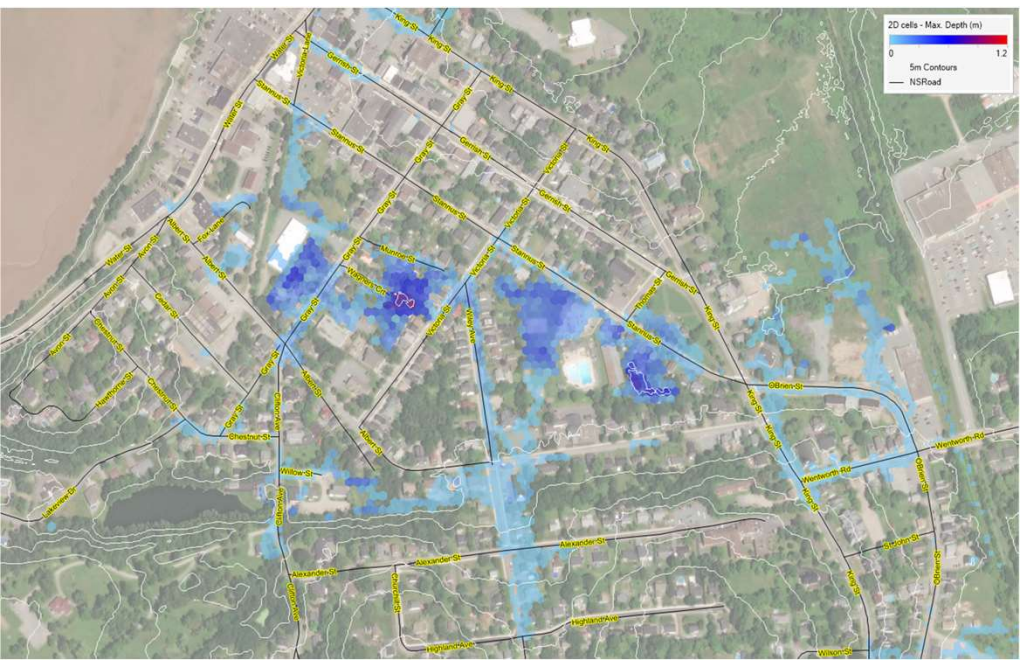


1:100 Existing

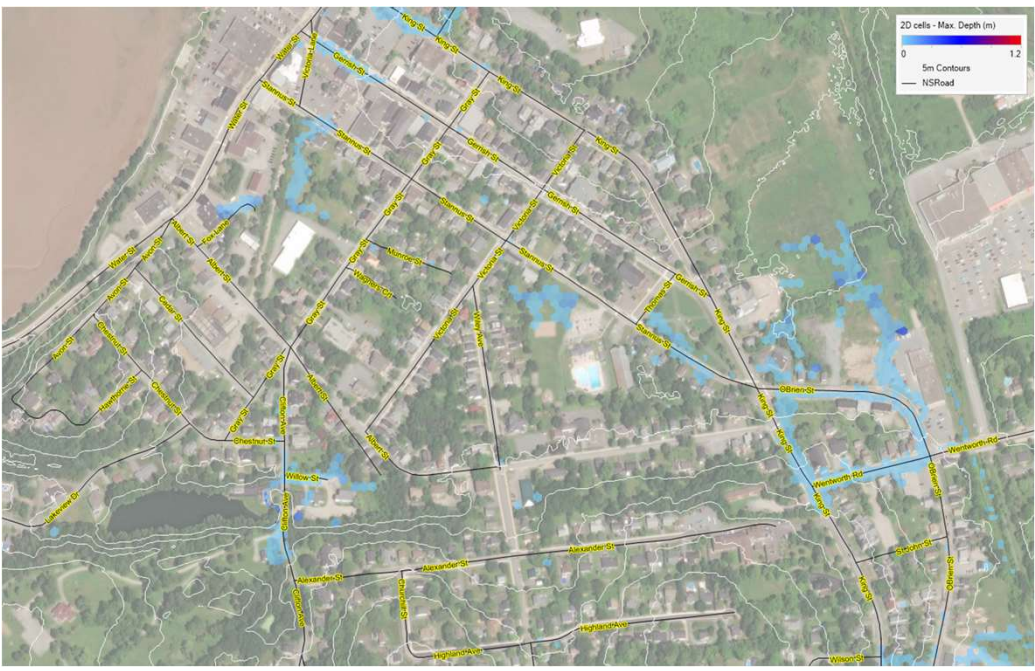


With Upgrades

Stannus St Upgrades and Albert St Diversion

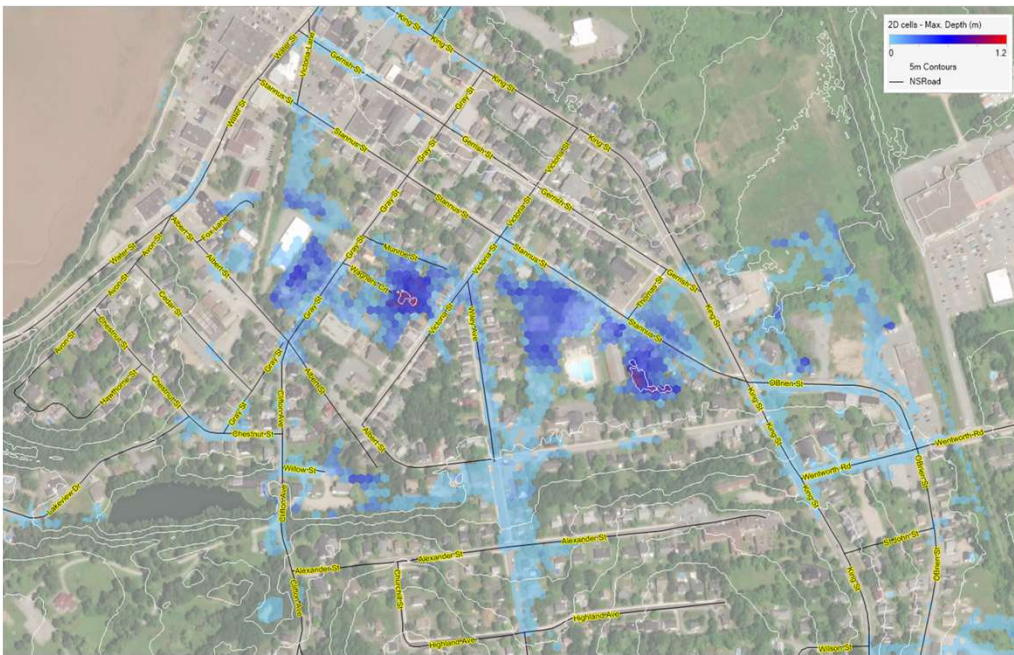


1:5 Existing

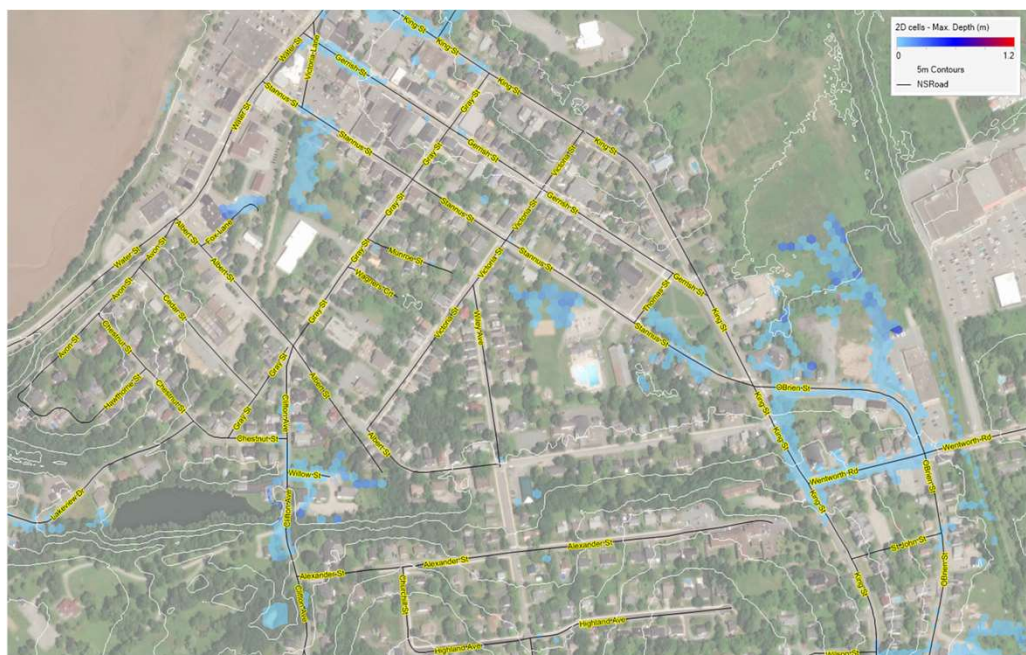


With Upgrades

Stannus St Upgrades and Albert St Diversion

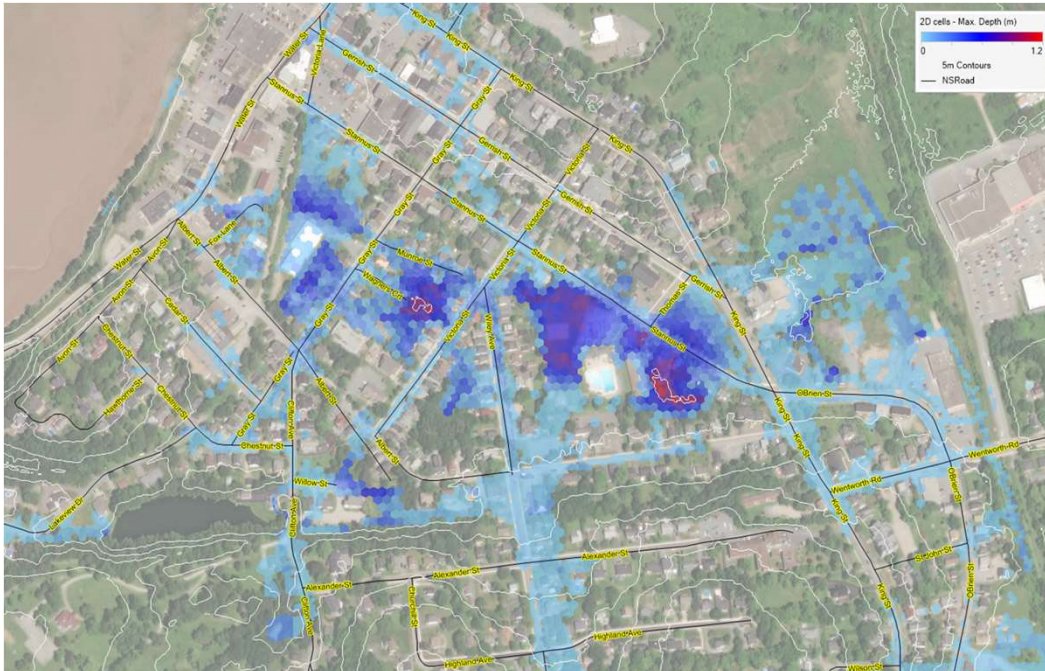


1:10 Existing

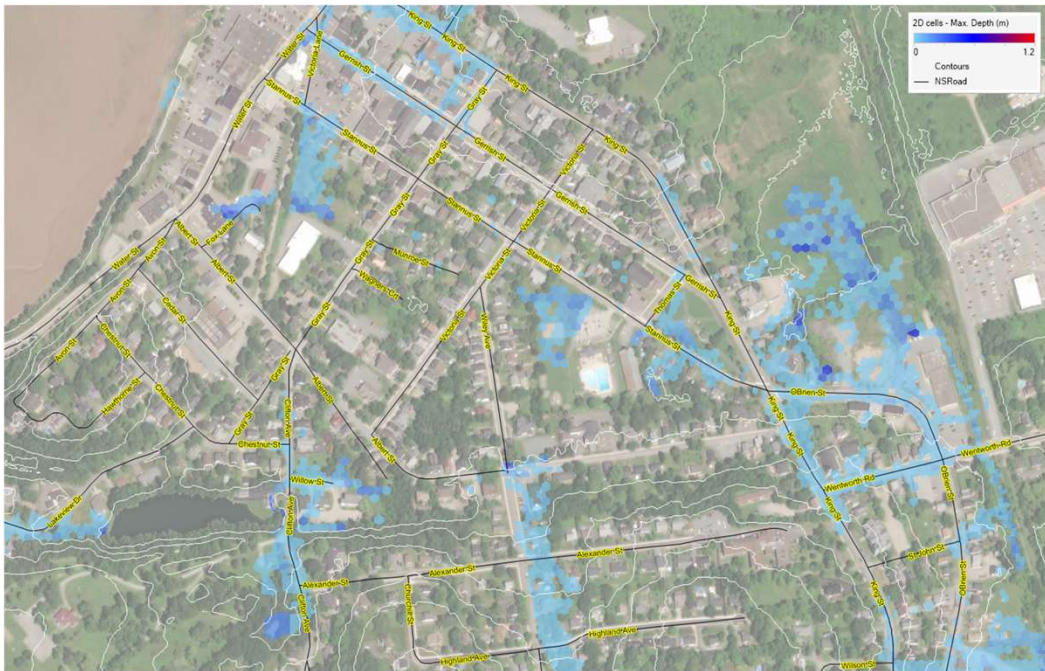


With Upgrades

Stannus St Upgrades and Albert St Diversion

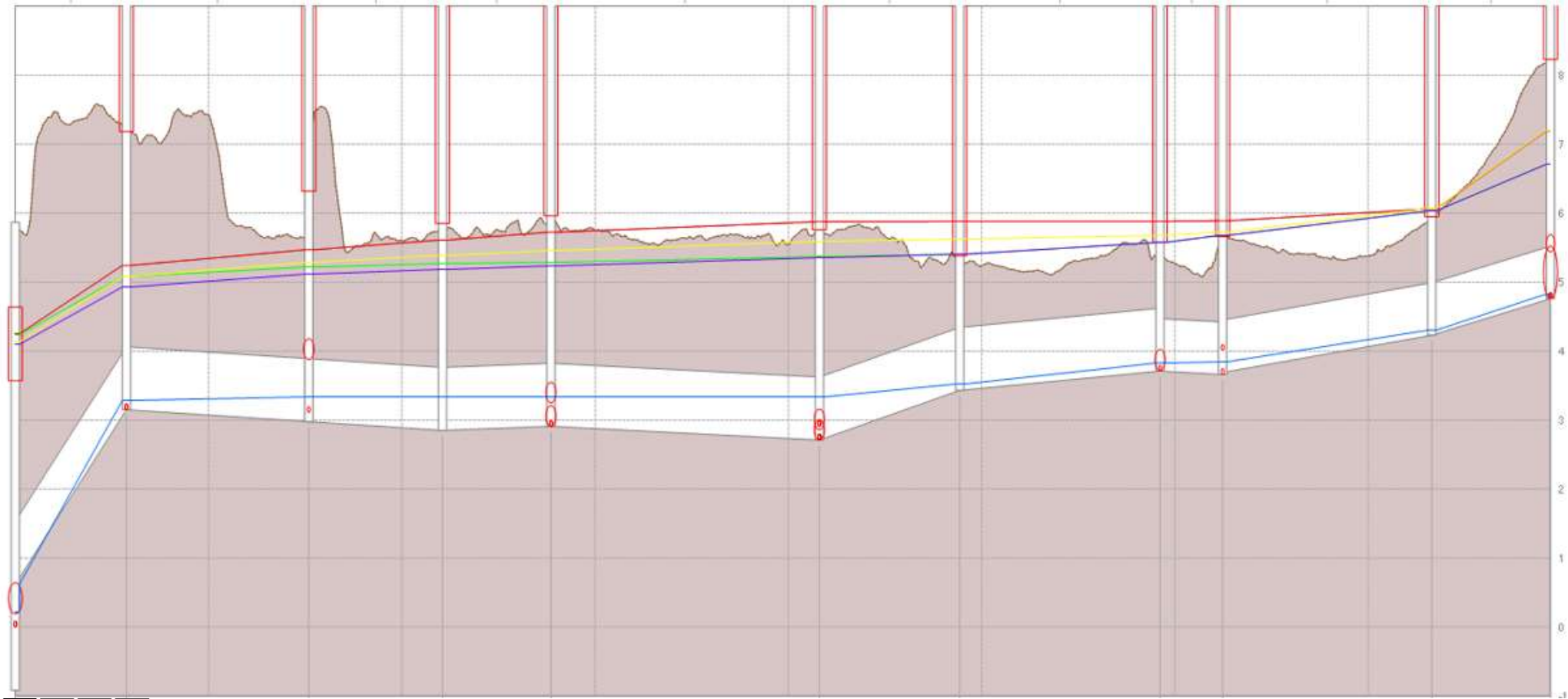


1:100 Existing



With Upgrades

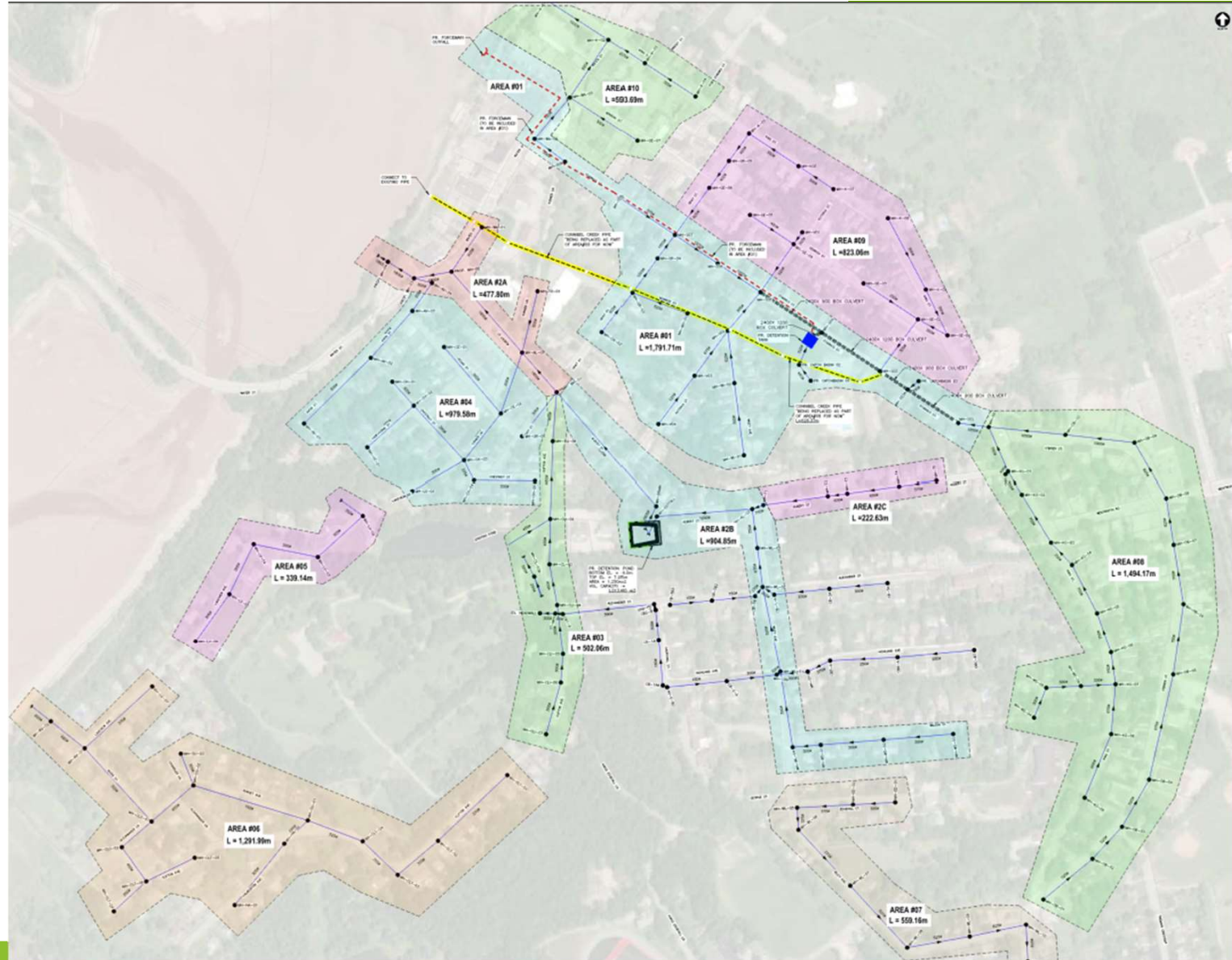
Cunnabel Creek – Fully Separated



Master Plan

Full Sewer Separation

Split into ~10 Phases



Implementation Plan

Need to confirm which area will be constructed first.

The combined diversion at Albert Street and pumping on Stannus Street provide effective relief of surface flooding.

Cunnabel Creel will still be at capacity until more of the existing system is separated and backflow preventors will be needed to prevent sewer backups.

Phasing

Area No.	Length	Unit
Area 1	1,791.71	m
Area 2A	477.81	m
Area 2B	904.85	m
Area 2C	222.63	m
Area 3	502.06	m
Area 4	979.58	m
Area 5	339.14	m
Area 6	1,291.99	m
Area 7	559.15	m
Area 8	1,494.17	m
Area 8.Cunnabel Creek	628.37	m
Area 9	823.06	m
Area 10	593.69	m
Total	10,608.22	m

Area	Name	Cost (\$)
1	Stormwater Pump Station	33,500,000
2	Stannus Street	15,400,000
3	Albert Street to Outfall	5,100,000
4	Wiley Avenue to Albert Street	6,700,000
5	Clifton Avenue	3,300,000
6	Cedar, Avon, Chestnut Street	6,100,000
7	Lake View	2,300,000
8	Sunset Avenue to River Road	16,700,000
9	Wiley Street	3,700,000
10	O'Brian and King Street	9,800,000
11	Land Purchases	300,000
12	Total Opinion of Probable Construction Costs	103,000,000
13	Engineering and Design	12,400,000
14	Total Opinion of Probable Cost	115,400,000



Costs

Area 2C Option

Alternate Price

\$1,500,000

Design Development,
Construction and
Location Factors
Included

OPC is based in 2025
dollars – escalation is
not included at this
time.

Next Steps

Confirm which phase is to be initiated first

Complete phasing plan

Initiate pre-design to confirm options

Start detail design of initial phases