

Stormwater Management Master Plan for Township of Centre Wellington (Fergus and Elora) - Public Information Centre #2 (February 21 - March 7, 2024)

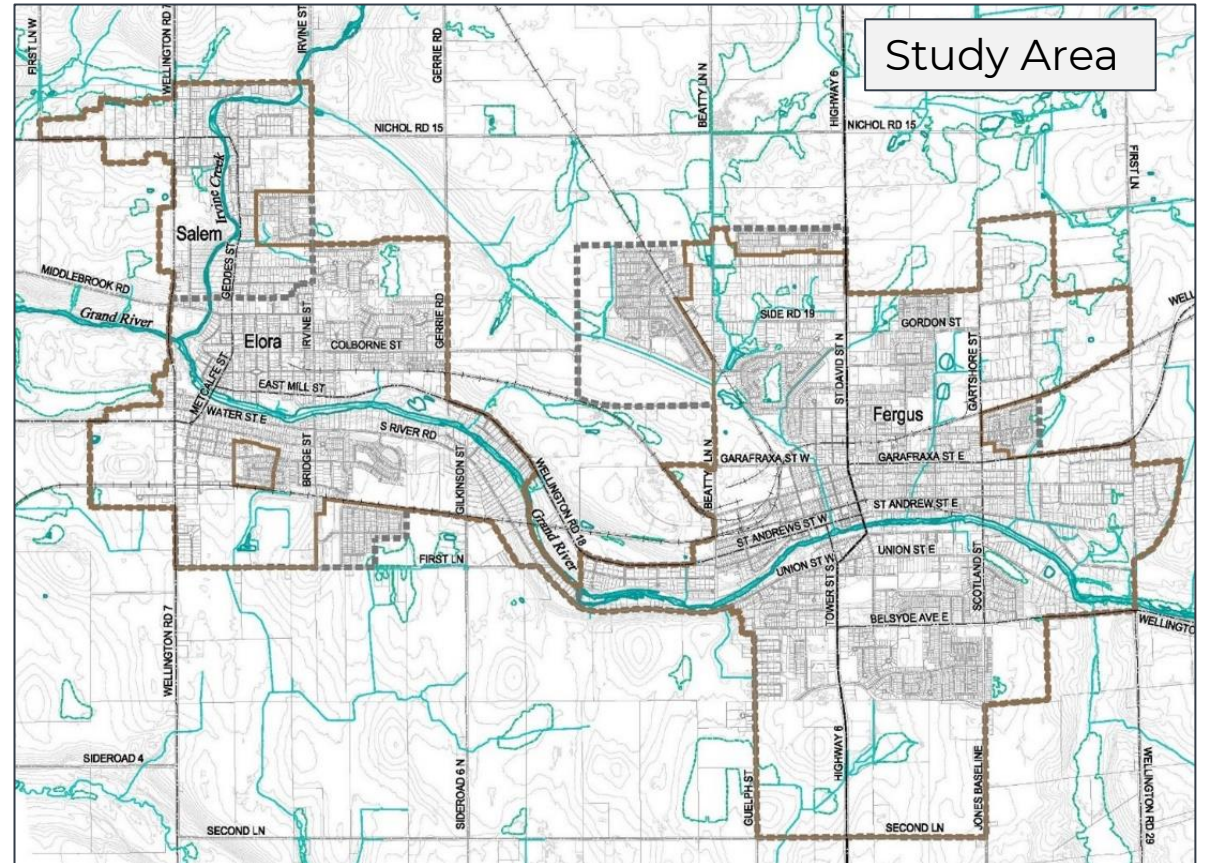
The Township is undertaking its first Stormwater Management Master Plan. We invite you to inform the development of this Master Plan by providing your feedback.

Stormwater refers to rain and snowmelt that either seeps into the ground or runs off the land into storm sewers, streams, and lakes.

The Stormwater Management Plan will:

- Assess the effectiveness of existing stormwater drainage systems.
- Identify and evaluate alternative solutions for these areas to improve levels of service.
- Determine long-term cost implications for these works and potential implementation mechanisms.

Innovative approaches such as Low Impact Development (LID) and green infrastructure will also be explored within the Township right-of-way with emphasis on water quality.



Purpose of this Public Information Centre

This event is being held to present the **Preferred Stormwater Management Strategy for the Township (communities of Fergus and Elora)**. The Preferred Stormwater Management Strategy is intended to most effectively manage stormwater flow characteristics, with a focus on conveyance.

The following information is being shared as part of this event:

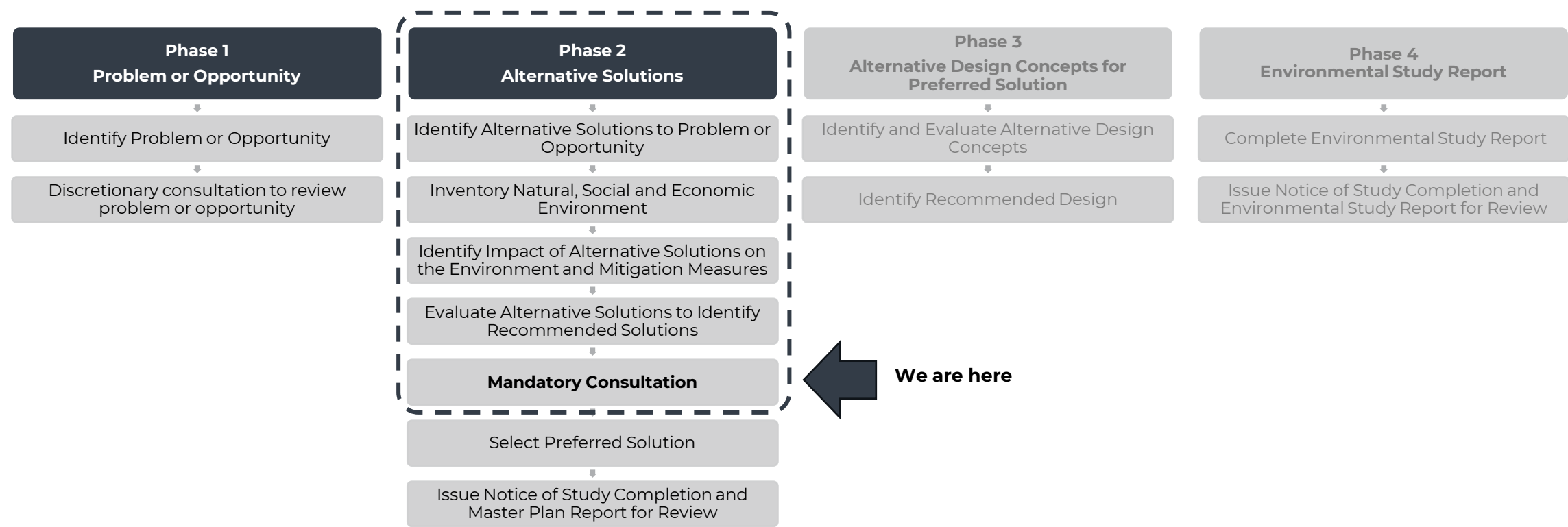
- Master Plan Study Process
- Consultation Program
- Summary of Findings of Mapping Data Analysis
- Summary of Findings of Hydrologic and Hydraulic Modelling
- Alternative Assessment and Preferred Approach to Conveyance
- Storm Sewer Upgrade Analysis
- Recommended Storm Sewer Upgrades and Financing Strategy
- Other Preferred Alternatives and Measures
- Next Steps and Project Schedule



We invite your feedback on the Preferred Stormwater Management Strategy.

Master Plan Study Process

This Master Plan study is following the requirements of Phases 1 & 2 of the Municipal Class Environmental Assessment (MCEA) process in accordance with **Approach #1** of the Master Plan Process. This study will recommend a group stormwater management improvement projects. This study will address the environmental assessment requirements for small scale projects, such as, storm sewer upgrades. If the Master Plan recommends projects that would need to satisfy the requirements of Schedule ‘B’ or ‘C’ Municipal Class EAs, then future project specific Municipal Class EAs would be required.



Consultation Program

Consultation is a key aspect of this study. Following graphic summarizes key planned consultation activities.



Public: Two Public Information Centres are planned to seek feedback from the public and interested stakeholders. This is second of the two events.



Indigenous Nations: Project notices are sent to the Indigenous Nations to initiate consultation and identify any interests / concerns about the project.



Government Agencies: Meetings are being held with the Technical Advisory Committee comprised of staff from Township and other government agencies.



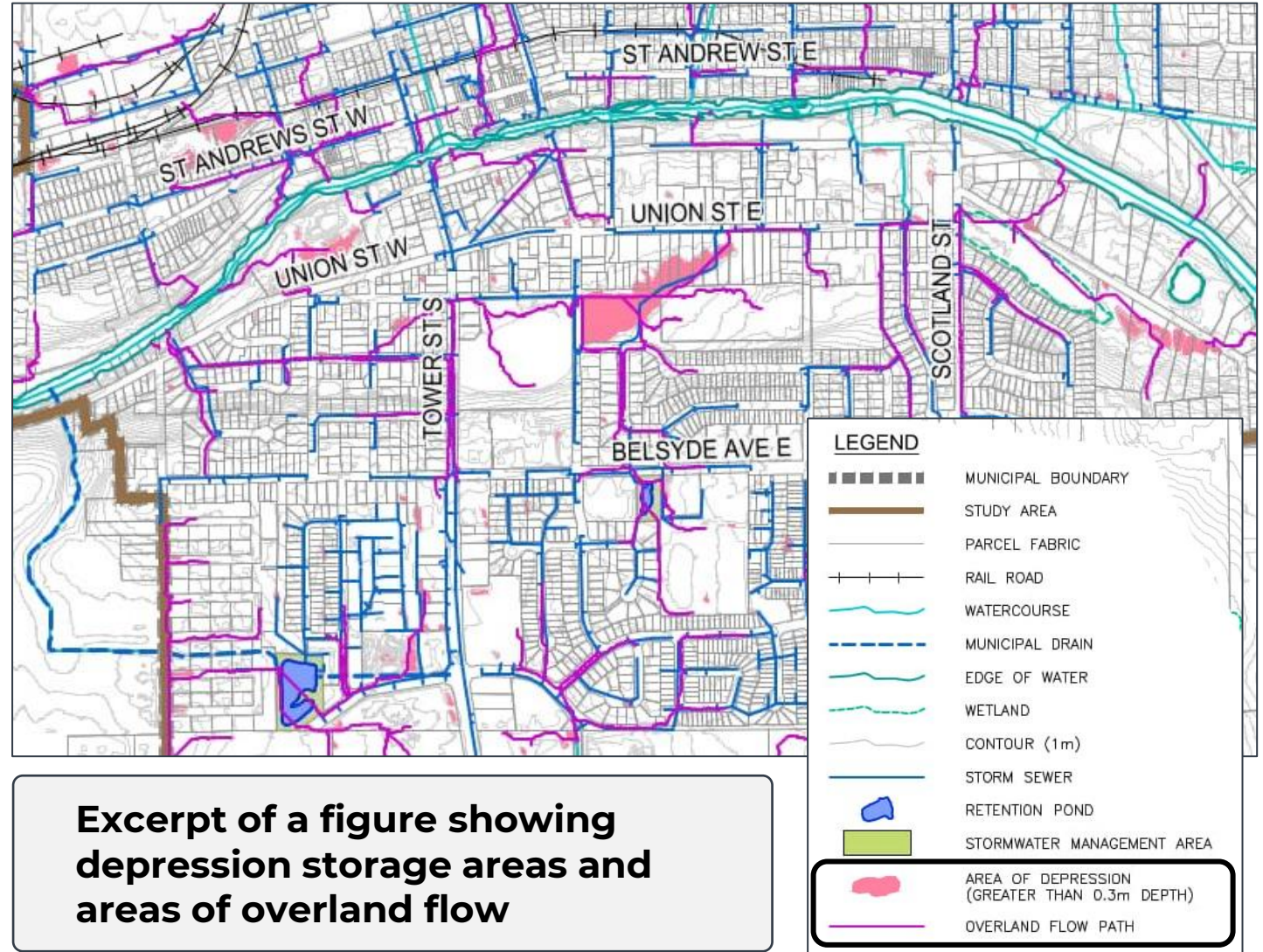
All project reports will be made available for review by the public, interested stakeholders, Indigenous Nations, and Government Agencies.



Project Website: <https://www.connectcw.ca/swm-master-plan>

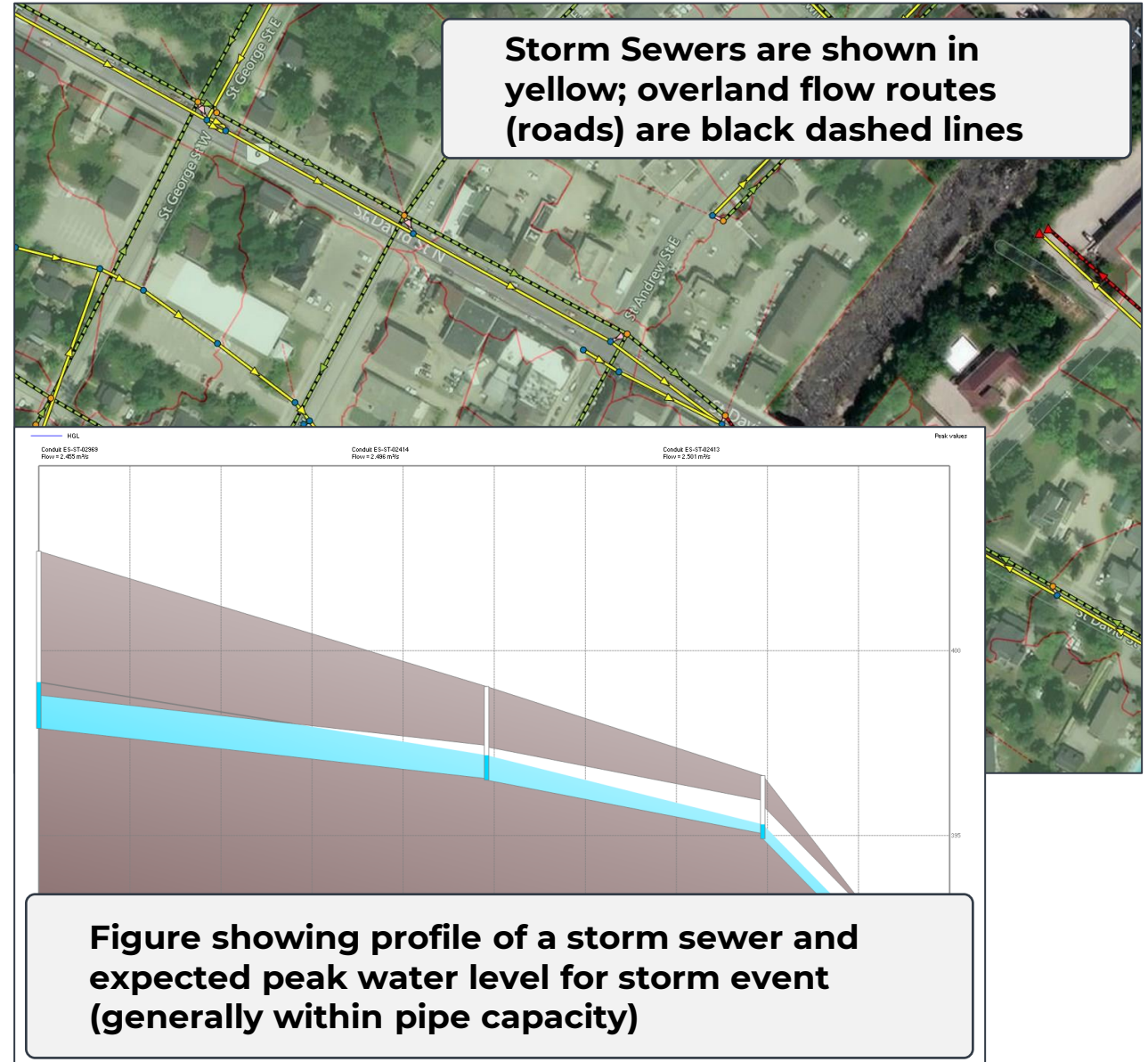
Summary of Findings – Mapping Data Analysis

- High-resolution topographic mapping data (LiDAR) is available for Centre Wellington
- This data was analyzed to identify areas where water might flow over the land during heavy rain. There are usually two types of these areas:
 - Depression storage areas (areas where water collects and doesn't have a direct way to leave)
 - Areas with larger accumulations of overland flow (areas where water tends collect and move over the land)
- Overall, the results indicate most areas are well graded, meaning they guide water towards rivers and streams. But, there are some paths where water flows across private lands. These paths might need a closer look.



Hydrologic and Hydraulic Modelling Development

- A computer model was also developed to assess:
 - How much water might flow into Township's drainage system during different storm events (like those that happen once every 5 years, and those that happen once every 100 years); and,
 - How well our storm sewers and roads can handle these water flows during these storm events
- The model was "validated" to confirm that it has generated reasonable results by comparing it with:
 - Data from 2022 field monitoring program; and,
 - Recent design studies for the Township
- Following completion of the validation exercise, the model was used to check how the drainage system is performing. This helped us inform the preferred solution, including priority locations for drainage system improvements.



Summary of Findings – Existing Conditions Modelling Results

Storm Sewer System (5-Year Storm Event)

- Overall results indicate that 43% of storm sewers can handle the water flow as per the current standards
- The remaining 57% would require conveyance capacity increase of some kind (varying degrees) to meet standards
- The risk of storm sewer overflowing is low in many cases. In these cases, storm sewers:
 - Are not expected to overflow enough to affect drainage on the surface.
 - May be deep enough below homes, or they might not be directly connected to them (sump pumps rather than gravity drains).
- There are minimal areas of drainage issues related to storm sewers noted by the public and Township staff

Overland Flow System (100-Year Storm Event)

- Results indicate minimal issues with drainage over the land
- Most areas have consistent drainage towards the Grand River
- There are very few low spots where water might collect.
- Findings match with what we found using GIS-based analysis.
- Stormwater Management Facilities generally indicate adequate capacity to manage the incoming water flow.

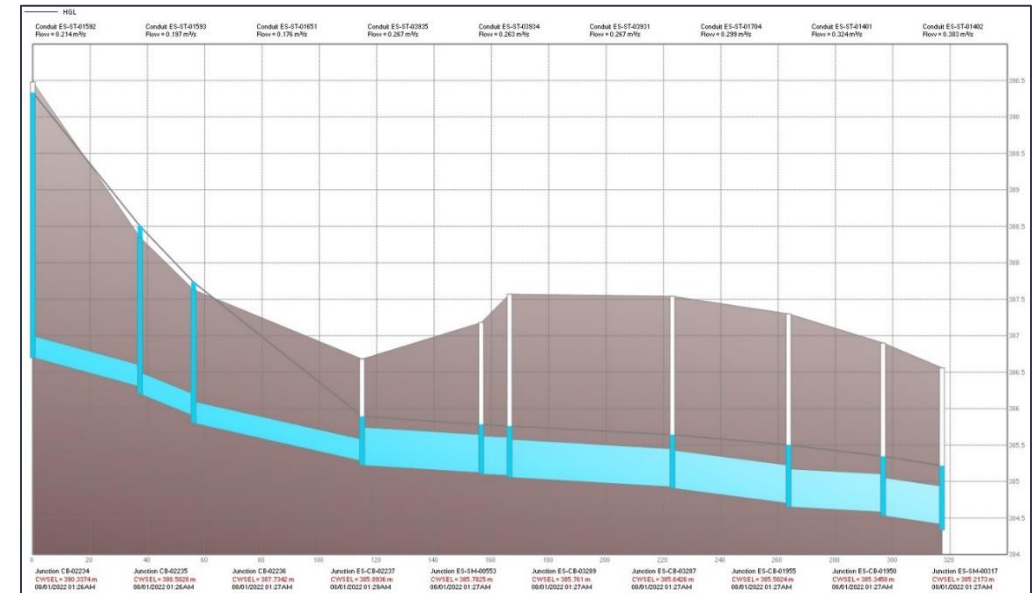
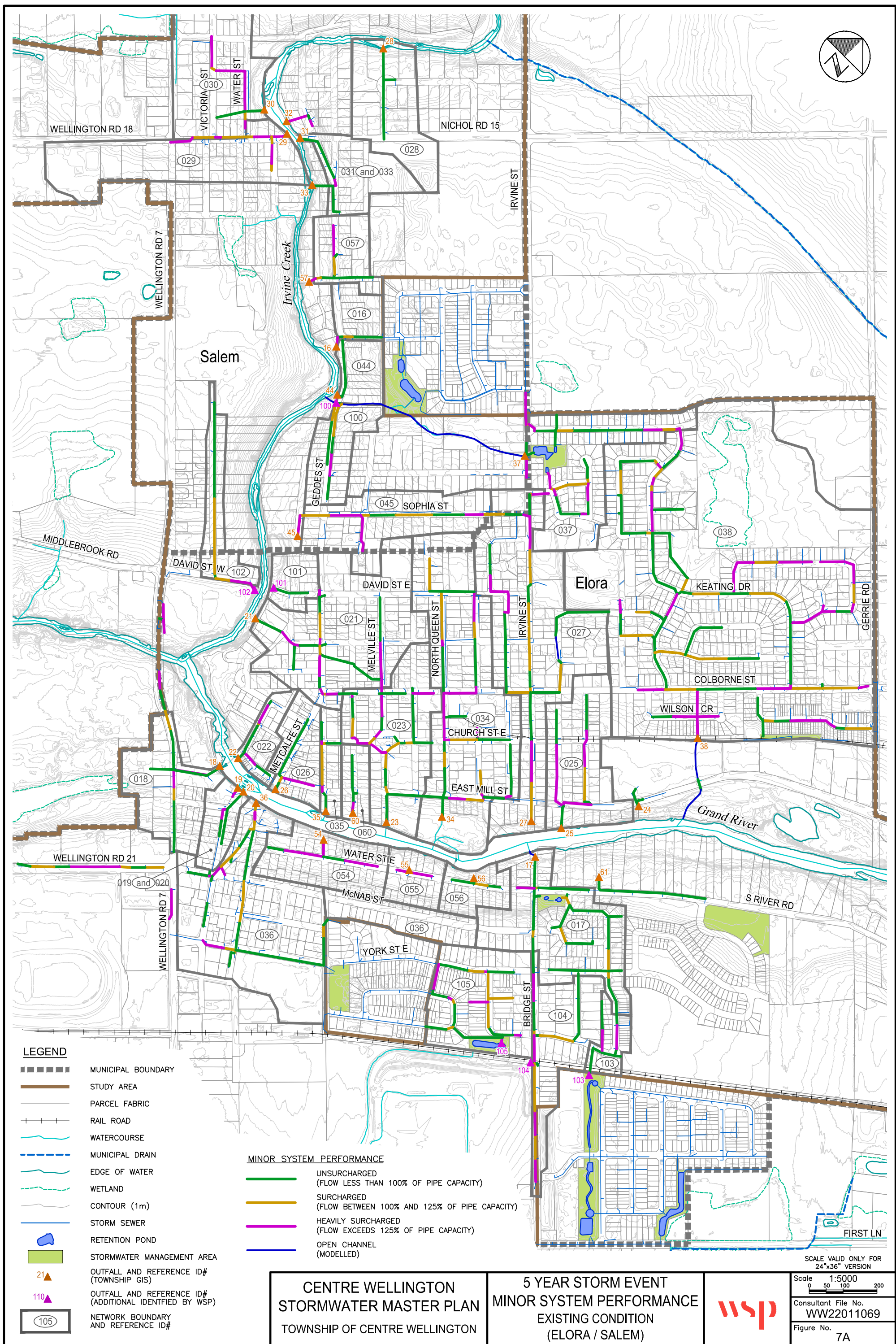
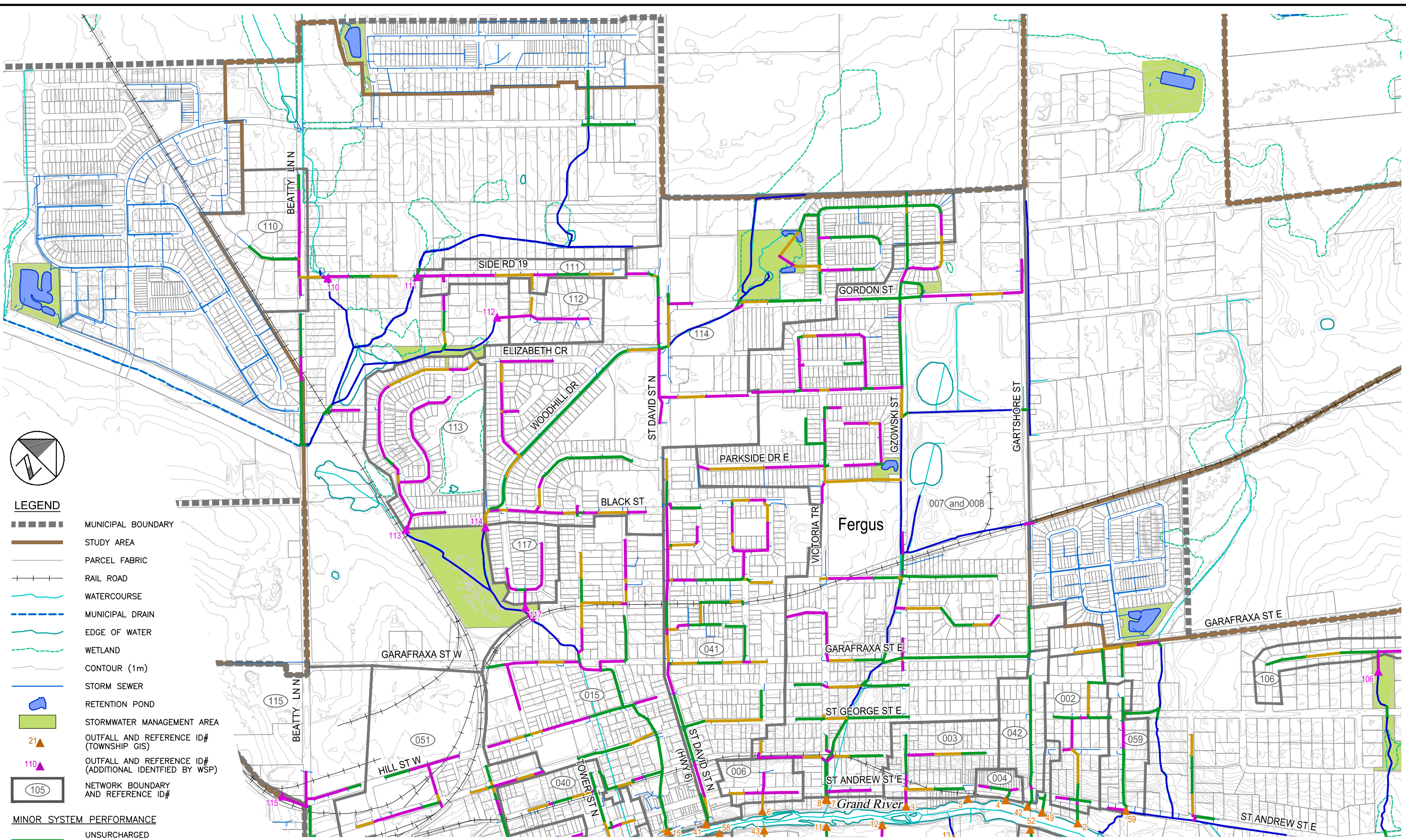


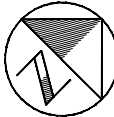
Figure showing profile of a storm sewer and expected peak water level for storm event. Results indicate minor surcharging in lower section, greater surcharging in upper section.

The following figures show the performance of existing storm sewers during 5-year and 100-year storm events



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LEGEND

- MUNICIPAL BOUNDARY
- STUDY AREA
- PARCEL FABRIC
- RAIL ROAD
- WATERCOURSE
- MUNICIPAL DRAIN
- EDGE OF WATER
- WETLAND
- CONTOUR (1m)
- STORM SEWER
- RETENTION POND
- STORMWATER MANAGEMENT AREA
- OUTFALL AND REFERENCE ID# (TOWNSHIP GIS)
- OUTFALL AND REFERENCE ID# (ADDITIONAL IDENTIFIED BY WSP)
- NETWORK BOUNDARY AND REFERENCE ID#

MINOR SYSTEM PERFORMANCE

- UNSURCHARGED (FLOW LESS THAN 100% OF PIPE CAPACITY)
- SURCHARGED (FLOW BETWEEN 100% AND 125% OF PIPE CAPACITY)
- HEAVILY SURCHARGED (FLOW EXCEEDS 125% OF PIPE CAPACITY)
- OPEN CHANNEL (MODELLED)

CENTRE WELLINGTON
STORMWATER MASTER PLAN
TOWNSHIP OF CENTRE WELLINGTON

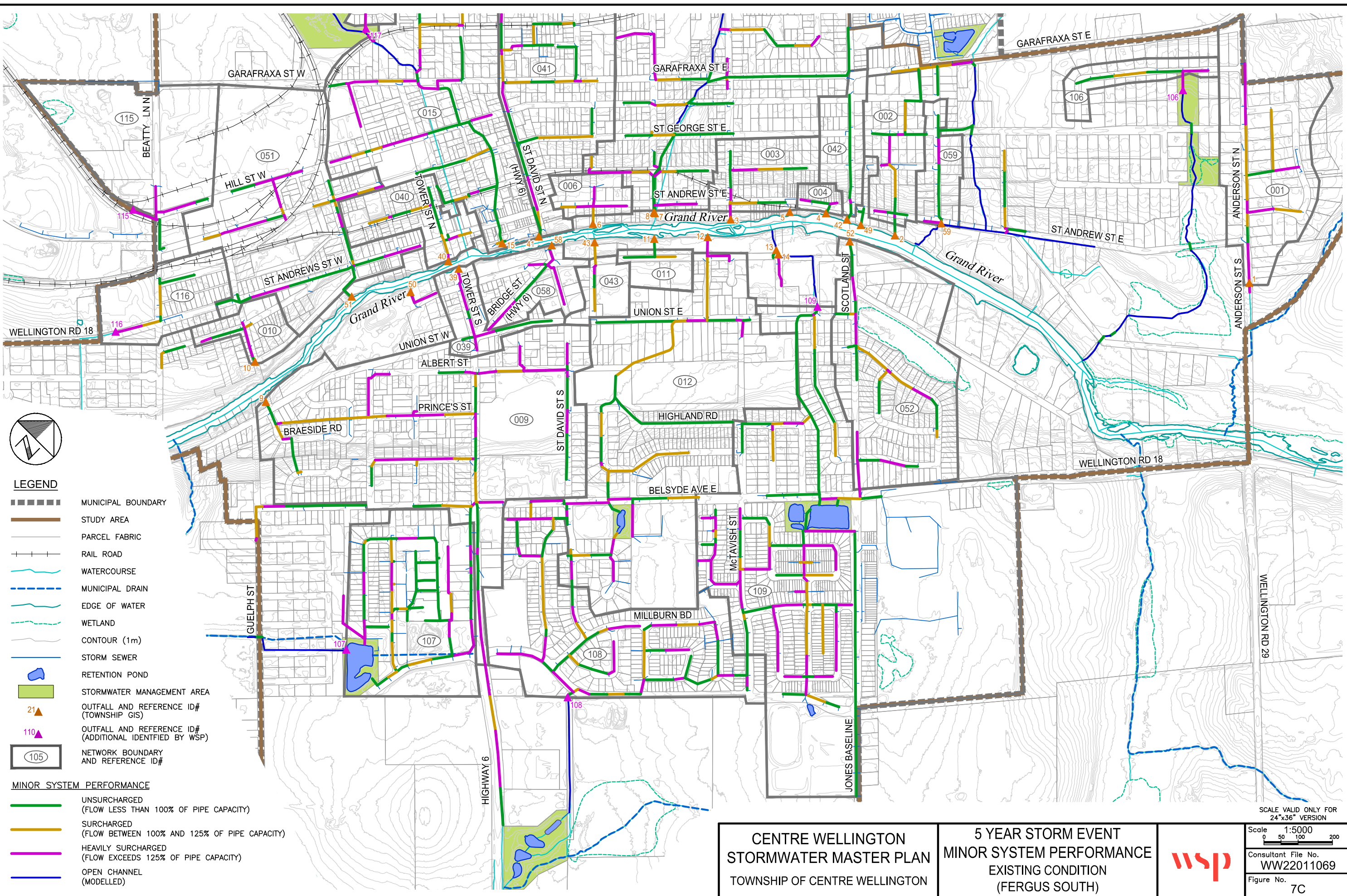
5 YEAR STORM EVENT
MINOR SYSTEM PERFORMANCE
EXISTING CONDITION
(FERGUS NORTH)



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LEGEND

	MUNICIPAL BOUNDARY
	STUDY AREA
	PARCEL FABRIC
	RAIL ROAD
	WATERCOURSE
	MUNICIPAL DRAIN
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	OPEN CHANNEL (MODELLED)

CENTRE WELLINGTON
STORMWATER MASTER PLAN
TOWNSHIP OF CENTRE WELLINGTON

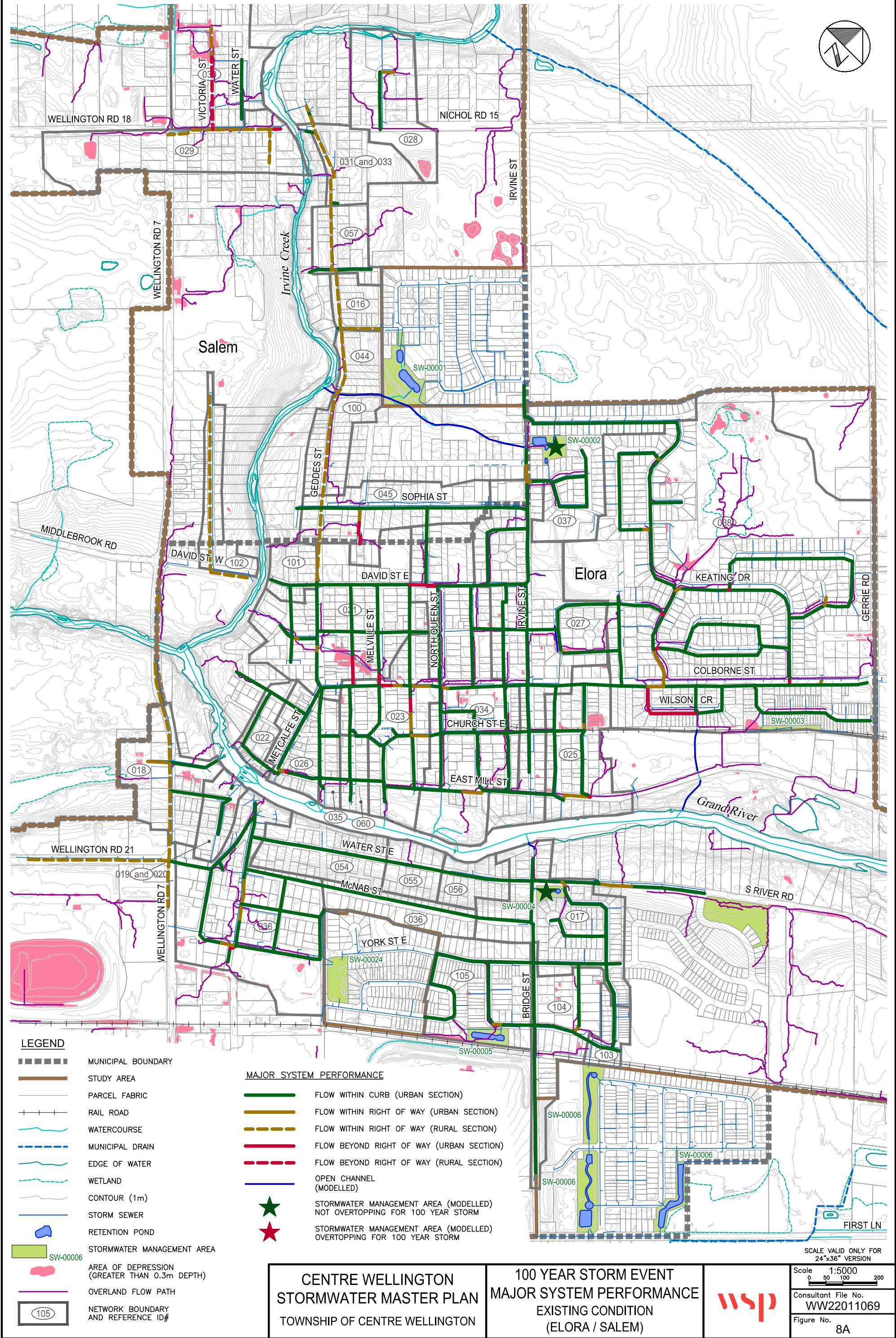
5 YEAR STORM EVENT
MINOR SYSTEM PERFORMANCE
EXISTING CONDITION
(FERGUS SOUTH)



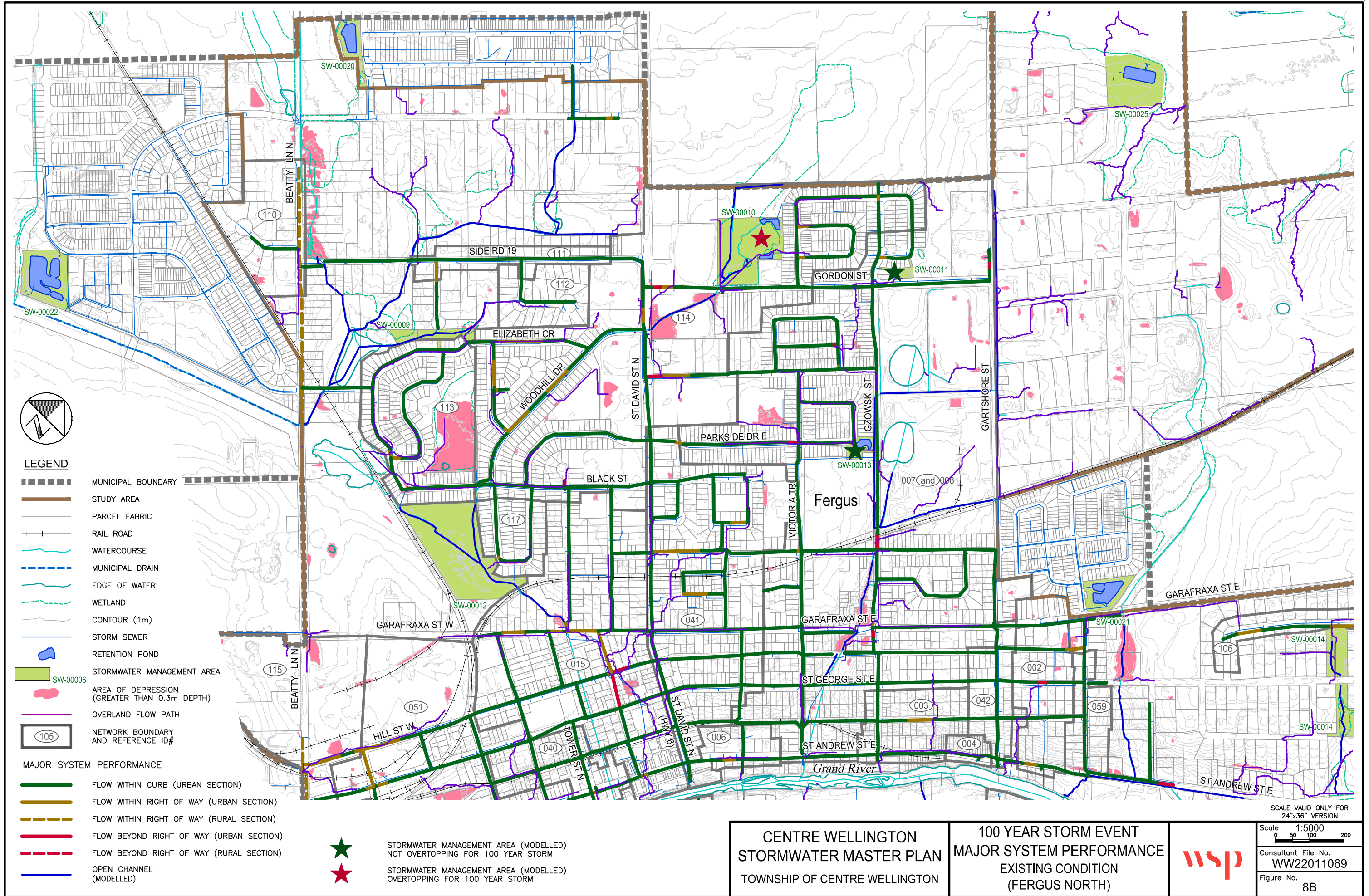
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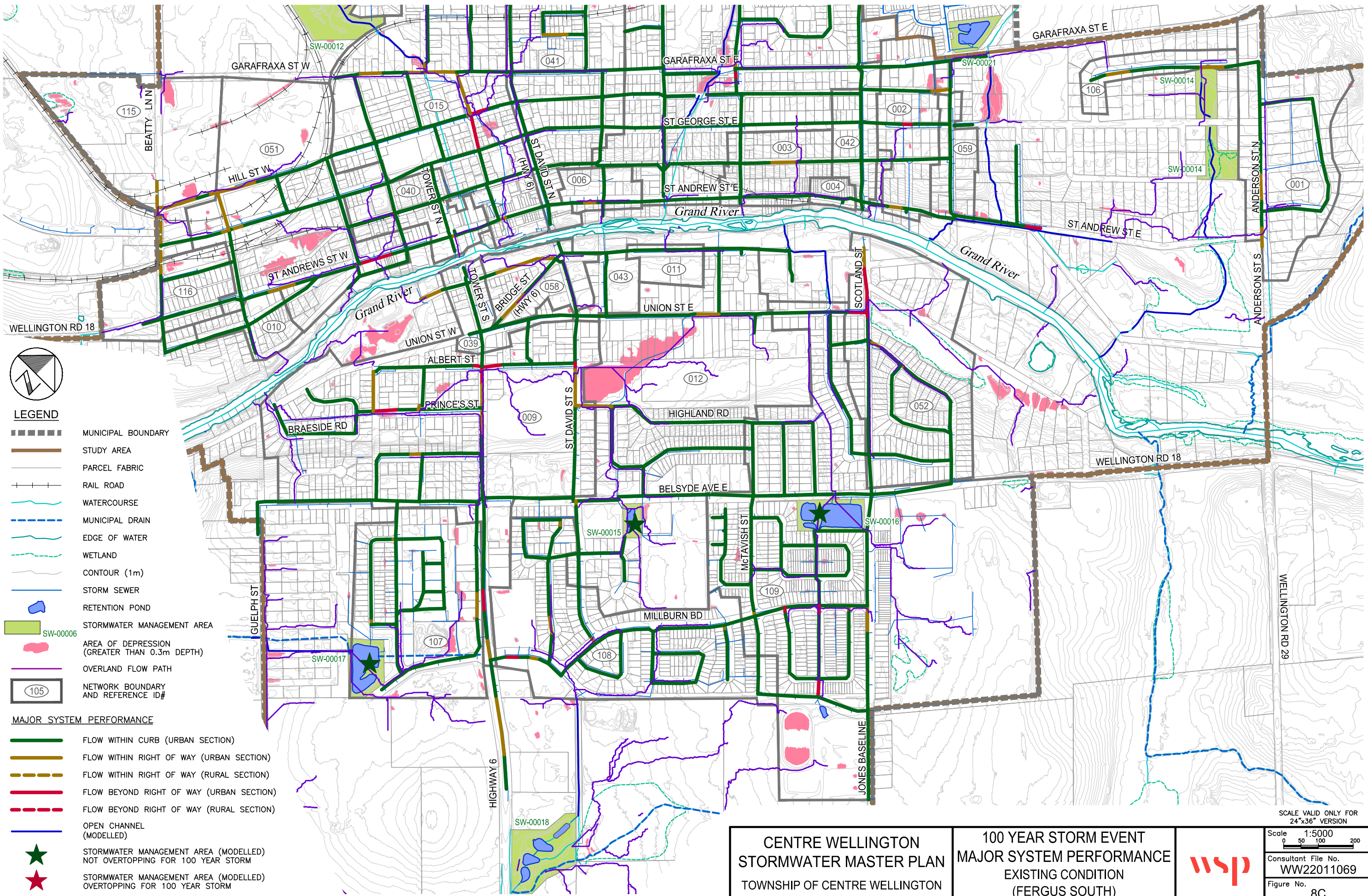
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CENTRE WELLINGTON
STORMWATER MASTER PLAN
TOWNSHIP OF CENTRE WELLINGTON

100 YEAR STORM EVENT
MAJOR SYSTEM PERFORMANCE
EXISTING CONDITION
(FERGUS SOUTH)



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Alternative Assessment and Preferred Approach to Conveyance

Based on the preceding, there are identified storm sewer deficiencies. Potential alternatives include:

- a) **Do Nothing** – do not undertake any planned storm sewer upgrade
- b) **Upgrade to meet Township Standards** – Improving system so it can handle the amount of water from a storm that only happens once **every 5 years**.
- c) **Upgrade to a higher standard** – upgrading system so it can handle even the amount of water from a big storm that only happens once **every 100 years**.

Options have been evaluated as per criteria below (negative, neutral or positive)

- **Functionality** – ability to address the identified concern
- **Social Environment** – community\neighbourhood impact of construction and long-term safety, impact to property (public and private)
- **Natural Environment** – impacts to natural environment (terrestrial and aquatic) and climate change resiliency
- **Economic Environment** – initial design and construction costs and longer-term operation and maintenance costs

Alternative	Functionality	Social Environment	Natural Environment	Economic Environment	Overall Ranking
Do Nothing					 (Not Preferred)
Upgrade to 5-Year					 (Preferred)
Upgrade to 100-Year					 (Not Preferred)

Storm Sewer Upgrade Analysis - Methodology



Based on the preceding, the preferred approach is to design all storm sewers to meet current Township criteria (conveyance of 1 in 5-year storm event without surcharging)

The modelling has helped determine expected storm sewer upgrades (increased pipe sizes) to achieve Township standard criteria

The modelling results show the required pipe sizes, and priority sewer upgrade projects.

Priority upgrades are required in areas where the current storm sewers can't handle the amount of water they need to; and areas with reported drainage problems with water flowing overland

To help with long-term budgeting and planning, initial construction cost estimates have been prepared

Costs are based on a multiplier of 3x of the current supply cost for storm sewers (for required sizes) to account for installation, related features (maintenance holes, catchbasins) and restoration

Costs would need to be updated periodically to account for inflation and construction cost escalation

Recommended Storm Sewer Upgrades and Financing Strategy

Short-term (Priority) Projects (*within next 10 years*)

- 9 priority projects have been identified for possible implementation in the near future
- These projects should be coordinated with other planned infrastructure projects in the same areas
- Estimated construction cost: ~ \$12 million

Long-term Projects (*likely more than 10 years from now*)

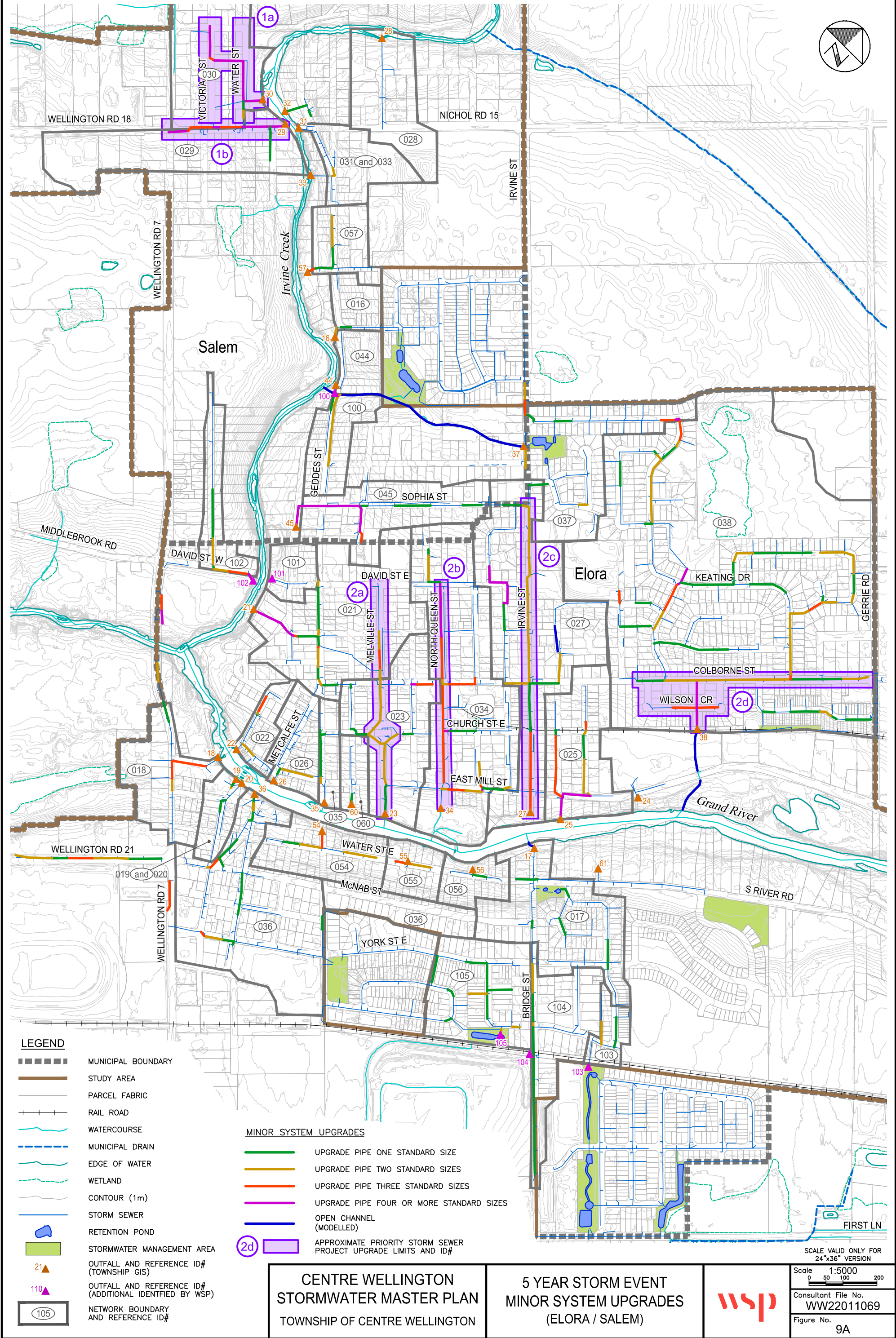
- There are also other storm sewer upgrades that we expect to undertake in the longer term
- These should be considered along with other related infrastructure priorities, such as road surface condition and water and sanitary sewer upgrades
- Estimated construction cost: ~ \$61 million

Financing Strategy

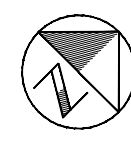
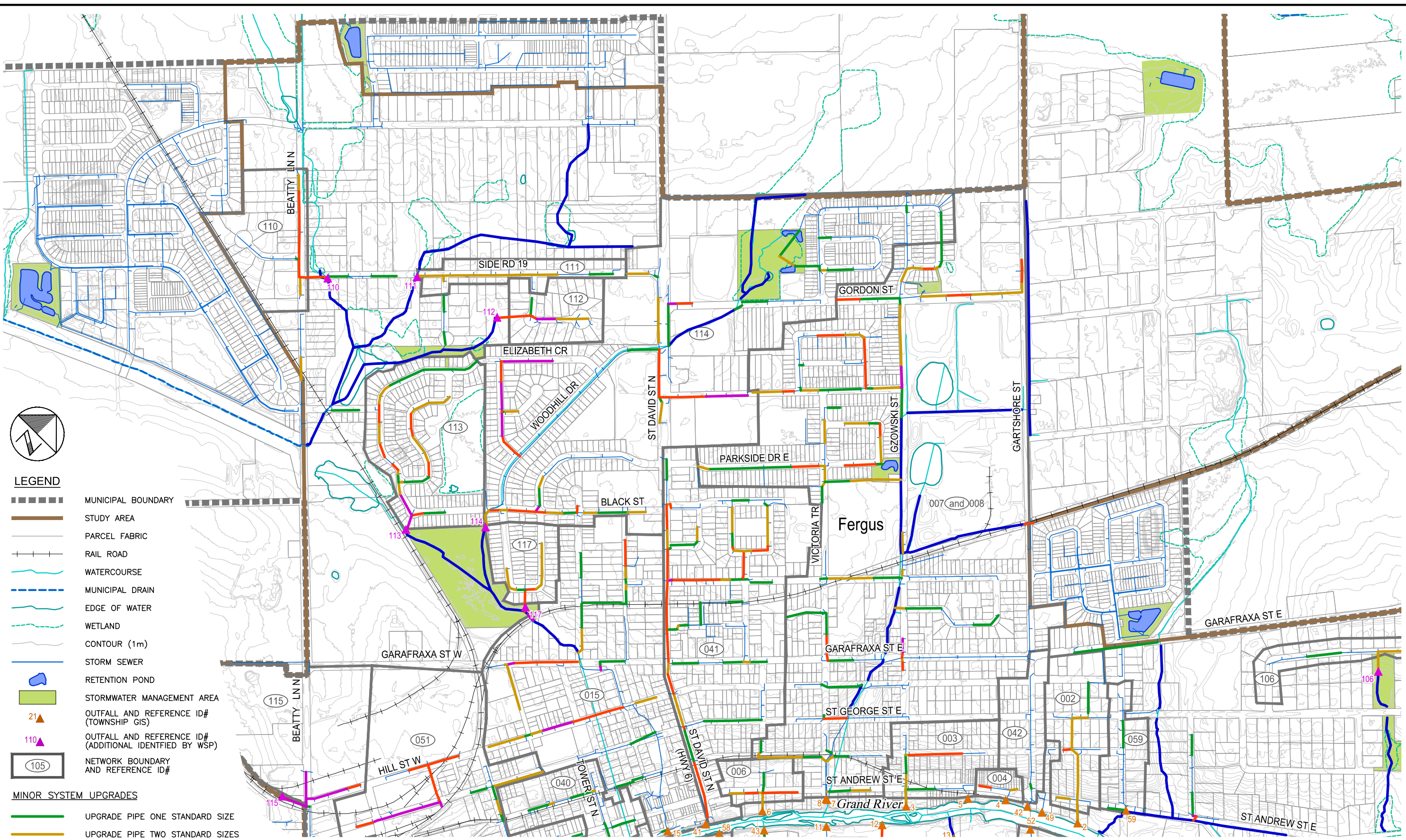
- To finance these projects, a financing strategy is required. Common approaches used by municipalities include:
 - General Capital Budgeting (usually a portion of the water/wastewater charge)
 - Stormwater Utility or Stormwater Fee (user pay)
- A stormwater utility is becoming a more common approach and is generally preferred. This approach is being considered or already in use by municipalities in the area, including Kitchener, Waterloo, Guelph, and Cambridge

The recommended storm sewer upgrades are shown on the following figures.

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- OUTFALL AND REFERENCE ID# (ADDITIONAL IDENTIFIED BY WSP)
- NETWORK BOUNDARY AND REFERENCE ID#
- MINOR SYSTEM UPGRADES
 - UPGRADE PIPE ONE STANDARD SIZE
 - UPGRADE PIPE TWO STANDARD SIZES
 - UPGRADE PIPE THREE STANDARD SIZES
 - UPGRADE PIPE FOUR OR MORE STANDARD SIZES
 - OPEN CHANNEL (MODELLED)
 - APPROXIMATE PRIORITY STORM SEWER PROJECT UPGRADE LIMITS AND ID#

CENTRE WELLINGTON
STORMWATER MASTER PLAN
TOWNSHIP OF CENTRE WELLINGTON

5 YEAR STORM EVENT
MINOR SYSTEM UPGRADES
(FERGUS NORTH)

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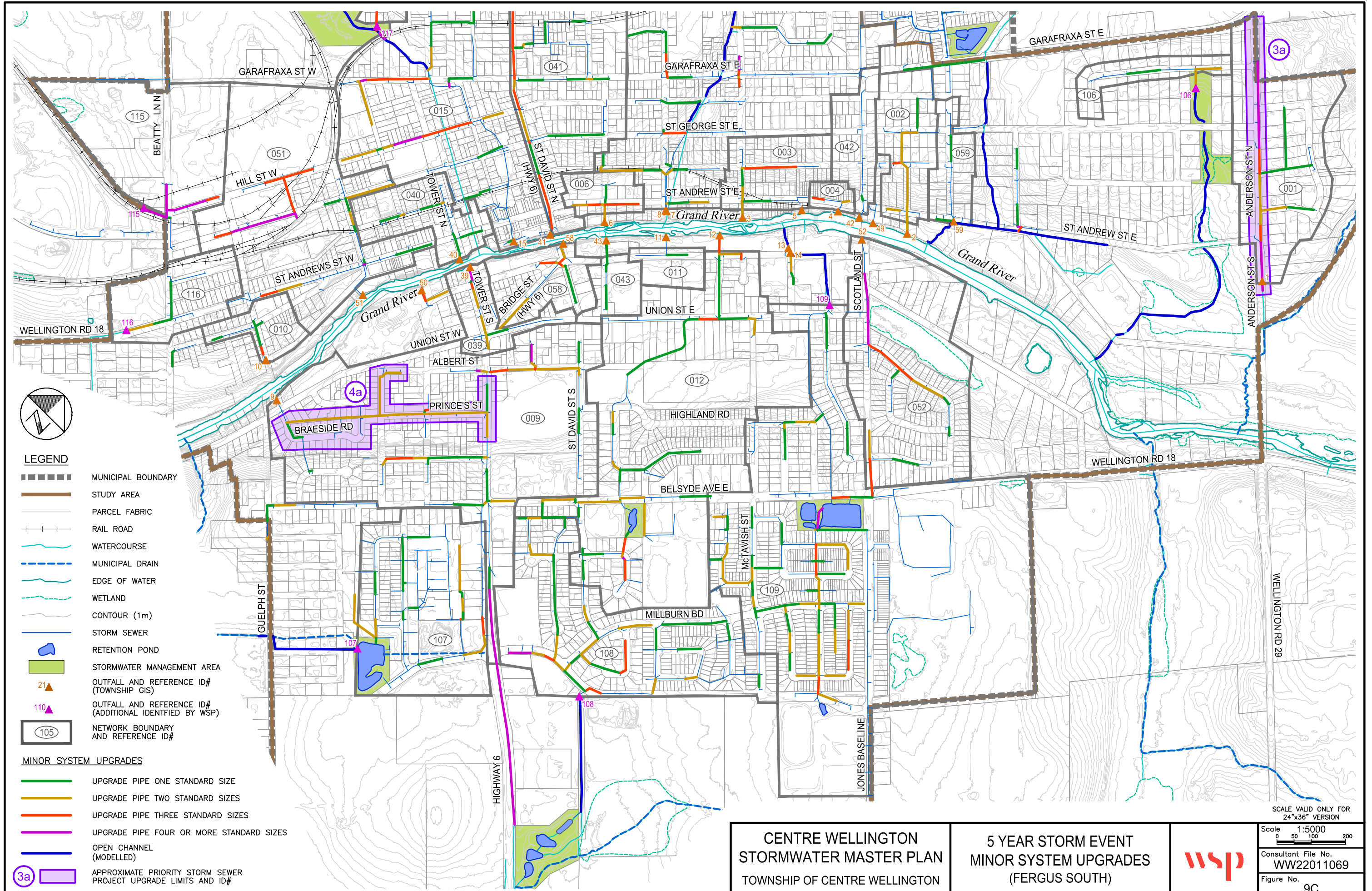
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CENTRE WELLINGTON
STORMWATER MASTER PLAN
TOWNSHIP OF CENTRE WELLINGTON

5 YEAR STORM EVENT
MINOR SYSTEM UPGRADES
(FERGUS SOUTH)

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Other Preferred Alternatives and Measures (1)

Climate Change Assessment

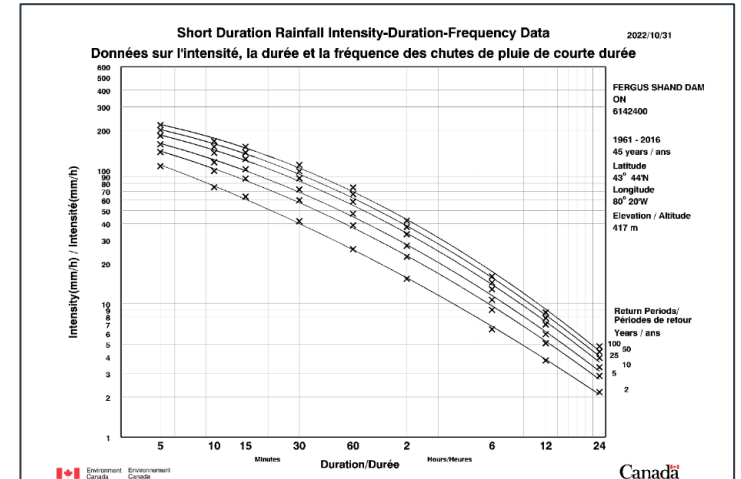
- A review of the Township's standard rainfall parameters has been undertaken as part of the current study. Three (3) different climate change projection models were reviewed to determine expected change in rainfall intensity in the future
- Based on the results, future rainfall standards (known as "IDF curves") will be updated to increase rainfall totals by approximately 5%

Low Impact Development and Green Infrastructure

- Provincial guidelines for Low Impact Development are currently pending (Draft 2022 MECP LID Guidelines)
- In the absence of formal direction, a minimum infiltration\retention target for new development (5 mm +/-) is being considered
- This would require future development to incorporate green infrastructure\LID measures

Future Development and Urban Boundary Expansion

- New development\expansion areas are still pending confirmation with Province
- All new developments would be required to incorporate modern stormwater controls as per requirements of Township, GRCA and Province
- Larger developments may be required to undertake further studies (subwatershed studies and similar) to ensure environmental constraints are considered



Other Preferred Alternatives and Measures (2)

Storm Sewer Operations and Maintenance Planning

- This would include regular inspections (video checks). This is generally defined as part of Asset Management Planning
- Capacity information from current study will help in guiding future replacement works

Stormwater Quality Control

- All new development required to implement modern stormwater quality controls
- Township should make best efforts to incorporate retrofit stormwater quality controls into road re-construction works to improve stormwater to receiving watercourses
- Incorporate LID and GI where feasible, including preserving rural road sections (ditches)

Stormwater Management Pond Maintenance and Retrofits

- Ongoing maintenance of Stormwater Management Facilities under Township's existing Operations and Maintenance Program
- Review opportunities to improve and enhance, including retrofit for the existing SWM Facility at Belsyde and Scotland Streets.
- Undertake a specific assessment to confirm potential issues at Holman Park Area – SWM Pond and Watercourse based on resident observations



Next Steps

The Study Team will

- Meet with the Technical Advisory Committee
- Finalize the Preferred Stormwater Management Strategy
- Prepare and Issue Master Plan Report for Review

Schedule

February 2024

Finalize the Preferred Stormwater Management Strategy



March 2024

Study Completion

Your Feedback is Invited!

Tell us what you think about the Preferred Stormwater Management Strategy presented at this Public Information Centre. We encourage you to complete the comment form available at this Open House. The comment form can be submitted during this event. Comments can also be submitted via project webpage **by March 7, 2024**: <https://www.connectcw.ca/swm-master-plan>.

Project Contacts

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