Parkhill Stormwater Management Master Plan

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1. Introduction

The Municipality of North Middlesex retained EXP Services Inc. to prepare the Parkhill Stormwater Management Master Plan (SWMMP). The purpose of the study is to evaluate the performance and condition of existing municipal drainage infrastructure, identify deficiencies within the storm, sanitary, and water systems, and establish a coordinated, long-term renewal program that supports future growth while maintaining compliance with municipal and provincial standards.

This Master Plan was initiated in response to recurring capacity and condition concerns within the Parkhill community. Increasing infill development, intensified land use, and more frequent high-intensity rainfall events have resulted in localized flooding, erosion, and infrastructure strain. The project provides Municipality with a defensible, data-driven framework to prioritize infrastructure investments, improve system resilience, and ensure alignment with the Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA, 2022), the Ausable Bayfield Conservation Authority (ABCA) policies, and the Municipality of North Middlesex Infrastructure Design Guidelines and Construction Standards (2025).

1.1 Background

The community of Parkhill currently faces significant challenges in managing stormwater due to limited existing capacity and the aging condition of underground infrastructure. As development pressure continues through infill and intensification, the risk of surface flooding and over-taxed outlets has increased. To address these issues, the Municipality initiated Parkhill SWMMP to evaluate drainage performance and develop a comprehensive, sustainable management strategy.

The study area encompasses the full urban boundary of Parkhill, as shown in **Figure 1,** and includes two principal drainage outlets: the Cameron-Gilles Drain and the Waldon-Hord Drain, the latter discharging through the Parkhill Reservoir managed by the ABCA. The existing network comprises storm sewers along most major corridors, open ditches, municipal drains, diversion channels, and the reservoir system that moderates downstream flows.

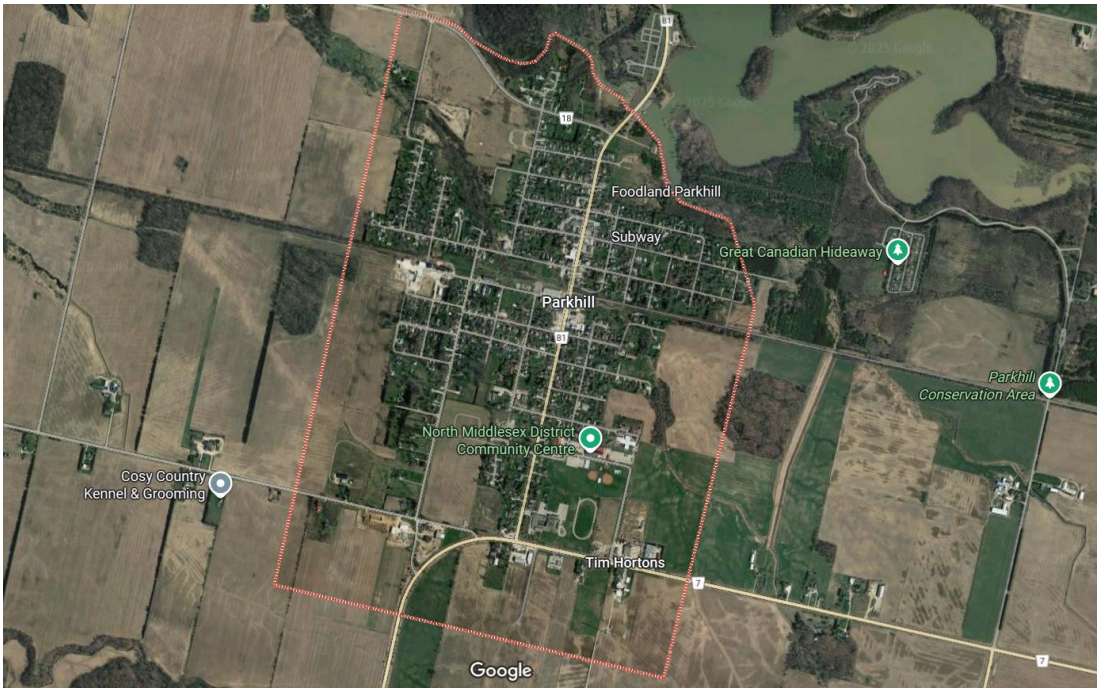

Figure 1. Parkhill Boundaries

Historical mapping and records indicate that pipe materials and vintage range from 1899 to 2022, with most of the system installed between 1940 and 2008 and now approaching or exceeding its nominal service life. Similar aging trends exist in the sanitary and watermain networks, highlighting the benefit of coordinated replacements to optimize investment and reduce surface disruption.

The primary objective of the SWMMP is to confirm the hydraulic adequacy of the existing system under current and projected conditions, identify structurally or hydraulically deficient segments, and prepare a phased implementation strategy that addresses both capacity and condition constraints while supporting long-term growth.

1.2 Methodology and Executive Summary

The Parkhill Stormwater Management Master Plan (SWMMP) was completed by EXP Services Inc. on behalf of the Municipality of North Middlesex to evaluate the performance, capacity, and condition of the existing stormwater, sanitary, and watermain systems within the Parkhill urban area. The study provides a coordinated strategy for infrastructure renewal, supporting future growth and compliance with the Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA) and the Municipality's Infrastructure Design Guidelines.

The assessment integrated GIS-based hydrologic and hydraulic analyses with infrastructure age, CCTV condition, and operational data to identify deficiencies and prioritize upgrades. Drainage catchments were delineated using LiDAR-based digital elevation models, and peak flows were estimated using the Rational Method with 1 in 5-year design storms derived from local IDF parameters. Hydraulic capacity was calculated using Manning's Equation, applying municipal standards for minimum slopes and cover depths. Results indicated that approximately half of the storm sewer network is undersized under the 5-year design storm, with much of the underground infrastructure installed between 1940 and 2008 now nearing the end of its service life.ss

A two-tier prioritization framework was developed, combining categorical and weighted scoring methods to integrate hydraulic capacity, age, CCTV ratings, and observed operational issues. This approach identified corridors where multiple utilities are simultaneously deficient, allowing for coordinated replacement within existing municipal rights-of-way. Preliminary cost estimates for the highest-priority (red) projects total approximately $10.9 million, including contingencies and engineering. Implementation of the recommended upgrades will improve system reliability, reduce flood risks, and ensure long-term compliance with municipal and provincial requirements.

1.3 Project Collaboration

The Parkhill Stormwater Management Master Plan (SWMMP) was developed through coordination with multiple stakeholders to verify that technical recommendations align with municipal objectives, environmental requirements, and community interests.

Key stakeholders engaged or consulted during the preparation of this study include:

- Municipality of North Middlesex: Project owner and primary decision-making authority overseeing implementation and coordination with municipal infrastructure programs.
- Ausable Bayfield Conservation Authority (ABCA): Provided input regarding watershed management, flood control, and regulatory requirements under Ontario Regulation 147/06.
- Local Residents and Businesses: A Public Information Centre (PIC) was held on October 6, 2025, to present the draft Master Plan and provide an opportunity for public review and comment.
- Contractors and Utility Providers: Provided input on constructability, coordination of underground services, and future replacement sequencing.

This collaborative process ensured that the proposed infrastructure improvements address not only hydraulic capacity and asset condition but also community values, regulatory context, and long-term sustainability objectives

for the Municipality of North Middlesex. For additional information on consultation activities, please refer to section 4 of this report.

2. Stormwater Implementation Strategy

Evaluating storm sewer replacements requires a multi-disciplinary approach that integrates hydraulic capacity analysis with asset condition assessments. The goal is to ensure that infrastructure upgrades are technically justified, cost-effective, and coordinated across systems to minimize disruption and maximize long-term performance.

2.1 Capacity Assessment

The storm sewer capacity assessment in Parkhill was undertaken to evaluate the performance of the existing minor storm system in managing runoff from urbanized areas under current and projected conditions. The analysis was guided by the Consolidated Linear Infrastructure Environmental Compliance Approval (CLI ECA), which outlines regulatory requirements for municipal stormwater systems.

2.1.1 Hydrologic Assessment

The hydrologic assessment was completed using the Rational Method, applying a 5-year design storm as the baseline event, consistent with MECP standards for minor system design and the requirements of the Consolidated Linear Infrastructure Environmental Compliance Approval (CLI ECA). Peak flows were determined using the standard Rational Method equation:

$$Q = 0.278CIA$$

where Q is peak flow (m³/s), C is the runoff coefficient, i is the rainfall intensity (mm/hr), and A is the drainage area (ha).

Rainfall intensities were calculated using the Municipality of North Middlesex Infrastructure Design Guidelines and Construction Standards. The Intensity–Duration–Frequency (IDF) relationship is given as:

$$i = A(t + C)^B$$

where t is the storm duration in hours (taken as the time of concentration, Tc), and A, B, and C are curve-fitting parameters. The applicable IDF parameters are provided in **Table 1**.

Table 1. IDF Curve-Fitting Parameters for Parkhill

Parameter	1 yr	2 yr	5 yr	10 yr	25 yr	50 yr	100 yr
A	27.0	30.7	41.8	49.3	58.5	65.1	71.4
B	-0.780	-0.798	-0.814	-0.820	-0.823	-0.824	-0.824
C	0.080	0.085	0.090	0.091	0.092	0.092	0.091

The time of concentration for each catchment was selected based on **Table 2** from the municipal guideline. This table provides standard inlet times corresponding to average runoff coefficients, which were used unless site-specific conditions justified alternative values. These selections ensure consistency with municipal standards and provide a reliable basis for estimating flow travel times across the drainage area.

Table 2. Time of Concentration based on Average Runoff Coefficient

Average Runoff Coefficient (C)	Time of Concentration (Tc) (min)
0.4	23.0
0.5	17.5
0.6	14.5
0.7	12.5
0.8	11.5
0.9	10.5

For Parkhill, existing land uses consist primarily of low–medium density residential development with some institutional and commercial areas. Based on this mix, runoff coefficients in the range of 0.40 to 0.50 were applied for the catchments, resulting in Tc values between 17.5 and 23 minutes.

Catchment delineation was performed using GIS-based topographic data to define drainage boundaries and overland flow paths. For this study, the storm sewer system was divided into a series of small drainage areas, each representing the contributing flow to an individual pipe segment or manhole. To facilitate system-wide analysis, these smaller drainage areas were grouped into five major catchments, which represent the dominant drainage zones within the Parkhill urban boundary. The delineation process combined municipal mapping, storm sewer as-built records, and elevation data derived from a Digital Elevation Model (DEM) to verify consistency with surface topography and sewer connectivity.

A layout of the five major catchments is shown in **Figure 2**, and the detailed network of individual drainage areas is shown in **Figure 3**. These figures illustrate how localized drainage areas contributing to individual pipes were aggregated into broader catchments for hydrologic and hydraulic assessment.

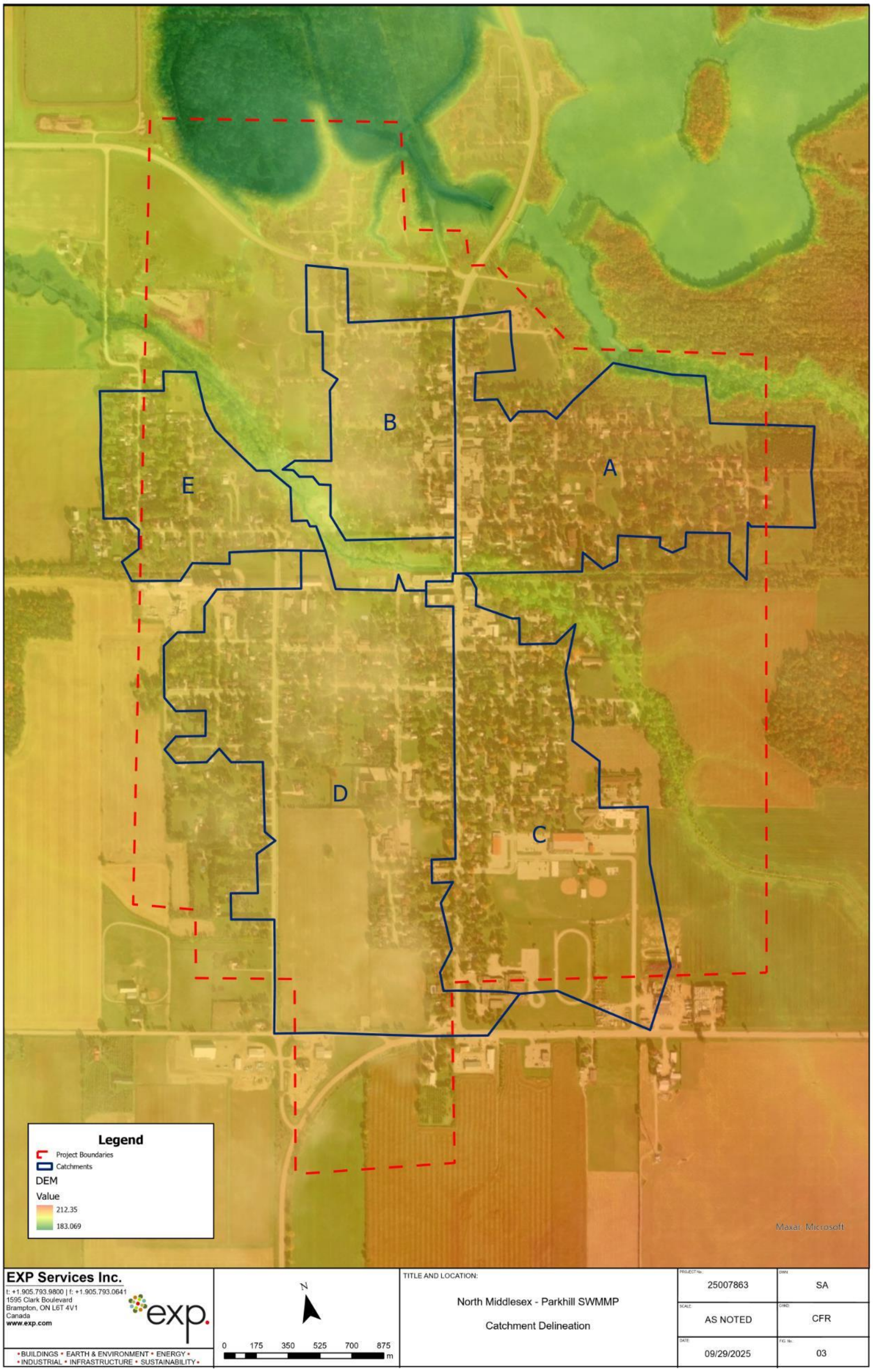

Figure 2. Catchment Delineation

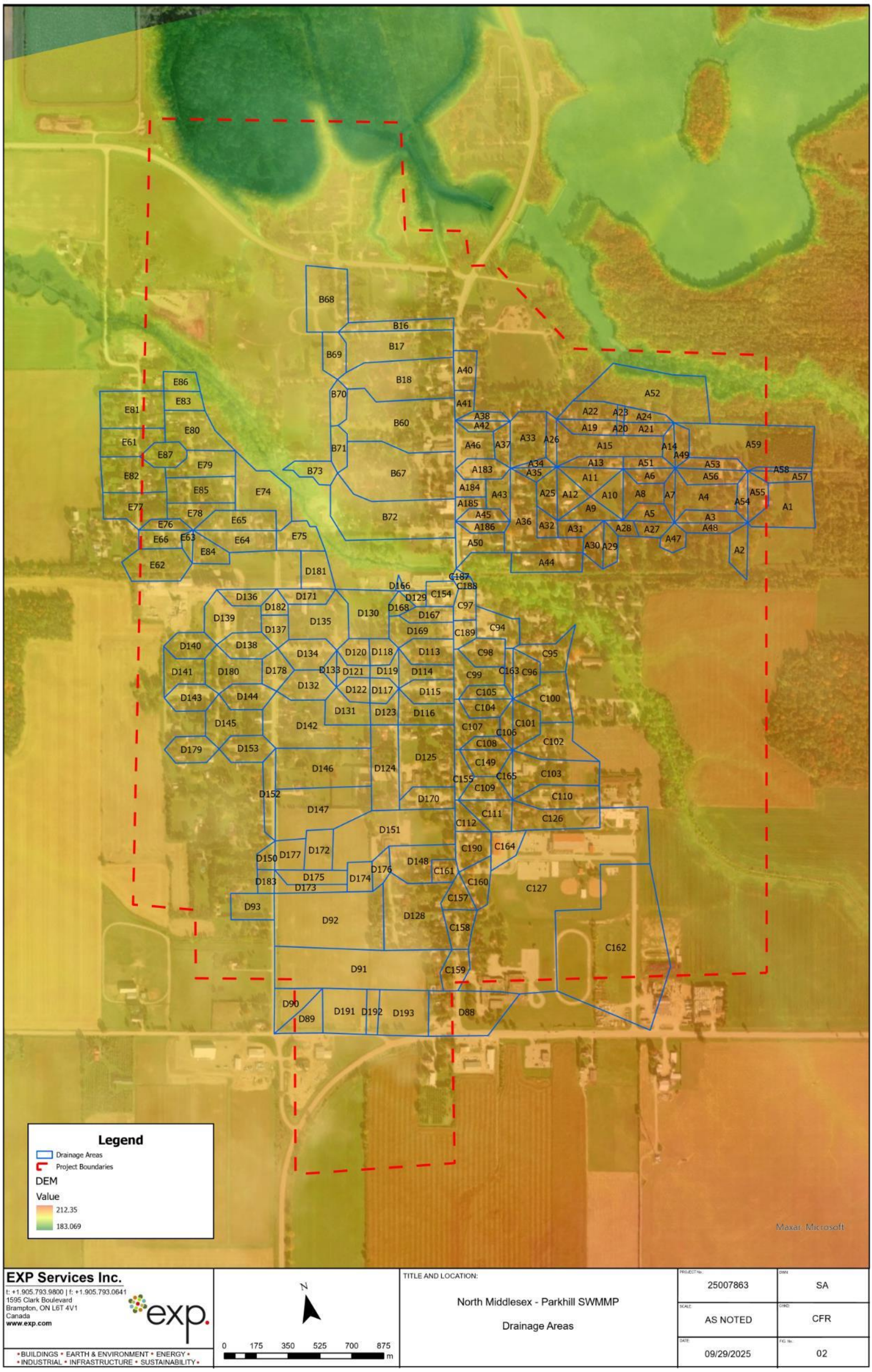

Figure 3. Drainage Areas

A summary of catchment characteristics is provided in **Table 3**, including total catchment area, the range of individual drainage area sizes within each catchment, runoff coefficient ranges based on land use, and the corresponding time of concentration (Tc) ranges applied in the Rational Method analysis. These values reflect a mix of low–medium density residential areas, institutional/commercial zones, and open space, consistent with existing land use in Parkhill.

Table 3. Summary of Catchment Characteristics

Catchment	Total Area (ha)	Range of Drainage Area Sizes (ha)	Runoff Coefficient Range (C)	Tc Range (min)
A	31.09	0.10 - 2.60	0.4-0.5	17.5 -23
B	16.23	0.23 - 2.75	0.5	17.5
C	37.52	0.35 - 1.36	0.5	17.5
D	51.66	0.04 - 4.09	0.5	17.5
E	14.50	0.02 - 3.20	0.5	17.5

Detailed characteristics for each individual drainage area, including, runoff coefficient, and time of concentration, are provided in **Appendix A**.

2.1.2 Hydraulic Assessment Inputs

The hydraulic assessment requires infrastructure properties to complete a standard storm sewer design sheet, applying Manning's equation to evaluate pipe capacity based on slope, diameter, and roughness coefficient. Due to the limited information available, several assumptions were made to complete the assessment.

- **List of Assumptions**

To address gaps in the available pipe data, several assumptions were made to complete the stormwater capacity assessment. Supporting information such as as-built drawings, drainage reports, stormwater management plans, and CCTV inspections was reviewed to validate these assumptions as much as possible; however, in the absence of complete data, the outlined approach was necessary to facilitate the hydraulic and capacity evaluation presented in this report.

Invert elevations that were not available were estimated using digital elevation models (DEMs) and ground surface information, with a standard deduction of 1.5 m applied to approximate cover depth. For pipes with missing information, minimum slope values were applied to ensure adequate conveyance and maintain self-cleansing velocity. The minimum slope values applied in the analysis are summarized in **Table 4**, which was developed directly from the applicable guideline tables.

Table 4. Minimum Slopes for Pipes

Diameter (mm)	Slope (%)
250	0.56
300	0.44
375	0.32
450	0.26
525	0.21
600	0.18
675	0.15
750	0.13
825	0.11
900 and larger	0.10

Pipe diameters were also assumed to meet the minimum sizes required by municipal standards. In cases where a manhole showed two outgoing pipes, these were treated as separate, disconnected systems rather than parallel outlets, to maintain a conservative basis for the assessment.

For areas identified for intensification or new greenfield development, it was assumed that on-site stormwater management controls would be required due to limited downstream capacity, with the understanding that developers may also need to contribute to sewer upgrades to maintain appropriate system sizing.

- **Pipe Network Data**

The pipe network data used in this assessment was compiled from multiple sources, including municipal as-built drawings, drainage reports, and GIS records. These sources provided information on pipe alignment, connectivity, and available attributes needed for the hydraulic analysis. The storm sewer system in Parkhill consists of a wide range of pipe diameters, generally between 300 mm and 1200 mm, reflecting both older and more recently installed infrastructure. The installation years available for the storm sewer network indicate a wide age distribution, ranging from as early as 1899 to as recent as 2010. A significant portion of the system dates to around 1950, representing the bulk of the infrastructure, while isolated upgrades and newer installations occurred in 1982, 1987, 1990, 1998, 2008, 2010, 2018, and 2022. This mix of very old and moderately aged pipes highlights the need to consider both hydraulic capacity and asset condition when prioritizing replacements. The age data was derived from municipal GIS records and cross-checked with available as-builts, and it provides important context for interpreting system performance and planning coordinated upgrades.

2.1.3 Hydraulic Assessment Results

The hydraulic assessment of the storm sewer system was conducted using a standardized storm sewer design sheet to evaluate the capacity and performance of existing infrastructure under defined design conditions. This methodical approach allowed for the calculation of flow rates, pipe velocities, and hydraulic gradients using Manning's equation, ensuring compliance with municipal and provincial design standards. Each pipe segment was assessed for adequacy based on contributing drainage area, estimated peak flow from the Rational Method, and the 5-year design storm intensity, which reflects typical minor system design criteria. The design sheet facilitated a clear comparison between existing pipe capacities and required conveyance, helping to identify undersized segments and prioritize upgrades. This assessment supports informed decision-making for infrastructure renewal and ensures alignment with the CLI ECA requirements for hydraulic performance and system connectivity.

A detailed storm sewer design spreadsheet has been included in **Appendix A**. It contains information for each segment, including drainage area, expected flow, calculated pipe capacity, velocity, slope, diameter, and a capacity check. To make the results easier to interpret at a system level, the pipe-specific data was aggregated into a summary by catchment, highlighting the range of capacity ratios and the percentage of pipes with adequate capacity. For example, in Catchment A capacity ratios ranged from 0.1 to 4.7, with approximately 52% of pipes meeting capacity requirements. This indicates that nearly half of the pipes within the catchment are undersized under the 5-year design storm, reflecting localized deficiencies in the core storm sewer network.

Table 5. Storm Sewer Network Summary

Location	Capacity Ratio	Sufficiency (%)
Catchment A	0.2-5.1	56.8
Catchment B	0.4-5.5	22.2
Catchment C	0.1-3.3	72.2
Catchment D	0.1-4.18	64.4
Catchment E	0.1-3.26	68.9

Figure 4 illustrates the existing storm sewer network for Parkhill, including pipe alignments and diameters.

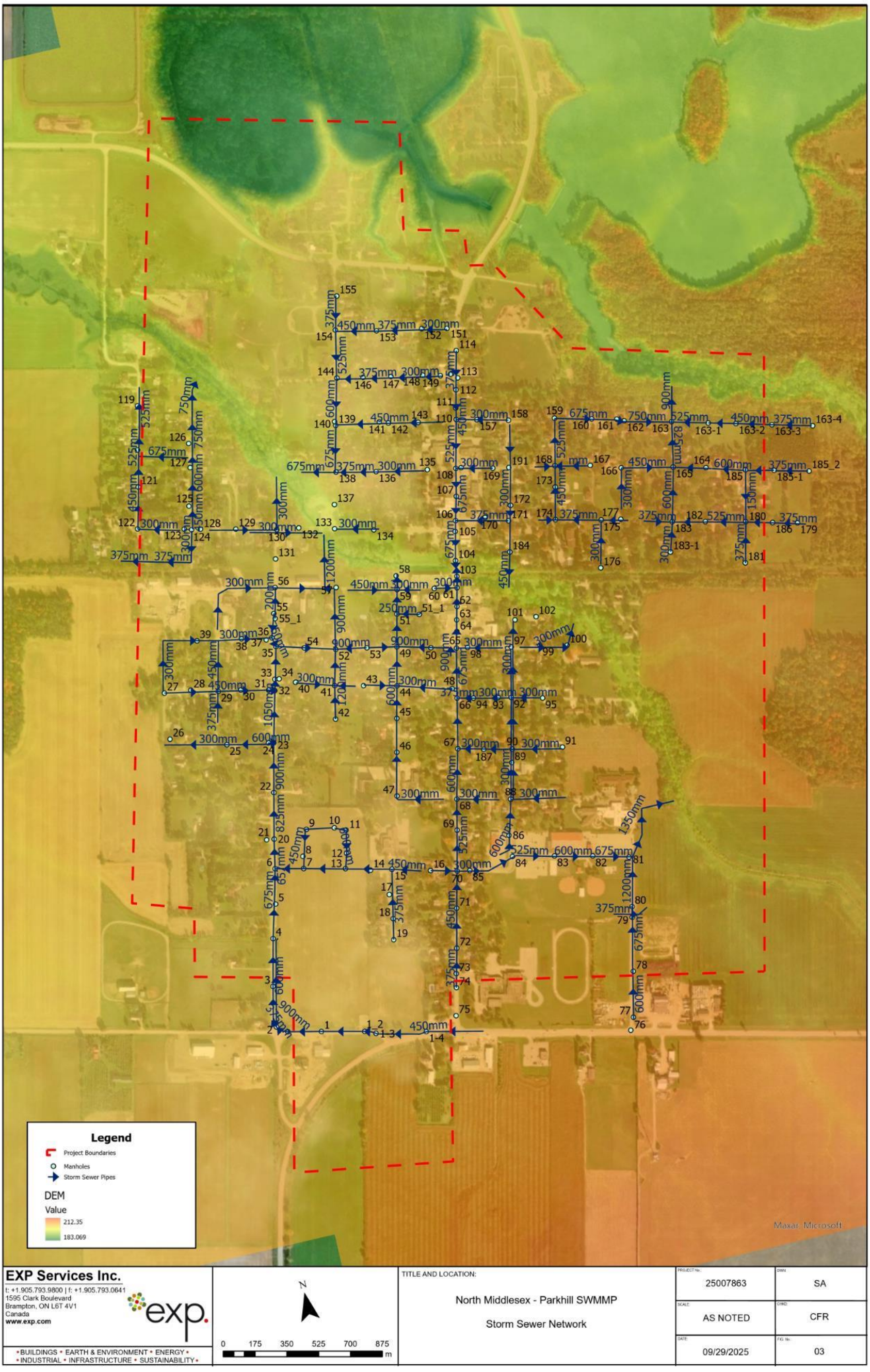

Figure 4. Storm Sewer Network Plan

2.2 Adjacent Infrastructure

When evaluating construction priorities for undersized storm sewers, the age of adjacent infrastructure, such as sanitary sewers and watermains, plays a critical role in decision-making. Older infrastructure is typically more susceptible to failure due to material degradation, historical design limitations, and cumulative wear. By aligning storm sewer upgrades with the replacement of aging sanitary and water systems, municipalities can reduce long-term maintenance costs, minimize service disruptions, and optimize capital investment. Coordinated construction also avoids redundant excavation and reinstatement, which can be particularly beneficial in urbanized areas with limited access or sensitive land uses. Prioritizing projects where multiple systems are nearing the end of their service life ensures a more resilient and efficient underground network.

A review of installation years for storm sewers, sanitary sewers, and watermains across the five catchments highlights that much of the infrastructure is considered old, with limited portions classified as mid-aged or new. As shown in **Table 6**, most storm sewers were installed between 1940 and 2008, with Catchment C and D containing the largest share of newer installations (up to 39–49% new). Sanitary sewers are generally from around 1980, meaning the entire system is now classified as mid-aged, with only small portions (up to 22%) considered new. Watermains show a mixed pattern, with installations dating from the 1950s to early 2022s. While some catchments (e.g., B) remain entirely old, others such as C contain up to 44% new assets. This overall distribution demonstrates that the underground network is predominantly at or beyond its expected service life, reinforcing the need to consider coordinated renewal strategies.

Table 6. Summary of Pipe Installation Years by Catchments

Pipes	Catchment	Installation Year	Aging Condition		
			% Old	% Mid	% New
Storm Sewer	Catchment A	1950-2006	71	11	18
	Catchment B	1950	100	0	0
	Catchment C	1940-2006	51	10	39
	Catchment D	1950-2018	41	10	49
	Catchment E	1899-2008	67	33	0
Sanitary	Catchment A	1980	0	100	0
	Catchment B	1980	0	100	0
	Catchment C	1980-2010	0	78	22
	Catchment D	1980-2010	0	79	21
	Catchment E	1980	0	100	0
Watermain	Catchment A	1950-2022	68	18	14
	Catchment B	1960-2002	94	0	6
	Catchment C	1960-2022	38	18	44
	Catchment D	1954-2010	37	19	44
	Catchment E	1960-2013	39	50	11

2.3 Prioritization Schedule

A prioritization schedule for the replacement of storm, sanitary, and watermain infrastructure in North Middlesex should be developed with a strategic focus on the age and expected service life of each system component. Aging infrastructure is more vulnerable to failure due to material degradation and outdated construction standards, which

can lead to increased maintenance costs and service disruptions. By identifying corridors where all three systems have reached or exceeded their design life, municipalities can prioritize these areas for coordinated replacement. This approach not only minimizes the risk of emergency repairs but also avoids redundant excavation and reinstatement, especially in urbanized zones. Scheduling replacements based on age supports proactive infrastructure renewal, enabling bundled project delivery and optimized capital planning while ensuring long-term reliability and performance across the municipal network.

Two complementary methods were applied to establish infrastructure renewal priorities across the study area: a criteria-based framework and a weighted scoring system.

- **Criteria-Based Framework (Categorical Method):**

The first method classifies road segments into four priority levels (Highest, Second, Third, and Lowest) based on a combination of observable conditions.

The classification considers storm sewer capacity deficiency, pipe age across all systems (storm, sanitary, and watermain), CCTV condition rating, and the presence of flagged issues. Segments with severe hydraulic constraints, multiple “Old” systems, and poor CCTV ratings were categorized as Highest Priority, whereas newer systems with minimal deficiencies were assigned Lowest Priority.

This approach provides a clear, rule-based framework for communicating priorities in a format that is easily interpreted by municipal staff and council.

- **Weighted Scoring Method (Quantitative Method):**

To complement the categorical framework, a weighted scoring approach was developed to produce a numerical priority score for each segment.

This method assigns relative weights to multiple criteria, such as capacity, system age, CCTV condition, and known issues, and combines them into a single score. Higher scores represent segments with greater risk of failure or deficiency. The weighted approach provides greater flexibility to adjust the influence of each factor and allows more nuanced comparison between segments, particularly when multiple areas share similar categorical rankings.

2.3.1 Integration of CCTV Inspection into prioritization

As part of the prioritization process, CCTV inspections were used to assess the condition of underground infrastructure. The assessments provided an additional layer of information beyond construction age, highlighting operational and structural concerns that support decisions on maintenance and rehabilitation.

For the storm sewer system, the CCTV ratings summarize the condition of segments and have been added to the dataset to guide prioritization. Where defects or hydraulic concerns were identified, these ratings highlight locations requiring earlier intervention despite construction year or material type.

For the sanitary sewer system, flagged issues from CCTV inspections have also been reviewed. These include encrustation, infiltration, pipe defects, and other recurring concerns that may impact system performance. The findings have been incorporated into the prioritization process to ensure maintenance and rehabilitation needs are recognized in parallel with aging and storm condition factors. **Table 7** summarizes the flagged issues from CCTV for the sanitary sewer system.

Table 7. CCTV Flagged Issues

Street	Segment (MH → MH)	Flagged Issues
Broadway	MH 53 → MH 49	Infiltration (dripper), encrustation, minor standing water
Broadway	MH 50 → MH 49	break-in tap, water sag, multiple factory taps
Catherine St	MH 89 → MH 90	Encrustation, active factory taps, minor standing water
Hastings St	MH 174 → MH 168	Heavy encrustation, multiple factory taps, standing water
Main St	MH 68 → MH 67	Encrustation, multiple factory taps, standing water
Main St	MH 69 → MH 68	Encrustation, multiple factory taps, standing water
Main St	MH 72 → MH 71	Severe encrustation, survey abandoned, standing water
Main St	MH 74 → MH 75	Pipe deformation, longitudinal crack, water sags, encrustation, standing water
Pearl St	MH 158 → MH 172	Heavy encrustation, multiple factory taps, standing water
Prince St	West → MH 39	Infiltration (dripper), encrustation, multiple factory taps (incl. capped)
Tain St	East → MH 88	Encrustation, standing water
West Park Rd	MH 23 → MH 32	Pipe fracture, multiple factory taps (some active), standing water
William St E	MH 159 → MH 160	Pipe deformation, break-in tap, water sags, multiple factory taps Infiltration (runner), multiple factory taps, standing water

The complete aging calculations have been finalized and are included in **Appendix B** for reference.

2.3.2 Prioritization Framework for Infrastructure Renewal

To guide strategic decision-making and optimize resource allocation, this framework establishes a tiered approach for prioritizing infrastructure renewal projects. The framework categorizes projects into four priority levels, from highest to lowest, ensuring that the most critical deficiencies are addressed first to mitigate risk and maintain service reliability.

1. Highest Priority:

- Storm sewer capacity significantly deficient
- All 3 systems “Old”
- Flagged sanitary issues (CCTV)
- Stormwater condition rating: 4–5

2. Second Priority

- Storm sewer capacity moderately deficient
- 2 systems “Old”
- No major flags
- Stormwater rating: 3–4

3. Third Priority

- 1 system “Old”, Other systems mid-life or newer
- No major flags
- Stormwater rating: 2–3

4. Lowest Priority

- Systems generally newer
- Stormwater rating: 1–2
- No major flags

2.3.3 Prioritization Scoring Methodology

To identify and rank infrastructure segments requiring rehabilitation or replacement, a weighted scoring system was developed to quantify the overall priority of each road segment based on multiple performance and condition criteria. This approach integrates the relative importance of various factors into a single composite score, providing a more transparent and flexible method than binary condition thresholds.

Each segment was evaluated according to six main criteria:

- Storm Sewer Capacity Ratio normalized based on exceedance above design capacity.
- Storm Sewer Age, Sanitary Sewer Age, and Watermain Age, each categorized as *Old* (>50 years), *Mid* (25–50 years), or *New* (<25 years).
- CCTV Condition Rating, based on the latest inspection results, converted to a normalized scale.
- Flagged Issues, accounting for known or reported operational or structural problems.

Each criterion was assigned a weighting factor (Table 6), reflecting its relative influence on system performance. The overall score for each segment was then computed using the following equation:

$$Priority\ Score\ =\ W_1\ f(C_R)\ W_2 f(A_{STM})\ W_3 f(A_{SAN})\ W_4 f(A_W)\ W_5 f(CCTV)\ W_6 f(F_{W1})$$

where:

C_R = Capacity Ratio

A_{STM}, A_{SAN}, A_W = Condition of storm, sanitary, and watermain systems (Old = 1, Mid = 0.3, New = 0)

CCTV = CCTV condition rating normalized to a 0–1 scale

F_1 = Flagged issue (Yes = 1, No = 0)

W_1-W_6 = weighting coefficients for each category

Table 8. Weighting factors

Criteria	Weight
Capacity Condition	25%
Storm Sewer Age	20%
Sanitary Sewer Age	15%
Watermain Age	20%
Storm Sewer Condition using CCTVs	10%
Sani Sewer Condition using CCTVs	10%
	100%

2.4 Description of the Proposed Development

The proposed development for the Parkhill Stormwater Masterplan will take place completely within the existing right-of-way (ROW) owned by the Municipality. The works will involve replacement of stormwater and sanitary sewers, along with watermains. The purpose of the upgrades is to ensure each of the sewers are at sufficient capacity for current conditions and future development. Outlet modifications do not form part of the proposed works and will be reviewed separately within another assignment.

Storm sewer capacity was evaluated based on the calculated capacity ratio, defined as the ratio of actual design flow to the pipe's conveyance capacity under the 1:5-year design storm. The following criteria were used to classify the degree of hydraulic adequacy:

Table 9. Storm sewer capacity Criteria

Capacity Class	Capacity Ratio Range	Description
1	< 1.0	Adequate capacity – pipe conveys flow below design limit
2	1.0 – 1.5	Moderately deficient – limited excess flow capacity
3	≥ 1.5	Significantly deficient – surcharge or insufficient capacity under design flow

Two mapping analyses were developed to guide infrastructure renewal priorities:

Figure 5 shows storm sewer capacity deficiency map. It illustrates hydraulic performance across the network based solely on the capacity ratio, highlighting segments with moderate or significant deficiencies (Classes 2 and 3).

Figure 6 shows weighted infrastructure priority map. It integrates multiple parameters into a weighted scoring system that produces an overall renewal priority for each segment.

Together, these maps distinguish between areas of hydraulic deficiency and overall renewal need, ensuring that both structural and hydraulic considerations are reflected in the proposed improvement program.

The complete hydraulic calculations, proposed sewer sizes, and upstream and downstream elevations have been prepared and are provided in **Appendix C** for reference. These details support prioritization and confirm the adequacy of the proposed design.

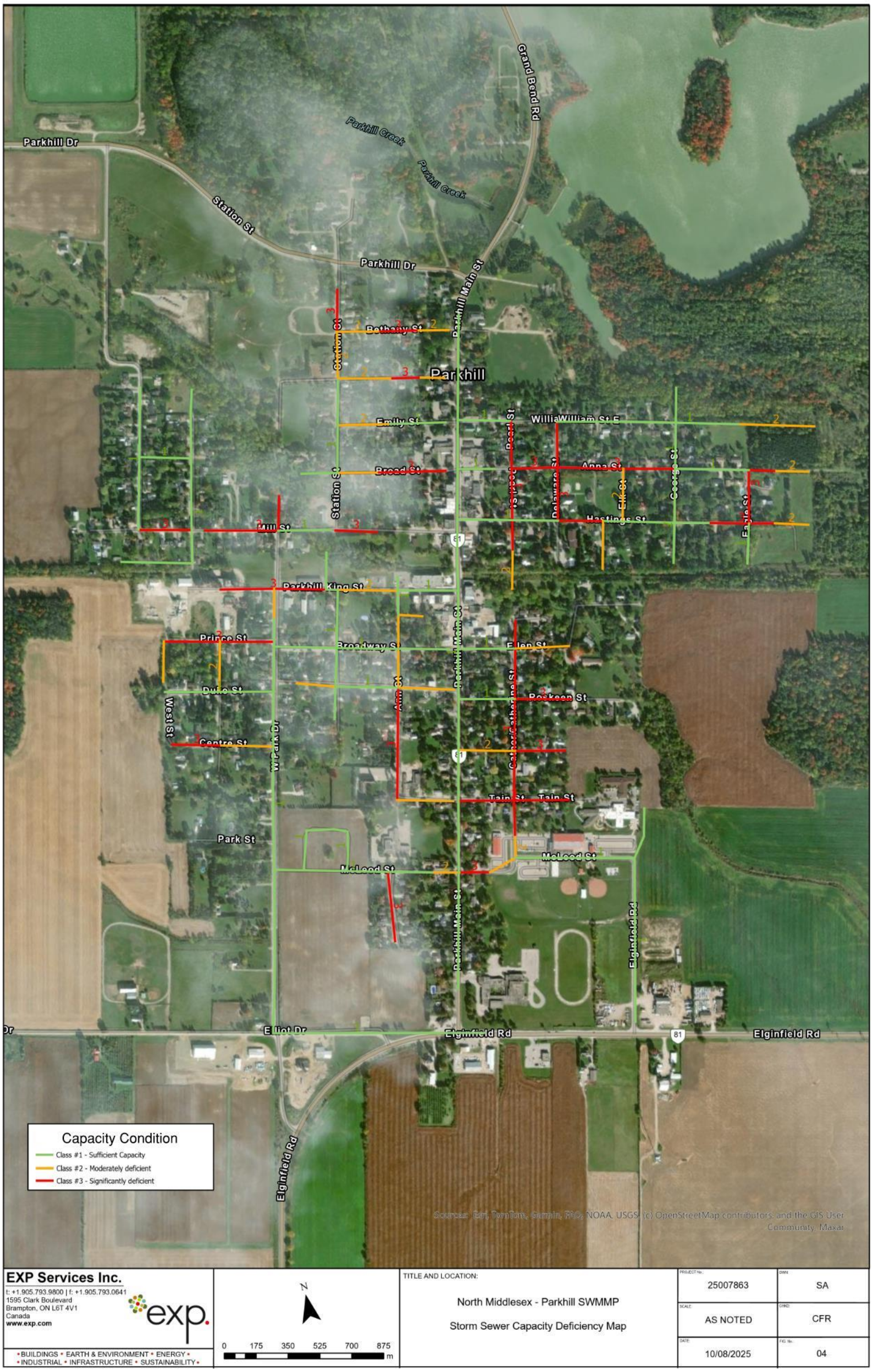

Figure 5. Storm Sewer Capacity Deficiency Map

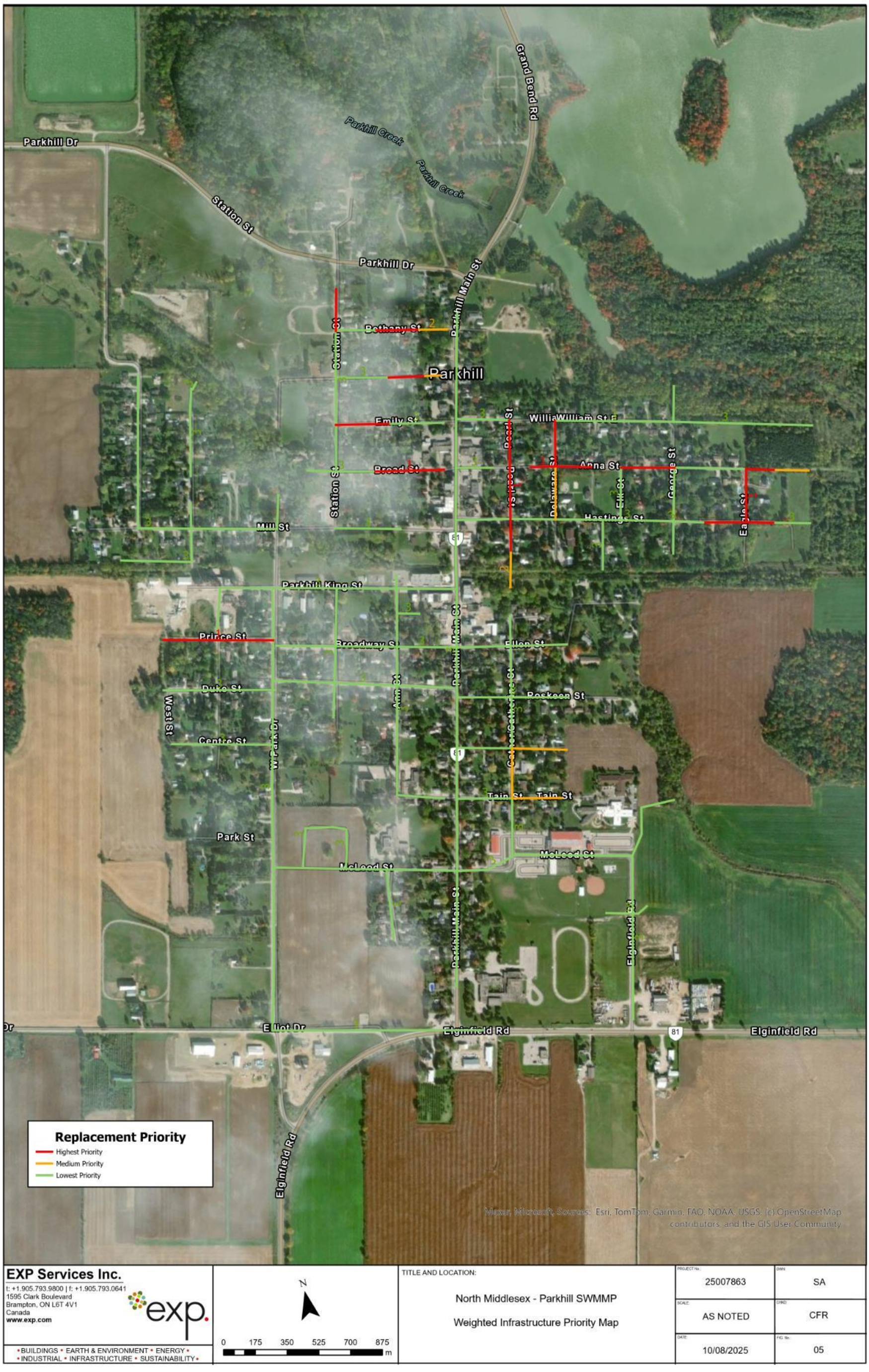

Figure 6. Weighted Infrastructure Priority Map

3. Cost Estimation

A preliminary cost estimate was developed for the proposed infrastructure renewal works identified through the prioritization analysis. The estimate reflects replacement of storm and sanitary sewers, watermains, and associated surface works within the municipal right-of-way. Costs were based on recent municipal tender prices, supplemented with historical data and engineering judgment.

The estimate was prepared for the highest-priority (red) streets identified by the weighted scoring method. Quantities are from the proposed design lengths/diameters and capacity checks; unit rates reflect typical 2025 prices for comparable projects in the region.

Key assumptions:

- All work is confined to the existing right-of-way (ROW); no property acquisition is required.
- Scope includes removals, granular materials, curb and gutter, asphalt paving, sidewalks, and surface reinstatement.
- A contingency allowance of 5% is applied.
- Engineering and Contract Administration costs are estimated at 20%, applied to the construction subtotal.
- HST is excluded from the estimate.
- The estimate is classified as Class D (±30%), suitable for master planning and early-stage budgeting.

Detailed itemized quantities and unit rates and the total estimated cost for the red-priority works are provided in **Table 10-13**.

Table 10. Cost Estimation for Catchment A

Item	QTY.	Unit	Cost/Unit	Total Price
Removals (assumed 10% of construction)	1	LS	-	$398,477
Granular A & B (road, sidewalk, entrances)	860	m of road	$435	$373,987
Curb and Gutter/Subdrain	860	m of road	$178	$153,034
Asphalt (road, driveways)	860	m of road	$668	$574,306
Sidewalk (both sides)	860	m of road	$279	$239,867
Watermain, Valves, Tees, Services (250mm)	633	m of road	$1,143	$723,313
Sanitary Sewer and Manholes (200mm)	646	m of road	$756	$488,089
Storm Sewer, Catchbasins, and Manholes (300mm)	45	m of road	$1,390	$62,550
Storm Sewer, Catchbasins, and Manholes (375mm)	78	m of road	$1,460	$113,841
Storm Sewer, Catchbasins, and Manholes (450mm)	102	m of road	$1,532	$156,312
Storm Sewer, Catchbasins, and Manholes (600mm)	429	m of road	$1,690	$724,548
Storm Sewer, Catchbasins, and Manholes (675mm)	94	m of road	$1,774	$166,227
Storm Sewer, Catchbasins, and Manholes (750mm)	112	m of road	$1,860	$208,692
Total Construction Cost + 5% Contingency				**$4,602,406**
Total Price including engineering cost				**$5,522,887**

Table 11. Cost Estimation for Catchment B

Item	QTY.	Unit	Cost/Unit	Total Price
Removals (assumed 10% of construction)	1	LS	-	$263,119
Granular A & B (road, sidewalk, entrances)	516	m of road	$435	$224,316
Curb and Gutter/Subdrain	516	m of road	$178	$91,789
Asphalt (road, driveways)	516	m of road	$668	$344,468
Sidewalk (both sides)	516	m of road	$279	$143,872
Watermain, Valves, Tees, Services (250mm)	516	m of road	$1,143	$589,411
Sanitary Sewer and Manholes (200mm)	516	m of road	$756	$389,847
Storm Sewer, Catchbasins, and Manholes (450mm)	68	m of road	$1,532	$103,749
Storm Sewer, Catchbasins, and Manholes (525mm)	287	m of road	$1,609	$461,216
Storm Sewer, Catchbasins, and Manholes (600mm)	44	m of road	$1,690	$74,070
Storm Sewer, Catchbasins, and Manholes (675mm)	118	m of road	$1,774	$208,449
Total Construction Cost + 5% Contingency				$3,039,020
Total Price including engineering cost				$3,646,823

Table 12. Cost Estimation for Catchment D

Item	QTY.	Unit	Cost/Unit	Total Price
Removals (assumed 10% of construction)	1	LS	-	$126,734
Granular A & B (road, sidewalk, entrances)	252	m of road	$435	$109,620
Curb and Gutter/Subdrain	252	m of road	$178	$44,856
Asphalt (road, driveways)	252	m of road	$668	$168,336
Sidewalk (both sides)	252	m of road	$279	$70,308
Watermain, Valves, Tees, Services (250mm)	252	m of road	$1,143	$288,036
Sanitary Sewer and Manholes (200mm)	252	m of road	$756	$190,512
Storm Sewer, Catchbasins, and Manholes (450mm)	128	m of road	$1,532	$196,463
Storm Sewer, Catchbasins, and Manholes (525mm)	124	m of road	$1,609	$199,206
Total Construction Cost + 5% Contingency				$1,463,775
Total Price including engineering cost				$1,756,530

Table 13. Summary of the total estimated cost

	A	B	C	D	E	Total
Total Construction Cost + 5% Contingency	$4,602,406	$3,039,020	$0	$1,463,775	$0	**$9,105,200**
Total Price including engineering cost	$5,522,887	$3,646,823	$0	$1,756,530	$0	**$10,926,240**

4. Consultation

4.1 Contact List

At the outset of the project, a contact list was developed for the applicable external agencies, Indigenous communities, Member of Parliament (MP), and Member of Provincial Parliament (MPP) listed below:

Conservation Authorities

- Ausable Bayfield Conservation Authority (ABCA)

Emergency Services

- London Police Services
- Middlesex Centre Fire Services
- North Middlesex – Fire & Emergency Services
- Ontario Provincial Police – Lambton Detachment
- Ontario Provincial Police
- Paramedic Services

Provincial Agencies

- Ministry of Heritage, Sport, Tourism, and Cultural Industries
- Ministry of Indigenous Affairs
- Ministry of Natural Resources (Aylmer District)
- Ministry of Transportation
- Ontario Clean Water Agency

Public Works

- Middlesex County – Planning & Development

Transportation Services

- Huron Shores Area Transit

Indigenous Communities

- Aamjiwnaang (Sarnia)
- Caldwell First Nation
- Chippewas of Kettle and Stoney Point First Nation
- Chippewas of Nawash Unceded First Nation
- Chippewas of the Thames First Nation
- Munsee-Delaware First Nation
- Oneida First Nation
- Walpole First Nation

MP & MPP

- MP Middlesex London (Lianne Rood)
- MPP – Elgin-Middlesex-London

The contact list was updated accordingly throughout the project where there were requests to be added or removed from the list.

4.2 Public Information Centre

A Notice of Public Information Centre (PIC) was sent out to the stakeholders listed in **Section 4.1** on September 22, 2025, via email, with the exception of Caldwell First Nation and Chippewas of the Thames First Nation who received

the Notice of PIC through NationsConnect. The Notice of PIC was also published on the Municipality's website for the public.

A Public Information Centre (PIC) was held on October 6, 2025, to share information on the Parkhill Stormwater Master Plan process, present the finding of the existing conditions review and preliminary analysis, and gather input from the community to help shape recommended solutions. The PIC was held in an open-house format with presentation boards on slides around the room to allow attendees to view the slides at their own leisure, while also having the opportunity to pose questions directly to members of the project team. The slides presented the following:

- Study objectives and scope;
- Existing infrastructures conditions and challenges;
- Hydrologic and hydraulic assessment results;
- Preliminary strategies for stormwater management and infrastructure renewal; and,
- Next steps in the Master Plan process.

No written comments were received during the PIC comment period. Materials from the PIC, including the Notice of PIC and PIC slides, are included in **Appendix E**.

4.3 Other Consultation

Separate emails were sent to the Ministry of Natural Resources and Forestry (MNRF) and the ABCA on July 23, 2025, both containing a Request for Information letter for any supplemental natural heritage background information. The MNRF responded on August 8, 2025, with a link to a Geohub webpage to assist with accessing all the natural heritage dates and values the MNRF has available for Parkhill. The response notes that the webpage functions as a self-serve tool, outlines how to make data requests for restricted data, and includes links to the Natural Heritage Make a Map tool and natural heritage policies and documentation to reference when conducting a natural heritage screening exercise. A response has not been received from the ABCA at the time of writing this report. Copies of this correspondence can be found in **Appendix E**.

Conclusion

The Parkhill Stormwater Management Master Plan provides a comprehensive assessment of the community's existing stormwater, sanitary, and watermain infrastructure, identifying both hydraulic deficiencies and condition-related concerns. The analysis confirmed that several sections of the storm sewer network are undersized under the 5-year design storm, while a substantial portion of the underground systems have reached or exceeded their expected service life.

The capacity analysis identified hydraulically constrained areas based on calculated capacity ratios, summarized in the Storm Sewer Capacity Deficiency Map. The weighted scoring approach integrated multiple factors, including capacity, infrastructure age (storm, sanitary, and watermain), CCTV condition ratings, and known operational issues, resulting in the Weighted Infrastructure Priority Map. Together, these tools provide a balanced representation of both hydraulic and structural system performance.

This framework verifies that upgrades are focused on corridors with the greatest overall need, particularly where multiple systems are classified as old or deficient. The proposed implementation plan emphasizes coordinated, staged replacements within the existing municipal right-of-way, minimizing disruption while optimizing cost efficiency.

By aligning renewal priorities with municipal design standards, MECP requirements, and the Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA) framework, the Master Plan confirms both regulatory compliance and long-term sustainability. In addition, an Environmental Impact Study (**Appendix D**) was completed in support of the proposed works. The EIS confirms that the recommended infrastructure replacements can be implemented with minimal environmental impact, provided that standard mitigation measures are applied.

In conclusion, the Parkhill SWMMP establishes a data-driven, transparent, and defensible strategy for infrastructure renewal. By integrating hydraulic capacity analysis with condition-based scoring, the Municipality of North Middlesex is equipped with a clear roadmap to address existing deficiencies, enhance system resiliency, and support future growth while maintaining reliable and sustainable stormwater management for the Parkhill community.

References

- Municipality of North Middlesex. Infrastructure Design Guidelines and Construction Standards (2025)
- Consolidated Linear Infrastructure Environmental Compliance Approval (CLI ECA, 2022)
- Ontario Ministry of Transportation Highway Drainage Design Standards (HDDS, 2008)
- Ministry of the Environment Stormwater Management Planning and Design Manual (SWMPDM, 2003)

Sarah Amerinia, EIT
Design EIT, Water Resources

Cameron Rickert, P.Eng
Design Lead, Water Resources

Appendix A – Assessment of Storm Sewer Capacity in the Existing System

November 2025

Project Name: Parkhill SWMMP

Project Number: 25007863-A0

Based on 1:5 Year Parkhill

Intensity Option # 1

1) Intensity (i) = a*(t+c)^b **2) Intensity (i) = a*t^b** **3) Insert Intensity**

a= 41.8 a= i=

b= -0.814 b=

c= 0.09

Manning's n = 0.013 Depth of Cover=1.5

Total Area (ha)= 199.35

Ground Elevation @ Outlet = High Water Level at Outlet=

A	197.88	A
B	201.08	B
C	0.33	C
D	0.33	D
E	0.70	E

Upstream 4	Upstream 3	Upstream 2	Upstream 1	Downstream 1	Location: Road /Stations	From MH	To MH	DA ID	Area (ha)	Run. Coef.	2.78AC	Accum. 2.78AC	T of In (min)	T of F (min)	T of Conc. (min)	Intensity (mm/hr)	Exp. Flow (L/s)	Capacity (L/s)	Velocity (m/s)	Wall Thickness (mm)	Length (m)	Pipe Dia. (mm)	Slope (%)	Invert US	Invert DS	Capacity Ratio	Existing Condition: CAPACITY CHECK	VELOCITY CHECK
				15	Hasting St	179	186	A1	1.58	0.40	1.76	1.76	23.00	1.13	23.00	76.84	**134.92**	**123.98**	1.12	25.00	76.20	375	0.50	203.67	203.29	1.09	DEFICIENT CAPACITY	OKAY
			14	22	Hasting St	186	180		2.19	0.40	2.43	4.19	23.00	0.97	24.13	74.44	**311.65**	**166.24**	1.05	25.00	60.96	450	0.34	203.22	203.01	1.87	DEFICIENT CAPACITY	OKAY
				22	Eagle St	181	180	A2	0.69	0.40	0.77	0.77	23.00	1.53	23.00	76.84	**58.81**	**99.18**	0.90	25.00	82.30	375	0.32	203.35	203.09	0.59	OKAY	OKAY
				22	Eagle St	North	180	A54,A55	0.64	0.50	0.89	0.89	17.50	2.65	17.50	91.56	**81.45**	**53.33**	0.75	25.00	120.00	300	0.30	204.15	203.79	1.53	DEFICIENT CAPACITY	CHECK VELOCITY
				19	Anna St	185_2	185_1	A57,A58	1.05	0.50	1.46	1.46	17.50	1.37	17.50	91.56	**133.96**	**102.23**	0.93	25.00	76.20	375	0.34	203.04	202.78	1.31	DEFICIENT CAPACITY	OKAY
			18	20	Anna St	185_1	185		1.46	0.50	2.03	3.49	17.50	1.03	18.87	87.32	**304.67**	**156.16**	0.98	25.00	60.96	450	0.30	202.70	202.52	1.95	DEFICIENT CAPACITY	OKAY
			19	21	Anna St	185	164	A53,A56	0.39	0.50	0.54	2.57	17.50	0.81	18.53	88.32	**226.81**	**442.77**	1.57	25.00	76.20	600	0.52	202.37	201.97	0.51	OKAY	OKAY
			20	22	Anna St	164	165		0.46	0.50	0.64	1.18	17.50	1.06	18.31	89.00	**105.15**	**504.35**	1.41	25.00	90.00	675	0.36	201.90	201.57	0.21	OKAY	OKAY
	17	16	15	23	Hasting St	180	182	A3,A48	0.85	0.40	0.95	5.03	23.00	1.68	24.53	73.63	**370.48**	**201.16**	0.93	25.00	93.70	525	0.22	203.87	203.66	1.84	DEFICIENT CAPACITY	OKAY
			22	25	Hasting St	182	183		1.90	0.40	2.12	3.06	23.00	1.14	24.68	73.33	**224.48**	**336.31**	1.19	25.00	81.50	600	0.30	203.59	203.36	0.67	OKAY	OKAY
				25	George St	183_1	183	A47	0.69	0.40	0.77	0.77	23.00	1.51	23.00	76.84	**58.81**	**64.14**	0.91	25.00	82.30	300	0.44	202.92	202.56	0.92	OKAY	OKAY
	39	23	24	28	George St	183	165	A4,A7	1.17	0.50	1.63	5.40	17.50	1.34	24.51	73.66	**397.58**	**434.17**	1.54	25.00	123.20	600	0.50	201.41	200.88	0.92	OKAY	OKAY
				27	Elk St	South	166	A8,A10	0.65	0.50	0.90	0.90	17.50	1.68	17.50	91.56	**82.44**	**64.14**	0.91	25.00	91.44	300	0.44	202.72	202.31	1.29	DEFICIENT CAPACITY	OKAY
			26	28	Anna St	166	165	A6,A51	1.46	0.50	2.03	2.93	17.50	2.07	19.18	86.43	**252.92**	**156.16**	0.98	25.00	121.92	450	0.30	202.16	201.79	1.62	DEFICIENT CAPACITY	OKAY
	27	25	21	32	George St	165	163	A14,A49	0.50	0.50	0.70	4.99	17.50	0.94	19.57	85.33	**425.51**	**1015.01**	1.90	25.00	106.70	825	0.50	201.41	200.88	0.42	OKAY	OKAY
			30	32	William St	162	163	A21,A24	0.60	0.50	0.83	0.97	17.50	2.09	17.75	90.75	**88.30**	**401.40**	0.91	25.00	114.00	750	0.13	202.12	201.97	0.22	OKAY	OKAY
			31	29	William St	161	162	A20,A23	0.10	0.50	0.14	1.42	17.50	0.25	19.99	84.17	**119.34**	**325.56**	0.91	25.00	13.60	675	0.15	202.12	202.10	0.37	OKAY	OKAY
			37	30	William St	159	161	A19,A22	0.92	0.50	1.28	3.42	17.50	2.49	19.51	85.50	**292.37**	**325.56**	0.91	25.00	136.00	675	0.15	202.12	201.91	0.90	OKAY	OKAY
	36	28	29		George St	163	HW	A52	2.60	0.50	3.61	5.75	17.50	0.63	19.59	85.27	**490.69**	**1378.69**	2.17	25.00	81.70	900	0.58	200.81	200.32	0.36	OKAY	OKAY
				34	William St	163_4	163_3		0.89	0.50	1.24	1.24	17.50	1.41	17.50	91.56	**113.26**	**99.18**	0.90	25.00	76.20	375	0.32	202.38	202.14	1.14	DEFICIENT CAPACITY	OKAY
			33	35	William St	163_3	163_2	A59	0.79	0.50	1.10	2.34	17.50	1.03	18.91	87.20	**203.62**	**156.16**	0.98	25.00	60.96	450	0.30	202.06	201.88	1.30	DEFICIENT CAPACITY	OKAY
			34	36	William St	163_2	163_1		0.48	0.50	0.67	1.77	17.50	1.21	18.53	88.32	**155.91**	**235.55**	1.09	25.00	79.25	525	0.30	201.80	201.56	0.66	OKAY	OKAY
			35	32	William St	163_1	163		0.44	0.50	0.61	1.28	17.50	1.24	18.71	87.79	**112.26**	**265.11**	1.22	25.00	91.44	525	0.38	201.53	201.02	0.42	OKAY	OKAY
	44	45	38	31	Delware St	168	159	A15,26	1.54	0.50	2.14	4.64	17.50	2.01	19.77	84.79	**393.63**	**201.72**	0.93	25.00	112.20	525	0.22	202.37	200.38	1.95	DEFICIENT CAPACITY	OKAY
		42	41	37	Delware St	174	168	A12,25	0.90	0.50	1.25	2.65	17.50	2.27	19.50	85.53	**227.08**	**145.38**	0.91	25.00	124.30	450	0.26	203.05	202.73	1.56	DEFICIENT CAPACITY	OKAY
				25	Hasing St	West	183	A5,A27	0.64	0.50	0.89	0.89	17.50	1.30	17.50	91.56	**81.45**	**99.18**	0.90	25.00	70.00	375	0.32	202.98	200.38	0.82	OKAY	OKAY
				41	Hasting St	East	175	A28	0.20	0.50	0.28	0.28	17.50	1.49	17.50	91.56	**25.45**	**31.47**	0.64	25.00	57.40	250	0.28	203.21	203.05	0.81	OKAY	CHECK VELOCITY
		48	40	42	Hasing St	175	174	A9,A31	0.74	0.50	1.03	3.04	17.50	2.00	19.37	85.88	**261.42**	**99.18**	0.90	25.00	107.60	375	0.32	203.41	203.07	2.64	DEFICIENT CAPACITY	OKAY
				38	Hasing St	West	174	A32	0.27	0.50	0.38	0.38	17.50	0.69	17.50	91.56	**34.36**	**44.50**	0.91	25.00	37.50	250	0.56	203.35	203.07	0.77	OKAY	OKAY
				50	Hasting St	171	106	A45,A186	0.56	0.50	0.78	0.78	17.50	2.28	17.50	91.56	**71.27**	**99.18**	0.90	25.00	122.70	375	0.32	202.20	201.81	0.72	OKAY	OKAY
				37	Anna St	West	168	A34,35	0.30	0.50	0.42	0.42	17.50	0.96	17.50	91.56	**38.18**	**24.54**	0.78	25.00	45.00	200	0.56	202.63	202.38	1.56	DEFICIENT CAPACITY	CHECK VELOCITY
				37	Anna St	East	168	A11,13	0.60	0.50	0.83	0.83	17.50	1.66	17.50	91.56	**76.36**	**24.54**	0.78	25.00	78.00	200	0.56	203.50	203.06	3.11	DEFICIENT CAPACITY	CHECK VELOCITY
			49		Pearl ST	184	Outlet	A44	0.73	0.50	1.01	3.10	17.50	1.01	20.90	81.80	**253.57**	**209.51**	1.32	25.00	80.00	450	0.54	197.83	203.07	1.21	DEFICIENT CAPACITY	OKAY
				41	Elk St	176	175	A29,30	0.66	0.50	0.92	0.92	17.50	1.98	17.50	91.56	**83.99**	**64.14**	0.91	25.00	108.00	300	0.44	204.00	203.52	1.31	DEFICIENT CAPACITY	OKAY
				49	Pearl ST	158	191	A33,A37	1.25	0.50	1.74	1.74	17.50	1.87	17.50	91.56	**159.08**	**64.14**	0.91	25.00	102.00	300	0.44	202.80	202.35	2.48	DEFICIENT CAPACITY	OKAY
			48	46	Pearl ST	191	184	A36,43	1.50	0.50	2.09	3.82	17.50	3.40	19.37	85.88	**328.27**	**64.14**	0.91	25.00	185.00	300	0.44	202.25	201.44	5.12	DEFICIENT CAPACITY	OKAY
		43	51		Main St	106	104	A50	0.65	0.50	0.90	2.02	17.50	1.69	19.78	84.76	**170.83**	**325.56**	0.91	25.00	92.00	675	0.15	198.70	198.56	0.52	OKAY	OKAY
			52	50	Main St	107	106	A185	0.24	0.50	0.33	0.65	17.50	1.03	18.68	87.89	**57.20**	**325.56**	0.91	25.00	56.20	675	0.15	199.25	199.17	0.18	OKAY	OKAY
		57	53	51	Main St	108	107	A184	0.23	0.50	0.32	1.86	17.50	1.18	19.57	85.33	**158.73**	**325.56**	0.91	25.00	64.30	675	0.15	199.40	199.30	0.49	OKAY	OKAY
		56	54	52	Main St	110	108	A46	0.63	0.50	0.88	1.83	17.50	2.07	19.72	84.92	**155.81**	**197.08**	0.91	25.00	113.00	525	0.21	200.40	200.16	0.79	OKAY	OKAY
			55	53	Main St	112	110	A41	0.26	0.50	0.36	1.01	17.50	1.25	19.18	86.43	**87.70**	**145.38**	0.91	25.00	68.70	450	0.26	200.65	200.47	0.60	OKAY	OKAY
				54	Main St	114	112	A40	0.47	0.50	0.65	0.65	17.50	1.68	17.50	91.56	**59.81**	**99.18**	0.90	25.00	90.45	375	0.32	201.25	200.96	0.60	OKAY	OKAY
				53	William St	158	110	A38,A42	0.43	0.50	0.60	0.60	17.50	2.22	17.50	91.56	**54.72**	**64.14**	0.91	25.00	120.80	300	0.44	202.54	202.01	0.85	OKAY	OKAY
				52	Anna St	169	108	A183	0.48	0.5	0.67	0.67	17.50	1.57	17.50	91.56	**61.09**	**64.14**	0.91	25.00	85.6	300	0.44	202.01	201.63	0.95	OKAY	OKAY
				60	Bethany St	151	152		0.73	0.50	1.01	1.01	17.50	1.14	17.50	91.56	**92.90**	**64.14**	0.91	25.00	61.84	300	0.44	200.51	200.24	1.45	DEFICIENT CAPACITY	OKAY
			59	61	Bethany St	152	153	B16,B17	0.87	0.50	1.21	2.22	17.50	1.73	18.64	88.02	**195.75**	**99.18**	0.90	25.00	93.3	375	0.32	200.13	199.83	1.97	DEFICIENT CAPACITY	OKAY
			60	63	Bethany St	153	154		0.81	0.50	1.13	2.34	17.50	1.70	19.23	86.28	**201.48**	**145.38**	0.91	25.00	93	450	0.26	199.51	199.27	1.39	DEFICIENT CAPACITY	OKAY
				63	Station St	155	154	B68	1.40	0.50	1.95	1.95	17.50	1.53	17.50	91.56	**178.17**	**99.18**	0.90	25.00	82.2	375	0.32	200.82	200.56	1.80	DEFICIENT CAPACITY	OKAY
			62	64	Station St	154	144	B69	0.52	0.50	0.72	2.67	17.50	2.00	19.03	86.87	**231.85**	**197.08**	0.91	25.00	109.2	525	0.21	200.54	200.31	1.18	DEFICIENT CAPACITY	OKAY
		69	63	65	Station St	144	139	B70	0.35	0.50	0.49	1.64	17.50	1.95	19.50	85.53	**140.28**	**260.50**	0.92	25.00	107.70	600	0.18	200.29	200.09	0.54	OKAY	OKAY
		71	64	75	Station St	139	138	B71	0.35	0.50	0.49	3.48	17.50	1.98	19.64	85.13	**295.82**	**325.56**	0.91	25.00	108.30	675	0.15	200.07	199.91	0.91	OKAY	OKAY
				67	William St	149	148		0.69	0.50	0.96	0.96	17.50	0.97	17.50	91.56	**87.81**	**64.14**	0.91	25.00	53.00	300	0.44	201.15	200.92	1.37	DEFICIENT CAPACITY	OKAY
			66	68	William St	148	147	B18	0.60	0.50	0.83	1.79	17.50	1.26	18.47	88.51	**158.70**	**99.18**	0.90	25.00	67.70	375	0.32	200.90	200.68	1.60	DEFICIENT CAPACITY	OKAY
			67	69	William St	147	146		0.50	0.50	0.70	1.53	17.50	1.04	18.76	87.66	**134.03**	**99.18**	0.90	25.00	56.00	375	0.32	200.66	200.48	1.35	DEFICIENT CAPACITY	OKAY
			68	64	William St	146	144		0.31	0.50	0.43	1.13	17.50	1.11	18.54	88.31	**99.42**	**99.18**	0.90	25.00	59.80	375	0.32	200.46	200.27	1.00	DEFICIENT CAPACITY	OKAY
				71	Emily St	143	142	B60	1.11	0.50	1.54	1.54	17.50	2.26	17.50	91.56	**141.26**	**145.38**	0.91	25.00	124.20	450	0.26	201.30	200.98	0.97	OKAY	OKAY
			70	65	Emily St	142	139		1.80	0.50	2.50	4.04	17.50	2.14	19.76	84.79	**342.97**	**145.38**	0.91	25.00	117.50	450	0.26	200.96	200.65	2.36	DEFICIENT CAPACITY	OKAY
				73	Broad St	135	188		2.10	0.50	2.92	2.92	17.50	2.04	17.50	91.56	**267.25**	**64.14**	0.91	25.00	111.13	300	0.44	201.70	201.21	4.17	DEFICIENT CAPACITY	OKAY
			72	74	Broad St	188	136	B67	0.58	0.50	0.81	3.73	17.50	0.81	19.54	85.41	**318.16**	**99.18**	0.90	25.00	43.84	375	0.32	201.19	201.05	3.21	DEFICIENT CAPACITY	OKAY
			73	75	Broad St	136	138		0.34	0.50	0.47	1.28	17.50	0.82	18.31	88.99	**113.80**	**99.18**	0.90	25.00	44.00	375	0.32	201.03	200.89	1.15	DEFICIENT CAPACITY	OKAY
		65	74		Broad St	138	West	B73	0.44	0.50	0.61	1.57	17.50	1.45	19.48	85.57	**134.40**	**325.56**	0.91	25.00	79.12	675	0.15	200.87	200.75	0.41	OKAY	OKAY
					Mill St	134	133	B72	2.75	0.50	3.82	3.82	17.50	1.68	17.50	91.56	**349.97**	**64.14**	0.91	25.00	91.40	300	0.44	198.74	198.34	5.46	DEFICIENT CAPACITY	OKAY
			80		Union	130	North	E74	1.36	0.50	1.89	3.60	17.50	1.61	20.56	82.66	**297.59**	**90.37**	1.28	25.00	123.78	300	0.87	200.25	199.17	3.29	DEFICIENT CAPACITY	OKAY
					Mill St	West	Outlet	E75	0.89	0.50	1.24	1.24	17.50	1.39	17.50	91.56	**113.26**	**142.20**	2.01	25.00	167.40	300	2.16	200.62	197.00	0.80	OKAY	OKAY
				78	Mill St	West	130	E64,E65	1.23	0.50	1.71	1.71	17.50	3.06	17.50	91.56	**156.53**	**58.26**	0.82	25.00	151.50	300	0.36	200.78	200.23	2.69	DEFICIENT CAPACITY	OKAY
				82	Richmond St	124	125	E78	0.54	0.50	0.75	0.75	17.50	0.92	17.50	91.56	**68.72**	**168.67**	1.06	25.00	58.80	450	0.35	200.90	200.69	0.41	OKAY	OKAY
			81	83	Richmond St	125	127	E85	0.95	0.50	1.32	2.07	17.50	0.76	18.42	88.65	**183.61**	**388.33**	1.37	25.00	62.30	600	0.40	200.67	200.43	0.47	OKAY	OKAY
			82	84	Richmond St	127	126	E79	0.82	0.50	1.14	2.46	17.50	0.64	18.26	89.17	**219.38**	**483.47**	1.71	25.00	65.16	600	0.62	200.41	200.00	0.45	OKAY	OKAY
			83	85	Richmond St	126	189	E80	1.04	0.50	1.45	2.59	17.50	0.81	18.14	89.54	**231.50**	**818.09**	1.85	25.00	89.52	750	0.54	199.98	199.50	0.28	OKAY	OKAY
			84	86	Richmond St	189	190	E83	0.39	0.50	0.54	1.99	17.50	0.42	18.31	89.01	**176.93**	**833.10**	1.89	25.00	47.46	750	0.56	199.48	199.21	0.21	OKAY	OKAY
			85		Richmond St	190	outlet	E86	0.35	0.50	0.49	1.03	17.50	0.14	17.92	90.21	**92.79**	**833.10**	1.89	25.00	16.30	750	0.56	199.19	199.10	0.11	OKAY	OKAY
				88	Mill St	123	122	E66,E76	0.69	0.50	0.96	0.96	17.50	2.27	17.50	91.56	**87.81**	**45.36**	0.64	25.00	87.43	300.00	0.22	200.80	200.61	1.94	DEFICIENT CAPACITY	CHECK VELOCITY
			87	89	Victoria St	122	121	E77	0.97	0.50	1.35	2.31	17.50	0.86	19.77	84.77	**195.61**	**262.40**	1.65	25.00	85.00	450.00	0.85	200.67	199.95	0.75	OKAY	OKAY
			88	90	Victoria St	121	120	E82	1.12	0.50	1.56	2.91	17.50	0.82	18.36	88.85	**258.13**	**269.21**	1.69	25.00	83.00	450.00	0.89	199.93	199.19	0.96	OKAY	OKAY
		92	89	91	Victoria St	120	119	E61	0.84	0.50	1.17	3.41	17.50	0.53	18.40	88.73	**302.16**	**371.31**	1.72	25.00	55.00	525.00	0.75	199.17	198.76	0.81	OKAY	OKAY
			90		Victoria St	119	North	E81	1.27	0.50	1.77	2.93	17.50	0.96	18.03	89.85	**263.53**	**365.34**	1.69	25.00	97.00	525.00	0.72	198.74	198.04	0.72	OKAY	OKAY
				90	Clara St	East	120	E87	0.49	0.50	0.68	0.68	17.50	0.90	17.50	91.56	**62.36**	**781.52**	2.18	25.00	118.00	675.00	0.86	199.52	198.50	0.08	OKAY	OKAY
				94	Front St	124	193	E63,E84	0.58	0.50	0.81	0.81	17.50	1.18	17.50	91.56	**73.81**	**76.05**	1.08	25.00	76.00	300.00	0.62	201.05	200.58	0.97	OKAY	OKAY
			93	95	Front St	193	192	E62	0.54	0.50	0.75	1.56	17.50	1.31	18.68	87.89	**136.83**	**115.53**	1.05	25.00	82.00	375.00	0.43	200.56	200.20	1.18	DEFICIENT CAPACITY	OKAY
			94		Front St	192	191		0.46	0.50	0.64	1.39	17.50	1.12	18.81	87.51	**121.64**	**114.97**	1.04	25.00	70.00	375.00	0.43	200.18	199.90	1.06	DEFICIENT CAPACITY	OKAY
				98	Main st	74	72	C159	0.49	0.50	0.68	1.42	17.50	1.34	19.07	86.74	**122.98**	**123.98**	1.12	25.00	90.00	375	0.50	202.80	202.35	0.99	OKAY	OKAY
			97	99	Main st	72	71	C158	0.53	0.50	0.74	1.42	17.50	1.57	18.84	87.43	**123.95**	**150.77**	0.95	25.00	89.40	450	0.28	202.30	202.05	0.82	OKAY	OKAY

	98	100	Main st	71	70	C157	0.39	0.50	0.54	1.28	17.50	1.41	19.07	86.74	**110.92**	**166.00**	1.04	25.00	88.50	450	0.34	202.00	201.70	0.67	OKAY	OKAY
	99	101	Main st	70	69	C190	0.61	0.50	0.85	1.39	17.50	1.72	18.91	87.20	**121.21**	**198.06**	0.91	25.00	94.30	525	0.21	201.70	201.50	0.61	OKAY	OKAY
	100	102	Main st	69	68	C112	0.30	0.50	0.42	1.26	17.50	1.12	19.22	86.32	**109.19**	**228.25**	1.05	25.00	71.00	525	0.28	201.45	201.25	0.48	OKAY	OKAY
127	101	103	Main st	68	67	C155	0.33	0.50	0.46	2.43	17.50	1.55	19.15	86.51	**210.43**	**357.64**	1.26	25.00	117.90	600	0.34	201.15	200.75	0.59	OKAY	OKAY
111	102	104	Main st	67	66	C107	0.64	0.50	0.89	1.96	17.50	1.77	19.05	86.79	**170.10**	**394.27**	1.10	25.00	116.80	675	0.22	200.70	200.45	0.43	OKAY	OKAY
113	103	105	Main st	66	65	C99	0.69	0.50	0.96	2.33	17.50	1.14	19.27	86.18	**200.83**	**605.85**	1.69	25.00	115.50	675	0.52	200.40	199.80	0.33	OKAY	OKAY
109	104	106	Main st	65	63	C189	0.30	0.50	0.42	2.18	17.50	0.45	18.93	87.14	**190.16**	**870.31**	2.43	25.00	65.30	675	1.07	199.70	199.00	0.22	OKAY	OKAY
	105	107	Main st	63	61	C97	0.36	0.50	0.50	0.92	17.50	1.12	17.95	90.12	**82.68**	**394.27**	1.10	25.00	74.00	675	0.22	198.90	198.50	0.21	OKAY	OKAY
110	106	108	Main st	61	103	C188	0.11	0.50	0.15	1.21	17.50	0.22	18.62	88.07	**106.50**	**728.88**	2.04	25.00	26.60	675	0.75	198.45	198.25	0.15	OKAY	OKAY
	107		Main st	103	Outlet	C187	0.04	0.50	0.06	0.21	17.50	0.11	17.72	90.85	**18.94**	**914.44**	2.56	25.00	16.90	675	1.18	198.00	197.80	0.02	OKAY	OKAY
		105	Ellen St	East	65	C98	0.58	0.50	0.81	0.81	17.50	1.43	17.50	91.56	**73.81**	**81.31**	1.15	25.00	99.00	300	0.71	201.70	201.00	0.91	OKAY	OKAY
		107	King St	60	61	C154	0.40	0.50	0.56	0.56	17.50	0.59	17.50	91.56	**50.90**	**90.02**	1.27	25.00	45.00	300	0.87	200.48	200.09	0.57	OKAY	OKAY
	112	103	Ardross St	187	67	C108,C149	0.44	0.50	0.61	1.22	17.50	0.58	18.60	88.14	**107.81**	**116.84**	1.65	25.00	57.91	300	1.46	201.77	200.75	0.92	OKAY	OKAY
		111	Ardross St	90	187		0.44	0.50	0.61	0.61	17.50	1.10	17.50	91.56	**56.00**	**65.59**	0.93	25.00	60.96	300	0.46	201.02	201.77	0.85	OKAY	OKAY
	114	104	Roskeen St	94	66	C104,C105	0.35	0.50	0.48	0.79	17.50	0.59	18.33	88.94	**70.25**	**180.51**	1.63	25.00	57.91	375	1.06	201.09	200.41	0.39	OKAY	OKAY
		113		92	94		0.22	0.50	0.31	0.31	17.50	0.83	17.50	91.56	**28.22**	**86.49**	1.22	25.00	60.96	300	0.80	201.65	201.09	0.33	OKAY	OKAY
	116		Catherine St	97	101	C94	0.65	0.50	0.90	1.40	17.50	1.08	19.64	85.13	**118.93**	**64.14**	0.91	25.00	58.85	300	0.44	201.18	200.92	1.85	DEFICIENT CAPACITY	OKAY
	118	115	Catherine St	92	97	C96,C163	0.36	0.50	0.49	1.04	17.50	2.14	19.59	85.26	**88.29**	**64.14**	0.91	25.00	116.50	300	0.44	201.01	200.49	1.38	DEFICIENT CAPACITY	OKAY
125	119			92	97		0.36	0.50	0.49	2.40	17.50	2.15	19.71	84.93	**203.65**	**64.14**	0.91	25.00	117.00	300	0.44	201.72	201.20	3.17	DEFICIENT CAPACITY	OKAY
	120	116	Catherine St	90	92	C101,C106	0.39	0.50	0.54	1.65	17.50	2.09	19.70	84.96	**140.54**	**64.14**	0.91	25.00	114.00	300	0.44	201.53	201.03	2.19	DEFICIENT CAPACITY	OKAY
126	121	117		90	92		0.39	0.50	0.54	3.00	17.50	2.21	19.64	85.15	**255.64**	**64.14**	0.91	25.00	120.45	300	0.44	202.27	201.74	3.99	DEFICIENT CAPACITY	OKAY
		118	Catherine St	88	90	C103,C165	0.80	0.50	1.11	1.11	17.50	2.20	17.50	91.56	**101.81**	**64.14**	0.91	25.00	119.88	300	0.44	202.07	201.55	1.59	DEFICIENT CAPACITY	OKAY
141	122	119		88	90		0.80	0.50	1.11	3.17	17.50	2.14	19.84	84.58	**268.05**	**64.14**	0.91	25.00	116.3	300	0.44	202.8	202.29	4.18	DEFICIENT CAPACITY	OKAY
	123	121	Catherine St	86	88	C126	0.58	0.50	0.81	1.52	17.50	1.47	18.56	88.25	**133.70**	**64.14**	0.91	25.00	80.00	300	0.44	202.45	202.09	2.08	DEFICIENT CAPACITY	OKAY
		122	Catherine St	South	86	C164	0.51	0.50	0.71	0.71	17.50	1.06	17.50	91.56	**64.90**	**64.14**	0.91	25.00	57.70	300	0.44	199.72	202.47	1.01	DEFICIENT CAPACITY	OKAY
			Ellen St	97	100	C95	0.64	0.50	0.89	0.89	17.50	2.02	17.50	91.56	**81.45**	**64.14**	0.91	25.00	110.1	300	0.44	201.72	201.24	1.27	DEFICIENT CAPACITY	OKAY
		117	Roskeen St	95	92	C100	0.98	0.50	1.36	1.36	17.50	1.08	17.50	91.56	**124.72**	**64.14**	0.91	25.00	58.7	300	0.44	201.83	201.57	1.94	DEFICIENT CAPACITY	OKAY
		119	Ardross St	91	90	C102	0.97	0.50	1.35	1.35	17.50	1.97	17.50	91.56	**123.44**	**64.14**	0.91	25.00	107	300	0.44	202.27	201.80	1.92	DEFICIENT CAPACITY	OKAY
		102	Tain St	East	68	C111,C109	1.12	0.50	1.56	1.56	17.50	1.65	17.50	91.56	**142.53**	**64.14**	0.91	25.00	90.00	300	0.44	202.48	202.08	2.22	DEFICIENT CAPACITY	OKAY
		129	McLeod St	16	70	C161	0.30	0.50	0.42	0.42	17.50	1.29	17.50	91.56	**38.18**	**64.14**	0.91	25.00	70.20	300	0.44	202.66	202.35	0.60	OKAY	OKAY
	128	130	Catherine St	70	East	C160	0.54	0.50	0.75	1.17	17.50	1.21	18.79	87.56	**102.24**	**64.14**	0.91	25.00	65.88	300	0.44	202.33	202.04	1.59	DEFICIENT CAPACITY	OKAY
	129	131	McLeod St	West	84		0.13	0.50	0.18	0.93	17.50	1.33	18.71	87.80	**81.75**	**64.14**	0.91	25.00	72.5	300	0.44	202.81	202.49	1.27	DEFICIENT CAPACITY	OKAY
	130	132	McLeod St	84	83		0.40	0.50	0.55	0.73	17.50	1.52	18.83	87.44	**64.14**	**197.08**	0.91	25.00	82.96	525	0.21	202.47	202.30	0.33	OKAY	OKAY
	131	133	McLeod St	83	82		0.52	0.50	0.72	1.28	17.50	1.81	19.02	86.89	**110.82**	**260.50**	0.92	25.00	100.12	600	0.18	202.28	202.10	0.43	OKAY	OKAY
	132	134	McLeod St	82	81	C127	0.66	0.50	0.91	1.64	17.50	1.59	19.31	86.06	**140.83**	**325.56**	0.91	25.00	86.75	675	0.15	202.08	201.95	0.43	OKAY	OKAY
139	133	135	McLeod St	81	81_1		2.63	0.50	3.66	10.50	17.50	0.77	19.09	86.69	**910.36**	**1687.83**	1.18	25.00	54.51	1350	0.1	201.93	201.87	0.54	OKAY	OKAY
	134	136	McLeod St	81_1	81_2		2.63	0.50	3.66	7.31	17.50	0.87	18.27	89.12	**651.78**	**1687.83**	1.18	25.00	61.39	1350	0.1	201.85	201.79	0.39	OKAY	OKAY
	135		McLeod St	81_2	81_3		2.63	0.50	3.66	7.31	17.50	1.04	18.37	88.83	**649.61**	**1687.83**	1.18	25.00	73.88	1350	0.1	201.77	201.70	0.38	OKAY	OKAY
		138	Elginfield Rd	77	78		1.02	0.50	1.42	1.42	17.50	2.18	17.50	91.56	**130.01**	**260.50**	0.92	25.00	120.68	600	0.18	204.16	203.94	0.50	OKAY	OKAY
	137	139	Elginfield Rd	78	80	C162	1.35	0.50	1.88	3.30	17.50	3.03	19.68	85.02	**280.25**	**325.56**	0.91	25.00	165.23	675	0.15	203.92	203.67	0.86	OKAY	OKAY
	138	140	Elginfield Rd	80	81		4.27	0.50	5.93	7.81	17.50	1.31	20.53	82.76	**646.09**	**1232.89**	1.09	25.00	85.74	1200	0.10	203.65	203.57	0.52	OKAY	OKAY
			Elginfield Rd	79	East		0.42	0.50	0.58	0.58	17.50	1.56	17.50	91.56	**53.03**	**99.18**	0.90	25.00	83.86	375	0.32	203.46	203.19	0.53	OKAY	OKAY
		124	Tain St	East	88	C110	0.9	0.50	1.25	1.25	17.50	2.34	17.50	91.56	**114.54**	**64.14**	0.91	25.00	127.5	300	0.44	202.70	202.14	1.79	DEFICIENT CAPACITY	OKAY
146	145	144		Ann St	59	58	D166	0.04	0.50	0.06	2.18	17.50	0.63	19.60	85.25	**186.05**	**260.50**	0.92	25.00	34.80	600	0.18	200.98	200.92	0.71	OKAY	OKAY
	147	145	143	Ann St	51	59	D168	0.21	0.50	0.29	1.07	17.50	1.03	18.63	88.05	**94.24**	**260.50**	0.92	25.00	57.00	600	0.18	201.11	201.00	0.36	OKAY	OKAY
		143	King St	East	59	D129	0.16	0.50	0.22	0.22	17.50	0.61	17.50	91.56	**20.36**	**64.14**	0.91	25.00	33.00	300	0.44	200.17	200.02	0.32	OKAY	OKAY
		143	King St	West	59	D130	1.16	0.50	1.61	1.61	17.50	2.10	17.50	91.56	**147.62**	**145.38**	0.91	25.00	115.00	450	0.26	199.89	199.59	1.02	DEFICIENT CAPACITY	OKAY
		144	Ann St	East	51	D167	0.40	0.50	0.56	0.56	17.50	1.13	17.50	91.56	**50.90**	**44.50**	0.91	25.00	61.20	250	0.56	200.30	199.96	1.14	DEFICIENT CAPACITY	OKAY
151	150	149	144	Ann St	49	51	D169	0.67	0.50	0.93	3.46	17.50	1.35	20.16	83.71	**289.74**	**260.50**	0.92	25.00	74.80	600	0.18	201.26	201.13	1.11	DEFICIENT CAPACITY	OKAY
		148	Broadway St	50	49	D113	0.67	0.50	0.93	0.93	17.50	2.66	17.50	91.56	**85.27**	**572.47**	0.90	25.00	143.78	900	0.10	201.55	201.41	0.15	OKAY	OKAY
		148	Broadway St	53	49	D118	0.35	0.50	0.49	0.49	17.50	1.20	17.50	91.56	**44.54**	**572.47**	0.90	25.00	64.60	900	0.10	201.27	201.21	0.08	OKAY	OKAY
154	153	152	148	Ann St	44	49	D114,D119	0.80	0.50	1.11	3.85	17.50	1.69	19.84	84.59	**325.72**	**260.50**	0.92	25.00	93.50	600	0.18	201.45	201.28	1.25	DEFICIENT CAPACITY	OKAY
		151	John St	48	44	D115	0.61	0.50	0.85	0.85	17.50	2.34	17.50	91.56	**77.63**	**64.14**	0.91	25.00	127.20	300	0.44	201.30	200.74	1.21	DEFICIENT CAPACITY	OKAY
		151	John St	43	44	D117	0.31	0.50	0.43	0.43	17.50	1.29	17.50	91.56	**39.45**	**64.14**	0.91	25.00	70.50	300	0.44	201.20	200.89	0.62	OKAY	OKAY
	155	151	Ann St	45	44	D116,D123	1.05	0.50	1.46	5.91	17.50	1.51	20.63	82.49	**487.31**	**260.50**	0.92	25.00	83.70	600	0.18	201.62	201.47	1.87	DEFICIENT CAPACITY	OKAY
	156	154	Ann St	47	45	D124,D125	3.20	0.50	4.45	5.28	17.50	3.13	19.52	85.47	**451.44**	**260.50**	0.92	25.00	173.00	600	0.18	201.95	201.64	1.73	DEFICIENT CAPACITY	OKAY
		155	Leonard Ave	East	47	D170	0.6	0.50	0.83	0.83	17.50	2.02	17.50	91.56	**76.36**	**64.14**	0.91	25.00	110	300	0.44	202.1	201.62	1.19	DEFICIENT CAPACITY	OKAY
		160	Albert St	42	41	D131	0.65	0.50	0.90	0.90	17.50	1.29	17.50	91.56	**82.72**	**1232.89**	1.09	25.00	84.3	1200	0.10	201.13	201.05	0.07	OKAY	OKAY
		160	John St	40	41	D132	0.72	0.50	1.00	1.00	17.50	1.65	17.50	91.56	**91.63**	**64.14**	0.91	25.00	90	300	0.44	201.15	200.75	1.43	DEFICIENT CAPACITY	OKAY
		160	John St	East	41	D122	0.36	0.50	0.50	0.50	17.50	0.86	17.50	91.56	**45.81**	**64.14**	0.91	25.00	47	300	0.44	201.3	201.09	0.71	OKAY	OKAY
157	158	159	162	Albert St	41	52	D121,D133	0.44	0.50	0.61	3.02	17.50	1.31	19.15	86.51	**260.93**	**1232.89**	1.09	25.00	85.8	1200	0.10	201.25	201.16	0.21	OKAY	OKAY
		162	Broadway St	53	52	D120	0.39	0.50	0.54	0.54	17.50	1.33	17.50	91.56	**49.63**	**572.47**	0.90	25.00	72	900	0.10	201.29	201.22	0.09	OKAY	OKAY
183	161	160	205	Albert St	52	57	D135	1.3	0.50	1.81	3.32	17.50	3.00	18.83	87.43	**290.46**	**572.47**	0.90	25.00	162.2	900	0.1	201.07	200.91	0.51	OKAY	OKAY
		164	Elliot Dr	East	1_4	D88	1.7	0.50	2.36	2.36	17.50	1.53	17.50	91.56	**216.35**	**229.00**	1.44	25.00	132.2	450	0.65	203.05	202.20	0.94	OKAY	OKAY
	163	165	Elliot Dr	1_4	1_3	D193	1.20	0.50	1.67	4.03	17.50	1.43	19.03	86.86	**350.13**	**899.55**	1.41	25.00	121.50	900	0.25	201.90	201.60	0.39	OKAY	OKAY
	164	166	Elliot Dr	1_3	1_2	D192	0.29	0.50	0.40	2.07	17.50	0.32	18.93	87.14	**180.49**	**677.36**	1.06	25.00	20.30	900	0.14	201.14	201.11	0.27	OKAY	OKAY
		167	Elliot Dr	1_2	1	D191	1.04	0.50	1.45	1.85	17.50	1.24	17.82	90.53	**167.37**	**849.11**	1.33	25.00	99.00	900	0.22	201.08	200.83	0.20	OKAY	OKAY
		168	Elliot Dr	1	1_1	D89	0.50	0.50	0.70	2.14	17.50	1.20	18.74	87.72	**187.77**	**677.36**	1.06	25.00	76.50	900	0.14	200.81	200.70	0.28	OKAY	OKAY
		169	Elliot Dr	1_1	2		0.04	0.50	0.06	0.75	17.50	0.40	18.70	87.83	**65.93**	**789.10**	1.24	25.00	29.50	900	0.19	200.70	200.62	0.08	OKAY	OKAY
	168			2	3		0.42	0.50	0.58	0.63	17.50	1.70	17.90	90.29	**57.15**	**572.47**	0.90	25.00	92.00	900	0.10	200.62	200.53	0.10	OKAY	OKAY
			Park Dr	3	Culvert	D90,D91	2.73	0.50	3.79	3.79	17.50	2.02	17.50	91.56	**347.13**	**572.47**	0.90	25.00	109.00	900	0.10	200.53	200.38	0.61	OKAY	OKAY
		172		2	3		0.18	0.50	0.26	0.26	17.50	1.90	17.50	91.56	**23.49**	**260.50**	0.92	25.00	105	600	0.18	200.00	199.72	0.09	OKAY	OKAY
	171	173		3	4		1.11	0.50	1.54	1.80	17.50	1.72	19.40	85.81	**154.13**	**260.50**	0.92	25.00	95	600	0.18	199.69	199.54	0.59	OKAY	OKAY
	172	174	Park Dr	4	5	D92,D93	2.80	0.50	3.89	5.43	17.50	1.51	19.22	86.32	**468.86**	**475.51**	1.33	25.00	120	675	0.32	199.48	199.16	0.99	OKAY	OKAY
	173	175	Park Dr	5	6	D173,D183	0.20	0.50	0.28	4.17	17.50	0.70	19.01	86.93	**362.51**	**460.41**	1.29	25.00	54	675	0.30	199.16	198.90	0.79	OKAY	OKAY
197	174	176	Park Dr	6	20	D177,D150	0.70	0.50	0.97	1.57	17.50	0.85	18.73	87.72	**137.79**	**460.41**	1.29	25.00	65.3	675	0.30	198.90	198.68	0.30	OKAY	OKAY
	179	177	Park Dr	20	22	D152	2.41	0.50	3.35	3.46	17.50	1.56	17.77	90.68	**313.84**	**673.28**	1.26	25.00	117.6	825	0.22	198.61	198.36	0.47	OKAY	OKAY
	176	178	Park Dr	22	23		2.21	0.50	3.07	6.42	17.50	1.56	19.06	86.78	**557.31**	**724.12**	1.14	25.00	106.2	900	0.16	198.23	197.88	0.77	OKAY	OKAY
	177	179	Park Dr	23	32	D142	2.1	0.50	2.92	5.99	17.50	1.66	19.06	86.79	**519.94**	**1057.61**	1.22	25.00	121.5	1050	0.15	197.74	197.54	0.49	OKAY	OKAY
	178	180	Park Dr	32	33	D178	0.08	0.50	0.11	3.03	17.50	0.27	19.16	86.49	**262.09**	**1057.61**	1.22	25.00	20	1050	0.15	197.54	197.66	0.25	OKAY	OKAY
	179	183	Park Dr	33	35		0.39	0.50	0.54	0.65	17.50	1.03	17.77	90.68	**59.24**	**1057.61**	1.22	25.00	75.6	1050	0.15	197.62	197.40	0.06	OKAY	OKAY
182	192	183	Park Dr	36	35	D137	0.08	0.50	0.11	1.42	17.50	0.33	19.77	84.77	**120.18**	**556.64**	1.26	25.00	25	750	0.25	198.65	198.58	0.22	OKAY	OKAY
		181	Park Dr	55	36		0.3	0.50	0.42	0.42	17.50	1.06	17.50	91.56	**38.18**	**103.73**	0.94	25.00	60	375	0.35	202.21	202.00	0.37	OKAY	OKAY
180	181	162	Broadway St	35	52	D134	0.26	0.50	0.36	1.01	17.50	1.19	18.53	88.33	**89.63**	**1568.68**	1.81	25.00	129.6	1050	0.33	197.40	196.97	0.06	OKAY	OKAY
	186	185	Duck St	29	31	D144	0.58	0.50	0.81	1.64	17.50	1.97	19.61	85.21	**139.77**	**145.38**	0.91	25.00	108.2	450	0.26	199.47	199.19	0.96	OKAY	OKAY
	184	179	Duck St	31	32		0.02	0.50	0.03	0.83	17.50	0.26	19.47	85.60	**71.39**	**145.38**	0.91	25.00	14.5	450	0.26	198.74	198.70	0.49	OKAY	OKAY
		184	Duck St	27	29	D143	0.6	0.50	0.83	0.83	17.50	2.11	17.50	91.56	**76.36**	**145.38**	0.91	25.00	115.8	450	0.26	199.77	199.47	0.53	OKAY	OKAY
		193	Elliot St	South	29	D145	0.5	0.50	0.70	0.70	17.50	0.33	17.50	91.56	**63.63**	**99.18**	0.90	25.00	17.6	375	0.32	199.60	199.19	0.64	OKAY	OKAY
		189	Centre St	24	25	D153	0.63	0.50	0.88	0.88	17.50	0.28	17.50	91.56	**80.18**	**64.14**	0.91	25.00	15	300	0.44	200.80	200.73	1.25	DEFICIENT CAPACITY	OKAY
	188		Centre St	25	26	D179	0.59	0.50	0.82	1.70	17.50	2.26	17.78	90.67	**153.76**	**64.14**	0.91	25.00	123	300	0.44	200.71	200.17	2.40	DEFICIENT CAPACITY	OKAY
		191	Prince St	South	North	D141	0.64	0.50	0.89	0.89	17.50	2.12	17.50	91.56	**81.45**	**64.14**	0.91	25.00	115.4	300	0.44	199.90	199.39	1.27	DEFICIENT CAPACITY	OKAY
	190	192	Prince St	West	39_1	D140	0.56	0.50	0.78	1.67	17.50	2.35	19.62	85.19	**142.10**	**64.14**	0.91	25.00	128.2	300	0.44	200.40	199.84	2.22	DEFICIENT CAPACITY	OKAY
184	191	181	Prince St	39_1	36	D138	0.64	0.50	0.89	2.47	17.50	2.27	19.85	84.54	**209.18**	**64.14**	0.91	25.00	123.8	300	0.44	199.82	199.27	3.26	DEFICIENT CAPACITY	OKAY
	187	192	Elliot St	29	39_1	D180	0.93	0.50	1.29	1.99	17.50	2.21	17.83	90.51	**179.90**	**145.38**	0.91	25.00	121.1	450	0.26	200.50	200.19	1.24	DEFICIENT CAPACITY	OKAY
		204	Park Dr	55_1	56	D182	0.26	0.50	0.36	0.36	17.50	2.68	17.50	91.56	**33.09**	**24.54**	0.78	25.00	125.7	200	0.56	201.40	200.70	1.35	DEFICIENT CAPACITY	CHECK VELOCITY
		198	McLeod St	10	13	D151	2.59	0.50	3.60	3.60	17.50	1.94	17.50	91.56	**329.61**	**356.63**	1.00	25.00	116	675	0.18	201.50	201.29	0.92	OKAY	OKAY
		197	McLeod St	10	7	D172	0.59	0.50	0.82	0.82	17.50	2.79	17.50	91.56	**75.08**	**145.38**	0.91	25.00	153	450	0.26	201.48	201.08	0.52	OKAY	OKAY
	196	175	McLeod St	7	6	D177	0.23	0.50	0.32	1.14	17.50	1.23	20.29	83.38	**95.03**	**325.56**	0.91	25.00	67.4	675	0.15	201.04	200.94	0.29	OKAY	OKAY

	200	197	McLeod St	13	7	D175	0.35	0.50	0.49	1.42	17.50	1.82	19.32	86.02	**121.95**	**325.56**	0.91	25.00	99.6	675	0.15	200.92	200.77	0.37	OKAY	OKAY
		200	McLeod St	East	15	D148	0.98	0.50	1.36	1.36	17.50	1.36	17.50	91.56	**124.72**	**145.38**	0.91	25.00	74.5	450	0.26	202.50	202.31	0.86	OKAY	OKAY
	199	198	McLeod St	15	13	D176	0.67	0.50	0.93	2.29	17.50	1.82	18.86	87.36	**200.36**	**325.56**	0.91	25.00	99.6	675	0.15	200.81	200.66	0.62	OKAY	OKAY
		200	Michelle Ave	19	15	D128	2.3	0.50	3.20	3.20	17.50	2.06	17.50	91.56	**292.70**	**99.18**	0.90	25.00	111	375	0.32	201.90	201.54	2.95	DEFICIENT CAPACITY	OKAY
	202	204	King St	West	56	D136	0.39	0.50	0.54	1.08	17.50	2.44	19.94	84.33	**91.43**	**64.14**	0.91	25.00	132.6	300	0.44	201.50	200.92	1.43	DEFICIENT CAPACITY	OKAY
203	194	205	King St	56	57	D171	0.4	0.50	0.56	1.47	17.50	2.09	20.18	83.66	**123.27**	**64.14**	0.91	25.00	114	300	0.44	200.90	200.39	1.92	DEFICIENT CAPACITY	OKAY
204	162		King St	57	Outlet	D181	0.59	0.50	0.82	3.45	17.50	1.89	20.50	82.81	**285.48**	**1232.89**	1.09	25.00	123.3	1200	0.10	200.37	200.25	0.23	OKAY	OKAY

Appendix B – Infrastructure Aging Data and Condition Assessment

Project Name: Parkhill SWMMP

Project Number:

Based on 1:5 Year Parkhill

Capacity Class:

1: <1
2. Between 1 and 1.5
3. >=1.5

Condition:

Old: 50+ years
Mid-Age: 25–50 years
New: <25 years

CCTV Rating:

[1,2): Good
[2,3): Fair
[3,4]: Poor
[4,5]: Very Poor

Priority:

- 1 (Highest Priority): All three systems are "Old".
- 2 (Second Priority): At least two are "Old".
- 3 (Third Priority): Storm is "Old" but others are not.
- 4 (Lowest Priority): Otherwise (significant Mid/New).

50	Old
25	Mid
> above	New

Storm Sewer Capacity Check					Infrastructure Aging											
					InstallationYear			Condition								
Road /Stations	From MH	To MH	Capacity Ratio	Capacity Condition	Storm Sewer	Sanitary	Watermain	Storm Sewer	Sanitary	Watermain	CCTV Condition Rating (Storm)	CCTV Flagged Issues (Sanitary)	Priority	Score	length	Cost
Hasting St	179	186	1.09	2	1950	1980	1960	Old	Mid	Old		No	2	60%	76.2	$ -
Hasting St	186	180	1.87	3	1950	1980	1960	Old	Mid	Old	2	No	1	74%	61.0	$ 335,280
Eagle St	181	180	0.59	1	1950	1980	1992	Old	Mid	Mid		No	3	33%	82.3	$ -
Eagle St	North	180	1.53	3	1950	1980	1992	Old	Mid	Mid		No	1	58%	120.0	$ -
Anna St	185_2	185_1	1.31	2	1950	1980	1960	Old	Mid	Old	4	No	2	65%	76.2	$ -
Anna St	185_1	185	1.95	3	1950	1980	1960	Old	Mid	Old		No	1	72%	61.0	$ 335,280
Anna St	185	164	0.51	1	1950	1980	1960	Old	Mid	Old		No	2	47%	76.2	$ -
Anna St	164	165	0.21	1	1950	1980	1960	Old	Mid	Old	2	No	2	49%	90.0	$ -
Hasting St	180	182	1.84	3	1950	1980	1960	Old	Mid	Old	2	No	1	74%	93.7	$ 515,350
Hasting St	182	183	0.67	1	1950	1980	1960	Old	Mid	Old		No	2	47%	81.5	$ -
George St	183_1	183	0.92	1	1950	1980	1960	Old	Mid	Old		No	2	47%	82.3	$ -
George St	183	165	0.92	1	1950	1980	1960	Old	Mid	Old	3	No	2	51%	123.2	$ -
Elk St	South	166	1.29	2	1950	1980	1960	Old	Mid	Old		No	2	60%	91.4	$ -
Anna St	166	165	1.62	3	1950	1980	1960	Old	Mid	Old		No	1	72%	121.9	$ 670,560
George St	165	163	0.42	1	1950	1980	1984	Old	Mid	Mid	2	No	3	35%	106.7	$ -
William St	162	163	0.22	1	1987	1980	1989	Mid	Mid	Mid	2	No	3	21%	114.0	$ -
William St	161	162	0.37	1	1987	1980	1989	Mid	Mid	Mid	2	No	3	21%	13.6	$ -
William St	159	161	0.90	1	1987	1980	1989	Mid	Mid	Mid	2	Yes	1	31%	136.0	$ -
George St	163	HW	0.36	1	1950	1980	1960	Old	Mid	Old	4	No	2	52%	81.7	$ -
William St	163_4	163_3	1.14	2	1950	1980	1960	Old	Mid	Old		No	2	60%	76.2	$ -
William St	163_3	163_2	1.30	2	1950	1980	1960	Old	Mid	Old		No	2	60%	61.0	$ -
William St	163_2	163_1	0.66	1	1950	1980	1960	Old	Mid	Old		No	2	47%	79.2	$ -
William St	163_1	163	0.42	1	1950	1980	1960	Old	Mid	Old		No	2	47%	91.4	$ -
Delware St	168	159	1.95	3	1950	1980	1960	Old	Mid	Old	2	No	1	74%	112.2	$ 617,100
Delware St	174	168	1.56	3	1987	1980	1960	Mid	Mid	Old	2	Yes	1	70%	124.3	$ -
Hasing St	West	183	0.82	1	1950	1980	1960	Old	Mid	Old		No	2	47%	70.0	$ -
Hasting St	East	175	0.81	1	1950	1980	1960	Old	Mid	Old	3	No	2	51%	57.4	$ -
Hasing St	175	174	2.64	3	1987	1980	1960	Mid	Mid	Old	2	No	1	60%	107.6	$ -
Hasing St	West	174	0.77	1	1950	1980	1960	Old	Mid	Old	2	No	2	49%	70.0	$ -
Hasting St	171	106	0.72	1	1950	1980	1960	Old	Mid	Old		No	2	47%	122.7	$ -
Anna St	West	168	1.56	3	1950	1980	1960	Old	Mid	Old	5	No	1	80%	70.0	$ 385,000
Anna St	East	168	3.11	3	1950	1980	1960	Old	Mid	Old	4	No	1	78%	57.4	$ 315,700
Pearl ST	184	Outlet	1.21	2	1899	1980	1960	Old	Mid	Old	3	No	2	63%	80.0	$ -
Elk St	176	175	1.31	2	1950	1980	1960	Old	Mid	Old		No	2	60%	108.0	$ -
Pearl ST	158	172	2.48	3	1950	1980	1960	Old	Mid	Old		Yes	1	82%	102.0	$ 561,000
Pearl ST	191	184	5.12	3	1950	1980	1960	Old	Mid	Old		No	1	72%	185.0	$ 1,017,500
Main St	106	104	0.52	1	2006	1980	2022	New	Mid	New		No	4	7%	92.0	$ -
Main St	107	106	0.18	1	2006	1980	2022	New	Mid	New		No	4	7%	56.2	$ -
Main St	108	107	0.49	1	2006	1980	2022	New	Mid	New		No	4	7%	64.3	$ -
Main St	110	108	0.79	1	2006	1980	2022	New	Mid	New		No	4	7%	113.0	$ -
Main St	112	110	0.60	1	2006	1980	2022	New	Mid	New		No	4	7%	68.7	$ -
Main St	114	112	0.60	1	2006	1980	2022	New	Mid	New		No	4	7%	90.5	$ -
William St	158	110	0.85	1	2006	1980	2022	New	Mid	New		No	4	7%	102.0	$ -
Anna St	169	108	0.95	1	2006	1980	2022	New	Mid	New		No	4	7%	85.6	$ -
								18.18181818	100	18.18181818				-	
Bethany St	151	152	1.45	2	1950	1980	1960	Old	Mid	Old	2	No	2	61%	61.8	$ -
Bethany St	152	153	1.97	3	1950	1980	1960	Old	Mid	Old	2	No	1	74%	93.3	$ 513,150
Bethany St	153	154	1.39	2	1950	1980	1960	Old	Mid	Old	2	No	2	61%	93.0	$ -
Station St	155	154	1.80	3	1950	1980	1960	Old	Mid	Old	2	No	1	74%	82.2	$ 452,100
Station St	154	144	1.18	2	1950	1980	1960	Old	Mid	Old		No	2	60%	109.2	$ -
Station St	144	139	0.54	1	1950	1980	1960	Old	Mid	Old		No	2	47%	107.7	$ -
Station St	139	138	0.91	1	1950	1980	1960	Old	Mid	Old		No	2	47%	108.3	$ -
William St	149	148	1.37	2	1950	1980	1960	Old	Mid	Old	4	No	2	65%	53.0	$ -
William St	148	147	1.60	3	1950	1980	1960	Old	Mid	Old	2	No	1	74%	67.7	$ 372,350
William St	147	146	1.35	2	1950	1980	1960	Old	Mid	Old		No	2	60%	56.0	$ -
William St	146	144	1.00	2	1950	1980	1960	Old	Mid	Old	2	No	2	61%	59.8	$ -
Emily St	143	142	0.97	1	1950	1980	1960	Old	Mid	Old	4	No	2	53%	124.2	$ -
Emily St	142	139	2.36	3	1950	1980	1960	Old	Mid	Old		No	1	72%	117.5	$ 646,250
Broad St	135	188	4.17	3	1950	1980	1960	Old	Mid	Old	5	No	1	80%	111.1	$ 611,215
Broad St	188	136	3.21	3	1950	1980	1960	Old	Mid	Old	5	No	1	80%	43.8	$ 241,120
Broad St	136	138	1.15	2	1950	1980	1960	Old	Mid	Old	2	No	2	61%	44.0	$ -
Broad St	138	West	0.41	1	1950	1980	1960	Old	Mid	Old		No	2	47%	79.1	$ -
Mill St	134	133	5.46	3	1950	1980	2002	Old	Mid	New		No	1	52%	91.4	$ -
								0	0	5.555555556				-	
Union	130	North	2.28	3	1950	1980	1982	Old	Mid	Mid		No	1	58%	123.8	$ -
Mill St	West	Outlet	0.80	1	1950	1980	2002	Old	Mid	New		No	3	27%	70.0	$ -
Mill St	West	130	2.69	3	1950	1980	2002	Old	Mid	New		No	1	52%	70.0	$ -
Richmond St	124	125	0.41	1	1998	1980	1995	Mid	Mid	Mid		No	4	19%	58.8	$ -
Richmond St	125	127	0.42	1	1998	1980	1995	Mid	Mid	Mid	3	No	3	23%	62.3	$ -
Richmond St	127	126	0.29	1	1998	1980	1995	Mid	Mid	Mid		No	4	19%	65.2	$ -
Richmond St	126	189	0.21	1	1998	1980	1995	Mid	Mid	Mid		No	4	19%	89.5	$ -
Richmond St	189	190	0.11	1	1998	1980	1995	Mid	Mid	Mid		No	4	19%	47.5	$ -

Criteria	Weight
Capacity	25%
Storm Age	20%
Sani Age	15%
WM Age	20%
Storm Cond	10%
Sani Cond	10%
	100%

max	82%
mean	38%

High Priority	70%	$ 8,654,855.00
Medium Priority	60%	

Richmond St	190	outlet	0.10	1	1998	1980	1995	Mid	Mid	Mid		No	4	19%	16.3	$ -
Mill St	123	122	1.94	3	1950	1980	1989	Old	Mid	Mid		No	1	58%	87.4	$ -
Victoria St	122	121	0.62	1	1940	1980	1960	Old	Mid	Old		No	2	47%	85.0	$ -
Victoria St	121	120	0.66	1	1940	1980	1960	Old	Mid	Old		No	2	47%	83.0	$ -
Victoria St	120	119	0.50	1	1940	1980	1960	Old	Mid	Old		No	2	47%	55.0	$ -
Victoria St	119	North	0.53	1	1940	1980	1960	Old	Mid	Old		No	2	47%	97.0	$ -
Clara St	East	120	0.08	1	1940	1980	1995	Old	Mid	Mid		No	3	33%	57.4	$ -
Front St	124	193	0.97	1	1940	1980	1960	Old	Mid	Old		No	2	47%	58.8	$ -
Front St	193	192	0.96	1	1940	1980	1960	Old	Mid	Old		No	2	47%	82.0	$ -
Front St	192	191	0.87	1	1940	1980	1960	Old	Mid	Old		No	2	47%	70.0	$ -
								33.33333333	0	38.88888889					-	
Main st	74	72	0.99	1	2006	1980	2022	New	Mid	New		No	4	7%	90.0	$ -
Main st	72	71	0.82	1	2006	1980	2022	New	Mid	New		Yes	1	17%	89.4	$ -
Main st	71	70	0.67	1	2006	1980	2022	New	Mid	New		No	4	7%	88.5	$ -
Main st	70	69	0.61	1	2006	1980	2022	New	Mid	New		No	4	7%	94.3	$ -
Main st	69	68	0.48	1	2006	1980	2022	New	Mid	New		Yes	1	17%	71.0	$ -
Main st	68	67	0.59	1	2006	1980	2022	New	Mid	New		Yes	1	17%	117.9	$ -
Main st	67	66	0.43	1	2006	1980	2022	New	Mid	New		No	4	7%	116.8	$ -
Main st	66	65	0.33	1	2006	1980	2022	New	Mid	New		No	4	7%	115.5	$ -
Main st	65	63	0.22	1	2006	1980	2022	New	Mid	New		No	4	7%	65.3	$ -
Main st	63	61	0.21	1	2006	1980	2022	New	Mid	New		No	4	7%	74.0	$ -
Main st	61	103	0.15	1	2006	1980	2022	New	Mid	New		No	4	7%	26.6	$ -
Main st	103	Outlet	0.02	1	2006	1980	2022	New	Mid	New		No	4	7%	16.9	$ -
Ellen St	East	65	0.91	1	1950	1980	1989	Old	Mid	Mid		No	3	33%	57.4	$ -
King St	60	61	0.57	1	1950	1980	1960	Old	Mid	Old		No	2	47%	45.0	$ -
Ardross St	187	67	0.92	1	1899	1980	1955	Old	Mid	Old	3	No	2	50%	57.9	$ -
Ardross St	90	187	0.85	1	1899	1980	1955	Old	Mid	Old	2	No	2	49%	61.0	$ -
Roskeen St	94	66	0.39	1	1982	1980	1984	Mid	Mid	Mid	3	No	3	22%	57.9	$ -
	92	94	0.33	1	1982	1980	1984	Mid	Mid	Mid	3	No	3	22%	61.0	$ -
Catherine St	97	101	1.85	3	1950	1980	1995	Old	Mid	Mid		No	1	58%	58.9	$ -
Catherine St	92	97	1.38	2	1950	1980	1995	Old	Mid	Mid		No	2	46%	61.0	$ -
	92	97	3.17	3	1950	1980	1995	Old	Mid	Mid		No	1	58%	61.0	$ -
Catherine St	90	92	2.19	3	1950	1980	1995	Old	Mid	Mid		No	1	58%	61.0	$ -
	90	92	3.99	3	1950	1980	1995	Old	Mid	Mid		No	1	58%	61.0	$ -
Catherine St	88	90	1.59	3	1950	1980	1995	Old	Mid	Mid		Yes	1	68%	119.9	$ -
	88	90	4.18	3	1950	1980	1995	Old	Mid	Mid		No	1	58%	119.9	$ -
Catherine St	86	88	2.08	3	1950	1980	1995	Old	Mid	Mid		No	1	58%	80.0	$ -
Catherine St	South	86	1.01	2	1950	1980	1972	Old	Mid	Old		No	2	60%	91.4	$ -
Ellen St	97	100	1.27	2	1950	1980	1989	Old	Mid	Mid		No	2	46%	58.9	$ -
Roskeen St	95	92	1.94	3	1950	1980	1984	Old	Mid	Mid		No	1	58%	58.7	$ -
Ardross St	91	90	1.92	3	1950	1980	1985	Old	Mid	Mid	4	No	1	64%	107.0	$ -
Tain St	East	68	2.22	3	1950	1980	1978	Old	Mid	Mid		No	1	58%	57.4	$ -
Leonard Ave	West	68	0.60	1	1950	1980	1954	Old	Mid	Old		No	2	47%	70.0	$ -
Catherine St	70	East	1.59	3	1950	1980	2009	Old	Mid	New		No	1	52%	94.3	$ -
McLeod St	West	84	1.27	2	1899	1980	2009	Old	Mid	New		No	2	40%	72.5	$ -
McLeod St	84	83	0.33	1	1899	2010	2009	Old	New	New		No	3	23%	83.0	$ -
McLeod St	83	82	0.43	1	1899	2010	2009	Old	New	New		No	3	23%	100.1	$ -
McLeod St	82	81	0.43	1	1899	2010	2009	Old	New	New		No	3	23%	86.8	$ -
McLeod St	81	81_1	0.54	1	1899	2010	2009	Old	New	New		No	3	23%	54.5	$ -
McLeod St	81_1	81_2	0.39	1	1899	2010	2009	Old	New	New		No	3	23%	61.4	$ -
McLeod St	81_2	81_3	0.38	1	1899	2010	2009	Old	New	New		No	3	23%	73.9	$ -
Elginfield Rd	77	78	0.50	1	1899	2010	2010	Old	New	New		No	3	23%	120.7	$ -
Elginfield Rd	78	80	0.86	1	1899	2010	2010	Old	New	New		No	3	23%	165.2	$ -
Elginfield Rd	80	81	0.52	1	1899	2010	2010	Old	New	New		No	3	23%	85.7	$ -
Elginfield Rd	79	East	0.53	1	1899	2010	2010	Old	New	New		No	3	23%	83.9	$ -
Tain St	East	88	1.79	3	1899	1980	1978	Old	Mid	Mid		Yes	1	68%	57.4	$ -
								26.66666667	22.22222222	53.33333333					-	
Ann St	59	58	0.71	1	2006	1980	1960	New	Mid	Old		No	4	27%	34.8	$ -
Ann St	51	59	0.36	1	2006	1980	1960	New	Mid	Old		No	4	27%	57.0	$ -
King St	East	59	0.32	1	1899	1980	1960	Old	Mid	Old		No	2	47%	57.4	$ -
King St	West	59	1.02	2	1950	1980	1960	Old	Mid	Old		No	2	60%	70.0	$ -
Ann St	East	51	1.14	2	1990	1980	1960	Mid	Mid	Old		No	2	46%	57.4	$ -
Ann St	49	51	1.11	2	2006	1980	1960	New	Mid	Old		No	2	40%	74.8	$ -
Broadway St	50	49	0.15	1	1950	1980	1960	Old	Mid	Old		Yes	1	57%	143.8	$ -
Broadway St	53	49	0.08	1	1950	1980	1960	Old	Mid	Old		Yes	1	57%	64.6	$ -
Ann St	44	49	1.25	2	2006	1980	1960	New	Mid	Old		No	2	40%	93.5	$ -
John St	48	44	1.21	2	1950	1980	1992	Old	Mid	Mid		No	2	46%	127.2	$ -
John St	43	44	0.62	1	1950	1980	2009	Old	Mid	New		No	3	27%	70.5	$ -
Ann St	45	44	1.87	3	1990	1980	1960	Mid	Mid	Old		No	1	58%	83.7	$ -
Ann St	47	45	1.73	3	1990	1980	1960	Mid	Mid	Old		No	1	58%	173.0	$ -
Leonard Ave	East	47	1.19	2	1950	1980	1960	Old	Mid	Old		No	2	60%	57.4	$ -
Albert St	42	41	0.07	1	1990	1980	1960	Mid	Mid	Old		No	4	33%	84.3	$ -
John St	40	41	1.43	2	1950	1980	2009	Old	Mid	New		No	2	40%	90.0	$ -
John St	East	41	0.71	1	1950	1980	2009	Old	Mid	New		No	3	27%	57.4	$ -
Albert St	41	52	0.21	1	1990	1980	1960	Mid	Mid	Old		No	4	33%	85.8	$ -
Broadway St	53	52	0.09	1	1950	1980	1960	Old	Mid	Old		No	2	47%	64.6	$ -
Albert St	52	57	0.51	1	1990	1980	1960	Mid	Mid	Old		No	4	33%	162.2	$ -
Elliot Dr	East	1_4	0.94	1	2018	1980	1982	New	Mid	Mid		No	4	13%	57.4	$ -
Elliot Dr	1_4	1_3	0.39	1	2018	1980	1982	New	Mid	Mid		No	4	13%	121.5	$ -
Elliot Dr	1_3	1_2	0.27	1	2018	1980	1982	New	Mid	Mid		No	4	13%	20.3	$ -
Elliot Dr	1_2	1	0.20	1	2018	1980	1982	New	Mid	Mid		No	4	13%	99.0	$ -
Elliot Dr	1	1_1	0.28	1	2018	1980	1982	New	Mid	Mid		No	4	13%	76.5	$ -
Elliot Dr	1_1	2	0.08	1	2018	1980	1982	New	Mid	Mid		No	4	13%	29.5	$ -

Park Dr	2	3	0.10	1	2018	1980	2008	New	Mid	New		No	4	7%	92.0	$	-
	3	Culvert	0.61	1	2008	2010	2008	New	New	New		No	4	3%	109.0	$	-
	2	3	0.09	1	2008	2010	2008	New	New	New		No	4	3%	92.0	$	-
	3	4	0.59	1	2008	2010	2008	New	New	New		No	4	3%	109.0	$	-
Park Dr	4	5	0.99	1	2008	2010	2008	New	New	New		No	4	3%	120.0	$	-
Park Dr	5	6	0.79	1	2008	2010	2008	New	New	New		No	4	3%	54.0	$	-
Park Dr	6	20	0.30	1	2008	2010	2008	New	New	New		No	4	3%	65.3	$	-
Park Dr	20	22	0.47	1	2008	1980	2008	New	Mid	New		No	4	7%	117.6	$	-
Park Dr	22	23	0.77	1	2008	1980	2008	New	Mid	New		No	4	7%	106.2	$	-
Park Dr	23	32	0.49	1	2008	1980	2008	New	Mid	New		Yes	1	17%	121.5	$	-
Park Dr	32	33	0.25	1	2008	1980	2008	New	Mid	New		No	4	7%	20.0	$	-
Park Dr	33	35	0.06	1	2008	1980	2008	New	Mid	New		No	4	7%	75.6	$	-
Park Dr	36	35	0.22	1	2008	1980	2008	New	Mid	New		No	4	7%	25.0	$	-
Park Dr	55	36	0.37	1	2008	1980	2008	New	Mid	New		No	4	7%	60.0	$	-
Broadway St	35	52	0.06	1	1950	1980	1960	Old	Mid	Old		No	2	47%	129.6	$	-
Duck St	29	31	0.96	1	1950	1980	2013	Old	Mid	New		No	3	27%	108.2	$	-
Duck St	31	32	0.49	1	1950	1980	2013	Old	Mid	New		No	3	27%	14.5	$	-
Duck St	27	29	0.53	1	1950	1980	2013	Old	Mid	New		No	3	27%	115.8	$	-
Elliot St	South	29	0.64	1	1950	1980	2013	Old	Mid	New		No	3	27%	91.4	$	-
Centre St	24	25	1.25	2	1950	1980	1985	Old	Mid	Mid		No	2	46%	15.0	$	-
Centre St	25	26	2.40	3	1950	1980	1985	Old	Mid	Mid		No	1	58%	123.0	$	-
Prince St	South	North	1.27	2	1950	1980	1972	Old	Mid	Old		No	2	60%	91.4	$	-
Prince St	West	39_1	2.22	3	1950	1980	1972	Old	Mid	Old		Yes	1	82%	70.0	$	385,000
Prince St	39_1	36	3.26	3	1950	1980	1972	Old	Mid	Old		No	1	72%	123.8	$	680,900
Elliot St	29	39_1	1.24	2	1950	1980	1960	Old	Mid	Old		No	2	60%	108.2	$	-
Park Dr	55_1	56	1.35	2	2008	2010	2008	New	New	New		No	2	15%	125.7	$	-
McLeod St	10	13	0.92	1	2010	2010	2010	New	New	New		No	4	3%	116.0	$	-
McLeod St	10	7	0.52	1	2010	2010	2010	New	New	New		No	4	3%	116.0	$	-
McLeod St	7	6	0.29	1	2010	2010	2010	New	New	New		No	4	3%	67.4	$	-
McLeod St	13	7	0.37	1	2010	2010	2010	New	New	New		No	4	3%	99.6	$	-
McLeod St	East	15	0.86	1	2010	2010	2010	New	New	New		No	4	3%	57.4	$	-
McLeod St	15	13	0.62	1	2010	2010	2010	New	New	New		No	4	3%	99.6	$	-
Michelle Ave	19	15	2.95	3	1950	1980	1991	Old	Mid	Mid		No	1	58%	111.0	$	-
King St	West	56	1.43	2	1950	1980	1960	Old	Mid	Old		No	2	60%	70.0	$	-
King St	56	57	1.92	3	1950	1980	1993	Old	Mid	Mid		No	1	58%	114.0	$	-
King St	57	Outlet	0.23	1	1950	1980	1993	Old	Mid	Mid		No	3	33%	123.3	$	-
								40.32258065	20.96774194	35.48387097							

48	1
60	2
27	3
52	4

Appendix C – Assessment of Storm Sewer Capacity in the Proposed System

November 2025

Project Name: Parkhill SWMMP

Project Number: 25007863-A0

Based on 1:5 Year Parkhill

Intensity Option # 1

1) Intensity (i) = a*(t+c)^b **2) Intensity (i) = a*t^b** **3) Insert Intensity**

a= 41.8 a= i=

b= -0.814 b=

c= 0.09

Manning's n = 0.013 Depth of Cover=1.5 1.50

Total Area (ha)= 199.35

Location								Storm Sewer Design																Proposed				
Upstream 4	Upstream 3	Upstream 2	Upstream 1	Downstream 1		Road /Stations	From MH	To MH	DA ID	Area (ha)	Run. Coef.	2.78AC	Accum. 2.78AC	T of In (min)	T of F (min)	T of Conc. (min)	Intensity (mm/hr)	Exp. Flow (L/s)	Capacity (L/s)	Velocity (m/s)	Wall Thickness (mm)	Length (m)	Pipe Dia. (mm)	Slope (%)	Invert US	Invert DS	Capacity Ratio	Proposed Pipe Dia. (mm)	US Invert (m)	DS Invert (m)	CAPACITY CHECK	VELOCITY CHECK
				15	15	Hasting St	179	186	A1	1.58	0.40	1.76	1.76	23.00	1.13	23.00	76.84	**134.92**	**123.98**	1.12	25.00	76.20	375	0.50	203.67	203.29	1.09	450	203.60	203.22	OKAY	OKAY
				14	22	Hasting St	186	180		2.19	0.40	2.43	4.19	23.00	0.97	24.13	74.44	**311.65**	**166.24**	1.05	25.00	60.96	450	0.34	203.22	203.01	1.87	600	203.07	202.86	OKAY	OKAY
					22	Eagle St	181	180	A2	0.69	0.40	0.77	0.77	23.00	1.53	23.00	76.84	**58.81**	**99.18**	0.90	25.00	82.30	375	0.32	203.35	203.09	0.59	375	203.35	203.09	OKAY	OKAY
					22	Eagle St	North	180	A54,A55	0.64	0.50	0.89	0.89	17.50	2.65	17.50	91.56	**81.45**	**53.33**	0.75	25.00	120.00	300	0.30	204.15	203.79	1.53	375	204.08	203.71	OKAY	OKAY
					19	Anna St	185_2	185_1	A57,A58	1.05	0.50	1.46	1.46	17.50	1.37	17.50	91.56	**133.96**	**102.23**	0.93	25.00	76.20	375	0.34	203.04	202.78	1.31	450	202.96	202.71	OKAY	OKAY
				18	20	Anna St	185_1	185		1.46	0.50	2.03	3.49	17.50	1.03	18.87	87.32	**304.67**	**156.16**	0.98	25.00	60.96	450	0.30	202.70	202.52	1.95	600	202.55	202.37	OKAY	OKAY
				19	21	Anna St	185	164	A53,A56	0.39	0.50	0.54	2.57	17.50	0.81	18.53	88.32	**226.81**	**442.77**	1.57	25.00	76.20	600	0.52	202.37	201.97	0.51	600	202.37	201.97	OKAY	OKAY
				20	22	Anna St	164	165		0.46	0.50	0.64	1.18	17.50	1.06	18.31	89.00	**105.15**	**504.35**	1.41	25.00	90.00	675	0.36	201.90	201.57	0.21	675	201.90	201.57	OKAY	OKAY
	17	16	15		23	Hasting St	180	182	A3,A48	0.85	0.40	0.95	5.03	23.00	1.68	24.53	73.63	**370.48**	**201.16**	0.93	25.00	93.70	525	0.22	203.87	203.66	1.84	675	203.72	203.51	OKAY	OKAY
			22		25	Hasting St	182	183		1.90	0.40	2.12	3.06	23.00	1.14	24.68	73.33	**224.48**	**336.31**	1.19	25.00	81.50	600	0.30	203.59	203.36	0.67	600	203.59	203.36	OKAY	OKAY
					25	George St	183_1	183	A47	0.69	0.40	0.77	0.77	23.00	1.51	23.00	76.84	**58.81**	**64.14**	0.91	25.00	82.30	300	0.44	202.92	202.56	0.92	300	202.92	202.56	OKAY	OKAY
	39	23	24		28	George St	183	165	A4,A7	1.17	0.50	1.63	5.40	17.50	1.34	24.51	73.66	**397.58**	**434.17**	1.54	25.00	123.20	600	0.50	201.41	200.88	0.92	600	201.41	200.88	OKAY	OKAY
					27	Elk St	South	166	A8,A10	0.65	0.50	0.90	0.90	17.50	1.68	17.50	91.56	**82.44**	**64.14**	0.91	25.00	91.44	300	0.44	202.72	202.31	1.29	375	202.64	202.24	OKAY	OKAY
			26		28	Anna St	166	165	A6,A51	1.46	0.50	2.03	2.93	17.50	2.07	19.18	86.43	**252.92**	**156.16**	0.98	25.00	121.92	450	0.30	202.16	201.79	1.62	600	202.01	201.64	OKAY	OKAY
	27	25	21		32	George St	165	163	A14,A49	0.50	0.50	0.70	4.99	17.50	0.94	19.57	85.33	**425.51**	**1015.01**	1.90	25.00	106.70	825	0.50	201.41	200.88	0.42	825	201.41	200.88	OKAY	OKAY
			30		32	William St	162	163	A21,A24	0.60	0.50	0.83	0.97	17.50	2.09	17.75	90.75	**88.30**	**401.40**	0.91	25.00	114.00	750	0.13	202.12	201.97	0.22	750	202.12	201.97	OKAY	OKAY
			31		29	William St	161	162	A20,A23	0.10	0.50	0.14	1.42	17.50	0.25	19.99	84.17	**119.34**	**325.56**	0.91	25.00	13.60	675	0.15	202.12	202.10	0.37	675	202.12	202.10	OKAY	OKAY
			37		30	William St	159	161	A19,A22	0.92	0.50	1.28	3.42	17.50	2.49	19.51	85.50	**292.37**	**325.56**	0.91	25.00	136.00	675	0.15	202.12	201.91	0.90	675	202.12	201.91	OKAY	OKAY
	36	28	29			George St	163	HW	A52	2.60	0.50	3.61	5.75	17.50	0.63	19.59	85.27	**490.69**	**1378.69**	2.17	25.00	81.70	900	0.58	200.81	200.32	0.36	900	200.81	200.32	OKAY	OKAY
					34	William St	163_4	163_3	A59	0.89	0.50	1.24	1.24	17.50	1.41	17.50	91.56	**113.26**	**99.18**	0.90	25.00	76.20	375	0.32	202.38	202.14	1.14	450	202.31	202.06	OKAY	OKAY
			33		35	William St	163_3	163_2		0.79	0.50	1.10	2.34	17.50	1.03	18.91	87.20	**203.62**	**156.16**	0.98	25.00	60.96	450	0.30	202.06	201.88	1.30	525	201.99	201.80	OKAY	OKAY
			34		36	William St	163_2	163_1		0.48	0.50	0.67	1.77	17.50	1.21	18.53	88.32	**155.91**	**235.55**	1.09	25.00	79.25	525	0.30	201.80	201.56	0.66	525	201.80	201.56	OKAY	OKAY
			35		32	William St	163_1	163		0.44	0.50	0.61	1.28	17.50	1.24	18.71	87.79	**112.26**	**265.11**	1.22	25.00	91.44	525	0.38	201.53	201.02	0.42	525	201.53	201.02	OKAY	OKAY
	44	45	38		31	Delware St	168	159	A15,26	1.54	0.50	2.14	4.64	17.50	2.01	19.77	84.79	**393.63**	**201.72**	0.93	25.00	112.20	525	0.22	202.37	200.38	1.95	750	202.14	201.89	OKAY	OKAY
		42	41		37	Delware St	174	168	A12,25	0.90	0.50	1.25	2.65	17.50	2.27	19.50	85.53	**227.08**	**145.38**	0.91	25.00	124.30	450	0.26	203.05	202.73	1.56	600	202.90	202.58	OKAY	OKAY
					25	Hasing St	West	183	A5,A27	0.64	0.50	0.89	0.89	17.50	1.30	17.50	91.56	**81.45**	**99.18**	0.90	25.00	70.00	375	0.32	202.98	200.38	0.82	375	202.98	202.76	OKAY	OKAY
					41	Hasting St	East	175	A28	0.20	0.50	0.28	0.28	17.50	1.49	17.50	91.56	**25.45**	**31.47**	0.64	25.00	57.40	250	0.28	203.21	203.05	0.81	375	203.09	202.93	OKAY	OKAY
		48	40		42	Hasing St	175	174	A9,A31	0.74	0.50	1.03	3.04	17.50	2.00	19.37	85.88	**261.42**	**99.18**	0.90	25.00	107.60	375	0.32	203.41	203.07	2.64	600	203.19	202.84	OKAY	OKAY
					38	Hasing St	West	174	A22	0.27	0.50	0.38	0.38	17.50	0.69	17.50	91.56	**34.36**	**44.50**	0.91	25.00	37.50	250	0.56	203.35	203.07	0.77	250	203.12	203.02	OKAY	OKAY
					50	Hasting St	171	106	A45,A186	0.56	0.50	0.78	0.78	17.50	2.28	17.50	91.56	**71.27**	**99.18**	0.90	25.00	122.70	375	0.32	202.20	201.81	0.72	375	202.20	201.81	OKAY	OKAY
					37	Anna St	West	168	A34,35	0.30	0.50	0.42	0.42	17.50	0.96	17.50	91.56	**38.18**	**24.54**	0.78	25.00	45.00	200	0.56	204.13	203.88	1.56	300	204.03	203.78	OKAY	OKAY
					37	Anna St	East	168	A11,13	0.60	0.50	0.83	0.83	17.50	1.66	17.50	91.56	**76.36**	**24.54**	0.78	25.00	78.00	200	0.56	205.00	204.56	3.11	375	204.83	204.39	OKAY	OKAY
				49		Peart ST	184	Outlet	A44	0.73	0.50	1.01	3.10	17.50	1.01	20.90	81.80	**253.57**	**209.51**	1.32	25.00	80.00	450	0.54	197.83	203.07	1.21	525	197.76	197.33	OKAY	OKAY
			41			Elk St	176	175	A29,30	0.66	0.50	0.92	0.92	17.50	1.98	17.50	91.56	**83.99**	**64.14**	0.91	25.00	108.00	300	0.44	205.50	205.02	1.31	375	205.43	204.95	OKAY	OKAY
					49	Pearl ST	158	191	A33,A37	1.25	0.50	1.74	1.74	17.50	1.87	17.50	91.56	**159.08**	**64.14**	0.91	25.00	102.00	300	0.44	204.30	203.85	2.48	450	204.15	203.70	OKAY	OKAY
			48		46	Pearl ST	191	184	A36,43	1.50	0.50	2.09	3.82	17.50	3.40	19.37	85.88	**328.27**	**64.14**	0.91	25.00	185.00	300	0.44	203.75	202.94	5.12	600	203.45	202.64	OKAY	OKAY
		43	51			Main St	106	104	A50	0.65	0.50	0.90	2.02	17.50	1.69	19.78	84.76	**170.83**	**325.56**	0.91	25.00	92.00	675	0.15	198.70	198.56	0.52	675	198.70	198.56	OKAY	OKAY
			52		50	Main St	107	106	A185	0.24	0.50	0.33	0.65	17.50	1.03	18.68	87.89	**57.20**	**325.56**	0.91	25.00	56.20	675	0.15	199.25	199.17	0.18	675	199.25	199.17	OKAY	OKAY
		57	53		51	Main St	108	107	A184	0.23	0.50	0.32	1.86	17.50	1.18	19.57	85.33	**158.73**	**325.56**	0.91	25.00	64.30	675	0.15	199.40	199.30	0.49	675	199.40	199.30	OKAY	OKAY
		56	54		52	Main St	110	108	A46	0.63	0.50	0.88	1.83	17.50	2.07	19.72	84.92	**155.81**	**197.08**	0.91	25.00	113.00	525	0.21	200.40	200.16	0.79	525	200.40	200.16	OKAY	OKAY
			55		53	Main St	112	110	A41	0.26	0.50	0.36	1.01	17.50	1.25	19.18	86.43	**87.70**	**145.38**	0.91	25.00	68.70	450	0.26	200.65	200.47	0.60	450	200.65	200.47	OKAY	OKAY
					54	Main St	114	112	A40	0.47	0.50	0.65	0.65	17.50	1.68	17.50	91.56	**59.81**	**99.18**	0.90	25.00	90.45	375	0.32	201.25	200.96	0.60	375	201.25	200.96	OKAY	OKAY
					53	William St	158	110	A38,A42	0.43	0.50	0.60	0.60	17.50	2.22	17.50	91.56	**54.72**	**64.14**	0.91	25.00	120.80	300	0.44	204.04	203.51	0.85	300	204.04	203.51	OKAY	OKAY
					52	Anna St	189	108	A183	0.48	0.5	0.67	0.67	17.50	1.57	17.50	91.56	**61.09**	**64.14**	0.91	25.00	85.6	300	0.44	202.01	201.63	0.95	300	202.01	201.63	OKAY	OKAY
					60	Bethany St	151	152		0.73	0.50	1.01	1.01	17.50	1.14	17.50	91.56	**92.90**	**64.14**	0.91	25.00	61.84	300	0.44	200.51	200.24	1.45	375	200.44	200.17	OKAY	OKAY
				59	61	Bethany St	152	153	B16,B17	0.87	0.50	1.21	2.22	17.50	1.73	18.64	88.02	**195.75**	**99.18**	0.90	25.00	93.3	375	0.32	200.13	199.83	1.97	525	199.98	199.68	OKAY	OKAY
				60	63	Bethany St	153	154		0.81	0.50	1.13	2.34	17.50	1.70	19.23	86.28	**201.48**	**145.38**	0.91	25.00	93	450	0.26	199.51	199.27	1.39	525	199.43	199.19	OKAY	OKAY
					63	Station St	155	154	B68	1.40	0.50	1.95	1.95	17.50	1.53	17.50	91.56	**178.17**	**99.18**	0.90	25.00	82.2	375	0.32	202.32	202.06	1.80	525	202.17	201.91	OKAY	OKAY
				62	64	Station St	154	144	B69	0.52	0.50	0.72	2.67	17.50	2.00	19.03	86.87	**231.85**	**197.08**	0.91	25.00	109.2	525	0.21	202.04	201.81	1.18	600	201.96	201.79	OKAY	OKAY
		69	63		65	Station St	144	139	B70	0.35	0.50	0.49	1.64	17.50	1.95	19.50	85.53	**140.28**	**260.50**	0.92	25.00	107.70	600	0.18	201.79	201.59	0.54	600	201.79	201.59	OKAY	OKAY
		71	64		75	Station St	139	138	B71	0.35	0.50	0.49	3.48	17.50	1.98	19.64	85.13	**295.82**	**325.56**	0.91	25.00	108.30	675	0.15	201.57	201.41	0.91	675	201.57	201.41	OKAY	OKAY
					67	William St	149	148		0.69	0.50	0.96	0.96	17.50	0.97	17.50	91.56	**87.81**	**64.14**	0.91	25.00	53.00	300	0.44	202.65	202.42	1.37	375	202.58	202.34	OKAY	OKAY
				66	68	William St	148	147	B18	0.60	0.50	0.83	1.79	17.50	1.26	18.47	88.51	**158.70**	**99.18**	0.90	25.00	67.70	375	0.32	202.40	202.18	1.60	525	202.25	202.03	OKAY	OKAY
				67	69	William St	147	146		0.50	0.50	0.70	1.53	17.50	1.04	18.76	87.66	**134.03**	**99.18**	0.90	25.00	56.00	375	0.32	202.16	201.98	1.35	450	202.09	201.91	OKAY	OKAY
				68	64	William St	146	144		0.31	0.50	0.43	1.13	17.50	1.11	18.54	88.31	**99.42**	**99.18**	0.90	25.00	59.80	375	0.32	201.96	201.77	1.00	450	201.89	201.69	OKAY	OKAY
					71	Emily St	143	142	B60	1.11	0.50	1.54	1.54	17.50	2.26	17.50	91.56	**141.26**	**145.38**	0.91	25.00	124.20	450	0.26	202.80	202.48	0.97	450	202.80	202.48	OKAY	OKAY
				70	65	Emily St	142	139		1.80	0.50	2.50	4.04	17.50	2.14	19.76	84.79	**342.97**	**145.38**	0.91	25.00	117.50	450	0.26	202.46	202.15	2.36	675	202.23	201.93	OKAY	OKAY
					73	Broad St	135	188	B67	2.10	0.50	2.92	2.92	17.50	2.04	17.50	91.56	**267.25**	**64.14**	0.91	25.00	111.13	300	0.44	201.70	201.21	4.17	525	201.48	200.99	OKAY	OKAY
				72	74	Broad St	188	136		0.58	0.50	0.81	3.73	17.50	0.81	19.54	85.41	**318.16**	**99.18**	0.90	25.00	43.84	375	0.32	201.19	201.05	3.21	600	200.97	200.83	OKAY	OKAY
				73	75	Broad St	136	138		0.34	0.50	0.47	1.28	17.50	0.82	18.31	88.99	**113.80**	**99.18**	0.90	25.00	44.00	375	0.32	201.03	200.89	1.15	600	200.81	200.66	OKAY	OKAY
		65	74			Broad St	138	West	B73	0.44	0.50	0.61	1.57	17.50	1.45	19.48	85.57	**134.40**	**325.56**	0.91	25.00	79.12	675	0.15	200.87	200.75	0.41	675	200.87	200.75	OKAY	OKAY
						Mill St	134	133	B72	2.75	0.50	3.82	3.82	17.50	1.68	17.50	91.56	**349.97**	**64.14**	0.91	25.00	91.40	300	0.44	200.24	199.84	5.46	600	199.94	199.54	OKAY	OKAY
				80		Union	130	North	E74	1.36	0.50	1.89	3.60	17.50	1.61	20.56	82.66	**297.59**	**90.37**	1.28	25.00	123.78	300	0.87	201.75	200.67	3.29	525	201.53	200.44	OKAY	OKAY
						Mill St	West	Outlet	E75	0.89	0.50	1.24	1.24	17.50	1.39	17.50	91.56	**113.26**	**142.20**	2.01	25.00	167.40	300	2.16	202.12	198.50	0.80	300	202.12	198.50	OKAY	OKAY
					78	Mill St	West	130	E64,E65	1.23	0.50	1.71	1.71	17.50	3.06	17.50	91.56	**156.53**	**58.26**	0.82	25.00	151.50	300	0.36	202.28	201.73	2.69	450	202.13	201.58	OKAY	OKAY
					82	Richmond St	124	125	E78	0.54	0.50	0.75	0.75	17.50	0.92	17.50	91.56	**68.72**	**168.67**	1.06	25.00	58.80	450	0.35	202.40	202.19	0.41	450	202.40	202.19	OKAY	OKAY
				81	83	Richmond St	125	127	E85	0.95	0.50	1.32	2.07	17.50	0.76	18.42	88.65	**183.61**	**388.33**	1.37	25.00	62.30	600	0.40	202.17	201.93	0.47	600	202.17	201.93	OKAY	OKAY
				82	84	Richmond St	127	126	E79	0.82	0.50	1.14	2.46	17.50	0.64	18.26	89.17	**219.38**	**483.47**	1.71	25.00	65.16	600	0.62	201.91	201.50	0.45	600	201.91	201.50	OKAY	OKAY
				83	85	Richmond St	126	189	E80	1.04	0.50	1.45	2.59	17.50	0.81	18.14	89.54	**231.50**	**818.09**	1.85	25.00	89.52	750	0.54	201.48	201.00	0.28	750	201.48	201.00	OKAY	OKAY
				84	86	Richmond St	189	190	E83	0.39	0.50	0.54	1.99	17.50	0.42	18.31	89.01	**176.93**	**833.10**	1.89	25.00	47.46	750	0.56	200.98	200.71	0.21	750	200.98	200.71	OKAY	OKAY
				85		Richmond St	190	outlet	E86	0.35	0.50	0.49	1.03	17.50	0.14	17.92	90.21	**92.79**	**833.10**	1.89	25.00	16.30	750	0.56	200.69	200.60	0.11	750	200.69	200.60	OKAY	OKAY
					88	Mill St	123	122	E66,E76	0.69	0.50	0.96	0.96	17.50	2.27	17.50	91.56	**87.81**	**45.36**	0.64	25.00	87.43	300.00	0.22	202.30	202.11	1.94	450	202.15	201.96	OKAY	OKAY
				87	89	Victoria St	122	121	E77	0.97	0.50	1.35	2.31	17.50	0.86	19.77	84.77	**195.61**	**262.40**	1.65	25.00	85.00	450.00	0.85	202.17	201.45	0.75	450	202.17	201.45	OKAY	OKAY
				88	90	Victoria St	121	120	E82	1.12	0.50	1.56	2.91	17.50	0.82	18.36	88.85	**258.13**	**269.21**	1.69	25.00	83.00	450.00	0.89	201.43	200.69	0.96	450	201.43	200.69	OKAY	OKAY
		92	89		91	Victoria St	120	119	E61	0.84	0.50	1.17	3.41	17.50	0.53	18.32	88.98	**303.02**	**371.31**	1.72	25.00	55.00	525.00	0.75	200.67	200.26	0.82	525	200.67	200.26	OKAY	OKAY
			90			Victoria St	119	North	E81	1.27	0.50	1.77	2.93	17.50	0.96	18.03	89.85	**263.53**	**365.34**	1.69	25.00	97.00	525.00	0.72	200.24	199.54	0.72	525	200.24	199.54	OKAY	OKAY
					90	Clara St	East	120	E87	0.49	0.50	0.68	0.68	17.50	0.57	17.50	91.56	**62.36**	**1228.41**	3.43	25.00	118.00	675.00	2.14	201.02	198.50	0.05	675	201.02	198.50	OKAY	OKAY
					94	Front St	124	193	E63,E84	0.58	0.50	0.81	0.81	17.50	1.18	17.50	91.56	**73.81**	**76.05**	1.08	25.00	76.00	300.00	0.62	202.55	202.08	0.97	300	202.55	202.08	OKAY	OKAY
				93	95	Front St	193	192	E62	0.54	0.50	0.75	1.56	17.50	1.31	18.68	87.89	**136.83**	**115.53**	1.05	25.00	82.00	375.00	0.43	202.06	201.70	1.18	450	201.99	201.63	OKAY	OKAY
				94		Front St	192	191		0.46	0.50	0.64	1.39	17.50	1.12	18.81	87.51	**121.64**	**114.97**	1.04	25.00	70.00	375.00	0.43	201.68	201.40	1.06	450	201.61	201.33	OKAY	OKAY
					98	Main st	74	72	C159	0.49	0.50	0.68	1.42	17.50	1.34	19.07	86.74	**122.98**	**123.98**	1.12	25.00	90.00	375	0.50	202.80	202.35	0.99	375	202.80	202.35	OKAY	OKAY
				97	99	Main st	72	71	C158	0.53	0.50	0.74	1.42	17.50	1.57	18.84	87.43	**123.95**	**150.77**	0.95	25.00	89.40	450	0.28	202.30	202.05	0.82	450	202.30	202.05	OKAY	OKAY
				98	100	Main st	71	70	C157	0.39	0.50	0.54	1.28	17.50	1.41	19.07	86.74	**110.92**	**166.00**	1.04	25.00	88.50	450	0.34	202.00	201.70	0.67	450	202.00	201.70	OKAY	OKAY
				99	101	Main st	70	69	C190	0.61	0.50	0.85	1.39	17.50	1.72	18.91	87.20	**121.21**	**198.06**	0.91	25.00	94.30	525	0.21	201.70	201.50	0.61	525	201.70	201.50	OKAY	OKAY
				100	102	Main st	69	68	C112	0.30	0.50	0.42	1.26	17.50	1.12	19.22	86.32	**109.19**	**228.25**	1.05	25.00	71.00	525	0.28	201.45	201.25	0.48	525	201.45	201.25	OKAY	OKAY
		127	101		103	Main st	68	67	C155	0.33	0.50	0.46	2.43	17.50	1.55	19.15	86.51	**210.43**	**357.64**	1.26	25.00	117.90	600	0.34	201.15	200.75	0.59	600	201.15	200.75	OKAY	OKAY
		111	102		104	Main st	67	66	C107	0.64	0.50	0.89	1.96	17.50	1.77	19.05	86.79	**170.10**	**394.27**	1.10	25.00	116.80	675	0.22	200.70	200.45	0.43	675	200.70	200.45	OKAY	OKAY
		113	103		105	Main st	66	65	C99	0.69	0.50	0.96	2.33	17.50	1.14	19.27	86.18	**200.83**	**605.85**	1.69	25.00	115.50	675	0.52	200.40	199.80	0.33	675	200.40	199.80	OKAY	OKAY
		109	104		106	Main st	65	63	C189	0.30	0.50	0.42	2.18	17.50	0.45	18.93	87.14	**190.16**	**870.31**	2.43	25.00	65.30	675	1.07	199.70	199.00	0.22	675	199.70	199.00	OKAY	OKAY
			105		107	Main st	63	61	C97	0.36	0.50	0.50	0.92	17.50	1.12	17.95	90.12	**82.68**	**394.27**	1.10	25.00	74.00	675	0.22	198.90	198.50	0.21	675	198.90	198.50	OKAY	OKAY

	110	106	108	Main st	61	103	C188	0.11	0.50	0.15	1.21	17.50	0.22	18.62	88.07	**106.50**	**728.88**	2.04	25.00	26.60	675	0.75	198.45	198.25	0.15	675	198.45	198.25	OKAY	OKAY
		107		Main st	103	Outlet	C187	0.04	0.50	0.06	0.21	17.50	0.11	17.72	90.85	**18.94**	**914.44**	2.56	25.00	16.90	675	1.18	198.00	197.80	0.02	675	198.00	197.80	OKAY	OKAY
			105	Ellen St	East	65	C98	0.58	0.50	0.81	0.81	17.50	1.43	17.50	91.56	**73.81**	**81.31**	1.15	25.00	99.00	300	0.71	203.20	202.50	0.91	300	203.20	202.50	OKAY	OKAY
			107	King St	60	61	C154	0.40	0.50	0.56	0.56	17.50	0.59	17.50	91.56	**50.90**	**90.02**	1.27	25.00	45.00	300	0.87	201.98	201.58	0.57	300	201.98	201.59	OKAY	OKAY
		112	103	Ardross St	187	67	C108,C149	0.44	0.50	0.61	1.22	17.50	0.58	18.60	88.14	**107.81**	**116.84**	1.65	25.00	57.91	300	1.46	201.77	200.75	0.92	300	201.77	200.75	OKAY	OKAY
			111	Ardross St	90	187		0.44	0.50	0.61	0.61	17.50	1.10	17.50	91.56	**56.00**	**65.59**	0.93	25.00	60.96	300	0.46	201.02	201.77	0.85	300	201.02	201.77	OKAY	OKAY
		114	104	Roskeen St	94	66	C104,C105	0.35	0.50	0.48	0.79	17.50	0.59	18.33	88.94	**70.25**	**180.51**	1.63	25.00	57.91	375	1.06	201.09	200.41	0.39	375	201.09	200.41	OKAY	OKAY
			113		92	94		0.22	0.50	0.31	0.31	17.50	0.83	17.50	91.56	**28.22**	**86.49**	1.22	25.00	60.96	300	0.80	201.65	201.09	0.33	300	201.65	201.09	OKAY	OKAY
		116		Catherine St	97	101	C94	0.65	0.50	0.90	1.40	17.50	1.08	19.64	85.13	**118.93**	**64.14**	0.91	25.00	58.85	300	0.44	202.68	202.42	1.85	375	202.61	202.35	OKAY	OKAY
		118	115	Catherine St	92	97	C96,C163	0.36	0.50	0.49	1.04	17.50	2.14	19.59	85.26	**88.29**	**64.14**	0.91	25.00	116.50	300	0.44	202.51	201.99	1.38	450	202.36	201.84	OKAY	OKAY
	125	119			92	97		0.36	0.50	0.49	2.40	17.50	2.15	19.71	84.93	**203.65**	**64.14**	0.91	25.00	117.00	300	0.44	203.22	202.70	3.17	525	202.99	202.48	OKAY	OKAY
		120	116	Catherine St	90	92	C101,C106	0.39	0.50	0.54	1.65	17.50	2.09	19.70	84.96	**140.54**	**64.14**	0.91	25.00	114.00	300	0.44	203.03	202.53	2.19	500	202.83	202.33	OKAY	OKAY
	126	121	117		90	92		0.39	0.50	0.54	3.00	17.50	2.21	19.64	85.15	**255.64**	**64.14**	0.91	25.00	120.45	300	0.44	203.77	203.24	3.99	600	203.47	202.94	OKAY	OKAY
			118	Catherine St	88	90	C103,C165	0.80	0.50	1.11	1.11	17.50	2.20	17.50	91.56	**101.81**	**64.14**	0.91	25.00	119.88	300	0.44	203.57	203.05	1.59	450	203.42	202.90	OKAY	OKAY
	141	122	119		88	90		0.80	0.50	1.11	3.17	17.50	2.14	19.84	84.58	**268.05**	**64.14**	0.91	25.00	116.3	300	0.44	204.3	203.79	4.18	525	204.08	203.56	OKAY	OKAY
		123	121	Catherine St	86	88	C126	0.58	0.50	0.81	1.52	17.50	1.47	18.56	88.25	**133.70**	**64.14**	0.91	25.00	80.00	300	0.44	203.95	203.59	2.08	450	203.80	203.44	OKAY	OKAY
			122	Catherine St	South	86	C164	0.51	0.50	0.71	0.71	17.50	1.06	17.50	91.56	**64.90**	**64.14**	0.91	25.00	57.70	300	0.44	204.22	203.97	1.01	450	204.07	203.82	OKAY	OKAY
				Ellen St	97	100	C95	0.64	0.50	0.89	0.89	17.50	2.02	17.50	91.56	**81.45**	**64.14**	0.91	25.00	110.1	300	0.44	203.22	202.74	1.27	450	203.07	202.59	OKAY	OKAY
			117	Roskeen St	95	92	C100	0.98	0.50	1.36	1.36	17.50	1.08	17.50	91.56	**124.72**	**64.14**	0.91	25.00	58.7	300	0.44	203.33	203.07	1.94	450	203.18	202.92	OKAY	OKAY
			119	Ardross St	91	90	C102	0.97	0.50	1.35	1.35	17.50	1.97	17.50	91.56	**123.44**	**64.14**	0.91	25.00	107	300	0.44	203.77	203.30	1.92	450	203.62	203.15	OKAY	OKAY
			102	Tain St	East	68	C111,C109	1.12	0.50	1.56	1.56	17.50	1.65	17.50	91.56	**142.53**	**64.14**	0.91	25.00	90.00	300	0.44	203.98	203.58	2.22	375	203.91	203.51	OKAY	OKAY
			129	McLeod St	16	70	C161	0.30	0.50	0.42	0.42	17.50	1.29	17.50	91.56	**38.18**	**64.14**	0.91	25.00	70.20	300	0.44	204.16	203.85	0.60	450	204.01	203.70	OKAY	OKAY
		128	130	Catherine St	70	East	C160	0.54	0.50	0.75	1.17	17.50	1.21	18.79	87.56	**102.24**	**64.14**	0.91	25.00	65.88	300	0.44	203.83	203.54	1.59	375	203.76	203.47	OKAY	OKAY
		129	131	McLeod St	West	84		0.13	0.50	0.18	0.93	17.50	1.33	18.71	87.80	**81.75**	**64.14**	0.91	25.00	72.5	300	0.44	202.81	202.49	1.27	375	202.74	202.42	OKAY	OKAY
		130	132	McLeod St	84	83		0.40	0.50	0.55	0.73	17.50	1.52	18.83	87.44	**64.14**	**197.08**	0.91	25.00	82.96	525	0.21	202.47	202.30	0.33	525	202.47	202.30	OKAY	OKAY
		131	133	McLeod St	83	82		0.52	0.50	0.72	1.28	17.50	1.81	19.02	86.89	**110.82**	**260.50**	0.92	25.00	100.12	600	0.18	202.28	202.10	0.43	600	202.28	202.10	OKAY	OKAY
		132	134	McLeod St	82	81	C127	0.66	0.50	0.91	1.64	17.50	1.59	19.31	86.06	**140.83**	**325.56**	0.91	25.00	86.75	675	0.15	202.08	201.95	0.43	675	202.08	201.95	OKAY	OKAY
	139	133	135	McLeod St	81	81_1		2.63	0.50	3.66	10.50	17.50	0.77	19.09	86.69	**910.36**	**1687.83**	1.18	25.00	54.51	1350	0.1	201.93	201.87	0.54	1350	201.93	201.87	OKAY	OKAY
		134	136	McLeod St	81_1	81_2		2.63	0.50	3.66	7.31	17.50	0.87	18.27	89.12	**651.78**	**1687.83**	1.18	25.00	61.39	1350	0.1	201.85	201.79	0.39	1350	201.85	201.79	OKAY	OKAY
				McLeod St	81_2	81_3		2.63	0.50	3.66	7.31	17.50	1.04	18.37	88.83	**649.61**	**1687.83**	1.18	25.00	73.88	1350	0.1	201.77	201.70	0.38	1350	201.77	201.70	OKAY	OKAY
		138	138	Elginfield Rd	77	78		1.02	0.50	1.42	1.42	17.50	2.18	17.50	91.56	**130.01**	**260.50**	0.92	25.00	120.68	600	0.18	205.66	205.44	0.50	600	205.66	205.44	OKAY	OKAY
		137	139	Elginfield Rd	78	80	C162	1.35	0.50	1.88	3.30	17.50	3.03	19.68	85.02	**280.25**	**325.56**	0.91	25.00	165.23	675	0.15	205.42	205.17	0.86	675	205.42	205.17	OKAY	OKAY
		138	140	Elginfield Rd	80	81		4.27	0.50	5.93	7.81	17.50	1.31	20.53	82.76	**646.09**	**1232.89**	1.09	25.00	85.74	1200	0.10	205.15	205.07	0.52	1200	205.15	205.07	OKAY	OKAY
				Elginfield Rd	79	East		0.42	0.50	0.58	0.58	17.50	1.56	17.50	91.56	**53.03**	**99.18**	0.90	25.00	83.86	375	0.32	204.96	204.69	0.53	450	204.89	204.62	OKAY	OKAY
			124	Tain St	East	88	C110	0.9	0.50	1.25	1.25	17.50	2.34	17.50	91.56	**114.54**	**64.14**	0.91	25.00	127.5	300	0.44	204.20	203.64	1.79	450	204.05	203.49	OKAY	OKAY
146	145	144		Ann St	59	58	D166	0.04	0.50	0.06	2.18	17.50	0.63	19.60	85.25	**186.05**	**260.50**	0.92	25.00	34.80	600	0.18	202.48	202.42	0.71	600	202.48	202.42	OKAY	OKAY
	147	145	143	Ann St	51	59	D168	0.21	0.50	0.29	1.07	17.50	1.03	18.63	88.05	**94.24**	**260.50**	0.92	25.00	57.00	600	0.18	202.61	202.50	0.36	600	202.61	202.50	OKAY	OKAY
			143	King St	East	59	D129	0.16	0.50	0.22	0.22	17.50	0.61	17.50	91.56	**20.36**	**64.14**	0.91	25.00	33.00	300	0.44	200.17	200.02	0.32	300	200.17	200.02	OKAY	OKAY
			143	King St	West	59	D130	1.16	0.50	1.61	1.61	17.50	2.10	17.50	91.56	**147.62**	**145.38**	0.91	25.00	115.00	450	0.26	201.39	201.09	1.02	525	201.32	201.02	OKAY	OKAY
			144	Ann St	East	51	D167	0.40	0.50	0.56	0.56	17.50	1.13	17.50	91.56	**50.90**	**44.50**	0.91	25.00	61.20	250	0.56	200.30	199.96	1.14	300	200.25	199.91	OKAY	OKAY
151	150	149	144	Ann St	49	51	D169	0.67	0.50	0.93	3.46	17.50	1.35	20.16	83.71	**289.74**	**260.50**	0.92	25.00	74.80	600	0.18	202.76	202.63	1.11	675	202.68	202.55	OKAY	OKAY
			148	Broadway St	50	49	D113	0.67	0.50	0.93	0.93	17.50	2.66	17.50	91.56	**85.27**	**572.47**	0.90	25.00	143.78	900	0.10	203.05	202.91	0.15	900	203.05	202.91	OKAY	OKAY
			148	Broadway St	53	49	D118	0.35	0.50	0.49	0.49	17.50	1.20	17.50	91.56	**44.54**	**572.47**	0.90	25.00	64.60	900	0.10	202.77	202.71	0.08	900	202.77	202.71	OKAY	OKAY
154	153	152	148	Ann St	44	49	D114,D119	0.80	0.50	1.11	3.85	17.50	1.69	19.84	84.59	**325.72**	**260.50**	0.92	25.00	93.50	600	0.18	202.95	202.78	1.25	675	202.87	202.70	OKAY	OKAY
			151	John St	48	44	D115	0.61	0.50	0.85	0.85	17.50	2.34	17.50	91.56	**77.63**	**64.14**	0.91	25.00	127.20	300	0.44	202.80	202.24	1.21	375	202.73	202.17	OKAY	OKAY
			151	John St	43	44	D117	0.31	0.50	0.43	0.43	17.50	1.29	17.50	91.56	**39.45**	**64.14**	0.91	25.00	70.50	300	0.44	202.70	202.39	0.62	300	202.70	202.39	OKAY	OKAY
		155	151	Ann St	45	44	D116,D123	1.05	0.50	1.46	5.91	17.50	1.51	20.63	82.49	**487.31**	**260.50**	0.92	25.00	83.70	600	0.18	203.12	202.97	1.87	825	202.89	202.74	OKAY	OKAY
		156	154	Ann St	47	45	D124,D125	3.20	0.50	4.45	5.28	17.50	3.13	19.52	85.47	**451.44**	**260.50**	0.92	25.00	173.00	600	0.18	203.45	203.14	1.73	750	203.30	202.99	OKAY	OKAY
			155	Leonard Ave	East	47	D170	0.6	0.50	0.83	0.83	17.50	2.02	17.50	91.56	**76.36**	**64.14**	0.91	25.00	110	300	0.44	203.6	203.12	1.19	375	203.53	203.04	OKAY	OKAY
			160	Albert St	42	41	D131	0.65	0.50	0.90	0.90	17.50	1.29	17.50	91.56	**82.72**	**1232.89**	1.09	25.00	84.3	1200	0.10	202.63	202.55	0.07	1200	202.63	202.55	OKAY	OKAY
			160	John St	40	41	D132	0.72	0.50	1.00	1.00	17.50	1.65	17.50	91.56	**91.63**	**64.14**	0.91	25.00	90	300	0.44	202.65	202.25	1.43	375	202.58	202.18	OKAY	OKAY
			160	John St	East	41	D122	0.36	0.50	0.50	0.50	17.50	0.86	17.50	91.56	**45.81**	**64.14**	0.91	25.00	47	300	0.44	202.8	202.59	0.71	300	202.80	202.59	OKAY	OKAY
157	158	159	162	Albert St	41	52	D121,D133	0.44	0.50	0.61	3.02	17.50	1.31	19.15	86.51	**260.93**	**1232.89**	1.09	25.00	85.8	1200	0.10	201.25	201.16	0.21	1200	201.25	201.16	OKAY	OKAY
			162	Broadway St	53	52	D120	0.39	0.50	0.54	0.54	17.50	1.33	17.50	91.56	**49.63**	**572.47**	0.90	25.00	72	900	0.10	202.79	202.72	0.09	900	202.79	202.72	OKAY	OKAY
183	161	160	205	Albert St	52	57	D135	1.3	0.50	1.81	3.32	17.50	3.00	18.83	87.43	**290.46**	**572.47**	0.90	25.00	162.2	900	0.1	201.07	200.91	0.51	900	201.07	200.91	OKAY	OKAY
			164	Elliot Dr	East	1_4	D88	1.7	0.50	2.36	2.36	17.50	1.53	17.50	91.56	**216.35**	**229.00**	1.44	25.00	132.2	450	0.65	203.05	202.20	0.94	450	203.05	202.20	OKAY	OKAY
		163	165	Elliot Dr	1_4	1_3	D193	1.20	0.50	1.67	4.03	17.50	1.43	19.03	86.86	**350.13**	**899.55**	1.41	25.00	121.50	900	0.25	201.90	201.60	0.39	900	201.90	201.60	OKAY	OKAY
		164	166	Elliot Dr	1_3	1_2	D192	0.29	0.50	0.40	2.07	17.50	0.32	18.93	87.14	**180.49**	**677.36**	1.06	25.00	20.30	900	0.14	201.14	201.11	0.27	900	201.14	201.11	OKAY	OKAY
		165	167	Elliot Dr	1_2	1	D191	1.04	0.50	1.45	1.85	17.50	1.24	17.82	90.53	**167.37**	**849.11**	1.33	25.00	99.00	900	0.22	201.08	200.83	0.20	900	201.08	200.83	OKAY	OKAY
		166	168	Elliot Dr	1	1_1	D89	0.50	0.50	0.70	2.14	17.50	1.20	18.74	87.72	**187.77**	**677.36**	1.06	25.00	76.50	900	0.14	200.81	200.70	0.28	900	200.81	200.70	OKAY	OKAY
		167	169	Elliot Dr	1_1	2		0.04	0.50	0.06	0.75	17.50	0.40	18.70	87.83	**65.93**	**789.10**	1.24	25.00	29.50	900	0.19	200.70	200.62	0.08	900	200.70	200.62	OKAY	OKAY
		168			2	3		0.42	0.50	0.58	0.63	17.50	1.70	17.90	90.29	**57.15**	**572.47**	0.90	25.00	92.00	900	0.10	200.62	200.53	0.10	900	200.62	200.53	OKAY	OKAY
				Park Dr	3	Culvert	D90,D91	2.73	0.50	3.79	3.79	17.50	2.02	17.50	91.56	**347.13**	**572.47**	0.90	25.00	109.00	900	0.10	200.53	200.38	0.61	900	200.53	200.38	OKAY	OKAY
			172		2	3		0.18	0.50	0.26	0.26	17.50	1.90	17.50	91.56	**23.49**	**260.50**	0.92	25.00	105	600	0.18	200.00	199.72	0.09	600	200.00	199.72	OKAY	OKAY
			173		3	4		1.11	0.50	1.54	1.80	17.50	1.72	19.49	85.81	**154.13**	**260.50**	0.92	25.00	95	600	0.18	199.69	199.54	0.59	600	199.69	199.54	OKAY	OKAY
		171	174	Park Dr	4	5	D92,D93	2.80	0.50	3.89	5.43	17.50	1.51	19.22	86.32	**468.86**	**475.51**	1.33	25.00	120	675	0.32	199.48	199.16	0.99	675	199.48	199.16	OKAY	OKAY
		172	175	Park Dr	5	6	D173,D183	0.20	0.50	0.28	4.17	17.50	0.70	19.01	86.93	**362.51**	**460.41**	1.29	25.00	54	675	0.30	199.16	198.90	0.79	675	199.16	198.90	OKAY	OKAY
	197	173	176	Park Dr	6	20	D177,D150	0.70	0.50	0.97	1.57	17.50	0.85	18.73	87.72	**137.79**	**460.41**	1.29	25.00	65.3	675	0.30	198.90	198.68	0.30	675	198.90	198.68	OKAY	OKAY
		174	177	Park Dr	20	22	D152	2.41	0.50	3.35	3.46	17.50	1.56	17.77	90.68	**313.84**	**673.28**	1.26	25.00	117.6	825	0.22	198.61	198.36	0.47	825	198.61	198.36	OKAY	OKAY
		175	178	Park Dr	22	23		2.21	0.50	3.07	6.42	17.50	1.56	19.06	86.78	**557.31**	**724.12**	1.14	25.00	106.2	900	0.16	198.23	197.88	0.77	900	198.23	197.88	OKAY	OKAY
		176	179	Park Dr	23	32	D142	2.1	0.50	2.92	5.99	17.50	1.66	19.06	86.79	**519.94**	**1057.61**	1.22	25.00	121.5	1050	0.15	197.74	197.54	0.49	1050	197.74	197.54	OKAY	OKAY
		177	180	Park Dr	32	33	D178	0.08	0.50	0.11	3.03	17.50	0.27	19.16	86.49	**262.09**	**1057.61**	1.22	25.00	20	1050	0.15	197.54	197.66	0.25	1050	197.54	197.66	OKAY	OKAY
		178	183	Park Dr	33	35		0.39	0.50	0.54	0.65	17.50	1.03	17.77	90.68	**59.24**	**1057.61**	1.22	25.00	75.6	1050	0.15	197.62	197.40	0.06	1050	197.62	197.40	OKAY	OKAY
	182	179	183	Park Dr	36	35	D137	0.08	0.50	0.11	1.42	17.50	0.33	19.77	84.77	**120.18**	**556.64**	1.26	25.00	25	750	0.25	198.65	198.58	0.22	750	198.65	198.58	OKAY	OKAY
		180	181	Park Dr	55	36		0.3	0.50	0.42	0.42	17.50	1.06	17.50	91.56	**38.18**	**103.73**	0.94	25.00	60	375	0.35	202.21	202.00	0.37	375	202.21	202.00	OKAY	OKAY
	180	181	162	Broadway St	35	52	D134	0.26	0.50	0.36	1.01	17.50	1.19	18.53	88.33	**89.63**	**1568.68**	1.81	25.00	129.6	1050	0.33	197.40	196.97	0.06	1050	197.40	196.97	OKAY	OKAY
		186	185	Duck St	29	31	D144	0.58	0.50	0.81	1.64	17.50	1.97	19.61	85.21	**139.77**	**145.38**	0.91	25.00	108.2	450	0.26	199.47	199.19	0.96	450	199.47	199.19	OKAY	OKAY
		184	179	Duck St	31	32		0.02	0.50	0.03	0.83	17.50	0.26	19.47	85.60	**71.39**	**145.38**	0.91	25.00	14.5	450	0.26	198.74	198.70	0.49	450	198.74	198.70	OKAY	OKAY
			184	Duck St	27	29	D143	0.6	0.50	0.83	0.83	17.50	2.11	17.50	91.56	**76.36**	**145.38**	0.91	25.00	115.8	450	0.26	199.77	199.47	0.53	450	199.77	199.47	OKAY	OKAY
			193	Elliot St	South	29	D145	0.5	0.50	0.70	0.70	17.50	0.33	17.50	91.56	**63.63**	**99.18**	0.90	25.00	17.6	375	0.32	199.60	199.19	0.64	375	199.60	199.54	OKAY	OKAY
			189	Centre St	24	25	D153	0.63	0.50	0.88	0.88	17.50	0.28	17.50	91.56	**80.18**	**64.14**	0.91	25.00	15	300	0.44	202.30	202.23	1.25	375	202.23	202.16	OKAY	OKAY
		188		Centre St	25	26	D179	0.59	0.50	0.82	1.70	17.50	2.26	17.78	90.67	**153.76**	**64.14**	0.91	25.00	123	300	0.44	202.21	201.67	2.40	450	202.06	201.52	OKAY	OKAY
			191	Prince St	South	North	D141	0.64	0.50	0.89	0.89	17.50	2.12	17.50	91.56	**91.45**	**64.14**	0.91	25.00	115.4	300	0.44	201.40	200.89	1.27	375	201.33	200.82	OKAY	OKAY
		190	192	Prince St	West	39_1	D140	0.56	0.50	0.78	1.67	17.50	2.35	19.62	85.19	**142.10**	**64.14**	0.91	25.00	128.2	300	0.44	201.90	201.34	2.22	450	201.75	201.19	OKAY	OKAY
	184	191	181	Prince St	39_1	36	D138	0.64	0.50	0.89	2.47	17.50	2.27	19.85	84.54	**209.18**	**64.14**	0.91	25.00	123.8	300	0.44	201.32	200.77	3.26	525	201.09	200.55	OKAY	OKAY
		187	192	Elliot St	29	39_1	D180	0.93	0.50	1.29	1.99	17.50	2.21	17.83	90.51	**179.90**	**145.38**	0.91	25.00	121.1	450	0.26	202.00	201.69	1.24	525	201.93	201.61	OKAY	OKAY
			204	Park Dr	55_1	56	D182	0.26	0.50	0.36	0.36	17.50	2.68	17.50	91.56	**33.09**	**24.54**	0.78	25.00	125.7	200	0.56	201.40	200.70	1.35	300	201.30	200.60	OKAY	OKAY
			198	McLeod St	10	13	D151	2.58	0.50	3.60	3.60	17.50	1.94	17.50	91.56	**329.61**	**356.63**	1.00	25.00	116	675	0.18	203.00	202.79	0.92	675	203.00	202.79	OKAY	OKAY
			197	McLeod St	10	7	D172	0.59	0.50	0.82	0.82	17.50	2.79	17.50	91.56	**75.08**	**145.38**	0.91	25.00	153	450	0.26	202.98	202.58	0.52	450	202.98	202.58	OKAY	OKAY
		196	175	McLeod St	7	6	D177	0.23	0.50	0.32	1.14	17.50	1.23	20.29	83.38	**95.03**	**325.56**	0.91	25.00	67.4	675	0.15	202.54	202.44	0.29	675	202.54	202.44	OKAY	OKAY
		200	197	McLeod St	13	7	D175	0.35	0.50	0.49	1.42	17.50	1.82	19.32	86.02	**121.95**	**325.56**	0.91	25.00	99.6	675	0.15	202.42	202.27	0.37	675	202.42	202.27	OKAY	OKAY
			200	McLeod St	East	15	D148	0.98	0.50	1.36	1.36	17.50	1.36	17.50	91.56	**124.72**	**145.38**	0.91	25.00	74.5	450	0.26	204.00	203.81	0.86	450	204.00	203.81	OKAY	OKAY
		199	198	McLeod St	15	13	D176	0.67	0.50	0.93	2.29	17.50	1.82	18.86	87.36	**200.36**	**325.56**	0.91	25.00	99.6	675	0.15	203.81	203.66	0.62	675	203.81	203.66	OKAY	OKAY
			200	Michelle Ave	19	15	D128	2.3	0.50	3.20	3.20	17.50	2.06	17.50	91.56	**292.70**	**99.18**	0.90	25.00	111	375	0.32	203.40	203.04	2.95	600	203.18	202.82	OKAY	OKAY
		202	204	King St	West	56	D136	0.39	0.50	0.54	1.08	17.50	2.44	19.94	84.33	**91.43**	**64.14**	0.91	25.00	132.6	300	0.44	201.50	200.92	1.43	450	201.35	200.77	OKAY	OKAY
	203	194	205	King St	56	57	D171	0.4	0.50	0.56	1.47	17.50	2.09	20.18	83.66	**123.27**	**64.14**	0.91	25.00	114	300	0.44	200.90	200.39	1.92	450	200.75	200.24	OKAY	OKAY
	204	162		King St	57	Outlet	D181	0.58	0.50	0.82	3.45	17.50	1.89	20.50	82.81	**285.48**	**1232.89**	1.09	25.00	123.3	1200	0.10	200.37	200.25	0.23	1200	200.37	200.25	OKAY	OKAY

Appendix D – Environmental Impact Study

Parkhill Stormwater Management Masterplan

The Municipality of North Middlesex

Type of document:
Scoped Environmental Impact Study

EXP Project number:
BRM-25007863-A0

Date submitted:
2025-11

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1 Introduction

The Municipality of North Middlesex has retained EXP Services Inc. (EXP) to complete a Scoped Environmental Impact Study (EIS) for the Parkhill Stormwater Management Masterplan. It was determined during the proposal stage that the project is classified as 'exempt' from the Municipal Class Environmental Assessment (EA) (February 2024) guidance, given the proposed works fall under Appendix 1, Table B (Municipal Water and Wastewater Projects), Project Descriptions 37 and 39. Although a formal EA is not required, a Scoped EIS has been undertaken to determine the effects that will be caused or that might reasonably be expected to be affected, directly or indirectly (Municipality of North Middlesex Official Plan, March 2023, Section 9.7.1).

The study area for the project follows the urban settlement area boundary for Parkhill as defined on Schedule B1 of the Official Plan (2023). The study area is shown in **Figure 1**.

Figure 1. Study Area

1.1 Scoped Environmental Impact Study

Upon review of the Municipality of North Middlesex Official Plan (2023) and scope of this assignment, it was assessed that a "Scoped Environmental Impact Study" shall be undertaken. As outlined in Section 9.7.1.1 of the Official Plan, the Scoped EIS will address the following:

- A description of the proposed use;
- A description of the significant natural features and their functions that will be affected or that might reasonably be expected to be affected, directly or indirectly;
- A description of the effects that will be caused or that might reasonably be expected to be caused to the significant features by the proposed use;

- A description of the actions necessary to prevent, change, mitigate or remedy the effects upon or might reasonably be expected upon the significant features; and,
- Recommended mitigation and compensation measures based on the general scope of the proposed works.

An EIS is required for the recommended stormwater upgrades, to address potential impacts of the proposed works. An EIS is a requirement of the municipal planning process and is intended to address policies of the Municipality of North Middlesex, Middlesex County, and the Ausable Bayfield Conservation Authority.

This EIS considers applicable policies of the Province of Ontario's Provincial Policy Statement (PPS; Ministry of Municipal Affairs and Housing; MMAH 2024) and associated provincial implementation on guidance contained in the County of Middlesex Official Plan (2023), the Municipality of North Middlesex Official Plan (2023), and the Ausable Bayfield Conservation Authority (ABCA) regulations and policies.

2 Natural Heritage Planning Considerations

An assessment of the quality and extent of natural heritage features found on, and within the study area and the potential impacts to these features from the proposed development was undertaken to comply with requirements of the following regulatory agencies, local municipality, and/or legislation:

- Provincial Policy Statement (2024);
- Endangered Species Act (2007);
- Fisheries Act (2019);
- Migratory Birds Convention Act (1994);
- Municipality of North Middlesex Official Plan (2023);
- County of Middlesex Official Plan (2023);
- ABCA; and
- Stormwater Infrastructure Guidelines.

An EIS is required for the recommended stormwater upgrades, to address potential impacts of the proposed works. An EIS is a requirement of the municipal planning process and is intended to address policies of the Municipality of North Middlesex, Middlesex County, and the ABCA.

2.1 Provincial Policy Statement

The PPS (MMAH 2024) provides policy direction on matters of provincial interest related to land use planning and development. It "supports a comprehensive, integrated and long-term approach to planning, and recognize linkages among policy areas." The PPS is to be read in its entirety and land use planners and decision-makers need to consider all relevant policies and how they work together. This report addresses those policies that are specific to Natural Heritage (Section 4.1) with some reference to other policies with relevance to Natural Heritage and impact assessment consideration.

Development and site alteration shall not be permitted in significant wetlands, or in significant coastal wetlands. Development and site alteration shall not be permitted in significant woodlands, significant valleylands, or significant Areas of Natural Scientific Interest (ANSI), unless it is demonstrated that there will be no negative impacts on the natural features or their ecological functions.

Development and site alteration shall not be permitted in the habitat of endangered and threatened species or in fish habitat, except in accordance with provincial and federal requirements. Development and site alteration may be permitted on lands adjacent to fish habitat provided it has been demonstrated that there will be no negative impacts on the natural feature or its ecological functions.

2.2 Endangered Species Act, 2007

The provincial *Endangered Species Act* (2007) (ESA) was developed to:

- Identify species at risk (SAR), based upon best available science;
- Protect SAR and their habitats and to promote the recovery of SAR; and
- Promote stewardship activities that would support those protection and recovery efforts.

The ESA protects all Threatened, Endangered, and Extirpated species listed on the SAR in Ontario List (SARO; Ontario Regula on 230/08). These species are legally protected from harm or harassment and their associated habitats are legally protected from damage or destruction, as defined under the ESA.

It should be noted that for the purposes of this EIS, SAR will be considered for those species designated as either Endangered or Threatened on the SARO list. Habitats for species with a designation of Special Concern on the SARO list are treated as a Species of Conservation Concern (SOCC) and are protected under the PPS as a type of SWH.

2.3 Federal Fisheries Act

Fisheries and Oceans Canada (DFO) administers the federal *Fisheries Act* (1985) which defines fish habitat as "spawning grounds and other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes" [subsection (2)1]. The *Fisheries Act* prohibits the death of fish by means other than fishing [subsection 34.4 (1)] and the harmful alteration, disruption or destruction of fish habitat [HADD; subsection 35. (1)]. A HADD is defined as "any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat's capacity to support one or more life processes".

Some projects may be eligible for exemption from the DFO review process, as specified under Step 3 of the DFO Fish and Fish Habitat Protec on Program review process, such as clear-span bridges and bridge maintenance projects where DFO mitigation measures are applied, artificial waterbodies with no hydrological connection to occupied fish habitat, and projects that follow the Standards and Codes of Practice defined by DFO. All other projects or activities that have the potential to impact fish or fish habitat should be submitted to DFO through the "Request for Review" process. DFO will review the proposed project to determine whether there is potential to (1) impact an aquatic SAR, (2) cause the death of fish or (3) result in HADD of fish habitat. The death of fish by means other than fishing or a HADD of fish habitat can be authorized by DFO under paragraphs 34.4(2)(b) or 35(2)(b) of the *Fisheries Act*. Authorizations require the preparation and submission of an application package identifying the impacts on fish and fish habitat as well as the avoidance, mitigation and offsetting measures that will be implemented as well as any monitoring that is proposed.

2.4 Migratory Birds Convention Act

The *Migratory Birds Convention Act* (1994) provides protection to migratory birds, their habitats and nests at the federal level by prohibiting the destruction of active migratory bird nests. Currently, 700 migratory bird species are protected under this Act, including songbirds, woodland birds, waterfowl, shorebirds and seabirds. Although no permit is required by the legislation, appropriate constraints on potentially disruptive activities such as vegetation clearing (e.g., tree removal) where migratory birds may be nesting are required to avoid contravention of this Act. The requirement to ensure that there are no bird nests present within the work area rests with the proponent of the activity.

2.5 Municipality of North Middlesex Official Plan (2023)

The study area constitutes the area of Parkhill located within the Municipality of North Middlesex. The Municipality of North Middlesex Official Plan (2023) was adopted by Council on June 23, 2003 and approved by the County of Middlesex in March 2004.

2.5.1 Natural Heritage

In partnership with the ABCA, Middlesex County and the Province, the Municipality strives to protect the natural environment. Section 7.0 (Environmental Policies) outlines the policies and Open Space Area Land Use designation developed to address the environmental objectives of the Plan. Policies include Watershed Management and the Natural Environment, along with the Open Space Area Land Use Designation.

The purpose of the Watershed Management policies is to protect water resources from contamination and degradation associated with certain land use and activities. In doing so, quality of life experienced by both existing residents and businesses is maintained and helps in supporting future growth. The Municipality contains two (2) major watershed systems – Parkhill Creek, which drains lands in the northwest and central portions of the Municipality; and the Ausable River, draining lands along the easterly, southerly and extreme westerly boundaries. Policies that provide linkage between watershed management and the Official Plan include:

- The Municipality working cooperatively with ABCA in dealing with land management issues within the Ausable River Watershed that extend beyond the Municipal boundaries.
- The Municipality will encourage both the preparation of watershed and subwatershed management plans to assist in water resource and land use planning on an ecosystem basis.
- The Municipality will encourage the protection of SAR, either aquatic or terrestrial, and species recovery strategies.
- The Municipality will support ABCA in the preparation and implementation of the subwatershed studies.
- The Municipality will support initiatives of the County, the Conservation Authority and other agencies in identifying strategies to protect groundwater resources.
- Applications for proposals requiring access to significant amounts of groundwater or surface water from streams or ponds will only be considered by the Municipality where the applicant has illustrated that the Ministry of the Environment, Conservation and Parks (MECP) has been consulted, and that the Ministry is considering an application for a water taking permit.
- Applications for development that need a private water source may be required to submit a detailed hydrogeological study to determine the suitability of the lands for groundwater extraction.

In relation to Natural Environment policies, the Official Plan separates natural environmental considerations into three (3) categories:

(1) Hazard Lands, as shown on Schedule “A” of the Official Plan: these lands that are susceptible to flooding or erosion, have steep slopes or soil instability, or exhibit other hazards, including human-made hazards. The following policies apply to Hazard Lands:

- No new development shall be permitted on Hazard Lands other than uses associated with the management of Hazard Lands.
- An EIS shall be required for all development or site alteration proposals within or abutting lands identified as Hazard Lands.
- Land proposed for development that is subject to site plan control. The site plan shall relate specifically to the implementation of the findings of the EIS. The site plan shall correctly and precisely delineate those lands impacted by flooding or erosion.
- The Municipality shall work cooperatively with the ABCA in the management of flood plains to ensure proper land use, minimize the level of risk to life, property damage and social disruption from flooding, and minimize the need for large capital expenditures for flood protection purposes.

Hazard lands are present to the north of the study area and through Parkhill in the form of Parkhill Creek.

(2) Environmentally Significant Features, being those lands that display sensitive features including significant wetlands, significant portions of the habitat of endangered and threatened species, and major watercourses, including municipal drains. The following policies apply to Environmentally Significant Features:

- Development and site alteration shall not be permitted on Environmentally Significant Features.
- An EIS shall be required for all development proposals within or adjacent to areas identified as Environmentally Significant Features.
- Development proposals adjacent to or abutting an Environmentally Significant Feature shall not result in a negative impact on the natural areas and functions or ecological processes of the Feature.

No Environmentally Significant Features are present within the Parkhill study area being used for this assignment.

(3) Natural Heritage Features are identified on Schedule "C" of the Official Plan and their delineation are based on the Middlesex County Natural Heritage Study. The PPS encourages the protection and enhancement of natural heritage features. The following policies apply to Natural Heritage Features:

- Natural Heritage Features identified on Schedule "C" of the Official Plan shall be subject to the policies of the underlying land use designation and the policies of this Section 7.3.4. of the Official Plan.
- Development or site alteration proposed within or on lands adjacent to a Natural Heritage Feature(s) shall be subject to the completion of an EIS. Development or site alteration within or adjacent to such features will be prohibited unless it can be shown that there will be no unmitigated impacts on the form or function of such Features.

As per Schedule "C" of the Official Plan, Natural Heritage Features are present in the study area in the form of woodlands predominantly to the north, northeast, and southwest of the study area.

In addition to the above noted Natural Environment policies, the Official Plan provides "General Environmental Polices" that must be adhered to as part of any development. These general policies relate to no limitation of agricultural uses within or adjacent to Natural Heritage features; encouraging the retention of woodlots; encourages the use of the Ministry of Natural Resources (NHR) *Natural Heritage Reference Manual*; encourages development proposals for creating new habitat, vegetation regeneration, and conserving natural landforms and functions; protects private lands from public use; and, ensures existing drains are maintained.

Uses on land designated as an Open Space Area, as shown on Schedule "A" of the Official Plan, must adhere to the following:

- Land shall be for the preservation and conservation of land and/or environment, as well as for the provision of outdoor recreational and educational opportunities.
- Uses such as agriculture, forestry, parks and recreation shall be permitted; however, it will depend on the particular physical and environmental constraints of any given site.
- Lands designated Open Space Area should be managed in such a fashion as to complement adjacent land uses and protect such uses from any physical hazards.
- Development and site alteration shall be prohibited on lands identified as Environmentally Significant Features on Schedule "A" of the Official Plan.
- Agriculture, parks, recreation and forestry operations on lands designated Open Space Area should maintain the unique natural characteristics of such lands, where possible and appropriate.
- The use of lands designated Open Space Area shall not contribute to problems of erosion, flooding, pollution or the deterioration of the natural environment.

- Buildings and structures shall be permitted on lands designated Open Space Area provided that they are clearly incidental and/or accessory to the main permitted use, but not in hazard lands, unless the buildings or structures are required for flood control, municipal services and/or utilities.
- Where Open Space Area lands are under private ownership, it shall not be construed that these lands shall be free and open to the general public, nor that the Municipality or any other public agency shall acquire them.

Parkhill contains several land use designations as shown on Schedule "A1" of the Official Plan including residential, employment areas, industrial areas, central land use area, general commercial area, and an institutional area to the southeast. A small Special Policy Area (5.3.3 – Parkhill King Street) is located at the northeast corner of Main Street and King Street; this Special Policy Area pertains to residential uses on the ground floor of existing commercial buildings.

2.5.2 Stormwater

Section 8.3.5 of the Official Plan outlines policies to be followed relating to stormwater management and servicing. The specific policies include the following:

- Use stormwater management measures to manage the storage and control the flow of water to receiving watercourses;
- Use stormwater management measures which prevent siltation and erosion, and do not negatively impact the water quality of receiving watercourses;
- Ensure that natural heritage features are avoided and that, where appropriate, consideration is given to enhancing vegetation, wildlife habitats and corridors in and along the storm water management system and the receiving watercourses;
- Employ the best available methods in the planning, construction and eventual use of the stormwater management systems; and,
- Ensure that the design of stormwater management facilities consider long-term maintenance and safety requirements.

The assignment has, where applicable, followed the above policies in the development of the Parkhill Stormwater Management Masterplan.

2.6 County of Middlesex Official Plan (2023)

Similar to the Municipality of North Middlesex Official Plan (2023), the County of Middlesex Official Plan (2023) also outlines policies and plans to provide direction of future and growth with the County. Schedule "C" (Natural Heritage System) shows the study area to contain plots of natural heritage to the north and south, and natural hazard areas to the north, as well as through the study area (Parkhill Creek) on Schedule "D" (Natural Hazard Areas). These hazard areas reflect ABCA's regulation limits (under Ontario Regulation 41/24). In relation to Schedule "F" (Source Water Protection) of the County Plan, a source water protection area (SWPA) is present to the northeast of Parkhill outside the study area. The SWPA is made up of Parkhill Reservoir.

2.7 Ausable Bayfield Conservation Authority

2.7.1 Ontario Regulation (O.Reg.) 41/24: Prohibited Activities, Exemptions and Permits

Effective April 1, 2024, Ontario Regulation (O.Reg.) 41/24: Prohibited Activities, Exemptions and Permits has come into force, replacing the former O.Reg. 147/06: Ausable Bayfield Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. O. Reg. 41/24 allows Conservation Authorities to implement Section 28 *Conservation Authorities Act*, 1990 (amended 2024), which states under Section 28(1) that:

- 28 (1) No person shall carry on the following activities, or permit another person to carry on the following activities, in the area of jurisdiction of an authority:
  - 1. Activities to straighten, change, divert or interfere in any way with the existing channel of a river, creek, stream or watercourse or to change or interfere in any way with a wetland.
  - 2. Development activities in areas that are within the authority's area of jurisdiction and are,

i. hazardous lands,

ii. wetlands,

iii. river or stream valleys the limits of which shall be determined in accordance with the regulations,

iv. areas that are adjacent or close to the shoreline of the Great Lakes-St. Lawrence River system or to an inland lake and that may be affected by flooding, erosion or dynamic beach hazards, such areas to be further determined or specified in accordance with the regulations, or,

v. other areas in which development should be prohibited or regulated, as may be determined by the regulations. 2017, c. 23, Sched. 4, s. 25.

Pursuant to O. Reg. 41/24, any interference with development in or on areas stated in the *Conservation Authorities Act* (e.g., hazardous lands, wetlands, river or stream valleys) requires permission from the Conservation Authority. The Conservation Authority may issue permits under Section 28.1 and may attach conditions on the permits per Sec on 9(1) of the Regulation. A review of the ABCA watershed explorer mapping tool was completed to understand whether hazardous lands, wetlands, shorelines and areas susceptible to flooding, and associated allowances were found within, or adjacent to, the boundaries of the Parkhill study area. Regulated areas are present within Parkhill in the form of watercourses through the centre and southwest of the study area, and Parkhill Creek that is located at the north of Parkhill from northwest to southeast.

2.7.2 ABCA: Stormwater Management Policies and Technical Guidelines (2009)

The purpose of the document is to provide direction to developers and their engineering consultants in the completion of stormwater management strategies and designs, and for use by ABCA staff in the review and approval. Policies and standards relating to the Municipality of North Middlesex and Town of Parkhill are presented in Sections F.1.2.5 and F.1.2.8, respectively, of Appendix F of the document.

In relation to Section F.1.2.5, ABCA advises that the Municipality utilize their design guidelines and construction standards that deal with aspects of stormwater management and that specifies the use of a 3-5 year storm event for design of storm sewers, roadside ditches, and road crossings.

Policy relating to the Town of Parkhill, outlined in Section F.1.2.8, notes that in relation to storm sewer sizing that a 1:5 year design storm be used using London, Sarnia, or Goderich gauges along with Rational Method. It is recommended by ABCA that no stormwater management is required; however, keep in mind this document was prepared in 2009.

2.8 Municipality of North Middlesex: Infrastructure Design Guidelines and Construction Standards (2025)

The Infrastructure Design Guidelines and Construction Standards provide a means of standardization for the design and construction of sanitary and storm sewers, watermains and roads in the Municipality of North Middlesex. The standards highlight that they should be read in conjunction with existing standard methods of design as outlined in the Municipal Engineers Association Design Manual, MECP Manuals and Guidelines, the MECP Stormwater Management Planning and Design Manual, Ministry of Transportation Ontario (MTO) Geometric Design Standards (roads) and the Ontario Provincial Standard Specification and Drawing Manuals.

Section 3.7 (Stormwater Practices) outlines the planning and design of stormwater quality and quantity controls that include Low Impact Development (LID) or source control concepts as well as traditional stormwater control measures. The Municipality encourages innovation as part of any stormwater project and provides information relating to Best Management Practices, LID, Stormwater Management Ponds, and operation and maintenance in accordance with the conditions of Consolidated Linear Infrastructure Environmental Compliance Approvals (CLI-ECA).

3 Summary of Data Collection Approaches and Methods

3.1 Background Information Review

EXP conducted a background search for supporting information to provide additional insight into the overall character of the study area as shown in **Figure 1**. Resources reviewed included:

- Ministry of Natural Resources (MNR) Land Information Ontario (LIO) Natural Features Mapping;
- Natural Heritage Information Centre (NHIC) database;
- Ontario Breeding Bird Atlas;
- Ontario Reptile and Amphibian Atlas;
- Fisheries and Oceans Canada (DFO) Aquatic Species at Risk Map;
- Ministry of Agriculture, Food and Rural Affairs (OMAFRA) AgMaps;
- MECP Source Protection Information Atlas; and,
- Google Earth aerial images.

The results of these background reviews are discussed in the following sections. Additional background materials made available to EXP by reviewing agencies have been reviewed and incorporated into this EIS, as appropriate. MNR Aylmer and ABCA were contacted on July 23, 2025 for pertinent information for the study area relating to terrestrial and aquatic species.

3.1.1 Land Information Ontario Natural Features Summary

Based on the MNRF's LIO geographic database, the following features were found within the study area (**Figure 2**):

- Woodlands are present predominantly in the periphery of the Parkhill – woodlands are denoted by the green on **Figure 2**; and,
- Parkhill Creek and Cameron-Gilles Drain along with Parkhill Reservoir to the northeast – no unevaluated or provincially significant wetlands are present within the study area.

Figure 2. Woodlands and Watercourses

3.1.2 NHIC Database Results

The NHIC database (MNR, 2025) was searched for Threatened, Endangered, and Extirpated SAR, along with provincially significant plants and vegetation communities within the study area. The database provides data by 1km^2 area squares. Four (4) 1km^2 squares fall within the study area and the species and natural heritage features that have been found within these squares include the following:

Species at Risk

- Bobolink: SARO – Threatened, COSEWIC – Special Concern;
- Common Five-lined Skink (Carolinian population): SARO – Endangered, COSEWIC – Endangered;
- Drooping Trillium: SARO – Endangered, COSEWIC – Endangered;
- Eastern Wood-peewee: SARO – Special Concern, COSEWIC – Special Concern; and,
- Snapping Turtle: SARO – Special Concern, COSEWIC – Special Concern.

Non-designated Species

- Slender Mountain Mint;
- Tufted Titmouse

No SAR fish are present within Parkhill Creek or its tributaries within the study area.

3.1.3 Ontario Breeding Bird Atlas

The Ontario Breeding Bird Atlas (OBBA) contains detailed information on the population and distribution status of Ontario birds (BSC et al. 2007). The data is presented on 100 km^2 area squares with one (1) square overlapping the study area (17TMH47). It should be noted that the study area is a small component of the overall bird atlas square, and therefore it is unlikely that all bird species are found within the study area. Habitat type, availability and size are all contributing factors in bird species presence and use.

A total of 171 bird species were recorded in atlas square, with the following species of interest noted:

- Species listed as Threatened or Endangered on the SARO List:
  - Northern Bobwhite – Endangered;
  - Red-headed Woodpecker – Endangered;
  - Bank Swallow – Threatened;
  - Bobolink – Threatened;
  - Cerulean Warbler – Threatened;
  - Chimney Swift - Threatened;
  - Eastern Meadowlark – Threatened;
  - Eastern Whip-poor-will – Threatened; and,
  - Least Bittern – Threatened.
- Species of Conservation Concern (i.e., listed as Special Concern on the SARO List or identified as an S1-S3 species; B = breeding population, N = non-breeding population, M = migrant population):
  - American Coot – S3B, S4N;
  - Bald Eagle – Special Concern;
  - Barn Swallow – Special Concern;
  - Blue-winged Teal – S3B, S4M;
  - Common Gallinule – S3B;
  - Common Nighthawk – Special Concern;
  - Eastern Wood-Pewee – Special Concern;
  - Grasshopper Sparrow – Special Concern;
  - Peregrine Falcon – Special Concern;
  - Purple Martin – S3B;
  - Upland Sandpiper – S2B; and,
  - Wood Thrush - Special Concern.

3.1.4 Ontario Reptile and Amphibian Atlas

The Ontario Reptile and Amphibian Atlas contains detailed information on the population and distribution status of Ontario herpetofauna (Ontario Nature 2020). The data is presented on 100 km^2 area squares with one square overlapping the study area (17MH47). It should be noted that the study area is a small component of the overall atlas square, and therefore it is unlikely that all herpetofauna species are found within the study area. Habitat type, availability and size are all contributing factors in herpetofauna species presence and use.

A total of 13 species were recorded in the atlas square, that overlaps with the study area. Of these species, the following species of interest is noted: Snapping Turtle – Special Concern.

3.1.5 Fisheries and Oceans Canada Aquatic Species at Risk Distribution Mapping

Aquatic species at risk distribution mapping (DFO, 2025) was reviewed to identify any known occurrences of aquatic SAR, including fish and mussels, within the subwatershed where the study area is located. No SAR were identified within the study area.

3.1.6 OMAFRA AgMaps

The online facility AgMaps provides agricultural and drainage information for Ontario. Within the study area, three (3) drains are present: Cameron-Gilles Drain; Laurens Drain; and, Poor-Masschelein Br. 1996. Laurens Drain and Poor-Masschelein Br. 1996 drain are closed/tiled drains for agriculture, and Cameron-Gilles Drain is a Class 'C' constructed drain with permanent flow. **Figure 3** shows the location of the drains.

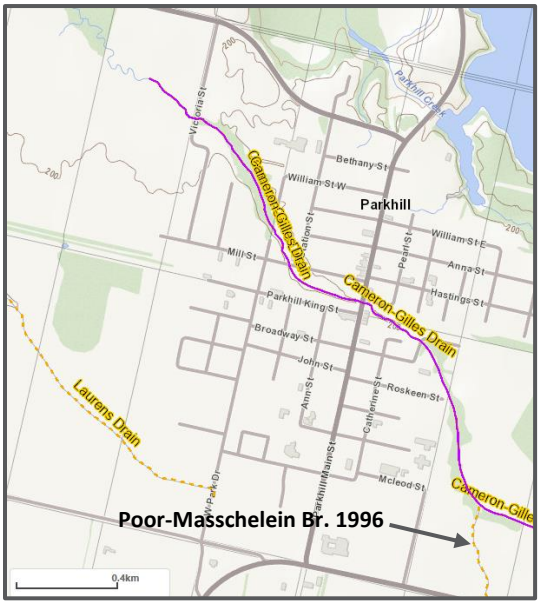


Figure 3. Drains within the Study Area

3.1.7 MECP Source Protection Information Atlas

No Highly Vulnerable Aquifers (HVA), Significant Groundwater Recharge Area (SGRA), or Wellhead Protection Areas are present within the study area (MECP, Source Protection Information Atlas (online)).

4 Environmental Setting and Characteristics

4.1 Physical Environment

The following physiographic, geological and soil maps were reviewed as part of this EIS:

- Ontario Ministry of Energy and Mines (MEM) website, Surficial Geology of Southern Ontario, 2010 (KML format), and;
- Ontario MEM website, Physiography of Southern Ontario, 2007.

The topography of the study area consists of relatively flat lands, sloping generally east to west. The bedrock geology of the study area is composed primarily of fine-textured glaciolacustrine deposits (silt and clay, minor sand and gravel), modern alluvial deposits (clay, silt, sand and gravel), and clay to silt-textured till. The physiography of the study area is sand plains within the physiographic region of the Huron Slope.

4.2 Biological Environment

The study area occurs within the Carolinian or Deciduous Forest Zone (also referred to as the mixed wood plains), an area characterized by a relatively warmer climate that supports plant species typical of more southern areas. This zone is referred to by the Province as Ecoregion 7E. Broadleaved trees, including American Beech (*Fagus grandifolia*), Sugar Maple (*Acer saccharum*), Basswood (*Tilia americana*), Red Maple (*Acer rubrum*), White Oak (*Quercus alba*) and Bur Oak (*Quercus marcrocarpa*), dominate natural upland forest cover in this region (Rowe 1972). This region also

contains Canada's main distribution of Black Walnut (*Juglans nigra*), Sycamore (*Platanus occidentalis*), Swamp White Oak (*Quercus bicolor*) and Shagbark Hickory (*Carya ovata*).

5 Analysis of Ecological and Natural Heritage Significance

Types of significant natural heritage features are defined in the PPS, and are as follows:

- Significant wetlands;
- Significant coastal wetlands;
- Significant woodlands;
- Significant valleylands;
- Fish habitat;
- Habitat of endangered and threatened species; and,
- Significant ANSIs.

The presence/absence of these elements within the study area is discussed in detail in the following sections. The Natural Heritage Reference Manual (MNR, 2010) was referenced to assess the potential significance of natural areas and associated functions. Where significant natural features are present, the sensitivity of those features is also discussed.

5.1 Significant Wetlands

Within Ontario, significant wetlands have been previously identified by the MNR or by their designates. Other evaluated or unevaluated wetlands may be identified for conservation by the municipality or the conservation authority. MNR's database was consulted, and no provincially significant wetlands are within 120m of the study area.

5.1.1 Other Wetlands

No other wetlands (e.g. unevaluated) are present within 120m of the study area.

5.2 Significant Coastal Wetlands

No significant coastal wetlands are present within 120m of the study area.

5.3 Significant Woodlands

Significant woodlands are identified by the planning authority in consideration of criteria established by the MNR. Under the NHRM (2010), woodlands are defined as:

> *"...treed areas that provide environmental and economic benefits to both the private landowner and the general public, such as erosion prevention, hydrological and nutrient cycling, provision of clean air and the long-term storage of carbon, provision of wildlife habitat, outdoor recreational opportunities, and the sustainable harvest of a wide range of woodland products. Woodlands include treed areas, woodlots or forested areas and vary in their level of significance at the local, regional and provincial levels."*

The Municipality of North Middlesex Official Plan (2023), Section 7.3.4, defines a significant woodland as:

> *"All woodlands 4 hectares or greater in area and all woodlots of any size straddling or immediately adjacent to a watercourse."*

Based on the description of the above from the Official Plan, three (3) areas of woodlands would be considered significant within the study area. The areas are outlined and shaded below in **Figure 4**.

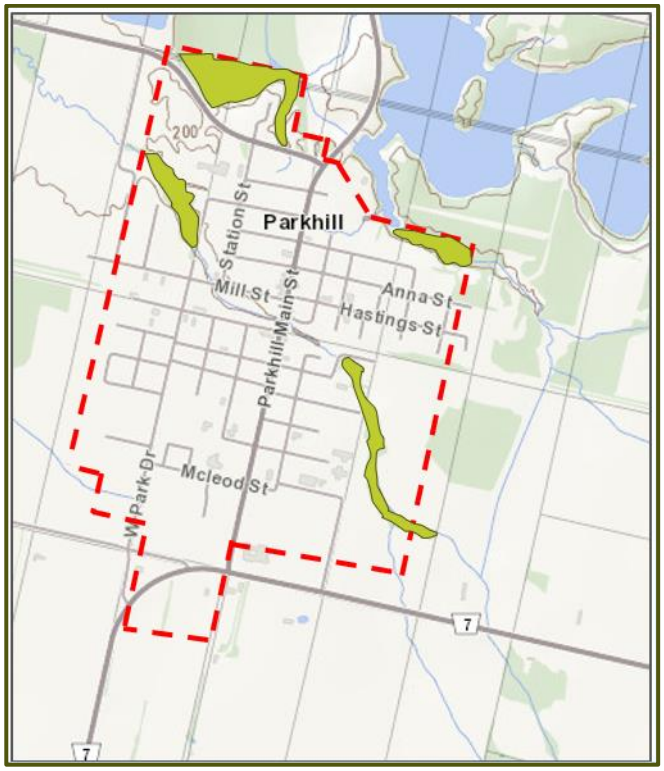


Figure 4. Significant Woodland Areas

5.3.1 Other Woodlands

All other woodlands are shown in **Figure 2** as derived from the NHIC online database (MNR, 2025).

5.4 Significant Valleylands

No significant valleylands are present within 120m of the study area.

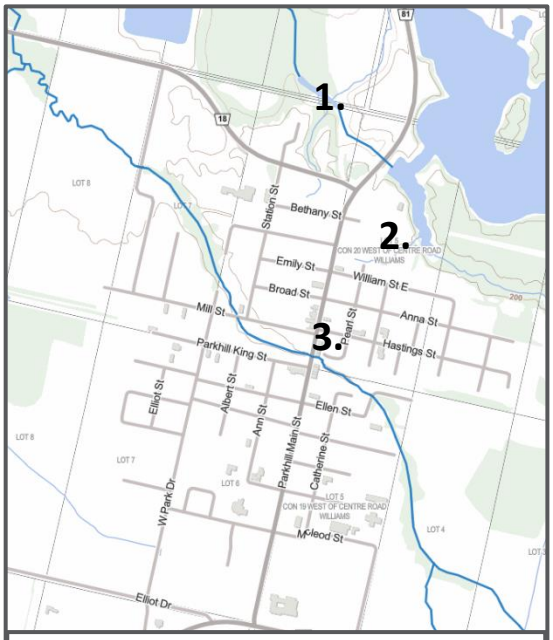
5.5 Fish Habitat

Fish habitat, as defined in the federal *Fisheries Act*, c. F-14, means, “spawning grounds and any other areas including nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly in order to carry out their life processes”. Fish, as defined in S.2 of the Fisheries Act, c. F-14, includes “parts of fish, shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals, and the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals.”

The aquatic resources area line segment online mapping provides data on physical characteristics and fish species of lakes, rivers or streams in Ontario. Upon review of direct fish habitat at Parkhill Creek to the north and watercourses that pass through the centre, southwest, and northeast of the study area, the following fish species were identified:

- Blacknose Dace
- Brassy Minnow
- Brook Stickleback
- Common Carp
- Common Shiner
- Creek Chub
- Fathead Minnow
- Finescale Dace
- Johnny Darter
- Johnny Darter x Tesselated Darter
- Largemouth Bass
- Pumpkinseed
- White Crappie
- White Sucker
- Yellow Bullhead

None of the above species are considered SAR under the provincial SARO list or federal COSEWIC list. The species indicate when work can be undertaken in-water based upon their spawning season and months. Upon review of the species, and verification with MNRF Aylmer, the permitted in-water timing window for watercourses is July 16 – March 14. The watercourse locations are shown in **Figure 5**.



1. Parkhill Creek
2. Cameron Gillies Drain
3. Unnamed Watercourse

Figure 5. Direct Fish Habitat in Study Area

5.6 Habitat for Endangered and Threatened Species

No threatened or endangered species or their suitable habitat were identified within the study area.

5.7 Significant ANSIs

No significant ANSIs are identified on or within 120m of the study area.

5.8 Ausable Bayfield Conservation Authority - Regulated Features (O.Reg. 41/24)

As noted in **Section 2.7.1,** regulated areas under O.Reg. 41/24 are present within the Parkhill study area. **Figure 6** shows the regulated area boundaries within the study area associated with the aforementioned watercourses.

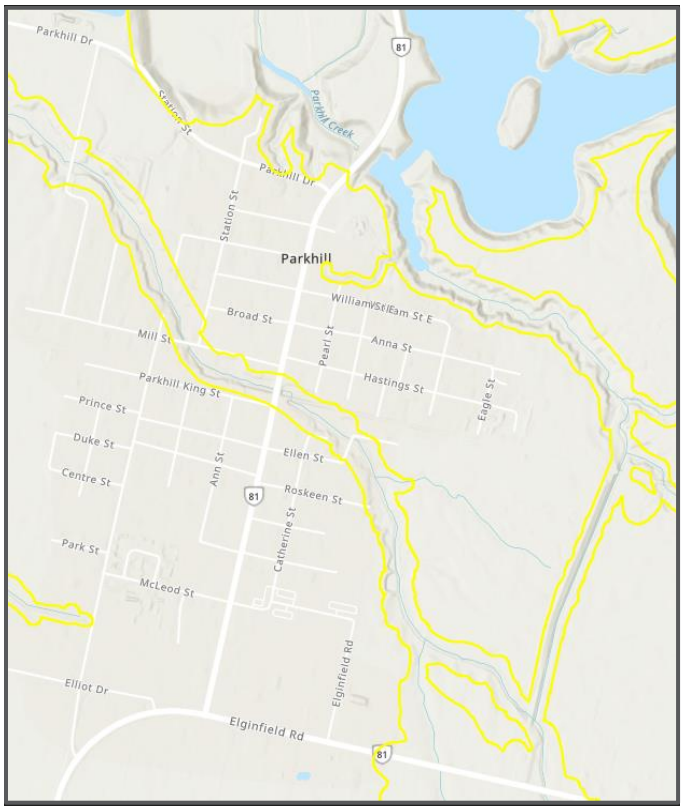


Figure 6. ABCA O.Reg. 41/24 Regulated Areas

5.9 Summary of Ecological Components Subject to Impact Assessment

Following the summary above, the following natural heritage features are either present or within 120m of the study area and will be assessed:

- Areas of significant woodland (**Figure 3**) and other woodlands;
- Watercourses and fish habitat (**Figure 4**); and,
- ABCA regulated areas under O.Reg. 41/24 (**Figure 5**).

Additionally, the proposed works will be reviewed against the background information in **Section 3**.

6 Stormwater Implementation Strategy

Evaluating storm sewer replacements requires a multi-disciplinary approach that integrates hydraulic capacity analysis with asset condition assessments. The goal is to ensure that infrastructure upgrades are technically justified, cost-effective, and coordinated across systems to minimize disruption and maximize long-term performance.

6.1 Capacity Assessment

The storm sewer capacity assessment in Parkhill was undertaken to evaluate the performance of the existing minor storm system in managing runoff from urbanized areas under current and projected conditions. The analysis was guided by the Consolidated Linear Infrastructure Environmental Compliance Approval (CLI ECA), which outlines regulatory requirements for municipal stormwater systems.

6.1.1 Hydrologic Assessment

The hydrologic assessment was completed using the Rational Method, applying a 5-year design storm as the baseline event, consistent with MECP standards for minor system design. The hydraulic assessment requires infrastructure properties to complete a standard storm sewer design sheet, applying Manning's equation to evaluate pipe capacity based on slope, diameter, and roughness coefficient. Due to the limited information available, several assumptions were made to complete the assessment; these assumptions are provided in the supporting Parkhill Stormwater Management Plan.

6.1.2 Hydraulic Assessment Results

The hydraulic assessment of the storm sewer system was conducted using a standardized storm sewer design sheet to evaluate the capacity and performance of existing infrastructure under defined design conditions. This methodical approach allowed for the calculation of flow rates, pipe velocities, and hydraulic gradients using Manning's equation, ensuring compliance with municipal and provincial design standards. Each pipe segment was assessed for adequacy based on contributing drainage area, estimated peak flow from the Rational Method, and the 5-year design storm intensity, which reflects typical minor system design criteria. The design sheet facilitated a clear comparison between existing pipe capacities and required conveyance, helping to identify undersized segments and prioritize upgrades. This assessment supports informed decision-making for infrastructure renewal and ensures alignment with the CLI ECA requirements for hydraulic performance and system connectivity. **Figure 7** provides a summary of the five (5) catchment areas and a ratio of capacity to expected flows, with sufficiency of each catchment. Location of the catchment areas is provided in the supporting Parkhill Stormwater Management Plan.

Figure 7. Storm Sewer Network Summary

Location	Capacity Ratio	Sufficiency (%)
Catchment A	0.1-4.7	52
Catchment B	0.3-3.4	44
Catchment C	0.1-4.7	64
Catchment D	0.1-4.5	70
Catchment E	0.1-2.7	83

6.2 Adjacent Infrastructure

A construction priority assessment was completed to determine what infrastructure required upgrading the soonest. When evaluating construction priorities for undersized storm sewers, the age of adjacent infrastructure, such as sanitary sewers and watermains, plays a critical role in decision-making. Older infrastructure is typically more susceptible to failure due to material degradation, historical design limitations, and cumulative wear. By aligning

storm sewer upgrades with the replacement of aging sanitary and water systems, municipalities can reduce long-term maintenance costs, minimize service disruptions, and optimize capital investment.

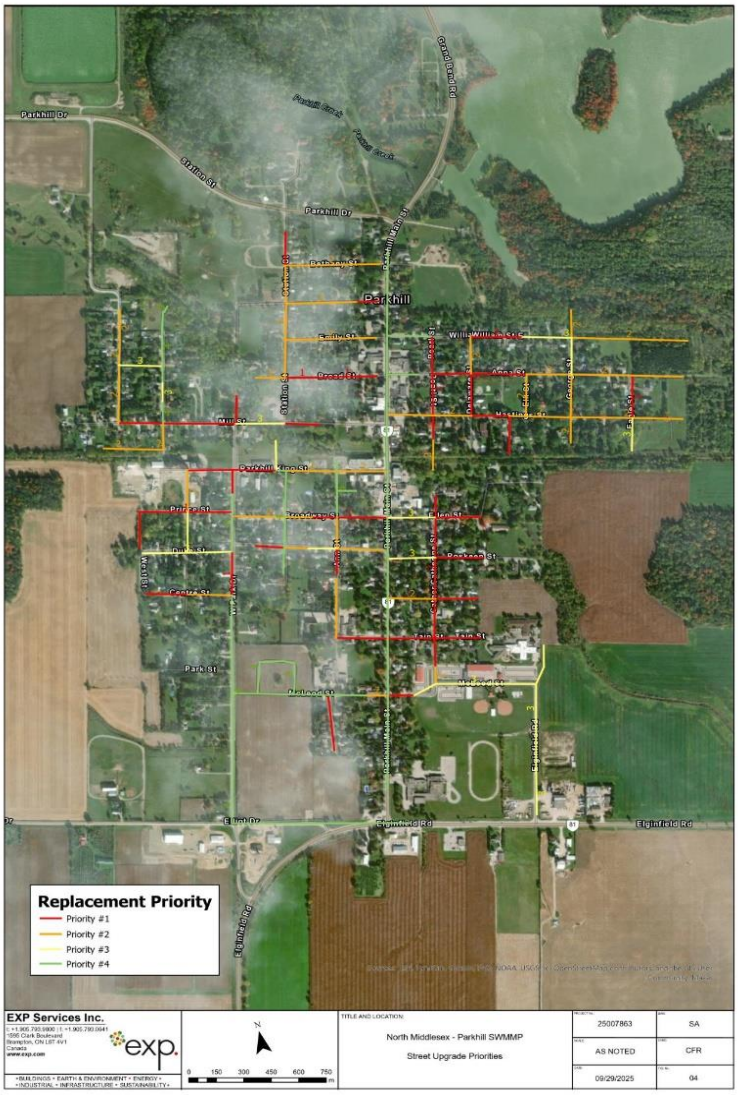
A review of installation years for sanitary sewers across the five (5) catchments highlights that much of the infrastructure is considered old, with only limited portions classified as mid-aged or new. Sanitary sewers are generally from around 1980, meaning the entire system is now classified as old.

Watermains show a similar pattern of old age, with most dating from the 1960s to early 2000s, leaving only a small percentage in the new category. This overall distribution demonstrates that the underground network is predominantly at or beyond its expected service life, reinforcing the need to consider coordinated renewal strategies.

6.3 Prioritization Schedule

A prioritization schedule for the replacement of storm, sanitary, and watermain infrastructure in North Middlesex was developed with a strategic focus on the age and expected service life of each system component. **Figure 8** shows the proposed plan and location of the upgrades in the street network and is colour-coded according to replacement priority. Priority 1 represents the highest urgency for replacement, followed by Priority 2, 3, and 4.

Figure 8. Street Replacement Priorities



6.4 Summary of the Proposed Development

The proposed development for the Parkhill Stormwater Masterplan will take place completely within the existing right-of-way (ROW) owned by the Municipality. The works will involve replacement of stormwater and sanitary sewers, along with watermains. The purpose of the upgrades is to ensure each of the sewers are at sufficient capacity for current conditions and future development. Outlet modifications do not form part of the proposed works and will be reviewed separately within another assignment.

To allow for the replacement of the sewer and watermain infrastructure, pavement removal and replacement will be required within the ROW along with minor grading. All proposed works will be contained within the ROW, including laydown areas, with no property acquisition required as part of the development. Priority of work is provided in **Figure 8**.

7 Impact Assessment and Ecological/Environmental Monitoring

This section of the scoped EIS assesses the potential effects on the natural features and ecological functions that could occur over the short term and long-term following implementation of the development plan. It also identifies appropriate mitigation measures to limit negative impacts.

The ecological components that were subject to an impact assessment, as identified in **Section 5.9**, are discussed below. In addition, the proposed works have been reviewed in line with the background information in **Section 3** to determine any further impacts, along with additional impacts to the surrounding environment (e.g. air quality, noise, and excess soils). Mitigation measures are also discussed to prevent and reduce potential impacts.

7.1 Natural Heritage Features

7.1.1 Areas of Significant Woodland, Other Woodlands, and Vegetation

No potential impacts to areas identified as significant woodlands (**Figure 4**) and other woodlands (**Figure 2**) are anticipated as a result of the proposed replacement works. Where proposed works are in close proximity to trees or shrubs, the work area will be segregated or delineated from these features.

If it is established by the Contractor that tree removal is required, removals shall take place outside of the Migratory Bird Period for the region (April 1st to August 15th). If this is not feasible to the project schedule, a Qualified Avian Biologist will be retained by the Contractor to check for bird nesting and activities prior to removal. The Contractor shall not handle or remove any bird nesting. If nesting is discovered, the Contract Administrator, municipality, and Environment and Climate Change Canada (ECCC) will be informed. A permit/approval may be required to remove the nest, and consultation shall take place with a Qualified Avian Biologist to determine requirements at the time of discovery.

Although not anticipated, mitigation measures pertaining to woodland or vegetation impacts have been provided if the proposed development is to be amended.

7.1.2 Watercourses and Fish Habitat

No loss of aquatic habitat or adverse effects to fish species or watercourses are anticipated as a result of the proposed works. No specific mitigation is required other than implementation of standard construction best management practices (BMPs) to minimize off-site disturbance effects. No modifications to outfalls are proposed as part of the works, therefore no significant changes to discharge or water quality to watercourse or drains identified on **Figure 3** are anticipated. Although in-water works are not required in any of the watercourses identified in **Figure 4**, if this is to change, the permitted timing window from July 16 to March 14 will be followed by the Contractor.

Where works are to take place near a watercourse, erosion and sediment control measures will be implemented in line with OPSS.MUNI 182. These measures, including silt fencing, shall be maintained in an effective, functioning, stable condition to prevent sedimentation to the adjacent watercourse. Routine inspections will be completed daily by the Contractor, and repair will be undertaken as required.

Accidental spills of potentially hazardous materials (e.g., fuel and oil from heavy equipment), could cause stress or injury to the surrounding fauna and flora including fish in adjacent watercourses. In order to mitigate the potential for adverse effects on aquatic habitats due to potential accidental spills during construction, it is recommended that a spill prevention and response plan be prepared to outline the material handling and storage protocols, mitigation measures (e.g., spill kits on-site), monitoring measures and spill response plans (i.e., emergency contact procedures, including the Spills Action Centre, and response measures including containment and clean-up). Implementation of an effective spill prevention and response plan is anticipated to be largely effective in preventing adverse effects on natural heritage features.

Overall, no adverse effects are expected to fish habitat from the proposed development following the mitigation measures outlined above.

7.1.3 ABCA Regulated Areas under O.Reg. 41/24

The proposed works fall within the areas regulated under O.Reg. 41/24. As such, prior written approval and a permit from the ABCA will be required prior to the commencement of the project. The application is typically sent with 60-90% detail design drawings giving ABCA sufficient detail to assess and approve the permit request.

Details on potential tree or shrub removal will need submitted with the application, along with proposed compensation for the removals. Additionally, erosion and sediment control measures shall be detailed on the design drawings to inform ABCA how sedimentation will be controlled, particularly around watercourses.

7.2 Surrounding Environment and Other Parameters

7.2.1 Construction Noise

Construction noise will be generated as a result of equipment and vehicles. The Contractor shall adhere to the following:

- Equipment shall be maintained in an operating condition that prevents unnecessary noise, including but not limited to non-defective muffler systems, properly secured components, and the lubrication of moving parts.
- Idling of equipment shall be restricted to the minimum necessary to perform the specified work.
- Installation of hydraulic drill dust collectors is recommended.

7.2.2 Short-term Effects to Air Quality (including dust emissions)

Short-term air quality effects will be generated by the use of equipment, vehicles, during pavement removal and replacement, and grading. Dust shall be controlled using water and not chemical suppressants in dust-sensitive areas (e.g., adjacent watercourses per the MTO general conditions of contract (OPSS.MUNI.182)). Air quality effects will be reduced through implementation of the noted mitigation measures and monitoring by the Contractor.

7.2.3 Excess Soil and Waste Management

Excess soil will be generated as part of the project as a result of required excavation. Excavation shall be contained within the Region's ROW. All activities involving the management of excess soil will be completed in accordance with O. Reg. 416/19 and the MECP's guidance documents titled 'Management of Excess Soil – A Guide for Best Management Practices' (2014) and the 'Rules for Soil Management and Excess Quality Standards' (2020). The intention would be to reuse as much excavated soil as possible within the ROW.

If hazardous contaminants are found in the sediment at elevated levels, the removed fill will require special handling as well as disposal at an approved facility in line with Part XV.1 of the Environmental Protection Act (EPA), O. Reg. 406/19, and O. Reg. 153/04. Contaminated soils will be handled and removed off-site in line with the mitigation and monitoring noted.

Additional waste that is expected to be generated in performing the work includes: asphalt concrete, aggregates, and packaging (i.e. wood, plastic, metal). Executing waste management strategies during the reconstruction project involves the following:

- On-Site Waste Management: Setting up designated areas for waste separation and storage.
- Monitoring and Reporting: Regularly tracking waste generation and diversion rates, adjusting practices as needed.
- Collaboration: Working with recycling facilities and re-use organizations receiving these materials to ensure proper handling of materials.

These processes should be evaluated as the project progresses and at the completion of the project to assess the effectiveness of the waste management plan and identify areas for improvement. A final waste audit should be conducted to determine the actual waste diversion rates achieved, and the results compared against targets and document successes and challenges.

7.2.4 Archaeological Resources

The proposed work areas have previously been disturbed by prior construction work. If something of archaeological significance is uncovered during construction the following direction is to be followed in accordance with OPSS.PROV 100 General Conditions of Contract G3.07.05:

- Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act*. The proponent or person discovering archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out an archaeological assessment, in compliance with Section 48(1) of the *Ontario Heritage Act*.
- The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 requires that any person discovering human remains must cease all activities immediately and notify the police or coroner. If the coroner does not suspect foul play in the disposition of the remains, in accordance with Ontario Regulation 30/11 the coroner shall notify the Registrar, Ontario Ministry of Public and Business Service Delivery, which administers provisions of that Act related to burial sites. In situations where human remains are associated with archaeological resources, the Ministry of Citizenship and Multiculturalism should also be notified (at archaeology@ontario.ca) to ensure that the archaeological site is not subject to unlicensed alterations which would be a contravention of the *Ontario Heritage Act*.

7.2.5 Built Heritage Resources and Cultural Heritage Landscapes

The proposed work areas within the ROW do not possess cultural heritage value or interest and no Cultural Heritage Evaluation Report was required as part of the assignment.

8 References

Ausable Bayfield Conservation Authority (2009). *Stormwater Management Policies and Technical Guidelines*.

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Fisheries and Oceans Canada (DFO) Aquatic Species at Risk Map.

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Ministry of Agriculture, Food and Rural Affairs (OMAFRA) AgMaps.

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Ministry of Natural Resources. (n.d.). *Significant Wetlands and the Ontario Wetland Evaluation System*. Government of Ontario.

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Ontario's Provincial Policy Statement (Ministry of Municipal Affairs and Housing, 2024).

Ontario Reptile and Amphibian Atlas, Ontario Nature.

The Endangered Species Act, 2007 (ESA) in Ontario, formally known as S.O. 2007, c. 6.

The Funeral, Burial and Cremation Services Act, 2002, S.O. 2002.

Appendix E – Consultation Materials

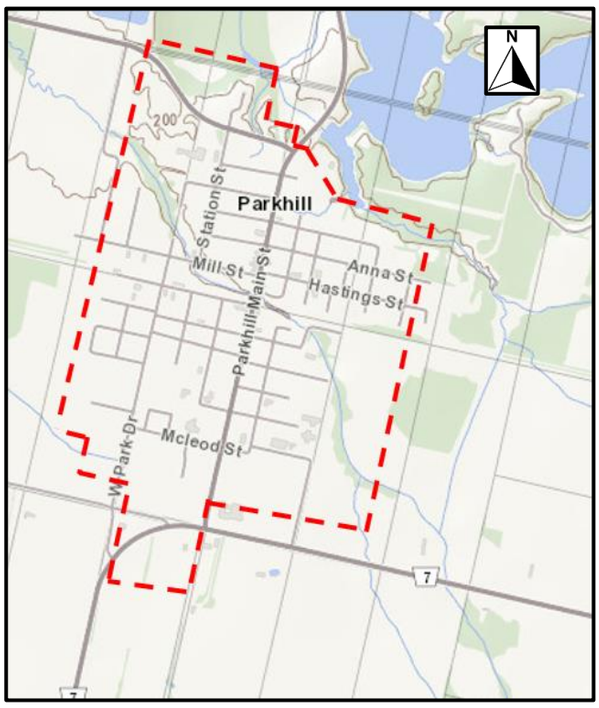
November 2025

Notice of PIC

Notice of Public Information Centre
Municipality of North Middlesex
Parkhill Stormwater Management Masterplan

THE PROJECT

The Municipality of North Middlesex has retained EXP Services Inc. (EXP) to undertake a Stormwater Management Masterplan for the community of Parkhill. With limited existing stormwater systems and increasing pressure from intensification and infill development, effective runoff management has become a growing priority, particularly in light of more frequent and severe storm events. The project includes assessing current conditions, identifying key drainage challenges, and developing practical, long-term solutions to enhance system performance, reduce flood risks, and ensure resilient, sustainable infrastructure for the community's future.



CONSULTATION

A Public Information Centre (PIC) is being planned to present and gather feedback on the study process. The PIC will be in an open-house format and will present the following: existing conditions; deficiencies in stormwater infrastructure; priority issues; solutions and recommendations for infrastructure; as well as next steps in the process. The PIC will take place as follows:

Date: Monday, October 6, 2025

Time: 6:00 p.m. to 8:00 p.m**.**

Location: Council Chambers, 229 Parkhill Main Street, Parkhill, ON N0M 2K0

The PIC will provide an opportunity for the public and stakeholders to provide input and comments. Please submit all comments on the PIC by **October 27, 2025,** to either of the contacts below or via comment sheet at the event. For further information on the study please visit: https://www.northmiddlesex.on.ca/stormwater-management-master-plan-parkhill.

For more information about the study and PIC, please contact the following:

Faishal Diwan, B.Eng.
Manager of Infrastructure
Municipality of North Middlesex
229 Parkhill Main Street
Parkhill, ON N0M 2K0
Phone: 519-294-6244 ext. 3218
Email: faishald@northmiddlesex.on.ca

Cameron Rickert, P.Eng.
Stormwater Engineer
EXP Services Inc.
1595 Clark Blvd.
Brampton, ON L6T 4V1
Phone: 519-963-3000
Email: cameron.rickert@exp.com

All information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act and Municipal Freedom of Information and Protection of Privacy Act*. Except for personal information, all comments will become part of the public record.

This notice was first issued on September 22, 2025.

PIC Slides

Public Information Centre – October 6, 2025

Stormwater Management Master Plan – Parkhill

Acknowledgement of Ancestral Lands

We acknowledge that this land on which we are gathered today is part of the ancestral land of the Attawandaron, Anishinabeg, Haudenosaunee, and Lunaapeewak peoples. It is through the connection with the spirit of the land, water and air that we recognize their unique cultures, traditions, and values. Together as treaty people, we have a shared responsibility to act with respect for the environment that sustains all life, protecting the future for those generations to come.

Language Pronunciations:
Attawandaron (Add-a-won-da-run),
Anishinabeg (Ah-nish-in-a-beg)
Haudenosaunee (Hoden-oh-show-nee)
Lunaapeewak (Len-ahpay-wuk)

Public Information Centre

Purpose of the PIC

- Share information on the Parkhill Stormwater Management Master Plan process
- Present the findings of the existing conditions review and preliminary analysis
- Gather input from the community to help shape recommended solutions

What Will Be Presented

- Study objectives and scope
- Existing infrastructure conditions and challenges
- Hydrologic and hydraulic assessment results
- Preliminary strategies for stormwater management and infrastructure renewal
- Next steps in the Master Plan process

How You Can Participate

- Review the display materials and ask questions to the project team
- Provide feedback through comment forms and online submissions
- Share local knowledge of flooding, drainage, or infrastructure issues
- Stay engaged through future PICs and project updates

Introduction

Why do we need a Stormwater Management Master Plan?

The community of Parkhill faces significant stormwater management challenges due to limited existing infrastructure, ongoing urban intensification, and increasingly severe rainfall events. These factors contribute to localized flooding, erosion, and system capacity issues. As the community continues to grow, the need for effective stormwater solutions becomes increasingly urgent.

Corner of Main Street and McLeod St
February 2023

Introduction

Problem & Opportunity Statement

- Address deficiencies in the existing stormwater system and infrastructure gaps
- Provide solutions to reduce flooding risks
- Support future development through sustainable, long-term drainage strategies
- Verify compliance with municipal, provincial, and conservation authority requirements

The SWMMP will Address the Following:

- Evaluate existing stormwater infrastructure performance and identify deficiencies
- Develop strategies to improve capacity, reduce flood risk, and enhance system resilience
- Incorporate updated hydrologic and hydraulic modeling to reflect current and future conditions
- Provide a framework for cost-effective, sustainable infrastructure replacement for the Parkhill community

Public Information Centre Objectives

Present Findings of Existing Stormwater Conditions

Present Alternative Solutions to address System Deficiencies

Gather Feedback and Discuss Next Steps in the Master Plan Process

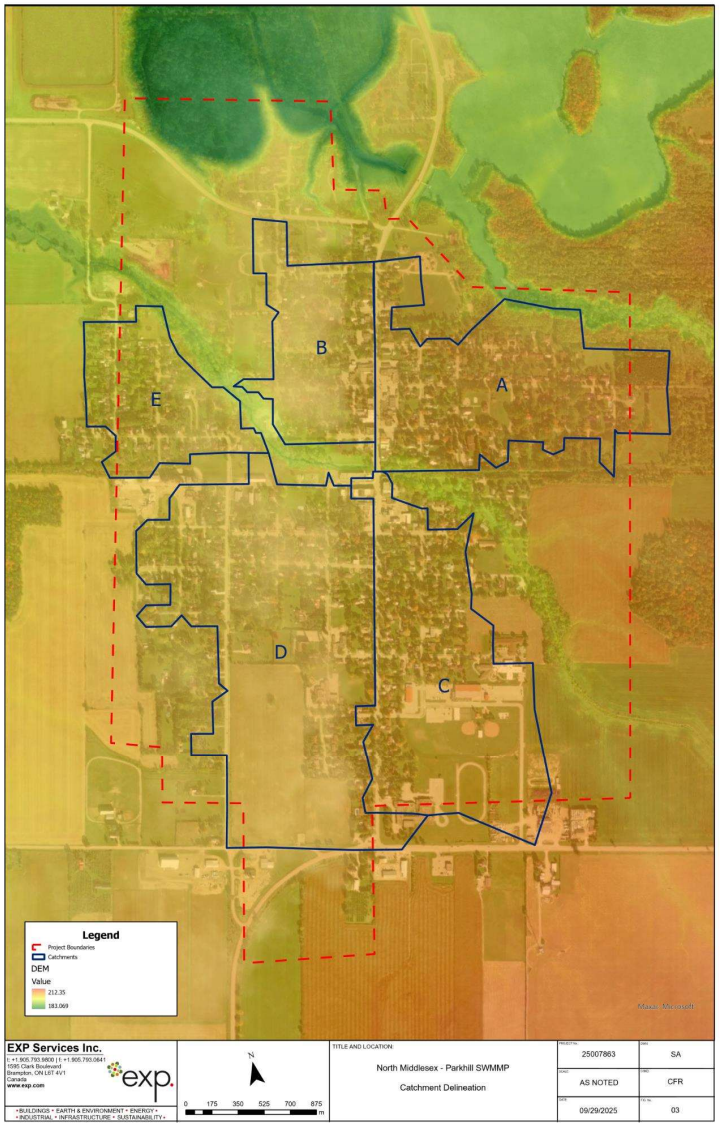
Glossary for the Public:

- **Stormwater Management Master Plan (SWMMP):** A long-term plan that guides how a community will handle rainwater to reduce flooding, protect property, and improve the environment.
- **Rational Method**: An engineering method used to estimate how much rainwater becomes runoff during a storm.
- **Catchment**: An area of land where rainwater drains into the same sewer system or watercourse.
- **Drainage Area**: A smaller section within a catchment that directs water into a specific pipe or manhole.
- **Runoff Coefficient**: A number that shows how much rainfall soaks into the ground vs. how much runs off into sewers.
- **Time of Concentration (Tc):** The time it takes for rainwater from the farthest point in a catchment to reach the sewer system.
- **Manning's Equation**: A formula engineers use to calculate how much water a pipe can carry, based on its size and slope.

Study Area

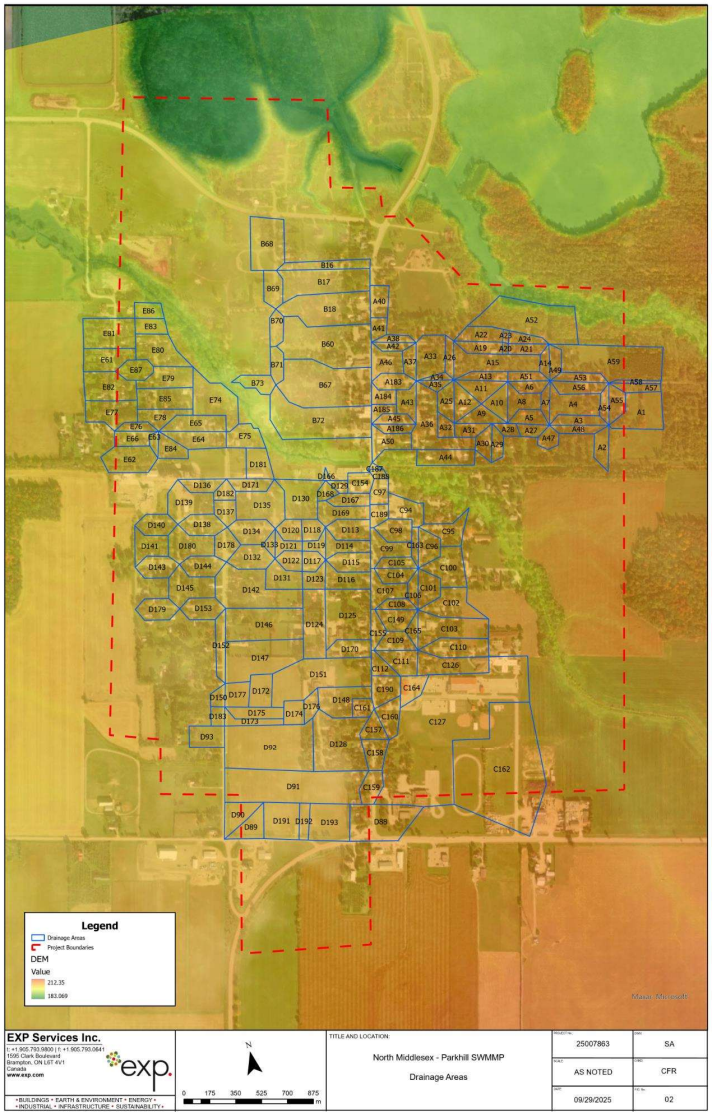
The Master Plan study area includes the entire urban boundary of Parkhill, encompassing residential, institutional, and commercial lands supported by a storm sewer network and outlet drains. For the purposes of hydrologic and hydraulic assessment, the drainage system was divided into five major catchments, each representing a dominant portion of the urban area:

- Catchment A: Northeast (Covers the Hastings Street and Eagle Street corridors, extending through Anna Street, George Street, Elk Street, Pearl Street, and portions of Main Street and William Street)
- Catchment B: Northwest (Serves the Bethany Street and Station Street areas, with drainage connections along William Street, Emily Street, Broad Street, and parts of Main Street)
- Catchment C: Southeast (Includes Main Street and surrounding streets such as Ellen Street, King Street, Catherine Street, McLeod Street, Ardross Street, Roskeen Street, Leonard Avenue, and the Elginfield Road corridor)
- Catchment D: Southwest (Encompasses the Ann Street and King Street neighborhoods, extending across Broadway Street, John Street, Albert Street, Elliot Street, West Park Drive, Duke Street, Centre Street, Prince Street, Michelle Avenue, and connecting to McLeod Street)
- Catchment E: West (Covers Union Street and the western residential blocks including Mill Street, Richmond Street, and Victoria Street)



Drainage Areas

The storm sewer system within Parkhill was divided into a series of individual drainage areas, each representing the contributing flow to a pipe segment or manhole. These areas were aggregated into five major catchments (A through E). The delineation was completed using GIS topographic data, DEM elevation information, and municipal mapping to verify consistency with overland flow paths and sewer connectivity. This framework provides the basis for the hydrologic and hydraulic assessment of existing system capacity.



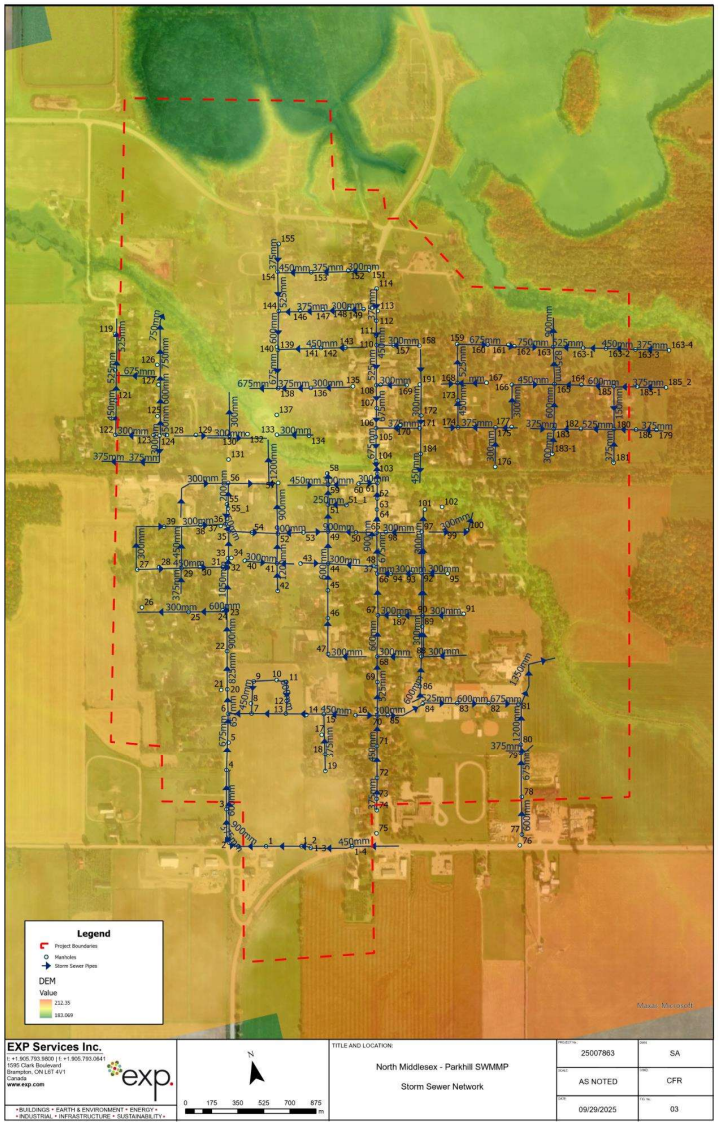
North Middlesex

Channel Flooding Analysis Process

The main watercourse within Parkhill is the Cameron-Gilles Municipal Drain. This watercourse and its operation is managed by the Ausable Bayfield Conservation Authority, and therefore flood risk cannot be mitigated solely by improvements to the Municipal Drain.

Hydraulic Assessment

The hydraulic assessment of the Parkhill storm sewer network was completed using a standardized design sheet to evaluate the capacity and performance of existing infrastructure. Flow rates, velocities, and hydraulic gradients were calculated using Manning's equation, and results were compared against municipal design standards. The analysis highlighted that several pipe segments, particularly within the core areas of the network, are undersized under current conditions. A smaller number of segments demonstrated adequate capacity, but overall, the assessment identified widespread limitations that will require targeted upgrades to support future growth and mitigate flood risk.



North Middlesex

Hydraulic Assessment

The hydraulic assessment of the Parkhill storm sewer system was carried out using standardized design methods to evaluate performance. Flow rates, velocities, and pipe capacities were calculated and compared to municipal design standards. The results indicate that while some pipes provide sufficient conveyance, a significant portion of the network is undersized, with capacity ratios above acceptable limits. This highlights system deficiencies that may contribute to localized flooding risks and points to priority areas for future upgrades and coordinated infrastructure renewal.

Catchment	Capacity Ratio	Pipes Over Capacity (%)
Catchment A	0.1-4.7	52
Catchment B	0.3-3.4	44
Catchment C	0.1-4.7	64
Catchment D	0.1-4.5	70
Catchment E	0.1-2.7	83

Adjacent Infrastructure

A review of installation years for storm sewers, sanitary sewers, and watermains across the five catchments shows that most of the underground infrastructure is considered old (>50 years). Storm sewers were generally installed between 1940 and 1987, with newer segments concentrated in Catchment E.

Sanitary sewers were typically introduced circa 1980, meaning the entire sanitary system is likely in need of repair.

Watermains are also generally considered old, with most dating from the 1960s to early 2000s.

This overall distribution indicates that much of the network is at or beyond its expected service life, highlighting the importance of coordinated renewal strategies.

Adjacent Infrastructure

Pipes	Catchment	Installation Year	Aging Condition		
			% Old	% Mid	% New
Storm Sewer	Catchment A	1950-2006	71	11	18
	Catchment B	1950	100	0	0
	Catchment C	1940-2006	51	10	39
	Catchment D	1950-2018	41	10	49
	Catchment E	1899-2008	67	33	0
Sanitary	Catchment A	1980	0	100	0
	Catchment B	1980	0	100	0
	Catchment C	1980-2010	0	78	22
	Catchment D	1980-2010	0	79	21
	Catchment E	1980	0	100	0
Watermain	Catchment A	1950-1987	68	18	14
	Catchment B	1960-2002	94	0	6
	Catchment C	1960-2002	38	18	44
	Catchment D	1954-2010	37	19	44
	Catchment E	1960-2013	39	50	11

Prioritization Schedule

To effectively prioritize infrastructure renewal, both a weighted scoring method and hydraulic capacity assessment were applied. The capacity analysis focuses on the hydraulic performance of the storm system under design storm events, while the weighted scoring approach evaluates each pipe segment based on criteria such as system age, CCTV condition, and known issues.

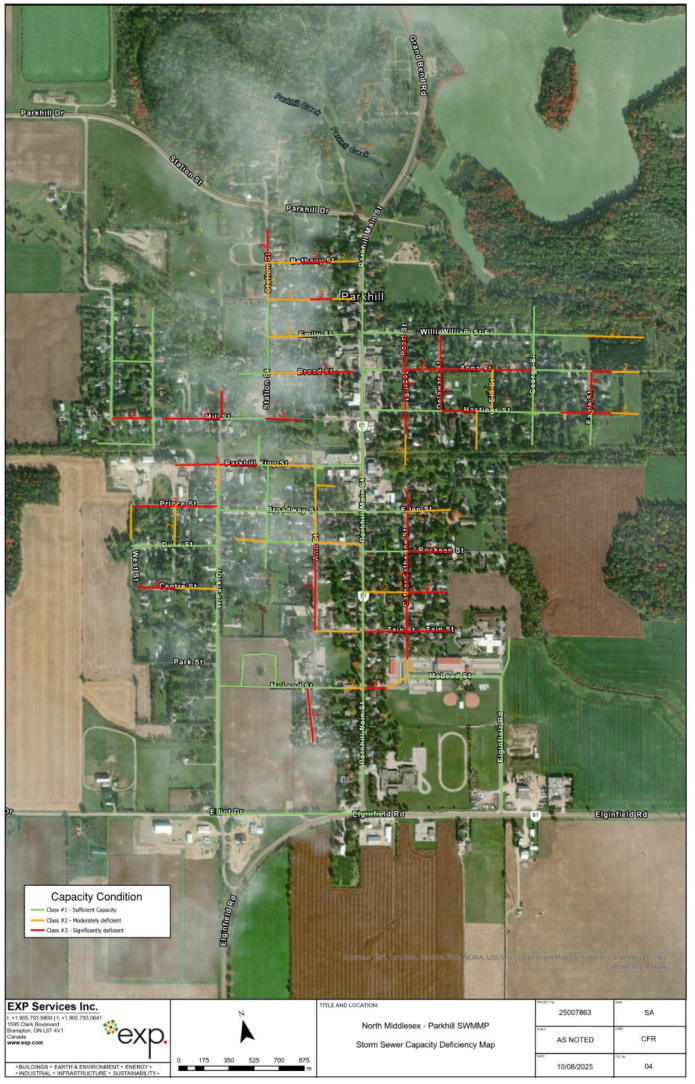
By combining these two perspectives, structural and hydraulic, the prioritization framework highlights both high-risk and hydraulically undersized segments. This data-driven process supports strategic planning and optimized capital investment for the Municipality of North Middlesex.

Weighting factors	
Criteria	**Weight**
Capacity Condition	25%
Storm Sewer Age	20%
Sanitary Sewer Age	15%
Watermain Age	20%
Storm Sewer Condition using CCTVs	10%
Sanitary Sewer Condition using CCTVs	10%
	100%

Prioritization Based on Storm Sewer Capacity Ratio

This map shows the storm sewer capacity ratio (Flow/Capacity) for the modeled system. Areas with higher ratios indicate limited hydraulic capacity and a higher likelihood of surcharging during major storm events. These results help identify potential upgrades to improve system performance and reduce flooding risk.

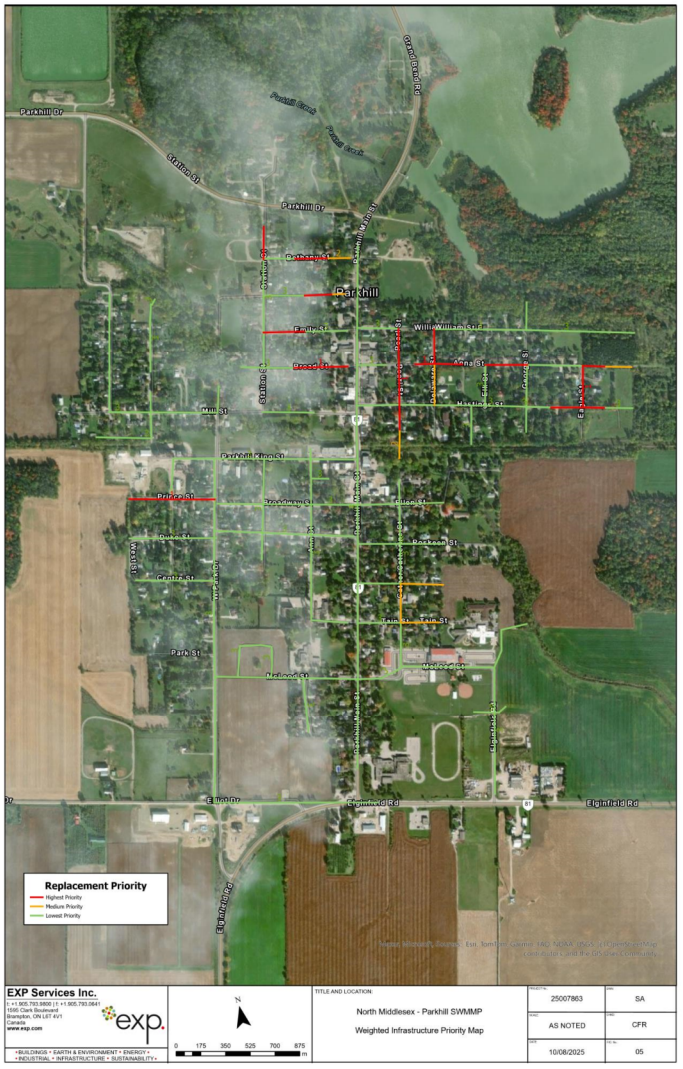
Capacity Ratio Range:
1. <1 : Adequate capacity
2. Between 1 and 1.5 : Moderately deficient
3. >1.5 : Significantly deficient



Prioritization Based on Scoring Method

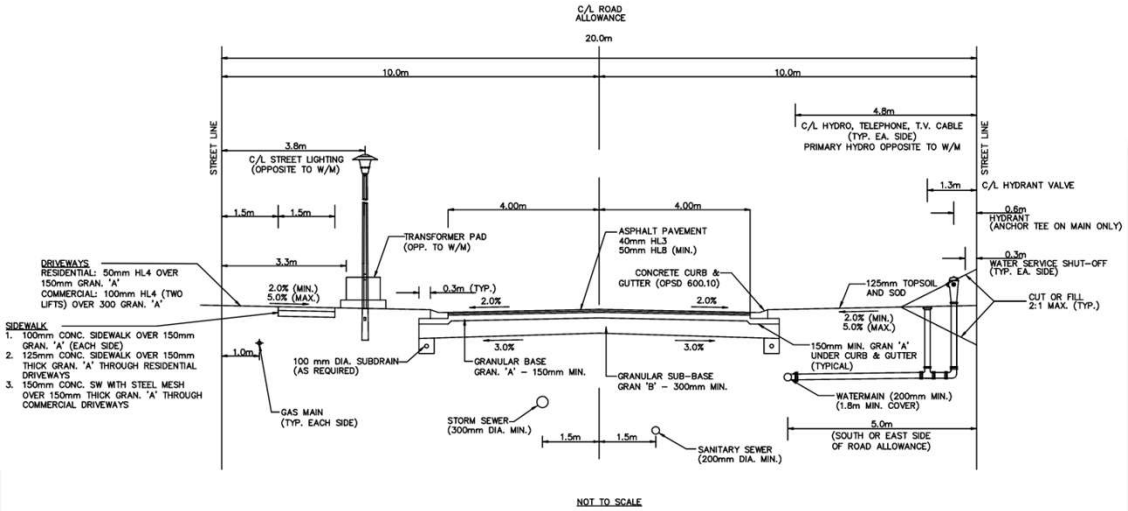
This map shows weighted infrastructure priority map. It integrates multiple parameters into a weighted scoring system that produces an overall renewal priority for each segment. Segments with higher scores represent greater renewal priority due to structural deficiencies, CCTV-identified issues, or aging infrastructure.

Replacement Priority
1. Highest Priority
2. Medium Priority
3. Lowest Priority



Conclusion

- Assessment of existing system performance completed using municipal guidelines.
- Undersized infrastructure was identified for each catchment.
- Proposed pipe sizing completed following the same approach.
- Adjacent infrastructure age was cross-referenced to determine most might-risk areas.



References

- Municipality of North Middlesex. Infrastructure Design Guidelines and Construction Standards (2025)
- Consolidated Linear Infrastructure Environmental Compliance Approval (CLI ECA, 2022)
- Ontario Ministry of Transportation Highway Drainage Design Standards (HDDS, 2008)
- Ministry of the Environment Stormwater Management Planning and Design Manual (SWMPDM, 2003)

Next Steps

Following the Public Information Centre, we will:

- Review public feedback to better understand the priorities of Parkhill residents and stakeholders.
- Refine the identified stormwater system needs, issues, and opportunities based on input received.
- Finalize recommended solutions for each servicing area within the Parkhill urban boundary.
- Present the Master Plan Report and recommendations to North Middlesex Council.

Next Steps

November 19, 2025 — Council Review (Parkhill Council presentation date)

December 2025 — Finalizing the Master Plan

Beginning in 2026 — Implementation Phases (To be initiated in 2026, based on Council direction, budget, and priorities)

Next Steps

Please visit the community website (www.northmiddlesex.on.ca) for study updates and more information.

Please forward any comments prior to October 27, 2025, to either of the contacts below.

Faishal Diwan, B. Eng
Manager of Infrastructure
Municipality of North Middlesex
T 519-294-6244 ext 3218
Email: faishald@northmiddlesex.on.ca

Cameron Rickert
Stormwater Engineer
EXP Services Inc.
Phone: 519-963-3000
Email: cameron.rickert@exp.com

PIC Sign-in Sheet

North Middlesex

PUBLIC INFORMATION CENTRE
PARKHILL STORMWATER MANAGEMENT MASTERPLAN
MONDAY, OCTOBER 6TH, 2025, 6:00 TO 8:00 P.M.

Sign-in Sheet

Name	Address	Contact Number	Email
[redacted]			

Information will be collected in accordance with the *Freedom of Information and Privacy Act*. With the exception of personal contact details, all information will become part of the public record.

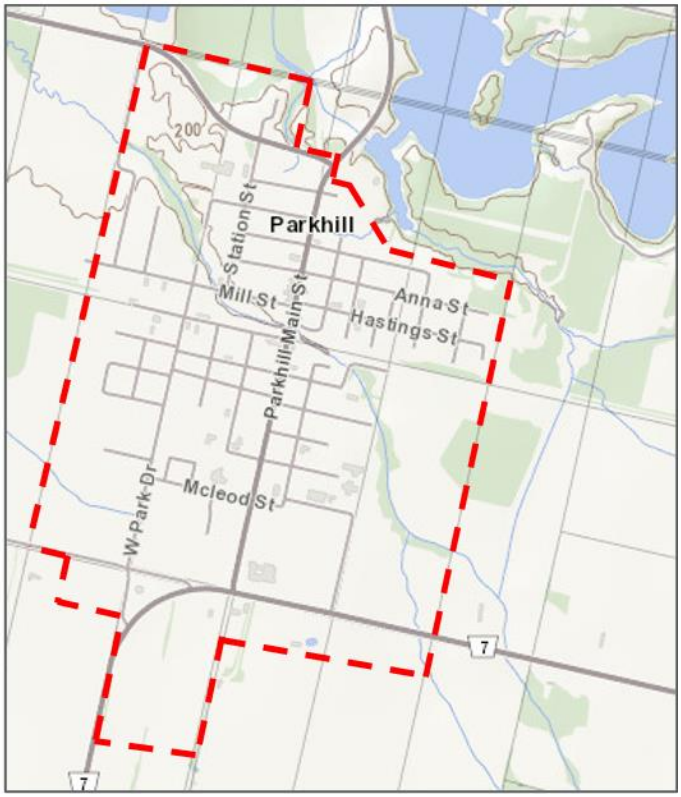
Request for Information Letters

Darren Ungar, Management Biologist
MNRF Aylmer
darren.ungar@ontario.ca

July 23, 2025

SUBJECT: Request for Information – Stormwater Upgrade Implementation Strategy for the area of Parkhill (Municipality of North Middlesex)

EXP Services Inc. has conducted an initial background search for aquatic and terrestrial ecosystem information within the project limits (red dashed line in map below). **At this time, we are requesting that your staff review our assembled background information and provide any supplemental information that they may have**. Our intent is to ensure that all natural heritage values are captured within the project limits.



We greatly appreciate your attention to this timely matter. Please contact me if you would like to discuss the project further.

Thank you very much,

Alastair Ross, Senior Environmental Manager
EXP Services Inc.

Attachment: Initial Natural Heritage Background Search

Initial Natural Heritage Background Search: Request for Confirmation and Supplementation

An initial natural heritage background search for this assignment has been completed using the following sources:

- NHIC data from 'Make a Map: Natural Heritage Areas'
- e-Bird
- Ontario Reptile and Amphibian Atlas
- Natural Heritage Information Centre (NHIC) database – 1 km squares
- Land Information Ontario (LIO) Shapefiles/Feature Classes including: Aquatic Resource Area Line Segment, Waterbodies, Wetlands, Wintering Areas, Conservation Reserves, Provincial Park Regulated, Crown Game Preserve, ANSI, Spawning Areas, Wintering Area, Nesting Site, Aquatic Feeding Area, Staging Area Wildlife
- Fisheries and Oceans Canada (DFO) Aquatic Species at Risk Map
- Google Earth aerial images

This project is located within the Aylmer District MNRF jurisdiction, situated within the St. Thomas Ecodistrict 7E-2. The natural heritage features are listed below. Please confirm and supplement as appropriate.

Species at Risk

Endangered

- Dropping Trillium (Endangered: SARO and COSEWIC)
- Common Five-lined Skink (Carolinian Population) (Endangered: SARO and COSEWIC)

Threatened

- Bobolink (Threatened: SARO)
- Wood Thrush (Threatended: COSEWIC)
- Western Chorus Frog (Great Lakes/St. Lawrence – Canadian Shield population (east and north of Toronto) (Threatened: SARO)

Significant Wildlife Habitat

Species of Special Concern

- Snapping Turtle and Eastern Wood-pewee in listed in NHIC Make a Map
- Snapping Turtle and Midland Painted Turtle in Ontario Reptile and Amphibian Atlas

Wildlife Concentration Areas

- None within the study area

Specialized Habitats for Wildlife

- None within the study area

Special Land Use Designations (i.e. ANSI, Provincial Park, Provincially Significant Wetlands etc.): None with the study area

Fisheries: Tributary of Parkhill Creek passes through the centre of the study area and unnamed watercourses are present to the northeast and southwest of the study area. The species within the watercourse includes: Blacknose Dace; Brook Stickleback; Common Shiner; Creek Chub; Fathead Minnow; and, White Sucker (LIO Aquatic Resource Area Line Segment). The permitted in-water work window based on the species present is July 16 to March 14.

No wetland systems are present in the study area.

Kari Jean, Aquatic Biologist
Ausable Bayfield Conservation Authority
kjean@abca.ca

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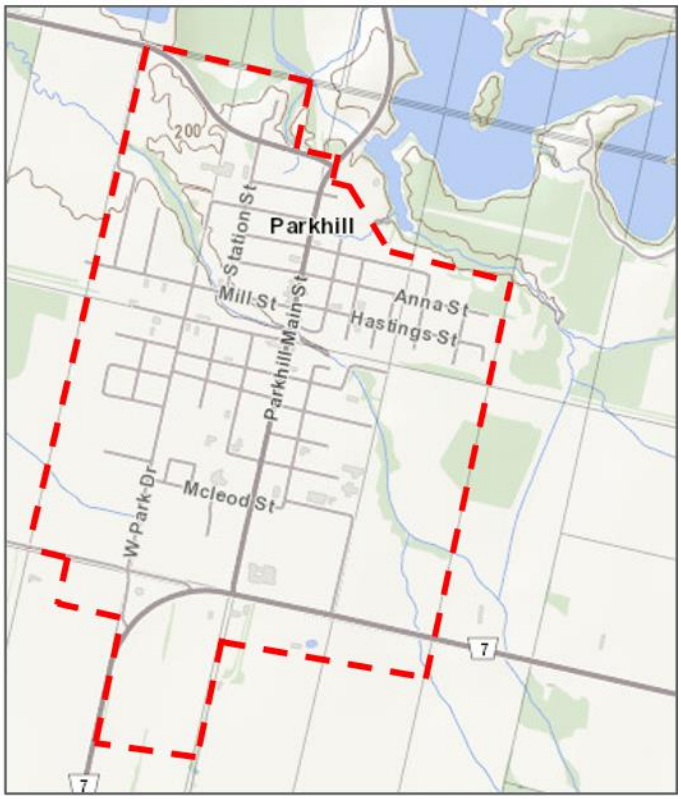

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No wetland systems are present in the study area.

Request for Information Correspondence

Outlook

RE: Request for Fisheries and Natural Sciences Information - Parkhill Stormwater Upgrade Implementation Strategy (MNRF Aylmer)

From Ungar, Darren (MNR) <Darren.Ungar@ontario.ca>
Date Fri 8/8/2025 11:45 AM
To Alastair Ross <Alastair.Ross@exp.com>
Cc MNRF.AYL (MNR) <MNRF.AYL@ontario.ca>

Good morning, Alastair,

Thank you for contacting the ministry seeking any additional natural heritage information for the Parkhill Stormwater Upgrade Implementation Strategy. The Government of Ontario is committed to transparency, customer service, and making information more publicly accessible. Access to natural heritage information is critical to informing municipal planning processes, development activities, and other initiatives such as science and research.

Natural Heritage Data Information Request

MNR has developed a Geohub webpage to assist you with accessing all the natural heritage data and values the Ministry of Natural Resources has available. The new page can be accessed here - Natural Heritage Data Access Requests. The new webpage not only consolidates all MNR natural heritage data into one location, it also functions as a self serve tool, outlines how to make data requests for MNR restricted data and includes links to the Natural Heritage Make a Map tool and natural heritage policies and documentation to reference when conducting a natural heritage screening exercise.

The information available from MNR and the sources listed and linked on the Geohub webpage should **not be considered as a substitute for site visits and appropriate field surveys.** Generally, information available from MNR can be regarded as a starting point from which to conduct further field studies, if needed. While this data represents MNR's best available current information, it is important to note that a lack of information for a site does not mean that additional features and values are not present. There are many areas where MNR does not currently have information. On-site assessments can better verify site conditions, identify natural heritage features and values, and determine any potential environmental impacts that may result from a proposed activity.

I've reviewed our records, and **you have all the pertinent natural heritage information for your project location**. Please note, The Ministry of Environment, Conservation & Parks (MECP) is now responsible for the Endangered Species Act and SAR in Ontario. Any inquires about SAR should be directed towards MECP staff at SAROntario@ontario.ca

I hope this information helps. Let me know if you need anything further.

Regards,

Darren Ungar
Management Biologist | Aylmer/Guelph District
Ministry of Natural Resources & Forestry | Ontario Public Service
226-962-6870 | darren.ungar@ontario.ca

Ontario

Taking pride in strengthening Ontario, its places and its people

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From: Alastair Ross <Alastair.Ross@exp.com>
Sent: Thursday, August 7, 2025 5:27 PM
To: Ungar, Darren (MNR) <Darren.Ungar@ontario.ca>
Cc: MNRF.AYL (MNR) <MNRF.AYL@ontario.ca>
Subject: FW: Request for Fisheries and Natural Sciences Information - Parkhill Stormwater Upgrade Implementation Strategy (MNRF Aylmer)

Hi Darren,

Just following up again on my request below and attached.

Thanks,

Alastair

Alastair Ross, MSc., CEnv
EXP | Senior Environmental Manager - Transportation
d: +1.249.315.8640 | c : +1.226.567.3284 | e : alastair.ross@exp.com
14 Cedar Pointe Drive, Unit 1510
Barrie ON
L4N5R7, CANADA

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keep it green, read from the screen

From: Alastair Ross
Sent: Wednesday, July 30, 2025 9:46 AM
To: Ungar, Darren (MNRF) <darren.ungar@ontario.ca>
Cc: MNRF.AYL (MNR) <mnrf.ayl@ontario.ca>; Cameron Rickert <Cameron.Rickert@exp.com>; Alyssa Speiran <Alyssa.Speiran@exp.com>
Subject: FW: Request for Fisheries and Natural Sciences Information - Parkhill Stormwater Upgrade Implementation Strategy (MNRF Aylmer)

Hi Darren,

I am just following up on my email below and the attached.

Any information would be much appreciated.

Thanks,

Alastair

Alastair Ross, MSc., CEnv
EXP | Senior Environmental Manager - Transportation
d: +1.249.315.8640 | c : +1.226.567.3284 | e : alastair.ross@exp.com
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L4N5R7, CANADA
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From: Alastair Ross
Sent: Wednesday, July 23, 2025 2:58 PM
To: Ungar, Darren (MNRF) <Darren.Ungar@ontario.ca>
Cc: MNRF.AYL (MNRF) <MNRF.AYL@ontario.ca>; Cameron Rickert <Cameron.Rickert@exp.com>; Alyssa Speiran <Alyssa.Speiran@exp.com>
Subject: Request for Fisheries and Natural Sciences Information - Parkhill Stormwater Upgrade Implementation Strategy (MNRF Aylmer)

Hi Darren,

The Municipality of North Middlesex has retained the services of EXP Services Inc. (EXP) to undertake a Stormwater Upgrade Implementation Strategy for the area of Parkhill. The study area is shown below within the red dashed lines.

To aid the evaluation of the components of the strategy, we have attached Natural Heritage data for MNRF's confirmation and supplementation of any additional information.

Any information you could please provide would be much appreciated.

Thanks,

Alastair

Alastair Ross, Chartered Environmentalist
EXP | Senior Environmental Manager, Transportation
t : +1.705.719.1100, 34029 | e : alastair.ross@exp.com
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Unit 1510
Barrie, ON L4N 5R7
CANADA

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Outlook

Request for Fisheries and Natural Sciences Information - Parkhill Stormwater Upgrade Implementation Strategy (Ausable Bayfield Conservation Authority)

From Alastair Ross <Alastair.Ross@exp.com>
Date Wed 7/23/2025 2:28 PM
To kjean@abca.ca <kjean@abca.ca>
Cc abicknell@abca.ca <abicknell@abca.ca>; Cameron Rickert <Cameron.Rickert@exp.com>; Alyssa Speiran <Alyssa.Speiran@exp.com>

1 attachment (226 KB)

Request for Information – Stormwater Upgrade Implementation Strategy for the area of Parkhill (Municipality of North Middlesex - ABCA).pdf;

Hi Kari,

The Municipality of North Middlesex has retained the services of EXP Services Inc. (EXP) to undertake a Stormwater Upgrade Implementation Strategy for the area of Parkhill. The study area is shown below within the red dashed lines.

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Any information you could please provide would be much appreciated.

Thanks,

Alastair

Alastair Ross, Chartered Environmentalist
EXP | Senior Environmental Manager, Transportation
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