

# TORONTO BASEMENT FLOODING CAPACITY STUDIES – BUNDLE F STUDY AREA 60: EA PROJECT FILE

Development and Assessment of Alternatives  
October 6, 2023

## 7.0 DEVELOPMENT AND ASSESSMENT OF ALTERNATIVES

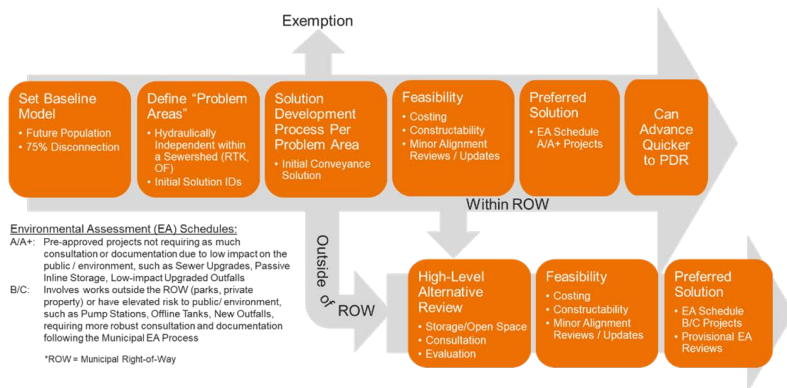
The following sections describe the development and assessment of alternative solutions for the system performance issues described in previous sections.

### 7.1 APPROACH AND METHODOLOGY

The baseline conditions represented the starting point from which solutions were required. Baseline conditions are represented by the design storm results, incorporating projected 2041 population on the sanitary model and an assumed 75% Downspout Disconnection for the storm model reflecting the intentions of the Wet Weather Flow Management Master Plan for new development to control onsite stormwater discharges to better than pre-development conditions under large storms. Boundary conditions were applied as described in **Section 4.2**. For the purpose of the study, no changes were made to the hydrology to reflect future 2041 conditions. **Figure 7—2** presents the baseline model results (100-yr) for the storm drainage systems, **Figure 7—3** presents the baseline major system results (100-yr), and **Figure 7—4** presents the baseline 2041 sanitary system results (May 12, 2000), which form the basis of solution development.

Problem Areas were identified based on the criteria infractions of the baseline condition models. HGL issues that could not be eliminated through model adjustments or those that were deemed low or inconsequential flood risk to private property, were summarized as Exemptions, with justification provided in **Section 3.3 of Attachment #3 – TM3**.

The approach to solution development was premised on the principle of conveyance within the municipal ROW as a first iteration, to maximize the number of solutions that fall within the Municipal Class EA Schedule A or A+ categorization. Where the initial solutions were constrained by unfavourable requirements, fell outside of the ROW, or may lead to Schedule B/C implications, alternatives were reviewed and assessed. The general approach is presented in **Figure 7—1** below.

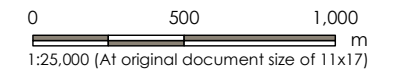


**Figure 7—1: General Approach for Solution Development**

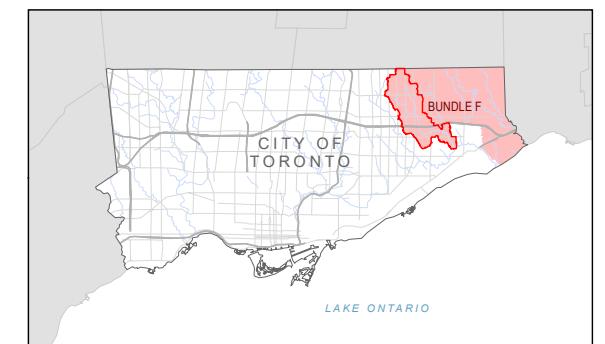


Legend

- Study Area
- Assignment Area
- Storm Outfall
- HGL Freeboard**
  - At or Above Surface
  - Within Basement Level (Within 1.8 m of Surface)
- Pipe Surcharge State**
  - Bottleneck (Undersized Sewer)
  - Backwater Conditions
  - Free-Flowing Conditions



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Project Location: City of Toronto  
 165660138 REVA  
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 BASEMENT FLOODING CAPACITY STUDIES  
 BUNDLE F - STUDY AREA 60

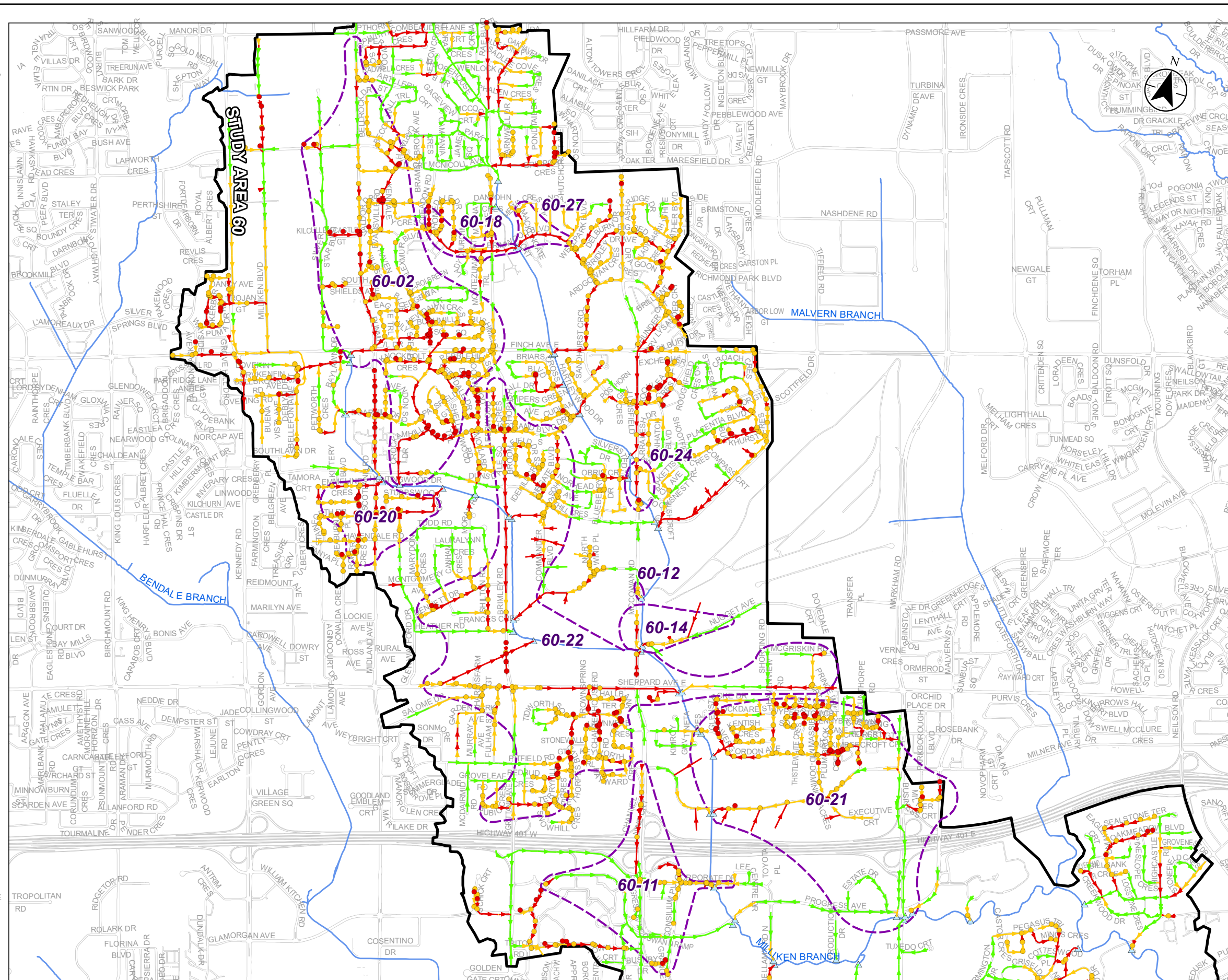
Figure No.

**7.2**

Title

**Baseline 100-yr Results - Storm  
 Minor System**

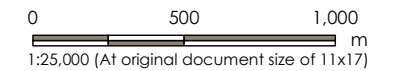
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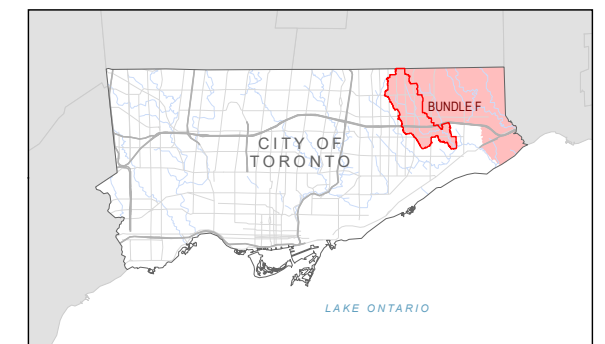


Legend

- Study Area
- Assignment Area
- Major System Outfall
- Overland Depth**
- Exceeds Maximum Allowable Depth
- Below Maximum Allowable Depth



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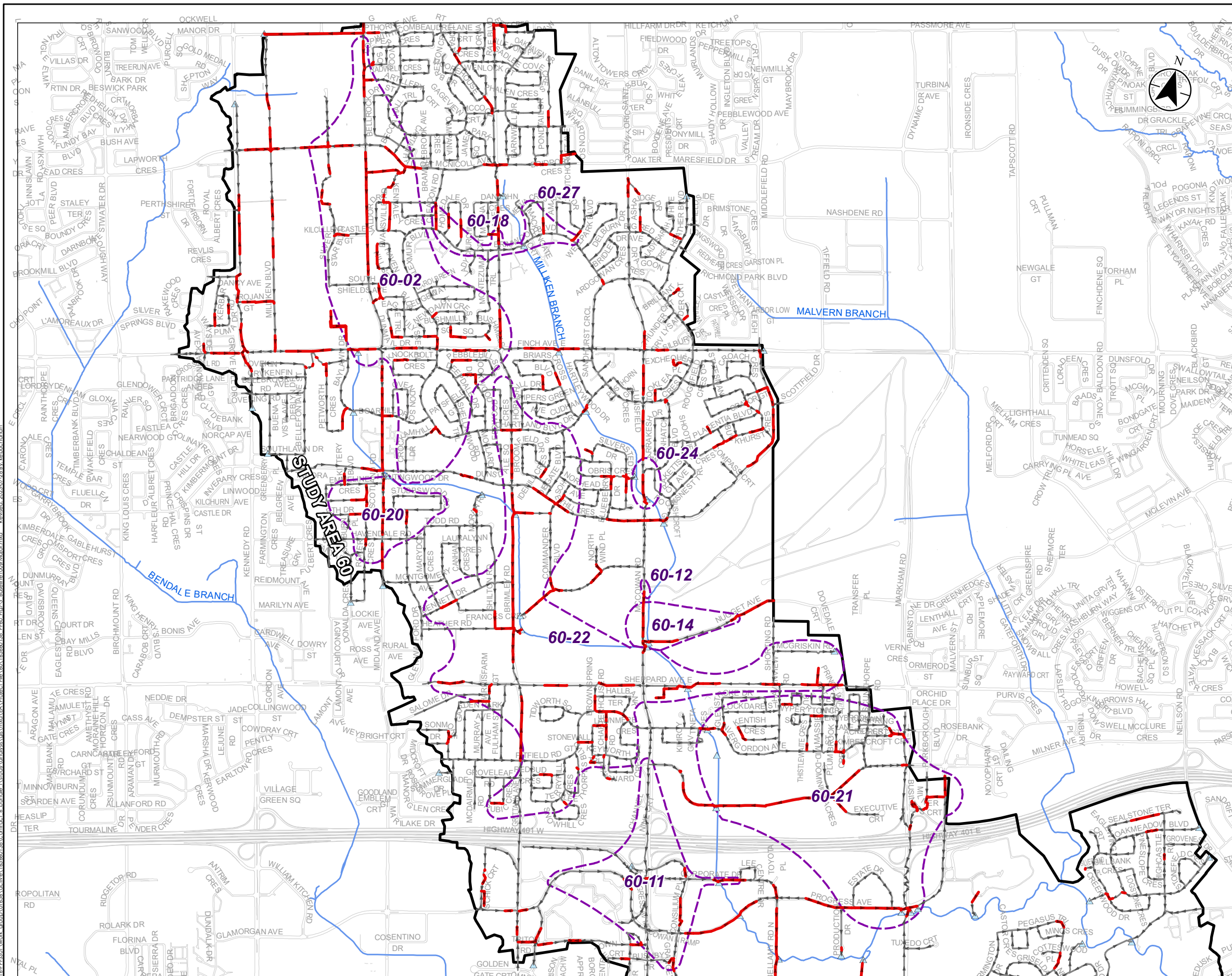
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 BUNDLE F - STUDY AREA 60

Figure No.

**7.3**

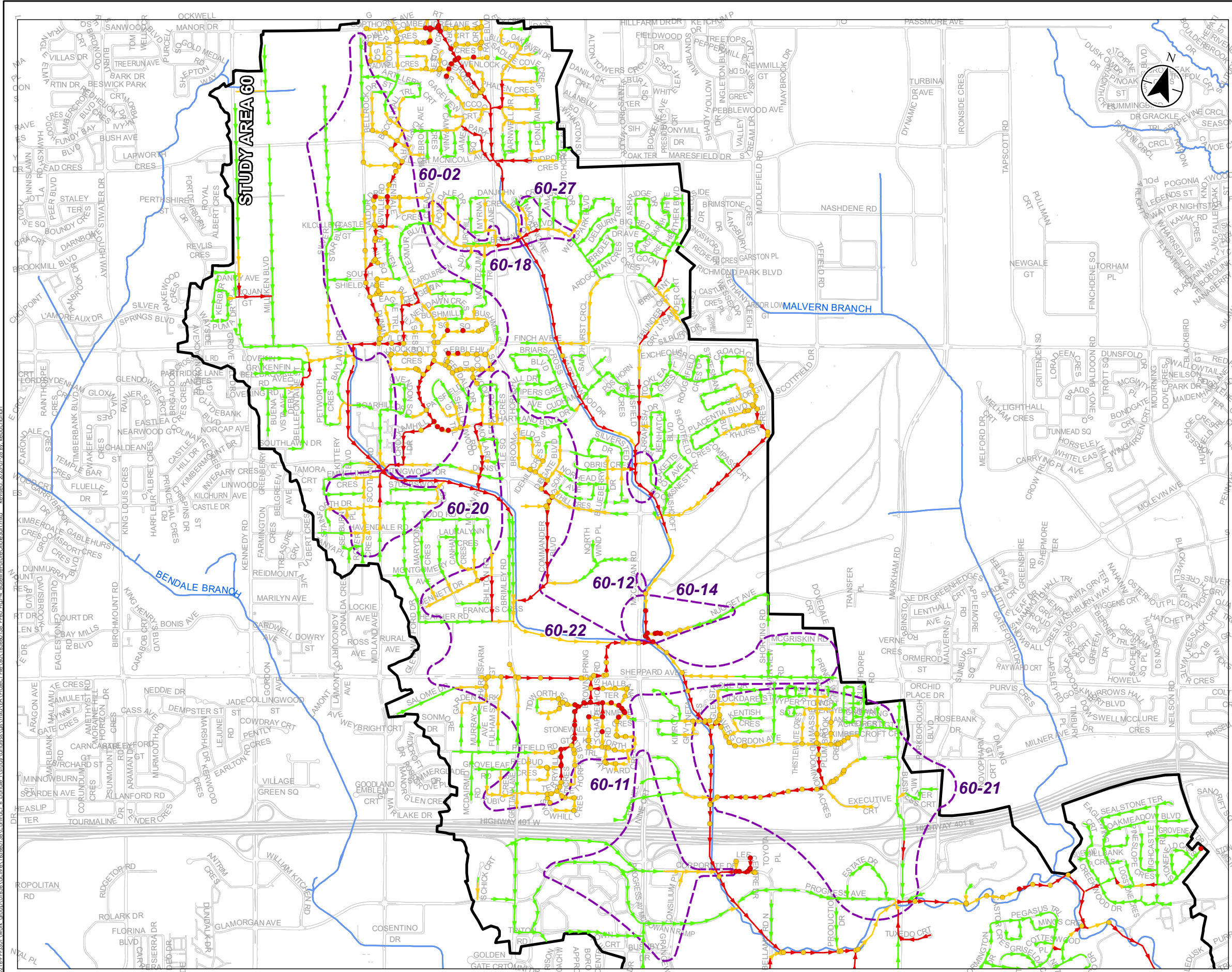
Title

**Baseline 100-yr Results - Major System**

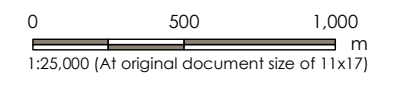


\\c0214\pfs01\work\_group\0165660138\EA\Project\_Files\165660138\_P60\_Fig7.3\_Baseline 100yr Major.mxd, P60\_Fig7.3\_Baseline 100yr Major.mxd, Revised: 2023-07-28 by: kdbachon

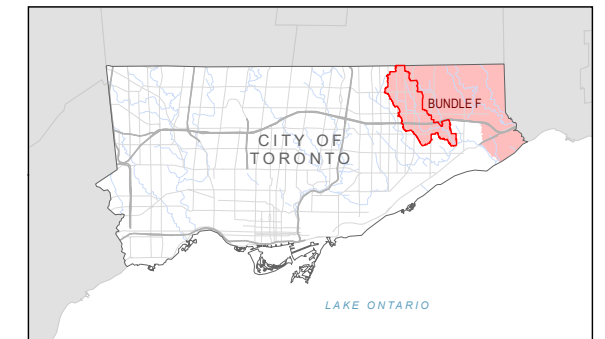




- Legend**
- Study Area
  - Assignment Area
- HGL Freeboard**
- At or Above Surface
  - Within Basement Level (Within 1.8 m of Surface)
  - Sealed MH
- Pipe Surcharge State**
- Bottleneck (Undersized Sewer)
  - Backwater Conditions
  - Free-Flowing Conditions



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 BUNDLE F - STUDY AREA 60

Figure No. **7.4**

Title: **Sanitary Baseline Future May 12, 2000, Design Storm Results**

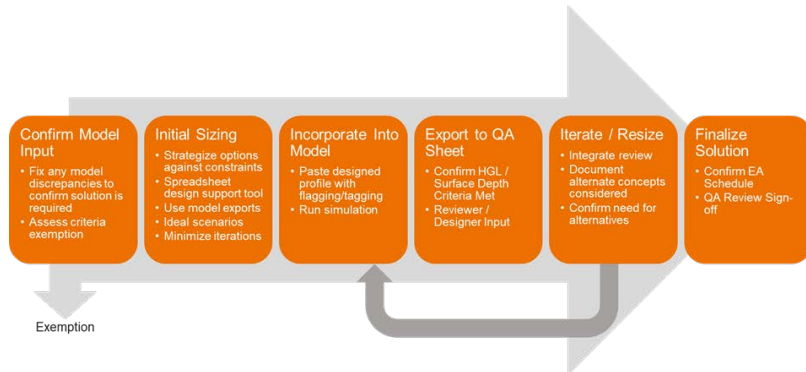
\\c0214\pfs01\work\_group\016561\sective\16560138\Fig-7.4\_BasementFutureCapacity\_San.mxd Revised: 2023-07-28 By: kabachanov

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Each Problem Area was reviewed following the process outlined in **Figure 7—5** below:



**Figure 7—5: Solution Development Process per Problem Area**

**Confirm Model Input:** The first step involved a review of the model input to confirm the problem was represented appropriately, since the entire Study Area was not reviewed to the same scrutiny in TM2, with the Modelled Flood Clusters of TM1 being the basis for focused drawing reviews and model updates. As a result, 50% of the Study Area had the potential for inaccuracies that could lead to false flood criteria exceedances. Therefore, the review rectified any model input issues to confirm the need for a solution. This step also evaluated any potential criteria exemption candidates, such as shallow sewers with no surcharge or other private-side sewers or overland ponding that is outside of City jurisdiction. These exemptions were catalogued with the corresponding rationale for City review and acceptance.

**Initial Sizing:** Solutions were strategized based on plan and profile review against constraints, including any integration with surrounding Problem Areas. A tracking design support tool was developed to document all considerations and facilitate QA/QC checks, and to undertake pipe profile design accounting for the City’s Design Criteria and conflict checking.

**Incorporate into Model:** The support tool provided data in a format that could be directly imported into the model, including flagging and associated tagging used for later categorization in both the costing and graphics generation.

**Export to QA Sheet:** Model results were re-exported into the design support tool to confirm surface and/or HGL criteria were met, enabling QA/QC review and documentation.

**Iterate/Resize:** Where criteria not fully met or issues extended elsewhere in the system, the process of resizing and/or re-evaluating alternative solutions was undertaken. The preliminary design team was consulted for input on feasibility. This process was repeated until satisfactory solution was defined.

**Finalize Solution:** Before the solution was finalized, the design team confirmed suitability of the solution feasibility and constraints, and the EA Schedule was documented.



# TORONTO BASEMENT FLOODING CAPACITY STUDIES – BUNDLE F STUDY AREA 60: EA PROJECT FILE

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## 7.2 DEVELOPMENT OF ALTERNATIVES

There are several storm sewersheds based on physical outfall location to watercourses or boundary conditions with adjacent Study Areas, and a number of sanitary subsewersheds connecting to the trunk. Within each sewershed, Problem Areas were defined based on the results of the baseline hydraulic models and became the initial basis for presentation and communication regarding solutions. These Problem Areas were in some cases compiled into Solution IDs when the problem areas and/or solutions were close in proximity or connected. Through the solutions development process and in planning for construction and solution implementation, these Solution IDs were then compiled into Assignments based on hydraulic connectivity.

Assignment 60-02 consists of the following Solution IDs:

- A60-SA-02
- A60-SA-03
- A60-OV-08
- A60-STM-02
  - Includes Problem Area IDs: A60-STOV-06 and A60-STOV-07
- A60-ST-03
- A60-STOV-08
- A60-STOV-10

Assignment 60-11 consists of the following Solution IDs:

- A60-ST-08
- A60-ST-20
- A60-STOV-48
- A60-STOV-49
- A60-STOV-50
- A60-STOV-52

Assignment 60-12 consists of the following Solution IDs:

- A60-ST-09

Assignment 60-14 consists of the following Solution IDs:

- A60-OV-14
- A60-STOV-34
- A60-STOV-35

Assignment 60-18 consists of the following Solution IDs:

- A60-STOV-05



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Assignment 60-20 consists of the following Solution IDs:

- A60-STM-11
  - Includes Problem Area IDs: A60-STOV-28, A60-STOV-29A, and A60-STOV-29B

Assignment 60-21 consists of the following Solution IDs:

- A60-SA-11
- A60-OV-19
- A60-STM-16
  - Includes Problem Area IDs: A60-STOV-37, A60-STOV-39, A60-STOV-40A, A60-STOV-40B, A60-STOV-40C, A60-STOV-41, and A60-STOV-42
- A60-STM-18
  - Includes Problem Area IDs: A60-OV-20 and A60-OVST-20
- A60-STOV-38
- A60-STOV-51

Assignment 60-22 consists of the following Solution IDs:

- A60-SA-14
- A60-SA-15
- A60-SA-16
- A60-STM-13
  - Includes Problem Area IDs: A60-STOV-15 and A60-STOV-16
- A60-STM-14
  - Includes Problem Area IDs: A60-ST-11, A60-STOV-36, A63-OV-45, and A63-OVST-45
- A60-STM-15
  - Includes Problem Area IDs: A60-ST-10, A60-STOV-32, and A60-STOV-33
- A60-STOV-31

Assignment 60-24 consists of the following Solution IDs:

- A60-STOV-24
- A60-STOV-25

Assignment 60-27 consists of the following Solution IDs:

- A60-STOV-19



# TORONTO BASEMENT FLOODING CAPACITY STUDIES – BUNDLE F STUDY AREA 60: EA PROJECT FILE

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Where the acronyms used are defined by:

- SA – Sanitary sewer system HGL exceedance only
- STM – Solution area consisting of a combination of Problem Areas
- ST – Storm sewer minor system HGL exceedance only
- OV – Overland depth exceedances
- OVST – Overland depth exceedances that when resolved creates a storm HGL issue
- STOV – Storm HGL and overland depth exceedances

Solution details were provided in Solution Summary Tables (SST) which contain graphics and specific elements that comprise the solutions. The SSTs were compiled by Solution ID and provide visual and physical context of the solution, explanation of the solution and its components, a brief constructability review, and discussion on alternatives considered (where deemed required). Where a second alternative was identified for evaluation, an additional SST with the denoted Alternative number was provided. The SSTs for each solution in Area 60 are provided in **Attachment #3 - TM3**. An additional alternative has been developed as part of the EA process that followed TM3 and Study Report and is discussed in the sections below. The preferred alternative SST is presented in **Appendix D** of this report.

## 7.2.1 Sizing of Flood Mitigation Measures

The remedial measures were conceptually designed using a combination of design sheets and the hydrologic/hydraulic models. Additional inlet capacity/control (for storm only) and sewer elements were added to the model and the size, alignment and length were iteratively adjusted until the model showed acceptable results based on the design BFPP criteria. The sizing and siting of proposed infrastructure included the following considerations/preferences: horizontal/vertical alignment, storage, overland solutions, sanitary-specific considerations, and boundary conditions. Further detail on each of these considerations is provided in **Section 2.4 of Attachment #3 – TM3**.

## 7.2.2 Assignment 60-02

Assignment solutions include sewers north of the Milliken Branch of Highland Creek (including Midland Ave, Finch Ave, McNicoll Ave, Crockamhill Dr). Three alternative solutions have been identified to mitigate surface and basement flood risk within the assignment area.

### 7.2.2.1 Alternative 1

Alternative 1 utilizes conveyance upgrades, in-line storage, relief/diversion sewers, as well as an outfall upgrade on City property to mitigate surface and basement flood risk. Due to the proposed work, this alternative is Schedule B. Refer to **Figure 7—6** for details. A summary of this alternative solution is outlined below:

- Increase storm inlet capacity and provide conveyance upgrades;
- Provide sanitary in-line storage on:
  - Crockamhill Dr with a realignment;
  - Chartland Blvd S;





## TORONTO BASEMENT FLOODING CAPACITY STUDIES – BUNDLE F STUDY AREA 60: EA PROJECT FILE

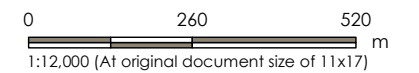
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- McNicoll Ave;
- Haven Hill Sq;
- Midland Ave (between South Shields Ave and Finch Ave E);
- Divert sanitary flows along Midland Ave, north of the HEPC, south towards Kilcullen Castle Gt to avoid upgrades through HEPC;
- Realign sanitary and storm sewers along Midland Ave to disconnect dual manhole;
- Redirect storm flows west on McNicoll Ave towards Midland Ave to avoid HEPC pipe upgrades, continuing south on Midland Ave to avoid easement upgrades;
- Redirect storm flows west on South Shields Ave to Midland Ave, and south on Alexmuir Blvd from Dunmall Dr towards Finch Ave E, to avoid easement pipe upgrades;
- Provide storm in-line storage on:
  - McNicoll Ave upstream of HEPC;
  - Valdor Dr upstream of easement;
  - Bushmills Sq upstream of easement;
  - Crookamhill Dr just north of Huntingwood Dr;
- Realign sewers on northern stretch of Bushmills Sq south of sanitary to avoid conflicts;
- Redirect flows west on Finch Ave E from Brimley Rd and realign sewers along Finch Ave E north into the ROW; and,
- Outfall upgrade on City property south of Finch Ave E.

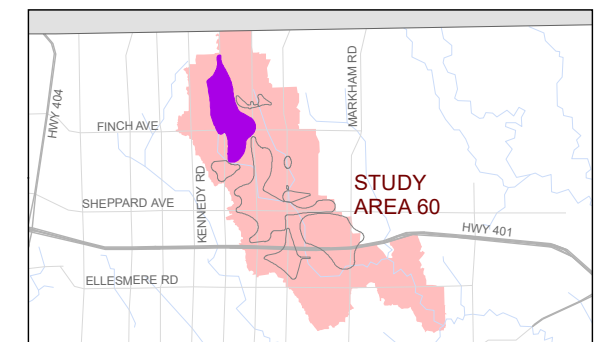


Legend

- Study Area
- Assignment Area
- Proposed Storm Solutions**
- Increase Inlet Capacity
- Isolate MH
- Remove CBs
- Upgrade Outfall
- New
- Realign
- Replace
- Upgrade
- Realign and Upgrade
- Inline Storage
- Proposed Sanitary Solutions**
- New
- Inline Storage
- Realign and Inline Storage
- Affected Easement



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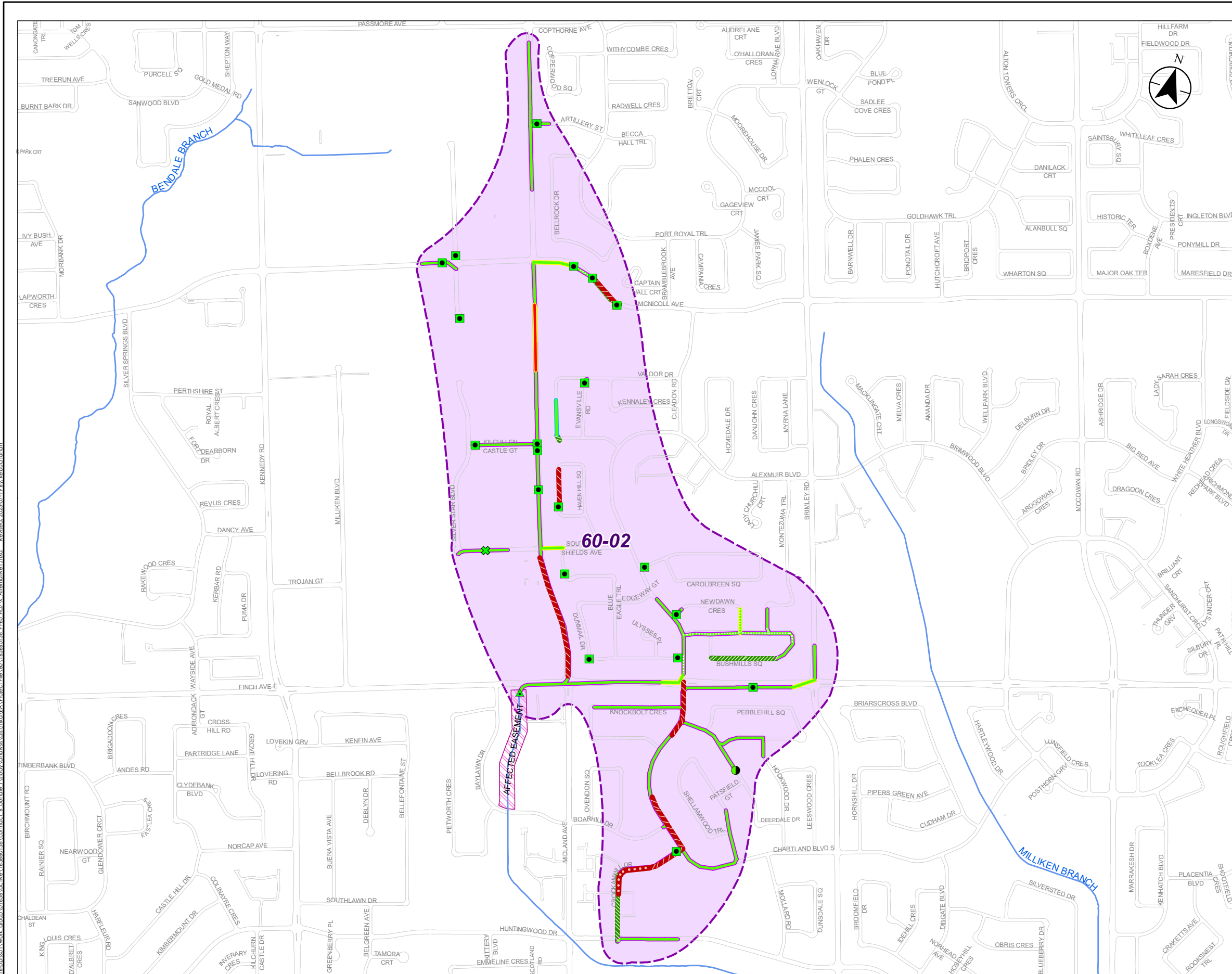
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 BUNDLE F - STUDY AREA 60

Figure No.

**7.6**

Title

**Alternative 1 Solutions for  
 Assignment 60-02**



# TORONTO BASEMENT FLOODING CAPACITY STUDIES – BUNDLE F STUDY AREA 60: EA PROJECT FILE

Development and Assessment of Alternatives  
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## 7.2.2.2 Alternative 2

Alternative 2 utilizes conveyance upgrades, cascading in-line storage, relief/diversion sewers, and easement upgrades to mitigate surface and basement flood risk. Due to the proposed work, this alternative is Schedule A/A+. Refer to **Figure 7—7** for details. A summary of this alternative solution is outlined below:

- Increase storm inlet capacity and provide conveyance upgrades;
- Realign sanitary and storm along Midland Ave to disconnect dual manhole;
- Provide sanitary in-line storage along:
  - Crockamhill Dr with a realignment;
  - Chartland Blvd S;
  - Midland Ave between South Shields Ave and Finch Ave E;
- Provide sanitary in-line storage within HEPC corridor between McNicoll Ave and Valdor Dr;
- Redirect storm flows:
  - West on Finch Ave E from Brimley Rd and realign storm sewers along Finch Ave E north into the ROW;
  - West on McNicoll Ave towards Midland Ave to avoid HEPC pipe upgrades, continuing south on Midland Ave to avoid easement upgrades;
  - West on South Shields Ave to Midland Ave, and south on Alexmuir Blvd from Dunmall Dr towards Finch Ave E, to avoid easement pipe upgrades;
- Provide storm in-line storage along:
  - McNicoll Ave upstream of HEPC;
  - Valdor Dr and Evansville Rd upstream of easement;
  - Haven Hill Sq upstream of easement;
  - Midland Ave (cascading in-line storage) and along Finch Ave E upstream of outfall pipe;
  - Bushmills Sq upstream of easement;
  - Crockamhill Dr and Mollard Rd just north of Huntingwood Dr;
- Storm sewer upgrades along easement between Valdor Dr and Haven Hill Sq; and,
- Realign storm sewers on northern stretch of Bushmills Sq south of sanitary sewers to avoid conflicts.







# TORONTO BASEMENT FLOODING CAPACITY STUDIES – BUNDLE F STUDY AREA 60: EA PROJECT FILE

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## 7.2.2.3 Alternative 3

An additional alternative was developed as part of the EA process that followed the Area 60 Study Report submission in May 2022. Alternative 3 utilizes conveyance upgrades, reduced in-line storage, relief/diversion sewers, an outfall upgrade, and park storage to mitigate surface and basement flood risk. Due to the proposed work, this alternative is Schedule B. Refer to **Figure 7—8** for details. A summary of this alternative solution is outlined below:

- Increase storm inlet capacity and provide conveyance upgrades;
- Provide sanitary in-line storage along:
  - Crockamhill Dr with a realignment;
  - Chartland Blvd S;
  - McNicoll Ave;
  - Haven Hill Sq;
  - Midland Ave (between South Shields Ave and Finch Ave E);
- Divert sanitary flows along Midland Ave north of the HEPC south towards Kilcullen Castle Gt to avoid upgrades through HEPC;
- Realign sanitary and storm sewers along Midland Ave to disconnect dual manhole;
- Redirect storm flows:
  - West on McNicoll Ave towards Midland Ave to avoid HEPC pipe upgrades, continuing south on Midland Ave to avoid easement upgrades;
  - West on South Shields Ave to Midland Ave, and south on Alexmuir Blvd from Dunmall Dr towards Finch Ave E, to avoid easement pipe upgrades;
  - West on Finch Ave E from Brimley Rd and realign sewers along Finch Ave E north into the ROW;
- Provide storm in-line storage along:
  - McNicoll Ave upstream of HEPC;
  - Valdor Dr upstream of easement;
  - Bushmills Sq upstream of easement;
  - Crockamhill Dr just north of Huntingwood Dr;
- Realign sewers on northern stretch of Bushmills Sq south of sanitary sewer to avoid conflicts;
- Outfall upgrade on City property south of Finch Ave E; and,
- Redirect flows from Crockamhill Dr to Chartland Park storage (approx. 2,644 m<sup>3</sup> with pumped return).







## TORONTO BASEMENT FLOODING CAPACITY STUDIES – BUNDLE F STUDY AREA 60: EA PROJECT FILE

Development and Assessment of Alternatives  
October 6, 2023

### 7.2.3 Assignment 60-11

Assignment solutions include sewers along McCowan Rd, Progress Ave, Consilium Pl, Corporate Dr, and Bushby Dr. Three alternative solutions have been identified to mitigate surface and basement flood risk within the assignment area.

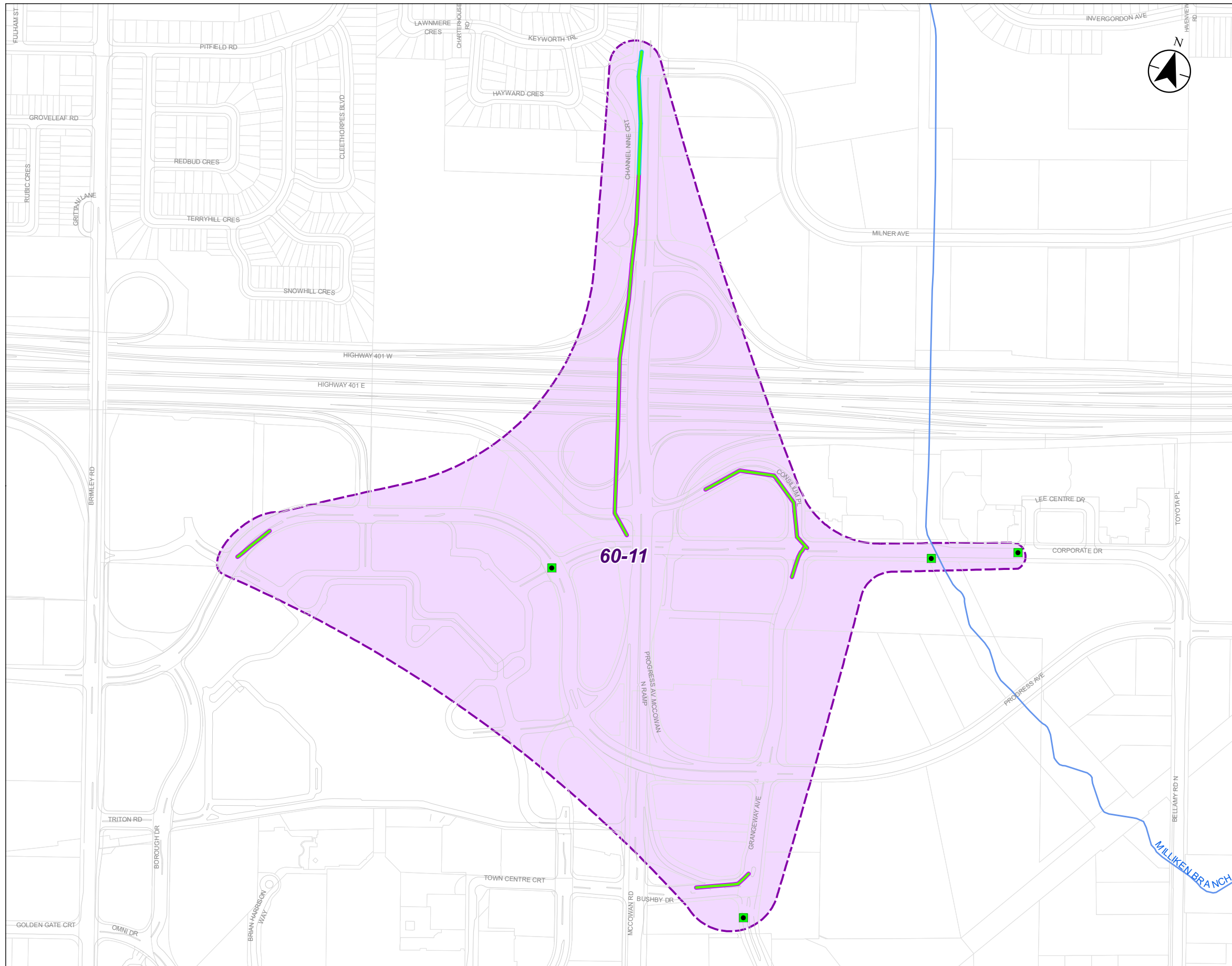
#### 7.2.3.1 Alternative 1

Alternative 1 utilizes increased inlet capacity and conveyance upgrades, including upgrades under Highway 401 to mitigate surface and basement flood risk. Due to the proposed work, this alternative is Schedule B. Refer to **Figure 7—6** for details. A summary of this alternative solution is outlined below:

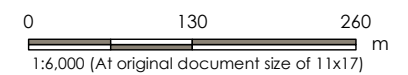
- Storm sewer conveyance upgrades along McCowan Rd under Highway 401, and along Progress Ave, Consilium Pl, and Bushby Dr; and,
- Increased inlet capacity on Progress Ave, Consilium Pl, Corporate Dr, and Bushby Dr.



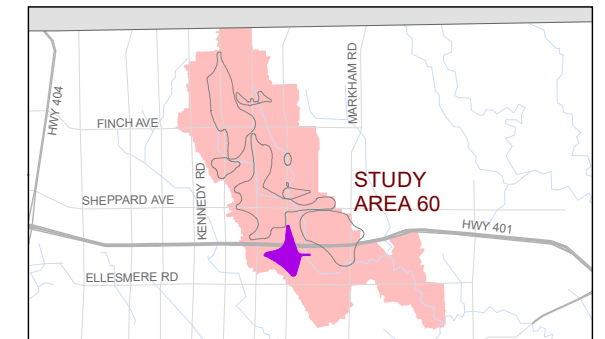
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- Legend
- Study Area
  - Assignment Area
  - Proposed Storm Solutions**
    - Increase Inlet Capacity
    - Replace
    - Upgrade
    - Affected Easement



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BUNDLE F - STUDY AREA 60

Figure No.  
**7.9**

Title  
**Alternative 1 Solutions for  
Assignment 60-11**

## TORONTO BASEMENT FLOODING CAPACITY STUDIES – BUNDLE F STUDY AREA 60: EA PROJECT FILE

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### 7.2.3.2 Alternative 2

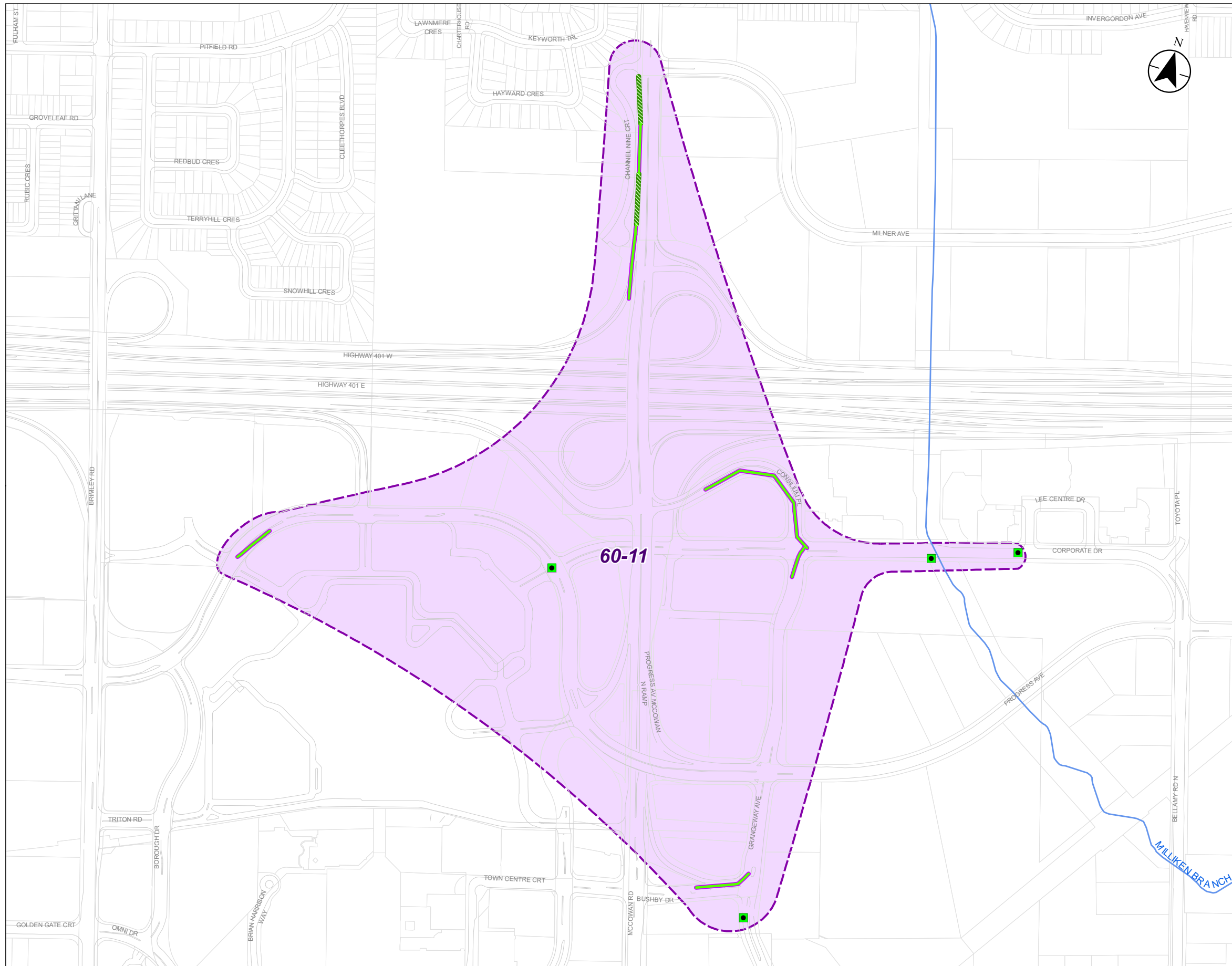
Alternative 2 utilizes increased inlet capacity, conveyance upgrades, and in-line storage to avoid upgrades under Highway 401 to mitigate surface and basement flood risk. Due to the proposed work, this alternative is Schedule A/A+. Refer to **Figure 7—10** for details. A summary of this alternative solution is outlined below:

- In-line storm storage on McCowan Rd to avoid upgrades under Highway 401;
- Storm sewer conveyance upgrades along Progress Ave, Consilium Pl, and Bushby Dr; and,
- Increased storm inlet capacity on Progress Ave, Consilium Pl, Corporate Dr, and Bushby Dr.



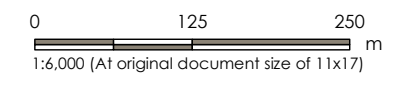


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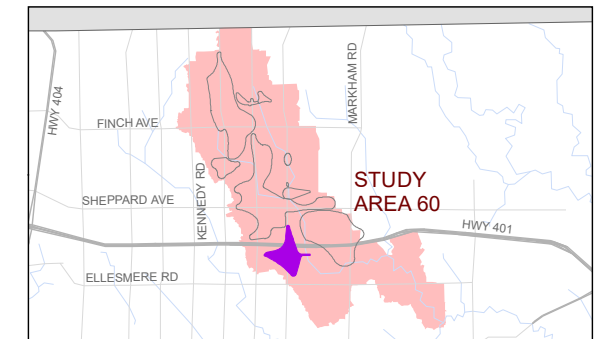
Legend

- Study Area
- Assignment Area
- Proposed Storm Solutions**
- Increase Inlet Capacity
- Upgrade
- Inline Storage
- Affected Easement



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Figure No.

**7.10**

Title

**Alternative 2 Solutions for  
 Assignment 60-11**

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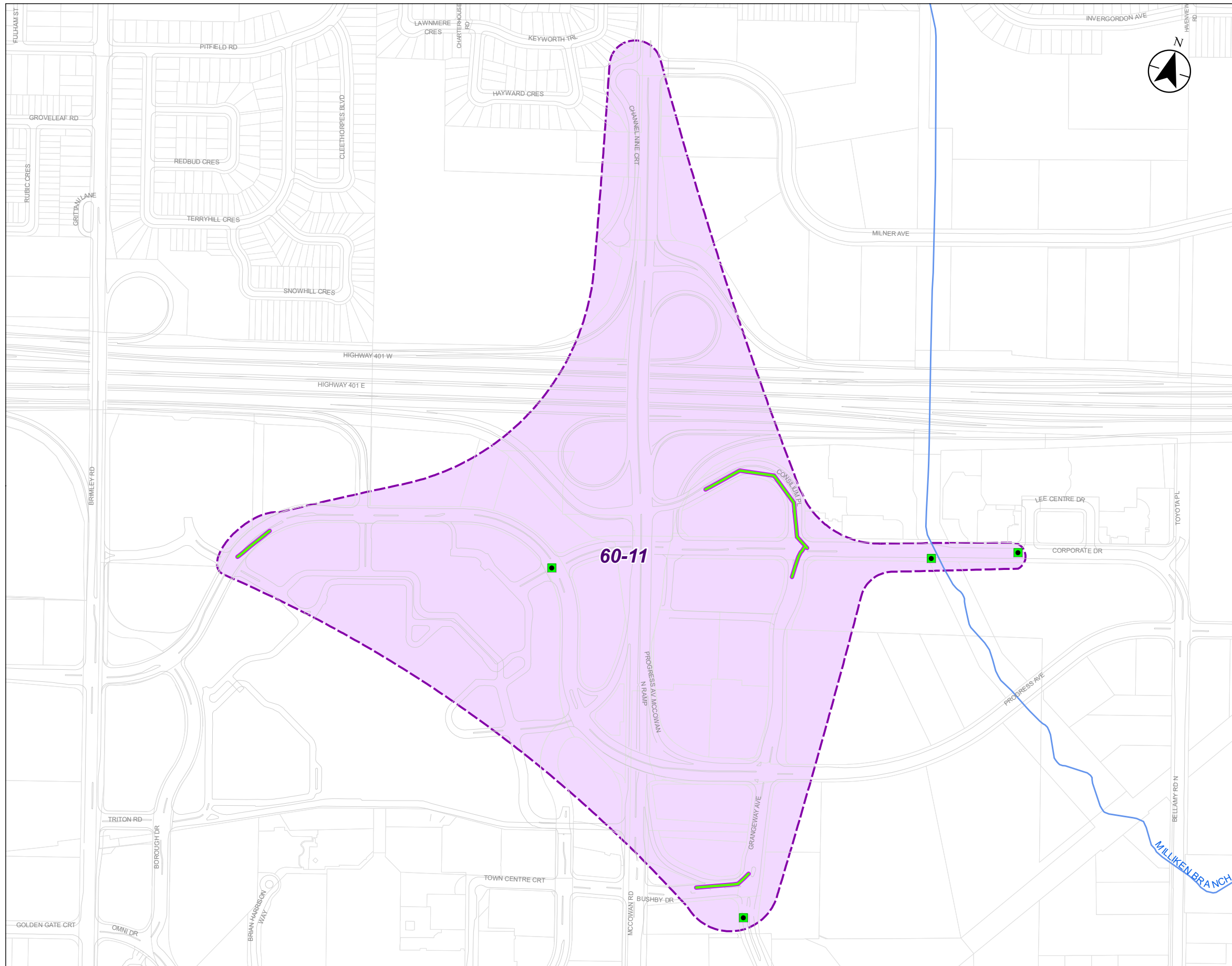
## 7.2.3.3 Alternative 3

An additional alternative was developed as part of the EA process that followed the Area 60 Study Report submission in May 2022. Alternative 3 utilizes increased inlet capacity and conveyance upgrades to mitigate surface and basement flood risk. This alternative also does not include any work on McCowan Rd due to the low perceived risk and few benefitting properties. Due to the proposed work, this alternative is Schedule A/A+. Refer to **Figure 7**—11 for details. A summary of this alternative solution is outlined below:

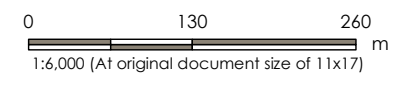
- This is a “Do Nothing” alternative for sewers on McCowan Rd due to low perceived risk and few benefitting properties;
- Storm sewer conveyance upgrades along Progress Ave, Consilium Pl, and Bushby Dr; and,
- Increased storm inlet capacity on Progress Ave, Consilium Pl, Corporate Dr, and Bushby Dr.



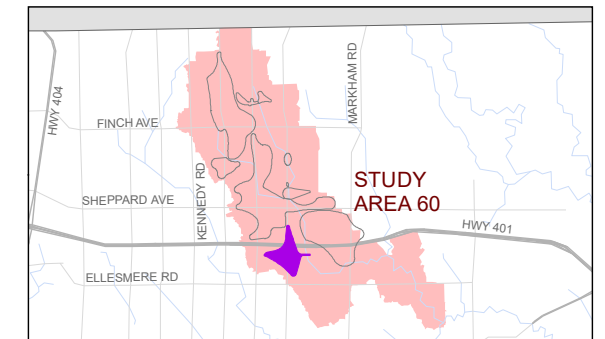
\\c0216cpd60\work\_group\016560\active\16560138\contact\_6\_bundle\16560138\mxd\16560138\_PFD0\_E07\_X\_Altimate3.mxd - Revised: 2023-07-19 by: kbuchanan



- Legend
- Study Area
  - Assignment Area
  - Proposed Storm Solutions**
  - Increase Inlet Capacity
  - Upgrade
  - Affected Easement



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 CITY OF TORONTO  
 BASEMENT FLOODING CAPACITY STUDIES  
 BUNDLE F - STUDY AREA 60

Figure No.  
**7.11**

Title  
**Alternative 3 Solutions for  
 Assignment 60-11**

## TORONTO BASEMENT FLOODING CAPACITY STUDIES – BUNDLE F STUDY AREA 60: EA PROJECT FILE

Development and Assessment of Alternatives  
October 6, 2023

### 7.2.4 Assignment 60-12

Assignment solutions include sewers along McCowan Rd between Commander Blvd and the Canadian Pacific Railway (CPR). Two alternative solutions have been identified to mitigate surface and basement flood risk within the assignment area.

#### 7.2.4.1 Alternative 1

Alternative 1 utilizes reprofiling to reduce headlosses with an outfall upgrade to mitigate surface and basement flood risk. Due to the proposed work, this alternative is Schedule B.

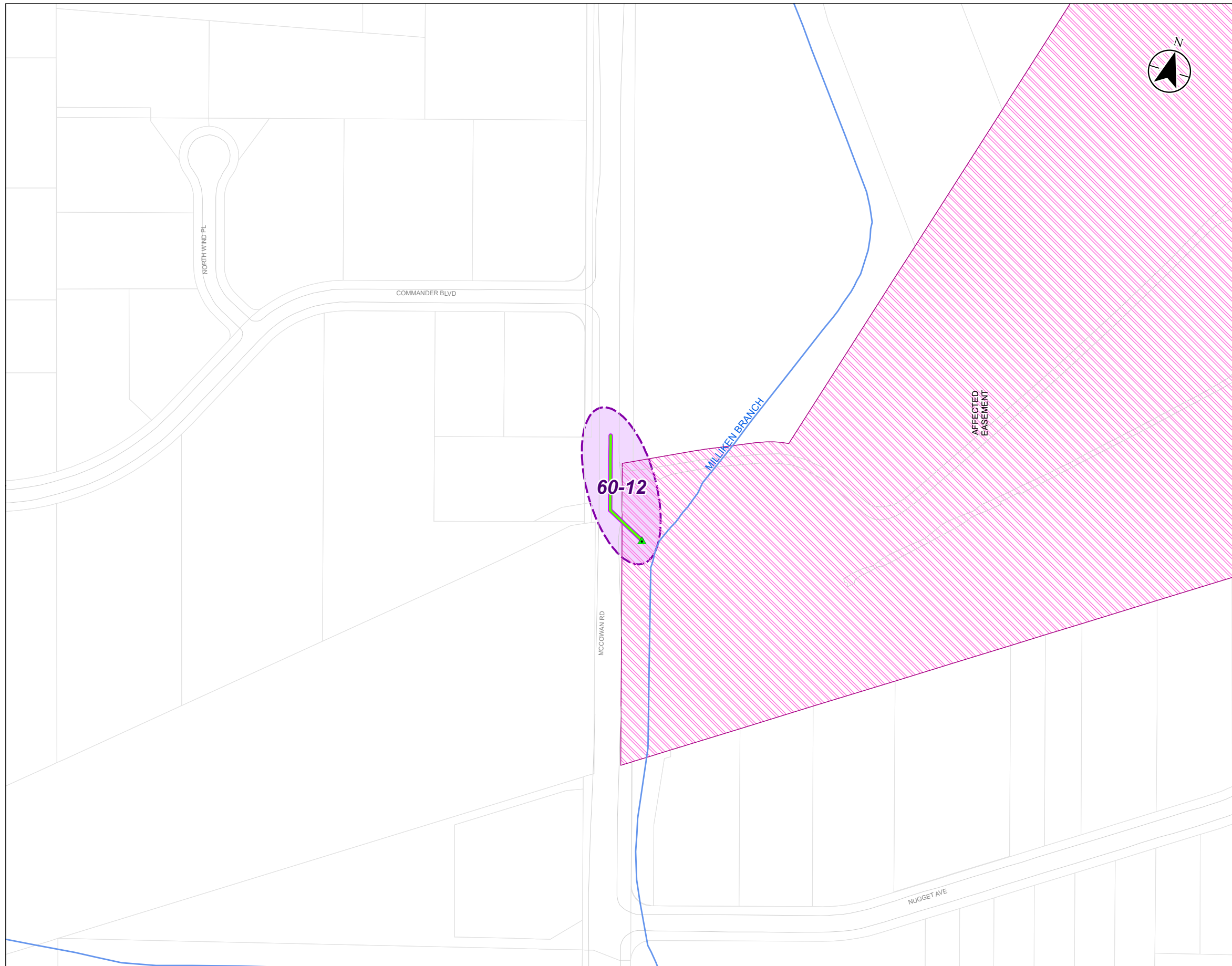
Refer to **Figure 7—12** for details. A summary of this alternative solution is outlined below:

- Existing pipes have capacity, however steep pipes generate high headlosses and a single HGL infraction. Reprofiling to reduce slope and velocity (thus headlosses) and upgrade a failing outfall.

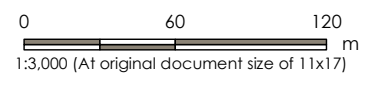




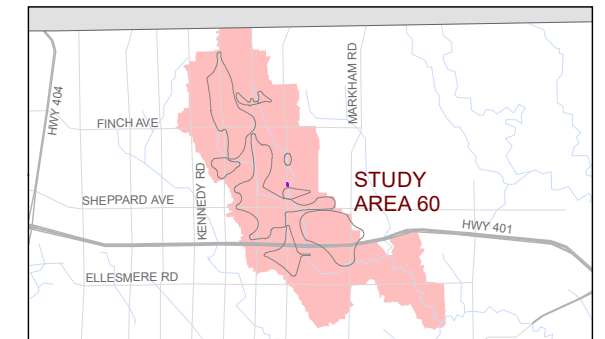
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- Legend
- Study Area
  - Assignment Area
  - Proposed Storm Solutions**
  - ▲ Upgrade Outfall
  - Upgrade
  - Affected Easement



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 BASEMENT FLOODING CAPACITY STUDIES  
 BUNDLE F - STUDY AREA 60

Figure No.  
**7.12**

Title  
**Alternative 1 Solutions for Assignment 60-12**

# TORONTO BASEMENT FLOODING CAPACITY STUDIES – BUNDLE F STUDY AREA 60: EA PROJECT FILE

Development and Assessment of Alternatives  
October 6, 2023

## 7.2.4.2 Alternative 2

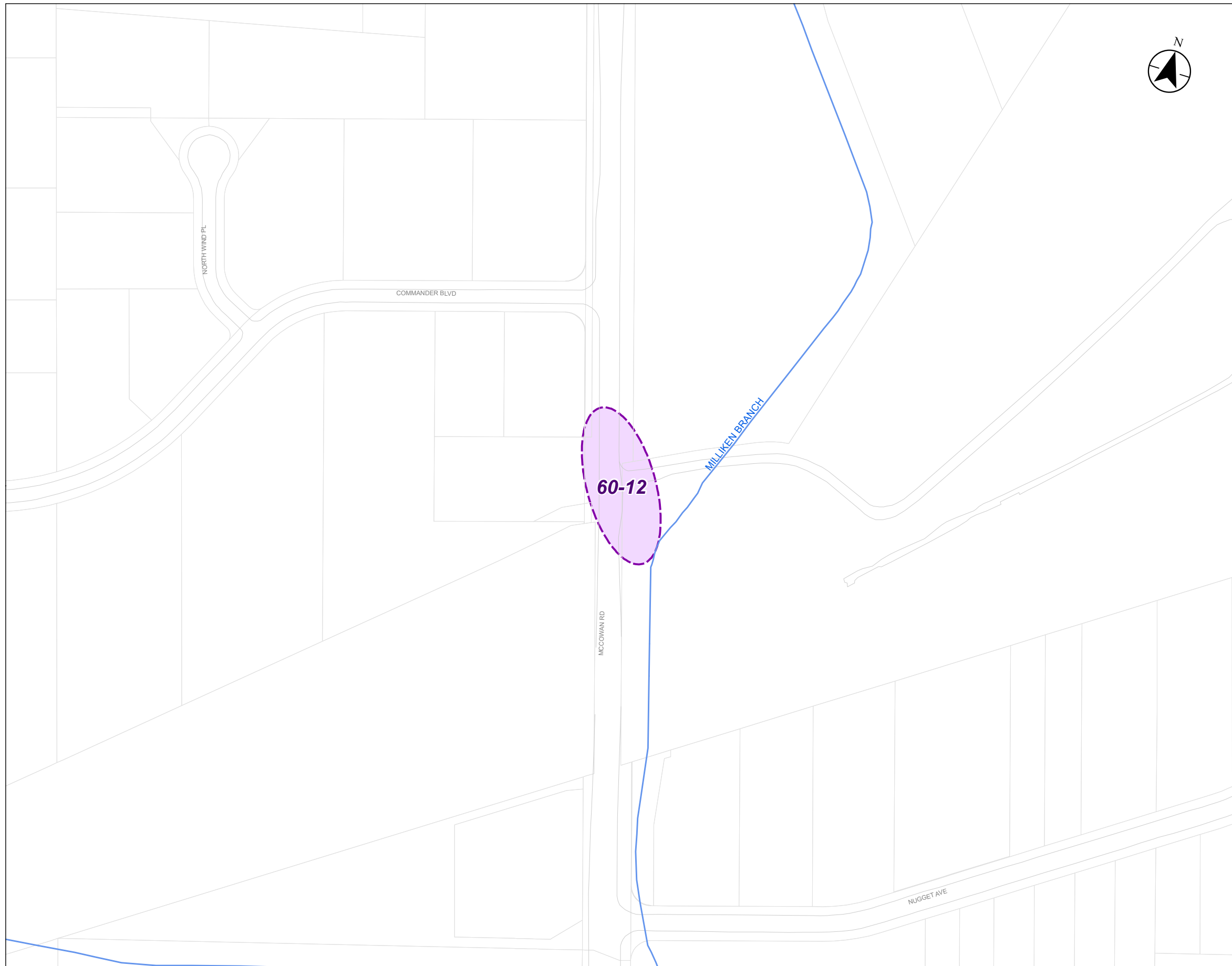
Alternative 2 is to do nothing.

Refer to **Figure 7—13** for details. A summary of this alternative solution is outlined below:

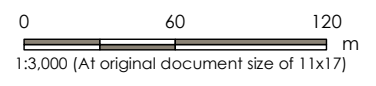
- Do Nothing;
- Only a single HGL infraction exists at the bottom of a steep slope near the outfall, thus it is considered a low flood risk.



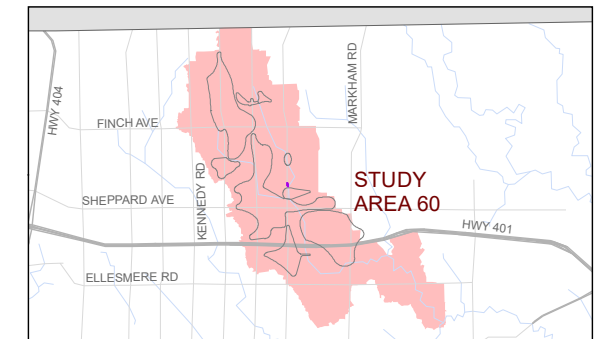
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- Legend
- Study Area
  - Assignment Area
  - Affected Easement



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 BASEMENT FLOODING CAPACITY STUDIES  
 BUNDLE F - STUDY AREA 60

Figure No.  
**7.13**

Title  
**Alternative 2 Solutions for  
 Assignment 60-12**

# TORONTO BASEMENT FLOODING CAPACITY STUDIES – BUNDLE F STUDY AREA 60: EA PROJECT FILE

Development and Assessment of Alternatives  
October 6, 2023

## 7.2.5 Assignment 60-14

Assignment solutions include sewers along McCowan Rd and Nugget Ave between the CPR and East Highland Creek outfall. Three alternative solutions have been identified to mitigate surface and basement flood risk within the assignment area.

### 7.2.5.1 Alternative 1

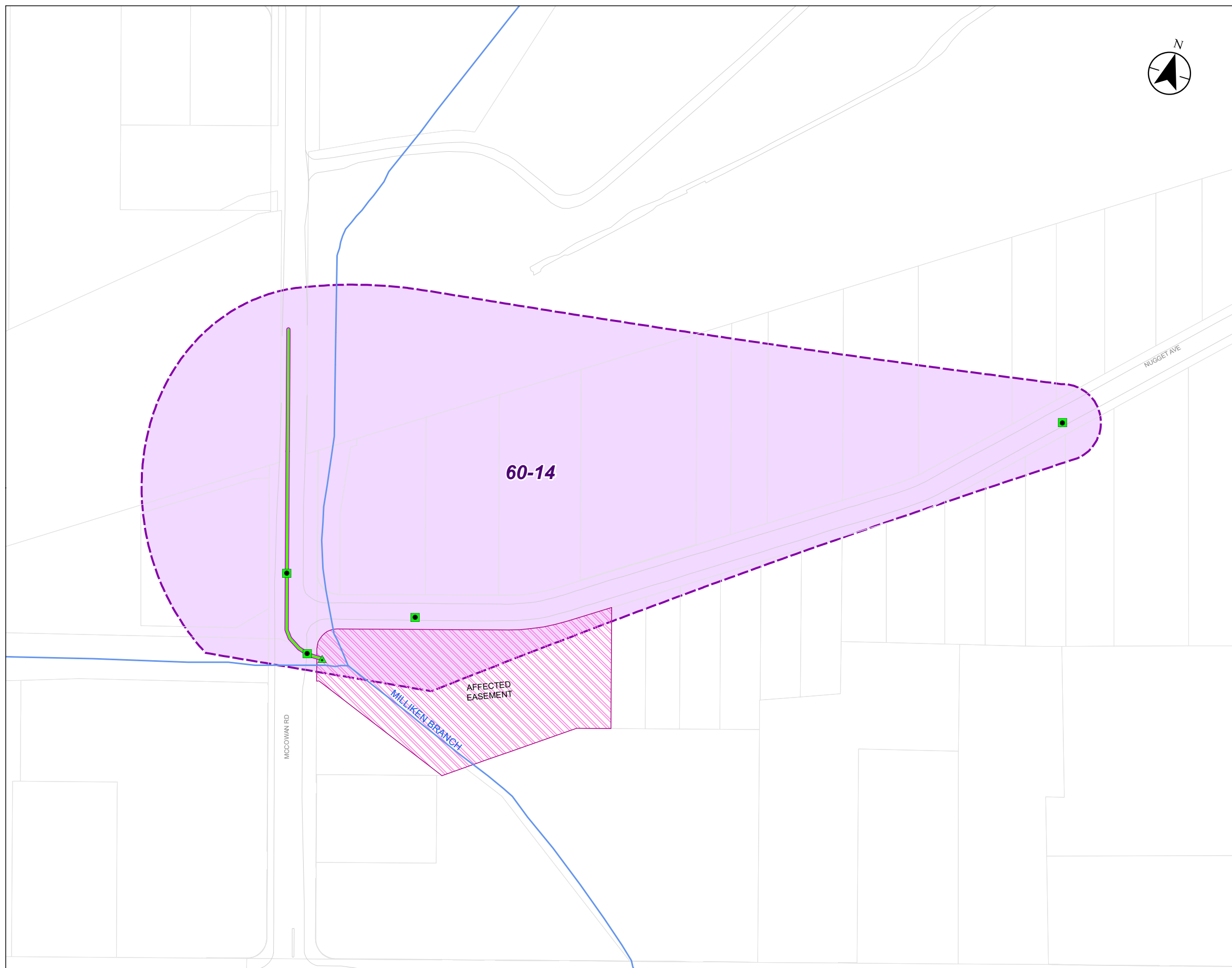
Alternative 1 utilizes increased inlet capacity, conveyance upgrades, and an outfall upgrade to mitigate surface and basement flood risk. Due to the proposed work, this alternative is Schedule B. Refer to **Figure 7—14** for details. A summary of this alternative solution is outlined below:

- Increase storm inlet capacity and provide conveyance upgrades along McCowan Rd from the CPR crossing to the East Highland Creek (Markham Branch) outfall, including upgrading the outfall; and,
- Increased storm inlet capacity on Nugget Ave.

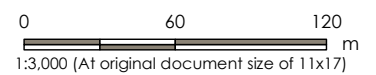




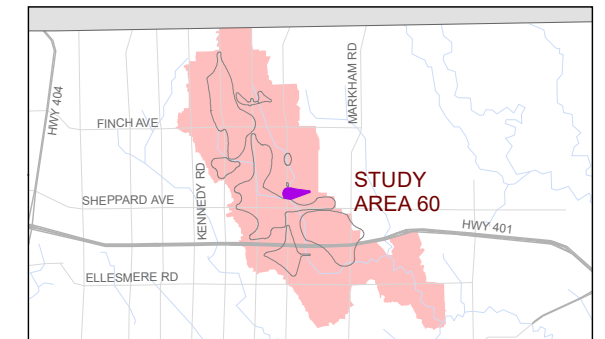
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- Legend
- Study Area
  - Assignment Area
  - Proposed Storm Solutions**
  - Increase Inlet Capacity
  - ▲ Upgrade Outfall
  - Upgrade
  - Affected Easement



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 BASEMENT FLOODING CAPACITY STUDIES  
 BUNDLE F - STUDY AREA 60

Figure No.

**7.14**

Title

**Alternative 1 Solutions for Assignment 60-14**

# TORONTO BASEMENT FLOODING CAPACITY STUDIES – BUNDLE F STUDY AREA 60: EA PROJECT FILE

Development and Assessment of Alternatives  
October 6, 2023

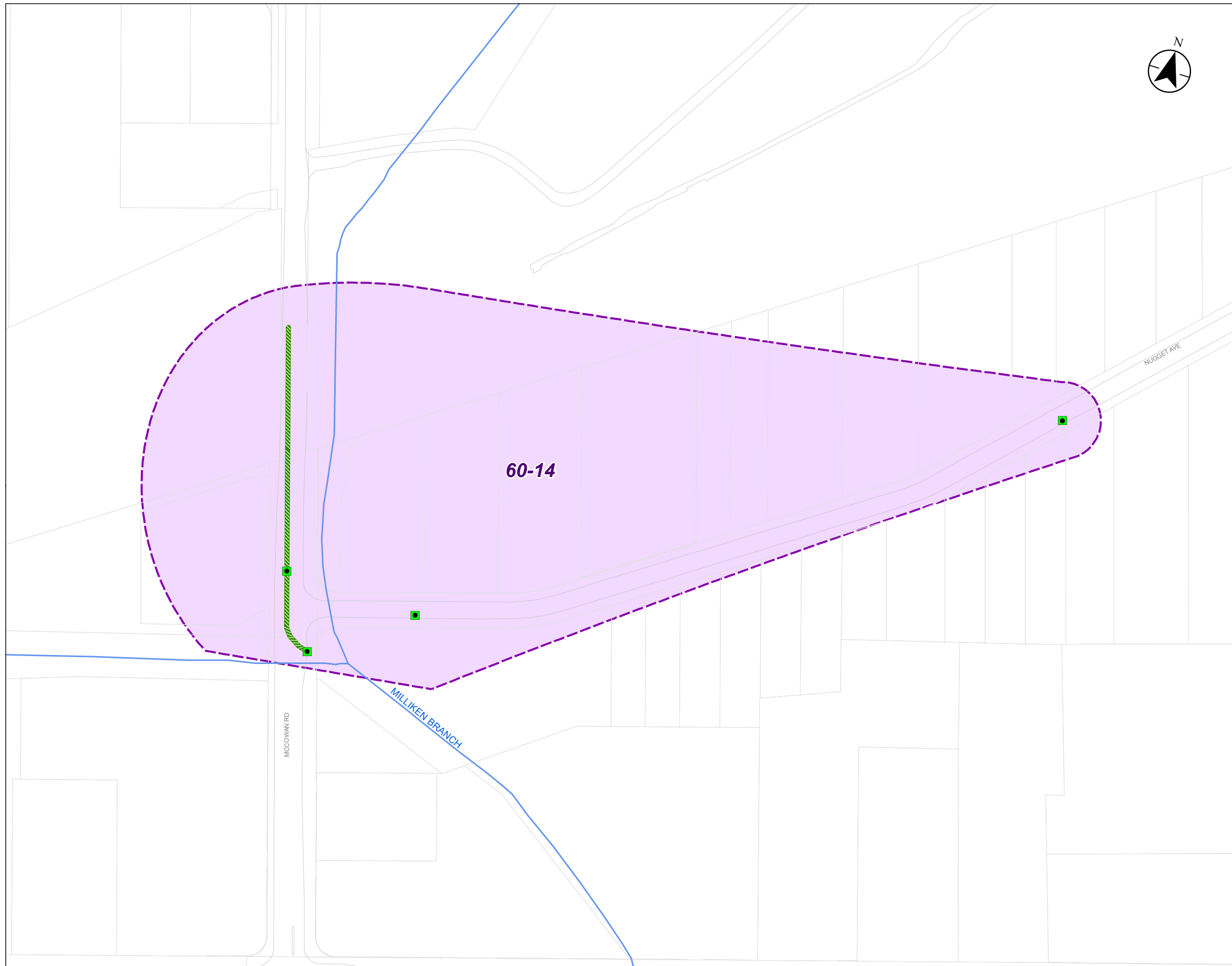
## 7.2.5.2 Alternative 2

Alternative 2 utilizes increased inlet capacity, conveyance upgrades, and in-line storage to avoid an outfall upgrade to mitigate surface and basement flood risk. Due to the proposed work, this alternative is Schedule A/A+. Refer to **Figure 7—15** for details. A summary of this alternative solution is outlined below:

- Storm conveyance upgrades and in-line storage on McCowan Rd to avoid outfall upgrade; and,
- Increased storm inlet capacity on Nugget Ave.

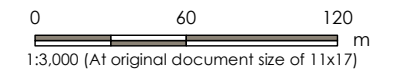


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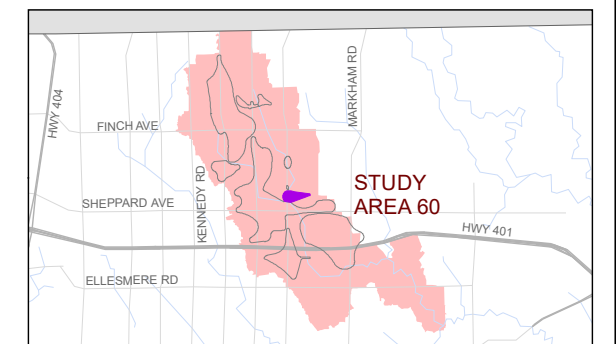


Legend

- Study Area
- Assignment Area
- Proposed Storm Solutions**
- Increase Inlet Capacity
- Inline Storage
- Affected Easement



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BASEMENT FLOODING CAPACITY STUDIES  
BUNDLE F - STUDY AREA 60

Figure No.

**7.15**

Title

**Alternative 2 Solutions for  
Assignment 60-14**

## TORONTO BASEMENT FLOODING CAPACITY STUDIES – BUNDLE F STUDY AREA 60: EA PROJECT FILE

Development and Assessment of Alternatives  
October 6, 2023

### 7.2.5.3 Alternative 3

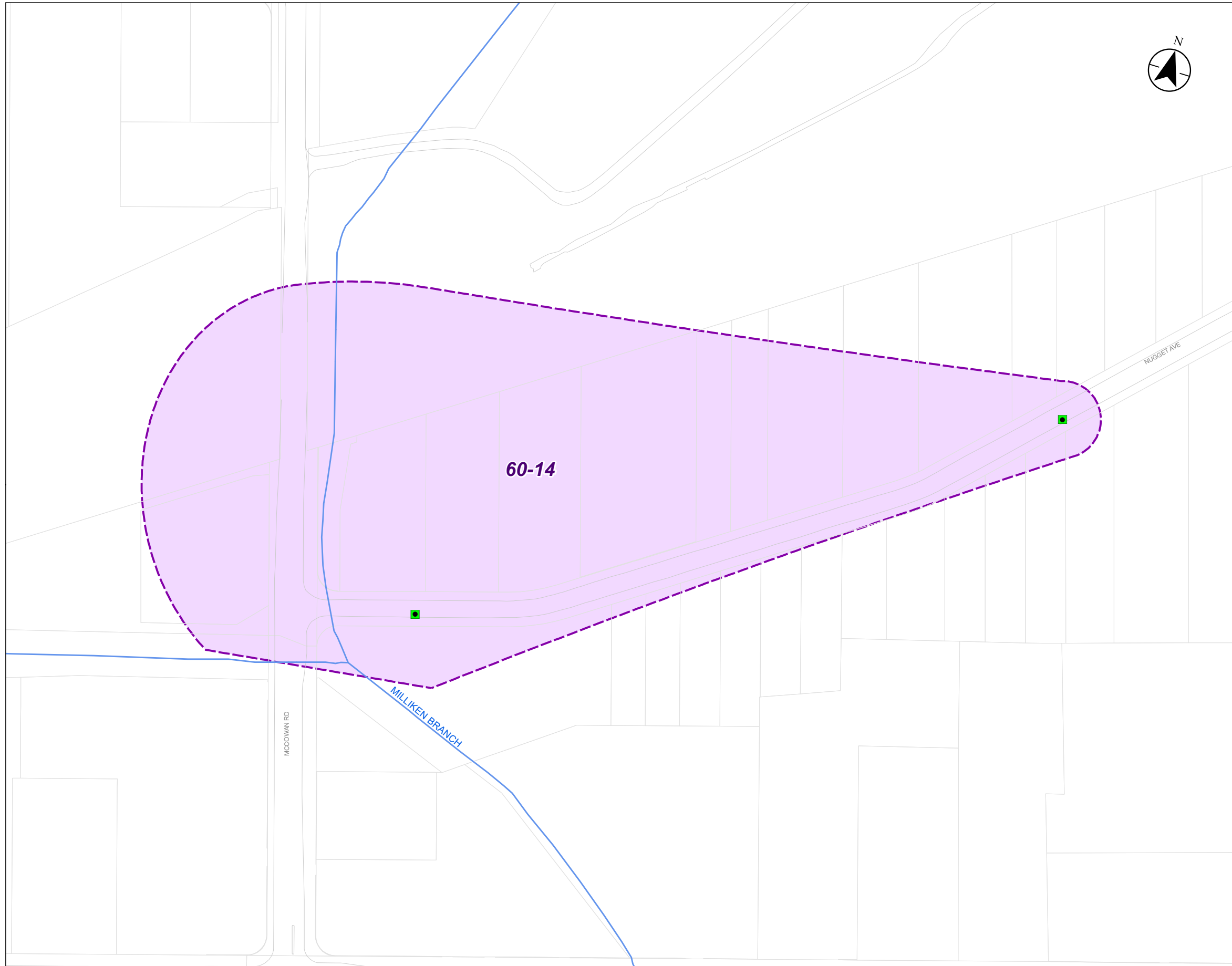
An additional alternative was developed as part of the EA process that followed the Area 60 Study Report submission in May 2022. Alternative 3 utilizes increased inlet capacity to mitigate surface and basement flood risk, and a “do nothing” approach on McCowan Rd due to low perceived risk and few benefitting properties. Due to the proposed work, this alternative is Schedule A/A+. Refer to **Figure 7—16** for details. A summary of this alternative solution is outlined below:

- A “Do Nothing” alternative for sewers on McCowan Rd due to low perceived risk and few benefitting properties; and,
- Increased storm inlet capacity on Nugget Ave.



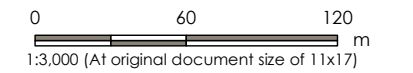


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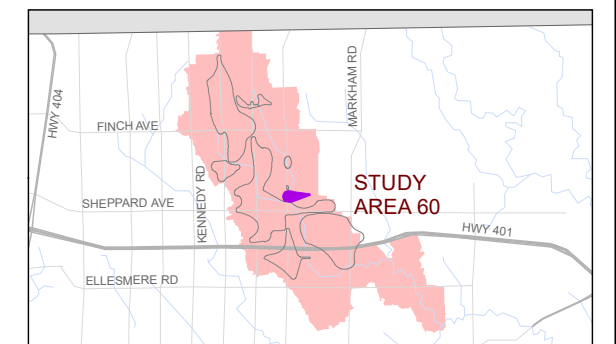


Legend

- Study Area
- Assignment Area
- Proposed Storm Solutions**
  - Increase Inlet Capacity
  - Affected Easement



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 BASEMENT FLOODING CAPACITY STUDIES  
 BUNDLE F - STUDY AREA 60

Figure No.

**7.16**

Title

**Alternative 3 Solutions for  
 Assignment 60-14**

## TORONTO BASEMENT FLOODING CAPACITY STUDIES – BUNDLE F STUDY AREA 60: EA PROJECT FILE

Development and Assessment of Alternatives  
October 6, 2023

### 7.2.6 Assignment 60-18

Assignment solutions include sewers south of McNicoll Ave discharging into East Highland Creek (including Alexmuir Blvd, Brimley Rd, Cleadon Rd, Homedale Dr). Three alternative solutions have been identified to mitigate surface and basement flood risk within the assignment.

#### 7.2.6.1 Alternative 1

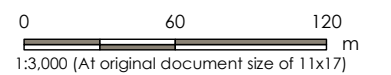
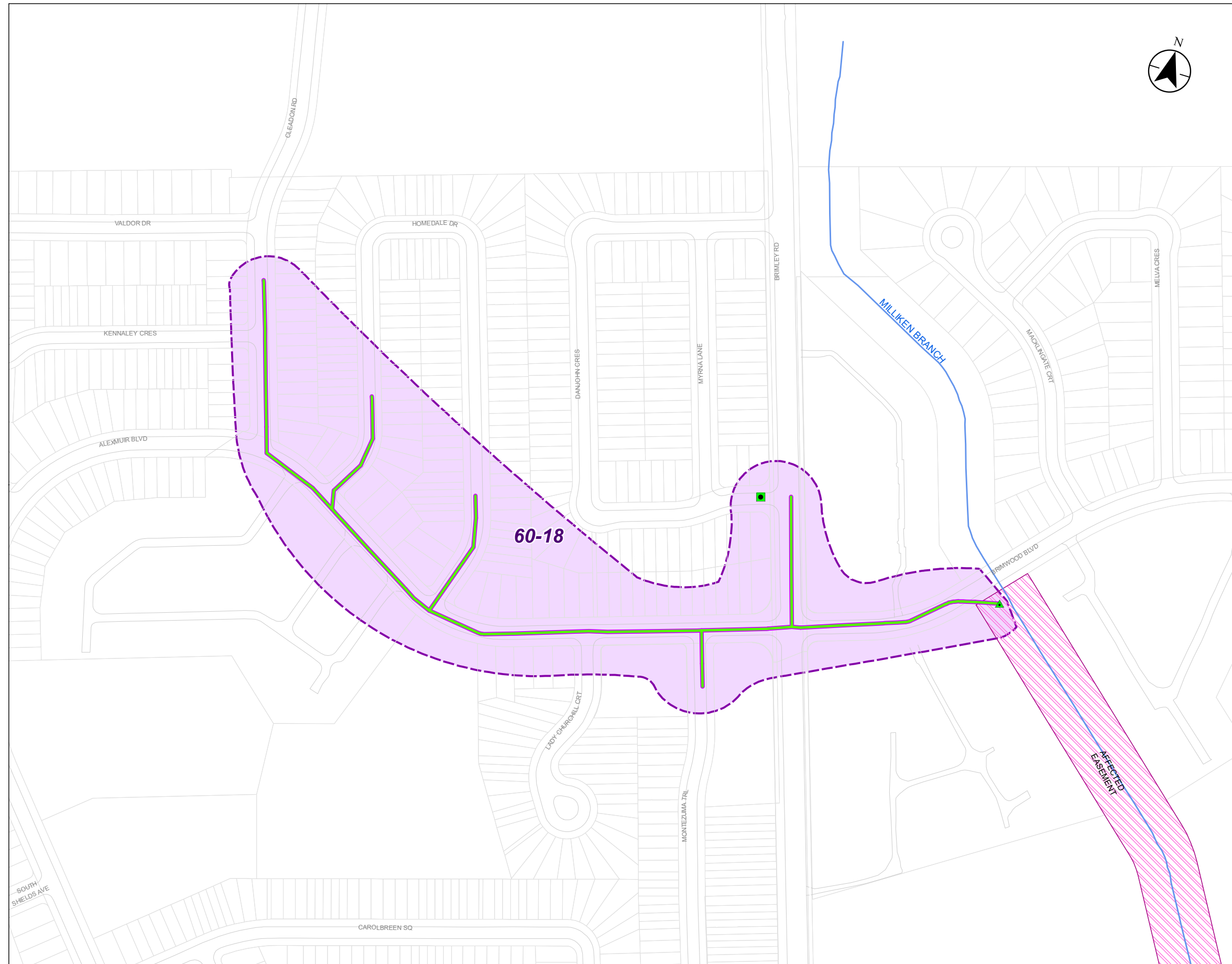
Alternative 1 utilizes conveyance upgrades and an outfall upgrade on City property to mitigate surface and basement flood risk. Due to the proposed work, this alternative is Schedule B. Refer to **Figure 7—17** for details. A summary of this alternative solution is outlined below:

- Increase storm inlet capacity and provide conveyance upgrades;
- Outfall upgrade to East Highland Creek on City property; and,
- Realign sanitary and storm sewers to achieve required hydraulic separation.

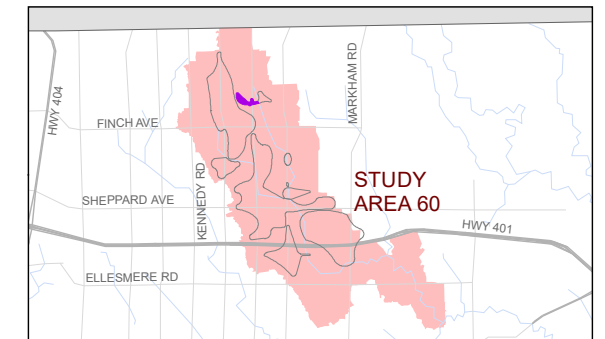


Legend

- Study Area
- Assignment Area
- Proposed Storm Solutions**
- Increase Inlet Capacity
- Upgrade Outfall
- Upgrade
- Affected Easement



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 BUNDLE F - STUDY AREA 60

Figure No.  
**7.17**

Title  
**Alternative 1 Solutions for  
 Assignment 60-18**

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# TORONTO BASEMENT FLOODING CAPACITY STUDIES – BUNDLE F STUDY AREA 60: EA PROJECT FILE

Development and Assessment of Alternatives  
October 6, 2023

## 7.2.6.2 Alternative 2

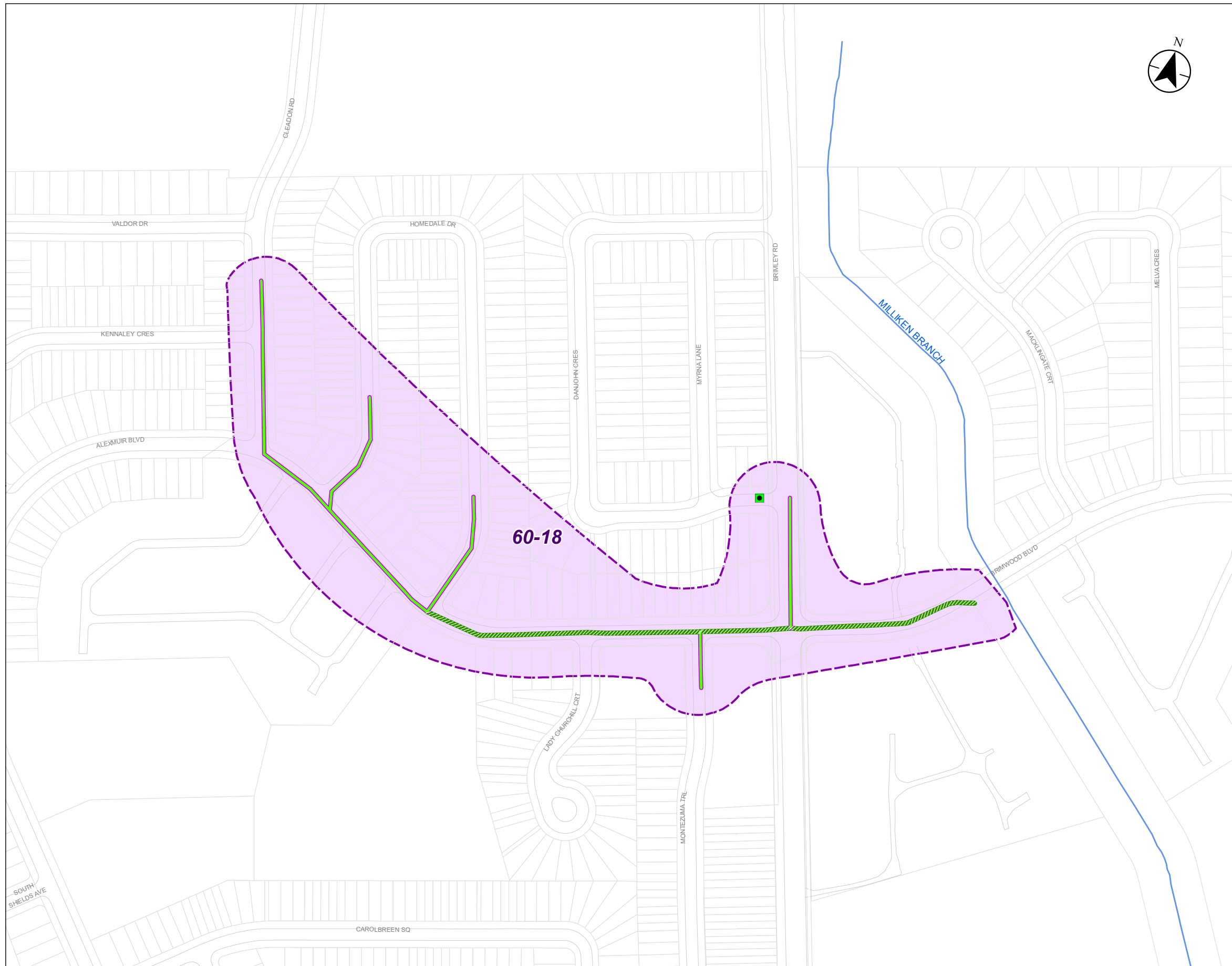
Alternative 2 utilizes conveyance upgrades and in-line storage to avoid an outfall upgrade, and to mitigate surface and basement flood risk. Due to the proposed work, this alternative is Schedule A/A+.

Refer to **Figure 7—18** for details. A summary of this alternative solution is outlined below:

- Increase storm inlet capacity and provide conveyance upgrades;
- Significant storm in-line storage along Alexmuir Blvd and Brimwood Blvd; and,
- Realign sanitary and storm sewers to achieve required hydraulic separation.

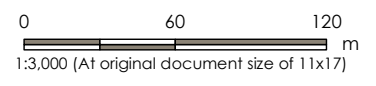


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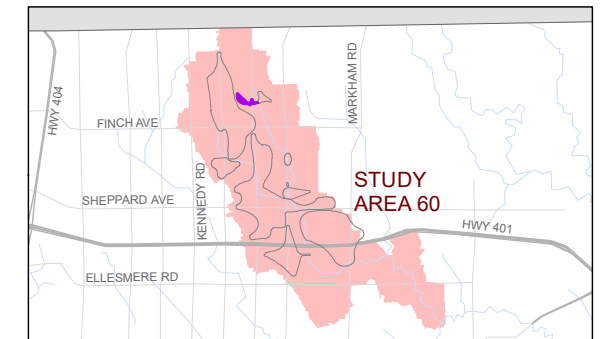
Legend

- Study Area
- Assignment Area
- Proposed Storm Solutions**
- Increase Inlet Capacity
- Upgrade
- Inline Storage
- Affected Easement



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BASEMENT FLOODING CAPACITY STUDIES  
BUNDLE F - STUDY AREA 60

Figure No.: **7.18**

Title: **Alternative 2 Solutions for Assignment 60-18**



## TORONTO BASEMENT FLOODING CAPACITY STUDIES – BUNDLE F STUDY AREA 60: EA PROJECT FILE

Development and Assessment of Alternatives  
October 6, 2023

### 7.2.6.3 Alternative 3

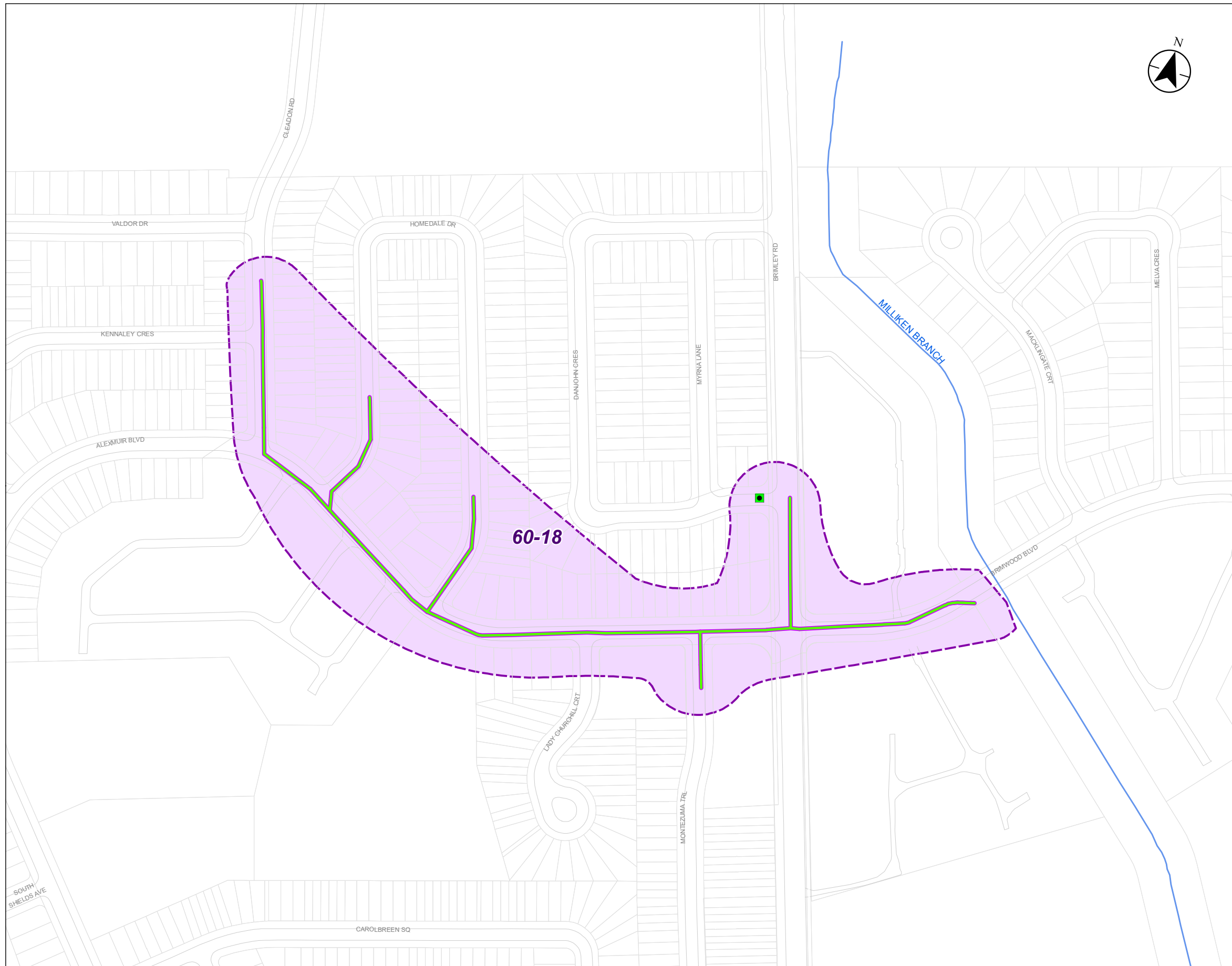
An additional alternative was developed as part of the EA process that followed the Area 60 Study Report submission in May 2022. Alternative 3, which is a hybrid alternative of Alternatives 1 and 2, utilizes conveyance upgrades, similar to Alternative 1 except without upgrading the pipe immediately upstream of the outfall or the outfall itself, to mitigate surface and basement flood risk. Due to the proposed work, this alternative is Schedule A/A+.

Refer to **Figure 7—19** for details. A summary of this alternative solution is outlined below:

- Increase storm inlet capacity and provide conveyance upgrades; and,
- Realign storm and sanitary sewers to achieve required hydraulic separation.

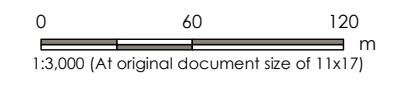


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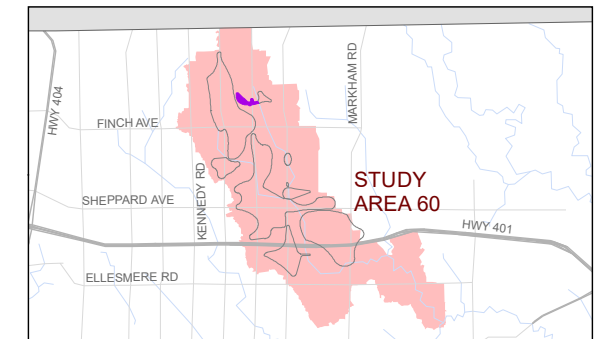


Legend

- Study Area
- Assignment Area
- Proposed Storm Solutions**
  - Increase Inlet Capacity
  - Upgrade
  - Affected Easement



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BASEMENT FLOODING CAPACITY STUDIES  
BUNDLE F - STUDY AREA 60

Figure No.: **7.19**

Title: **Alternative 3 Solutions for Assignment 60-18**