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1.0 Background

1.1 Introduction

The Ministry of Transportation (MTO) is planning to reconstruct the Sunnidale Road Bridge crossing over Highway 400 (referred herein as the Sunnidale Bridge). Construction is planned to begin in the early 2020s. The Ministry has notified the City that all third party utilities routed within the bridge structure are required to be relocated by December 2019.

The bridge presently contains a 300mm watermain and a 300mm sanitary sewer within the bridge structure. The relocation of the watermain has been addressed by a previously completed Schedule B Class Environmental Assessment (Class EA) completed in 2013. The impetus for that EA was the need to increase water supply to the downtown area. The preferred alternative alignment for the watermain is illustrated in Figure 1.

To address MTO's requirement to relocate all third party utilities from the Sunnidale Bridge, the City is undertaking a Class EA to identify a suitable realignment and outlet in order to continue to provide sanitary servicing to residents located in the upstream catchment.

This Class EA is being undertaken as a Schedule “B” project in accordance with the Municipal Class EA Document as prepared by the Municipal Engineers Association (MEA) and approved by the Ministry of the Environment, Conservation and Parks (MECP). This Class EA is a planning procedure developed to ensure that the potential natural, social, cultural and economic environmental effects are considered in the planning and design of a project. The proponents of a Schedule “B” project are required to follow Phases 1 and 2 of the Class EA process (see Figure 2). This planning process includes mandatory contact with the directly affected public and relevant government agencies to ensure that they are informed of the proposed project and that their concerns are addressed. At the conclusion of Phase 2, the City will assess the need to file a notice of completion pending the selection of the preferred alternative solution.

Please refer to Figure 3 for the project study area.

1.2 Project Team

The Project Team that participated in this Class EA consisted of:

- City of Barrie - Project Lead
- Azimuth Environmental Consulting Inc. - Natural Heritage
- Archeoworks Inc. - Archeology and Cultural Heritage
- WSP Canada - Dam Specialist
Figure 1 - Sunnidale Watermain Preferred Alternative (from Sunnidale Watermain Class EA)

- Route 3 is 725 metres in length from Leititia Road to Wellington Street W.
- Majority of Route 3 is within the Sunnidale Road right-of-way (ROW).
- Hwy 400 watermain crossing is proposed in an easement on the east side of the Sunnidale-Hwy 400 overpass.
- Minor portion of Route 3 is within the Lake Simcoe Region Conservation Authority regulation limits.
- Permanent easements will be required for off road construction.
- Requires trenchless crossing shafts in front yard of Sunnidale Road residences.
- Property acquisition will be required for the crossing of Hwy 400.
- Land uses along Route 3 are mostly residential.
EXHIBIT A.2  MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

NOTE: This flow chart is to be read in conjunction with Part A of the Municipal Class EA

**PHASE 1**
- IDENTIFY PROBLEM OR OPPORTUNITY
  - DISCRETIONARY PUBLIC CONSULTATION TO REVIEW PROBLEM OR OPPORTUNITY

**PHASE 2**
- SELECT SCHEDULE (APPENDIX 1)
  - INVENTORY NATURAL, SOCIAL, ECONOMIC ENVIRONMENT
  - IDENTIFY IMPACT OF ALTERNATIVE SOLUTIONS ON THE ENVIRONMENT, AND MITIGATING MEASURES
  - EVALUATE ALTERNATIVE SOLUTIONS, IDENTIFY RECOMMENDED SOLUTIONS
  - CONSULT REVISIONS INTO PROPOSED SCHEDULE AND SELECT PREFERRED SOLUTION
  - REVIEW AND CONFIRM CHOICE OF SCHEDULE

**PHASE 3**
- IDENTIFY ALTERNATIVE DESIGN CONCEPTS FOR PREFERRED SOLUTION
  - ENVIRONMENTAL STUDY REPORT (ESR)
  - NOTICE OF COMPLETION TO RECIPIENTS AND PUBLIC

**PHASE 4**
- COMPLETE ENVIRONMENTAL STUDY REPORT (ESR)
  - INDIKATES MANDATORY DATES
  - INDIKATES MANDATORY DATES
  - INDIKATES MANDATORY DATES

**PHASE 5**
- COMPLETE CONTRACT DOCUMENTS
  - PROCEED TO CONSTRUCTION AND OPERATION
  - MONITOR FOR ENVIRONMENTAL PROVISIONS AND COMMITMENTS

MUNICIPAL ENGINEERS ASSOCIATION

DRAFT FINAL
Figure 3 - Study Area
1.3 Objectives

The overall objective of this report is to document the planning and decisions making process required for a Schedule B Class EA for the location of the sanitary sewer off the Sunnidale Bridge. The objectives of this report are as follows:

- Prepare a description of the problem;
- Establish alternative solutions to address the problems;
- Undertake a detailed inventory of the natural, social, cultural and economic environment;
- Screen the impact of the alternatives on the environment;
- Develop a preliminary preferred alternative solution;
- Document the public consultation;
- Address any concerns that were raised;
- Develop the preferred alternative solution in consideration of comments received;
- Establish mitigative measures to minimize potential environmental effects; and
- Outline the remaining steps involved in the planning/design to implement the preferred alternative solution and the completion of the Class EA process.

2.0 Phase 1 – Problem or opportunity

The MTO is planning to replace the Sunnidale Bridge. MTO has notified the City that MTO will not permit the attachment of third party utilities to the replacement structure. This restriction eliminates the City’s ability to maintain the present sanitary sewer alignment and requires an assessment of alternative alignments to relocate the sanitary sewer.

2.1 Problem / Opportunity Statement

That an alternative alignment for the Sunnidale Road sanitary sewer be identified and implemented, in an environmentally friendly and cost effective manner.

3.0 Phase 2 - Alternative Solutions

The Class EA planning process includes the development of alternative solutions to address the need to identify an alternative alignment for the Sunnidale Road sanitary sewer.

3.1 Long List of Alternative Solutions

This section of the report will identify a long list of potential alternative solutions considered to document the decision making process. Figure 4 depicts the following alternatives under consideration. The description of each alternative references Highway 400 as aligned north-south and Kidds Creek as aligned east-west.
Figure 4 – Long List of Alternatives
3.1.1 Do-Nothing

The “Do–Nothing” alternative considers not undertaking any changes to the existing sanitary sewer. This alternative provides a benchmark for the purposes of gauging the effects of the proposed improvements. It is important to note that the “do-nothing” alternative is not viable as sanitary servicing to residents must be maintained.

3.1.2 Pump Station

Utilize a pump station/forcemain to convey sewage to an outlet not accessible via gravity flow.

3.1.3 Alternative 1 – Sunnidale Road Alignment (suspended from new bridge)

This alternative would maintain the same general alignment on Sunnidale Road and be suspended from the new replacement bridge. The vertical alignment of the sanitary sewer would need to be raised to match the proposed road profile that is being elevated to accommodate the structure depth of the replacement bridge.

3.1.4 Alternative 2A – Eccles Street Alignment

This alignment utilizes open cut and trenchless construction to connect the sanitary sewer to an existing 250mm sanitary sewer on Eccles Street North. Trenchless shafts would be required at 80 Sunnidale Road (private residential property) and within the municipal right-of-way on Eccles Street North. Property (or an easement) would be required from 54 and 50 Sunnidale Road for the portion of the sewer alignment routed through these properties.

3.1.5 Alternative 2B – Sunnidale Road Alignment

This alignment utilizes open cut and trenchless construction to connect the sanitary sewer to the existing sanitary sewer east of the highway bridge where it would tie-in to the existing sanitary sewer on Sunnidale Road by matching grade. Trenchless shafts would be required at 79 Sunnidale Road (City owned) and within the municipal right-of-way on Sunnidale Road.

3.1.6 Alternative 2C – Kidds Creek Valley Alignment 1

This alignment utilizes open cut and trenchless construction to connect the sanitary sewer to the existing sanitary trunk sewer that is routed parallel to Kidds Creek (north side) on the east side of the highway. Trenchless shafts would be required at 79 Sunnidale Road (City owned) and within the Simcoe County District School Board (SCDSB) property on the east side of Highway 400, north of Kidds Creek. Property (or an easement) would need to be acquired from the SCDSB for the portion of the sewer alignment routed through this property.

3.1.7 Alternative 2D – Kidds Creek Valley Alignment 2

This alignment utilizes open cut and trenchless construction to connect the sanitary sewer to the existing sanitary trunk sewer that is routed parallel to Kidds Creek (north side) on the east side of the highway. Trenchless shafts would be required at 79 Sunnidale Road (City owned), 53 Sunnidale Road (City owned) and within the Simcoe County District School Board (SCDSB) property immediately north of 53 Sunnidale Road near the toe of slope. This alignment requires open cut construction within the Kidds Creek valley and the Kidds Creek watercourse.

3.1.8 Alternative 3A – Sunnidale Park Natural Area Alignment

This alignment utilizes open cut construction to connect the existing sanitary sewer to the existing sanitary trunk sewer that is routed parallel to Kidds Creek (north side) on the west side of the highway. The alignment would be routed through 79 Sunnidale Road (City owned) and
the Sunnidale Park natural area west of the KD01 berm structure. This alignment requires open cut construction within the Kidds Creek valley and the Kidds Creek watercourse.

3.1.9 Alternative 3B – KD01 Berm Alignment 1

This alignment utilizes open cut construction to connect the existing sanitary sewer to the existing sanitary trunk sewer that is routed parallel to Kidds Creek (north side) on the west side of the highway. The alignment would be routed through 79 Sunnidale Road (City owned) and the KD01 berm crest. The KD01 berm structure is considered an embankment dam by the Ministry of Natural Resources and Forestry (MNRF).

3.1.10 Alternative 3C – KD01 Berm Alignment 2

This alignment utilizes open cut construction to connect the existing sanitary sewer to the existing sanitary trunk sewer that is routed parallel to Kidds Creek (north side) on the west side of the highway. The alignment would be routed through 79 Sunnidale Road (City owned) and the KD01 berm crest. The alignment would connect to the existing sanitary trunk sewer located between the KD01 berm and Highway 400 immediately north of Kidds Creek. The KD01 berm structure is considered an embankment dam by the MNRF.

3.1.11 Alternative 3D – Swale Alignment

This alignment utilizes open cut construction to connect the existing sanitary sewer to the existing sanitary trunk sewer that is routed parallel to Kidds Creek (north side) on the west side of the highway. The alignment would be routed through 79 Sunnidale Road (City owned) and the area between the KD01 berm structure and highway 400 to the north side of Kidds Creek. The alignment would connect to the existing sanitary trunk sewer located immediately north of Kidds Creek. The alignment would require fill placed in the swale area to raise the ground elevation (to allow for gravity flow with earth cover) and includes the enclosure of Kidds Creek (this section is routed in a concrete channel). The sewer would be routed above the culvert utilized to enclose Kidds Creek as the creek shares the same approximate elevation as the trunk sewer (this precludes the ability to cross underneath the creek).

3.1.12 Alternative 3E – Toe of Slope Alignment

This alignment utilizes open cut construction to connect the existing sanitary sewer to the existing sanitary trunk sewer that is routed parallel to Kidds Creek (north side) on the west side of the highway. The alignment would be routed through 79 Sunnidale Road (City owned) and along the downstream toe of slope of the KD01 berm structure. The alignment would connect to the existing sanitary trunk sewer located immediately north of Kidds Creek. The sewer would cross over the 675mm control pipe immediately behind the headwall.
4.0 Project Environment

This section provides a description of the physical, social, cultural and economic environment of the study area. A combination of field investigation and available information established this inventory.

4.1 Land-Use Planning Objectives

The following section summarizes land-use planning designations for the study area.

4.1.1 Land Use Designation

The study area contains residential, open space and environmentally protected designated lands per Schedule A of the Official Plan.

4.1.2 Special Policy Areas

The study area contains a historic neighborhood defined policy area per Schedule C of the Official Plan.

4.1.3 Zoning

The study area contains land zoned open space (OS), residential (R2, RM1), environmentally protected (EP) and educational institution (I-E). Zoning By-Law 2009-141 includes Special Provision 445 for Sunnidale Park:

a) Infrastructure shall be restricted to the replacement or minor upsizing of infrastructure existing at the time of the passing of this By-law, and construction of a water reservoir of approximately 18,000m3; and

b) That any future infrastructure be limited to that which accommodates amenities for low impact, passive recreational uses.

4.1.4 Conservation Authority Limits and Regulation Areas

The study area is located within the Lake Simcoe watershed and within the Kidds Creek subwatershed. The study area contains lands that fall under the Lake Simcoe Region Conservation Authority (LSRCA) regulation limits per Schedule F of the Official Plan.

4.1.5 Drinking Water Vulnerable Areas

The study area is located within wellhead protection area (WHPA) zone D and an issues contributing area for Wells 11, 12 and 14 for Chloride and Sodium per Schedule G of the Official Plan.

4.1.6 Natural Heritage Resources

The study area contains Level 1 and Level 2 Natural Heritage Resources.

4.2 Planning Policies / Acts

The following section summarizes select planning policies applicable to the study area.

4.2.1 2017 Provincial Growth Plan
The 2017 Provincial Growth Plan population and employment distribution will be utilized to determine the projected population within the upstream catchment for the 2041 planning horizon.

4.2.2 2014 Provincial Policy Statement (2014 PPS)

This project is consistent with the 2014 PPS as it is intended to maintain municipal sewage services, which is the preferred form of servicing in a municipal settlement area (1.6.6.2).

4.2.3 Lake Simcoe Protection Plan

This project involves the relocation of an existing sanitary sewer (not a designated policy or strategic action). Construction activities will include sedimentation and erosion protection (4.20-DP).

4.2.4 Clean Water Act and South Georgian Bay Lake Simcoe Source Protection Plan

The project was examined by the City of Barrie Risk Management Office to ensure compliance with the Clean Water Act and the South Georgian Bay Lake Simcoe Source Protection Plan. The construction or operation of a sanitary sewer is not a Significant Drinking Water Threat.

4.3 Natural Environment

The following section summarizes the natural environment for the study area.

4.3.1 Natural Heritage

Please refer to the supporting Natural Heritage studies completed by Azimuth Environmental Consulting Inc. in Appendix F.

4.3.2 Landforms

The study area includes the well-defined forested valley of Kidds Creek and associated tablelands with residential lands in the northern half of the study area with a transition to a much less defined valley at the southern limits of the study area. There are man-made wetlands (evaluated non-provincially significant) west of the SWMF berm and east of Highway 400.

Predominant man-made features within the study area include Highway 400 that bisects the study area in the north-south direction and a flood control berm that is part of the City’s stormwater management facility KD01.

4.3.3 Surface Water

The study area is located within the Kidds Creek subwatershed and includes Kidds Creek which is classified as a cold water fishery.

4.3.4 Groundwater

The study area is located within a WHPA Zone D and an issues contributing area for sodium and chloride. The study area contains a very small area near the northwest boundary classified as a significant groundwater recharge area.

4.4 Physical Environment

The following section summarizes the physical environment for the study area.
4.4.1 Utilities

The municipal right-of-ways (ROW) within the study area contain public and private utilities. The portion of Sunnidale Park within the study area functions as a stormwater management facility (KD01). The park also contains a 450mm sanitary trunk sewer (STS) and a stormwater outlet for Sunnidale Road. Utility coordination and subsurface utility investigations are to be completed during detailed design.

4.4.2 KD01 Stormwater Management Pond

The study area contains the easterly limits of Sunnidale Park. This portion of the park is a stormwater management facility (SWMF) referred to as KD01. KD01 was constructed in the mid-1980s and serves as an online peak flow control facility that provides 11 ha-m of storage. The earth berm structure that allows for storage within the Kidds Creek valley is visible from Highway 400 and includes a well-defined concrete spillway and a 675mm control pipe. KD01 provides flood protection for the portion of the City’s downtown within the Kidds Creek subwatershed. Through conversations with the MNRF; the structure is considered an earth embankment dam.

4.5 Social Environment

4.5.1 Recreational Facilities

The study area includes the easterly limits of Sunnidale Park. This part of the park is used as a SWMF; passive use does occur in this area by way of a walking trail routed along the crest of the KD01 berm.

4.5.2 Existing Residential Area

The study area consists primarily of single family homes.

4.6 Cultural Environment

4.6.1 Archaeological Resources

A Stage 1 Archeological Assessment was completed by Archeworks Inc. The investigation determined the need to undertake a Stage 2 Assessment in non-disturbed areas. Please refer to Appendix D.

4.6.2 Cultural Heritage Resources

Screening for cultural heritage resources was completed by Archeworks Inc. Screening identified buildings older than 40 years old within the study area; impact would only occur if the preferred alternative impacted these structures (requiring further assessment). Please refer to Appendix D.

4.7 Economic Environment

4.7.1 Existing Sanitary Sewer – Capital Costs

The existing sanitary sewer was replaced in 1990 with an anticipated service life of 75 to 100 years. The sewer has 45 to 70 years remaining service life. In the absence of MTO’s request to relocate the sewer; there is no identified need (or capital funds) to replace the sewer, however, as per the Public Service Works on Highways Act, the municipality has a responsibility to relocate these works at request of the road authority (in this context, the road
authority is the MTO). The act notes that the road authority will fund 50% of the cost of labour, with the balance of labour and material costs funded by the City (https://www.ontario.ca/laws/statute/90p49).

4.7.2 Existing Sanitary Sewer – Operations & Maintenance (O&M) Costs

The existing sanitary sewer exhibits typical O&M costs for a sanitary gravity sewer (routine video inspection at 5-10 year intervals).
5.0 Screening of Alternatives

5.1 Pre-Screening

The comprehensive long list of alternatives have been pre-screened for technical and economic viability; the alternatives that are deemed technically viable proceed through the complete evaluation process to determine their impact on the physical, social, cultural, natural and economic environments.

5.1.1 Do Nothing

This alternative is not viable as the sanitary sewer must be relocated.

5.1.2 Pump Station / Forcemain

This alternative is not economically viable as a gravity solution exists.

5.1.3 Alternative 1 – Sunnidale Road Alignment (suspended from new bridge)

This alternative is not viable as MTO is not allowing the sanitary to be suspended from the new bridge.

5.1.4 Alternative 2A – Eccles Street Alignment

This alternative is not technically viable as the existing sanitary sewer on Eccles Street does not have excess capacity to receive flows from the additional catchment area.

5.1.5 Alternative 2B - Sunnidale Road Alignment (trenchless)

This alignment is technically viable.

5.1.6 Alternative 2C - Kidds Creek Valley Alignment 1

This alignment is not technically viable due to the elevation of the existing ground surface precluding the ability to maintain adequate cover over the proposed sanitary sewer pipe.

5.1.7 Alternative 2D – Kidds Creek Valley Alignment 2

This alignment is not technically viable as the elevation of Kidds Creek precludes the ability to provide a gravity connection to the existing sanitary trunk sewer.

5.1.8 Alternative 3A – Sunnidale Natural Area Alignment

This alignment is not technically viable as the elevation of the existing sanitary trunk sewer would result in the sewer crossing Kidds Creek at a shallow depth (less than 1.0m).

5.1.9 Alternative 3B – KD01 Berm Alignment

This alignment requires construction through the earth berm structure that functions as an embankment dam for 11 ha-m of runoff during extreme storm events. This alignment would require construction along the top of the structure for its full length; the excavation would be required to be progressively deeper into the core of the structure. Given increased risks of negatively impacting the embankment dam’s structural integrity, this alternative is not being carried forward.
5.1.10 Alternative 3C – KD01 Berm Alignment

This alignment requires construction through the earth berm structure that functions as an embankment dam for 11 ha-m of runoff during extreme storm events. This alignment would require construction along the top of the structure for approximately half its length; the excavation would be required to be progressively deeper into the core of the structure. Given increased risks of negatively impacting the embankment dam’s structural integrity, this alternative is not being carried forward.

5.1.11 Alternative 3D – Swale Alignment

This alignment is technically viable and will be evaluated.

5.1.12 Alignment 3E – Toe of Slope Alignment

This alignment is technically viable and will be evaluated.
5.1.13 Prescreening Summary

<table>
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<th>Pre-Screening Result</th>
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<tr>
<td>Do Nothing</td>
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<tr>
<td>Pump Station / Forcemain</td>
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<td>Alternative 3E</td>
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5.2 Alternatives Evaluation

The alternatives carried forward through the prescreening process (Alternatives 2B, 3D and 3E) have been developed to correct the deficiencies noted in Section 2 and are to be screened with respect to their impact on the physical, social, cultural and economic environments presented in Section 4. For each of these criteria, sub-factors were established, which are presented in Section 5.3.

The assessment process compares various alternatives to the undertaking in a comprehensive manner by ensuring that the conclusions and recommendations are reached in a clear and logical fashion and that all environmental issues are given thorough consideration.
5.3 Alternative Analysis

5.3.1 Alternative 2B – Sunnidale Road Alignment

Alternative 2B (see Figure 5) uses trenchless construction to follow an alignment along Sunnidale Road. Trenchless construction shafts would be required at 79 Sunnidale Road and within Sunnidale Road west of Wellington Street. This alternative will provide uninterrupted servicing and does not require construction of a temporary sewer (minor re-routing and short-term diversion sewer may be required at the east construction shaft).

- Natural Environment: No tree removal is required. This alternative will not impact surface water or groundwater (assuming sealed shaft/tunneling methods).

- Physical Environment: This alternative will allow the sanitary sewer to be relocated off of the Sunnidale Road Bridge. This alternative will maintain sanitary servicing to the upstream catchment. This alternative does not impact the KD01 berm structure.

- Climate Change:
  - Greenhouse Gas Emissions: This alternative will have the greatest negative relative impact due to emissions required to construct the tunnel and tunnel shafts, material to construct the tunnel and tunnel shafts and processing/disposal of tunneling spoil.
  - Carbon Sinks: This alternative will have a minimal negative relative impact as limited tree removal is required for the tunnel shaft.
  - Resiliency/Vulnerability: Sewers are vulnerable to hydraulic failure caused by excessive inflows that occur during extreme precipitation events. This alternative will be least likely to experience sewer inflows due to extreme precipitation events due to its alignment (outside of the Kidds Creek valley) and fewer number of manholes within the road right-of-way (positive impact).

- Social Environment: This alternative will result in disruptions to the public as Sunnidale road will require an extended duration closure between Wellington Street and Shirley Avenue; local access would be maintained, but some residents may be required to park on Sunnidale Road as driveway access near the tunnel shafts may be restricted.

- Cultural Environment: The Stage 1 archeological assessment identified the need to complete a Stage 2 investigation in the vicinity of the west shaft as there is potential for undisturbed areas. This alignment will not impact any cultural heritage features.

- Economic Environment: This alternative is the most expensive due to the requirement of trenchless construction.
5.3.2 Alternative 3D – Swale Alignment

Alternative 3D (see Figure 6) is routed to the existing sanitary trunk sewer north of Kidds Creek in the swale between the KD01 berm and Highway 400. This alternative will provide uninterrupted servicing and does not require construction of a temporary sewer. The swale area would need to be filled by approximately 2 m and a short section of Kidds Creek would need to be enclosed (presently within a concrete channel) to allow the sewer to maintain gravity drainage to the existing sanitary trunk sewer. It should be noted that MTO is planning to extend their existing culvert to the west to accommodate the Highway widening. Existing drainage patterns would be preserved.

- Natural Environment: Tree removal is required between Sunnidale Road and the KD01 berm structure. The short section of Kidds Creek will require enclosure. This impact is being offset by daylighting of Kidds Creek at the former Knights Inn property. Limited dewatering may be required to support construction.

- Physical Environment: This alternative will allow the sanitary sewer to be relocated off of the Sunnidale Road Bridge. This alternative will maintain sanitary servicing to the upstream catchment. This alternative will require reconstruction of a portion of the KD01 berm spillway. A dam safety review is required to obtain a dam alteration permit.

- Climate Change:
  - Greenhouse Gas Emissions: This alternative will have a moderate negative relative impact due to emissions associated with fill transport and construction of the Kidds Creek culvert enclosure.
  - Carbon Sinks: This alternative has the moderate negative relative impact as tree removal is required.
  - Resiliency/Vulnerability: Sewers are vulnerable to hydraulic failure caused by excessive inflows that occur during extreme precipitation events. This alternative will be at risk of sewer inflows due to extreme precipitation events due to its alignment (within the Kidds Creek valley).

- Social Environment: This alternative will result in minimal disruptions to the public as the alignment is routed in areas that are presently not designated for public activity and is primarily located outside of the Sunnidale Road right-of-way.

- Cultural Environment: The Stage 1 archeological assessment identified the need to complete a Stage 2 archeological assessment in undisturbed areas. This alignment will not impact any cultural heritage features.

- Economic Environment: This alternative is moderately costly due to the need to enclose Kidds Creek and construction of a new inlet structure for flows under Highway 400.
Figure 6 – Alternative 3D – Swale Alignment
5.3.3 Alternative 3E – Toe of Slope Alignment

Alternative 3E (see Figure 7) is routed to the existing sanitary trunk sewer north of Kidds Creek in the downstream toe of slope of the KD01 berm structure. This alternative will cross over top of the 675mm control pipe behind the headwall; this eliminates the need to enclose Kidds Creek.

- Natural Environment: Tree removal is required between Sunnidale Road and the KD01 berm structure. This alternative will not impact surface water. Limited dewatering may be required to support construction.

- Physical Environment: This alternative will allow the sanitary sewer to be relocated off of the Sunnidale Road Bridge. This alternative will maintain sanitary servicing to the upstream catchment. This alternative will require reconstruction of a portion of the spillway. A dam safety review is required to obtain a dam alteration permit.

- Climate Change:
  - Greenhouse Gas Emissions: This alternative will have a minor negative relative impact due to emissions associated with open typical open-cut sewer construction.
  - Carbon Sinks: This alternative has the moderate negative relative impact as tree removal is required.
  - Resiliency/Vulnerability: Sewers are vulnerable to hydraulic failure caused by excessive inflows that occur during extreme precipitation events. This alternative will be at risk of sewer inflows due to extreme precipitation events due to its alignment (within the Kidds Creek valley).

- Social Environment: This alternative will result in minimal disruptions to the public as the alignment is routed in areas that are presently not designated for public activity and is primarily located outside of the Sunnidale Road right-of-way.

- Cultural Environment: The Stage 1 archeological assessment identified the need to complete a Stage 2 archeological assessment in undisturbed areas. This alignment will not impact any cultural heritage features.

- Economic Environment: This alternative is the least costly.
Figure 7 – Alternative 3E – Toe of Slope Alignment
## 5.3.4 Alternatives Evaluation

<table>
<thead>
<tr>
<th>Evaluation Summary</th>
<th>Positive Impact</th>
<th>Least</th>
<th>Neutral Impact</th>
<th>Least</th>
<th>Negative Impact</th>
<th>Greatest</th>
</tr>
</thead>
</table>

### Natural Environment

<table>
<thead>
<tr>
<th>Alternative 2B – Trenchless Alignment</th>
<th>Alternative 3D – Swale Alignment</th>
<th>Alternative 3E – Toe of Slope Alignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Use</td>
<td>no impact</td>
<td>no impact</td>
</tr>
<tr>
<td>Groundwater Resources</td>
<td>no impact</td>
<td>construction dewatering anticipated</td>
</tr>
<tr>
<td>Surface Water and Fisheries</td>
<td>no impact</td>
<td>culvert extension</td>
</tr>
<tr>
<td>Vegetation and Wetlands</td>
<td>no impact</td>
<td>tree removal is required</td>
</tr>
<tr>
<td>Wildlife and Habitat</td>
<td>no impact</td>
<td>tree removal is required and culvert extension</td>
</tr>
</tbody>
</table>

### Land Use

- **Sunnidale Road – Sanitary Sewer Relocation**
- **Municipal Class Environmental Assessment**
- **DRAFT**

### Climate Change

- **Greenhouse Gas Emissions**
  - Energy intensive construction methodology (material production, tunnel spoil transportation, shaft construction)
- **Carbon Sink Impacts**
  - Trees that are being removed are mature and in declining health; limited viability as a carbon sink

### Physical Environment

- **Transportation / Highway Crossing Structure**
  - MTO will require an alignment further north than shown requiring additional property acquisitions for the alignment
- **Operations and Maintenance (O&M)**
  - MH structures would be located outside areas that could flood during extreme precipitation events limiting inflow

### Social Environment

- **Vegetation and Wetlands**
  - MH structures in locations that can flood during extreme precipitation events increasing risk of inflow

### Economic Environment

- **Capital Costs**
  - Significant cost
- **Lifecycle Costs**
  - Culvert extension will require periodic maintenance and rehabilitation as well as frequent inspections to ensure spillway inlet grates are clear
5.4 Construction Costs

For comparison purposes, preliminary construction costs have been estimated for each alternative (see Appendix “G”). Table 6 below provides a summary of the estimated costs for the alternatives (includes 35% contingency, 15% engineering/contract administration, 10% for misc. project related costs/investigations).

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Estimated Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alt 2B – Sunnidale Alignment (trenchless)</td>
<td>$5,000,000</td>
</tr>
<tr>
<td>Alt 3D – Swale Alignment</td>
<td>$1,300,000</td>
</tr>
<tr>
<td>Alt 3E – Toe of Slope Alignment</td>
<td>$800,000</td>
</tr>
</tbody>
</table>

5.5 Sunnidale Park – Zoning By-Law 2009-141, Special Provision 445

The Engineering Department and Planning and Building Services Department have consulted regarding the Zoning By-law Special Provision – 445. The proposed works are in keeping with the spirit of the special provision. The area of work is within a stormwater management facility (SWMF KD01), that contains existing utilities (storm sewer, trunk sanitary sewer) and is located in a ditch/drainage area between the SWMF KD01 berm and Highway 400. In addition the proposed work will accommodate low impact, passive recreation uses through the potential development of pedestrian access into Sunnidale Park.

5.6 Public Consultation

5.6.1 Notice of Class Environmental Assessment

The Notice of Study Commencement was advertised in the Barrie Advance on November 15 and 26, 2018.

5.6.2 Preliminary Preferred Alternative Notification

A letter was sent to property owners/tenants within the study area, agencies and first nations advising of the preliminary preferred alternative to solicit study input. The following is a brief summary of responses pertaining to the Class EA study.

<table>
<thead>
<tr>
<th>Comment</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concerns regarding privacy impacts from the proposed pedestrian trail into Sunnidale Park.</td>
<td>The property immediately adjacent to the trail is being purchased by the MTO (87 Sunnidale Road). This will provide a buffer to the adjacent residential property (91 Sunnidale Road). The City will assess options for more formal delineations with use of chain link fencing as well as plantings to provide visual screening as part of detailed design in consultation with the MTO.</td>
</tr>
<tr>
<td>Concerns regarding loss of coniferous trees located at the rear of 79 Sunnidale Road.</td>
<td>The preferred solution alignment has been optimized to reduce the number of trees requiring removal, however, the MTO will require removal of the majority of the trees in this area to</td>
</tr>
</tbody>
</table>
5.7 Selection of the Preferred Alternative

5.7.1 Preferred Alternative Solution

The Preferred Solution is Alternative 3E – Toe of Slope Alignment and is recommended for the following reasons:

- It does not encumber the future MTO highway bridge;
- It minimizes negative impacts to the KD01 berm structure;
- It maintains sanitary servicing to residents and can be advanced ahead of MTO’s bridge construction project;
- It is the least impactful to the public;
- It is the least impactful to the environment (including climate change considerations);
- Provides an opportunity for a trail connection between Sunnidale Road and the walking trail on the crest of the embankment dam; and
- Is the least cost alternative.

5.7.2 Storm Sewer Relocation

An existing storm sewer located to the east of 79 Sunnidale Road requires relocation to accommodate the MTO Bridge replacement project. The sewer will be installed parallel to the preferred solution sanitary sewer alignment and reconnect further downstream where it is no longer in conflict. The storm sewer relocation forms part of the preferred solution.

Appendix A contains an overall utility relocation schematic to accommodate the MTO Bridge replacement project.

5.7.3 Project Timing

Detailed design is scheduled to commence in 2019. Construction is expected to commence in 2020 and continue into 2021 as this work forms part of a larger overall utility relocation program. It is anticipated that the MTO Bridge replacement project will commence in 2022.

5.7.4 Property Requirements

The City has purchased 79 Sunnidale Road as part of a previous Class EA for a transmission watermain installation on Sunnidale Road. The preferred solution will utilize 79 Sunnidale Road to access the peripheral area of Sunnidale Park.

The MTO is in process of expropriating the majority of 79 Sunnidale Road from the City to accommodate grading for Highway 400. The MTO and City are working together to ensure that

| Minimize impacts to Kidds Creek/floodplain. | The preferred solution minimizes impacts to Kidds Creek as the sewer alignment crosses over top of Kidds Creek where it is routed within a culvert. |
the preferred solution can be implemented within the remaining property not required by the MTO or through a combination of the remaining property and encroachment within the MTO corridor.

Although not anticipated, there is the potential that the MTO could require the City to shift the alignment of the preferred solution to the west, this would result in the alignment utilizing 87 Sunnidale Road. The MTO would need to facilitate this shift through the provision of property or encroachment to the City.

### 5.7.5 Pedestrian Access to Sunnidale Park via 79 Sunnidale Road

A maintenance access path will be constructed along the preferred solution alignment; use of this path for pedestrian access is being considered, but may be subject to the MTO's Highway Corridor Management requirements pending MTO's ultimate property needs.

### 5.7.6 Mitigating Measures

As with any construction project; there is potential for negative impacts to the environment and the general public. These impacts can largely be mitigated through the following actions:

<table>
<thead>
<tr>
<th>Potential Negative Impact</th>
<th>Mitigating Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Impacts</td>
<td><strong>Access:</strong> Impacts will be largely concentrated outside of the traveling roadway with exception of the tie-in on Sunnidale Road, which will require road closures of minor duration. Access to residential properties will be maintained during construction.</td>
</tr>
<tr>
<td></td>
<td><strong>Noise:</strong> The City of Barrie Noise By-law 2006-140 is typically adhered to during construction unless a temporary exemption is required to facilitate critical project phases, reduce risk to the environment or reduce length of public disruption (i.e. road closures).</td>
</tr>
<tr>
<td></td>
<td><strong>Dust:</strong> Dust will be controlled during construction to prevent nuisance impacts to neighboring properties and maintain visibility on Highway 400.</td>
</tr>
<tr>
<td>Sewer Exfiltration</td>
<td>To minimize risks of sanitary sewer exfiltration in proximity to the KD01 berm structure; it is recommended to use watermain rated pipe (better relative joint performance) and waterproof maintenance holes by way of exterior joint wraps (using Blueskin or equivalent) and interior coating (using epoxy spray lining or equivalent).</td>
</tr>
<tr>
<td>Sewer Inspection</td>
<td>To facilitate sewer inspection, provision of manholes east and west of Highway 400 to facilitate by-pass pumping (generally off of the roadway) along the Sunnidale Road Bridge (to allow a dry CCTV inspection of the sewer alignment through the KD01 berm structure) should be implemented.</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Tree Removal</td>
<td>A detailed restoration plan will be prepared by a landscape architect as part of detailed design. In LSRCA regulated areas, a tree compensation plan will be developed as part of the permit application and in consultation with the City’s Forestry Department.</td>
</tr>
<tr>
<td>Vegetation</td>
<td>Topsoil and hydro-seeding with native species will be applied as required.</td>
</tr>
<tr>
<td>Erosion and Sediment Control</td>
<td>A detailed erosion and sediment control plan will be developed in detailed design including specific consideration of emergency plans (proactive and reactive) for extreme weather during construction (i.e. convective storms).</td>
</tr>
<tr>
<td>Fisheries and Aquatic Habitat</td>
<td>As part of detailed design, a fisheries ecologist will assess risk and prescribe necessary mitigation measures in compliance with the Fisheries Act.</td>
</tr>
<tr>
<td>Climate Change</td>
<td>Carbon Sinks: Vegetation/Tree restoration will mitigate impacts. Resiliency/Vulnerability: Watertight manhole covers are recommended to prevent inflow (within the Kidds Creek valley area).</td>
</tr>
</tbody>
</table>
6.0 Work Plan

6.1 Where Do We Go From Here

This section will be updated as part of the final report. The next steps in the study are as follows:

1) Directly affected property owners and agencies will be contacted via mail with a letter and comment sheet to provide notification, an opportunity to provide comments on the preliminary preferred alternative and inform the City if they wish to be kept informed of study updates.

2) Comments received will be considered in a final review of the preliminary preferred alternative to establish the preferred alternative.

3) A staff report will be submitted to General Committee advising of the preferred alternative; once accepted by Council, a Notice of Study Completion will be advertised initiating a 30 day review period. Those who wish to be kept informed of study updates will be notified in advance of the staff report submission. (WE ARE HERE)

4) During the 30-day review period, members of the public with outstanding concerns that cannot be addressed through discussion with the City may file a Part II Order Request, please see https://www.ontario.ca/page/class-environmental-assessments-part-ii-order for further information.

6.2 Detailed Design – Class EA Commitments / Select Action Items

6.2.1 Sewer Alignment Adjustments

During detailed design; optimize the alignment and access route for sewer construction to limit tree removal if/where feasible for trees located at the rear of 79 and 87 Sunnidale Road.

6.2.2 LSRCA Permit

This work will require a permit from LSRCA as it will occur in a regulated area.

6.2.3 Stage 2 Archeological Assessment

A Stage 2 Archeological Assessment is required in non-disturbed areas. In addition to the standard procedures with the Ministry of Tourism, Culture & Sport, the report is to be circulated to Maxime Picard, Project Coordinator for the Huron-Wendat First Nations at maxime.picard@cnhw.gc.ca.

6.2.4 Cultural Heritage Evaluation Report

The preferred alternative does not impact any buildings; therefore there is no cultural heritage impact. No further action is required.

6.2.5 Sewer Alignment Adjustments

During detailed design; optimize the alignment and access route for sewer construction to limit tree removal if/where feasible for trees located at the rear of 79 and 87 Sunnidale Road.

6.2.6 Updated Environmental Impact Study (EIS)
An EIS update will be required once the limits of disturbance have been determined and will support the LSRCA permitting process. This study will address tree removal compensation requirements within the LSRCA regulated area.

6.2.7 Kidds Creek Crossing / DFO Self-Assessment

As part of the updated EIS, a fisheries ecologist should review the proposed plan to determine if there are any impacts, required mitigation measures and that activities are in compliance with the Fisheries Act including completion of a DFO self-assessment to determine if a project review is required. A project review shall be carried out if required.

6.2.8 Alterations, improvements and repairs to existing dams – MNRF Alteration Permit

Install of the sanitary sewer is subject to MNRF approval due to its proximity to the KD01 berm structure. In support of this approval, a dam safety review shall be completed for the KD01 berm structure and include the design for the sanitary sewer in order to obtain MNRF approval. This work includes an assessment of the dam structure and a geotechnical investigation.

6.2.1 Permit to Take Water

The geotechnical investigation should assess groundwater levels and make recommendations on dewatering requirements as well as obtain a Permit-to-Take-Water if required.

6.2.2 Maintenance Access

Maintenance access is to be provided along the preferred solution alignment. This access may serve dual use as a pedestrian path into Sunnidale Park pending confirmation in detailed design.

6.2.3 Restoration

A landscape architect shall design a restoration plan for disturbed areas and include a trail connection along the proposed maintenance access to the existing trails located south of the KD01 berm (to be confirmed during detailed design). The restoration plan shall include plantings to assist in screening the pedestrian trail from adjacent residential properties (87 or 91 Sunnidale Road, the MTO may demolish 87 Sunnidale Road). The plan shall also be developed in consideration of LSRCA tree removal compensation requirements as well as development of an edge management plan to address clearing and grading required to establish a new forest edge.

6.2.4 Tree Removal

Tree removal should be undertaken from October 1st through to March 30th (or as recommended by through the updated EIS).

6.2.5 87 Sunnidale Road

To provide visual and physical separation from the proposed pedestrian trail, a chain link fence (BSD-1210) shall be installed on the north and east property boundaries (fence shall be City owned and installed 150mm on the City’s side of the property line) and include plantings to provides a visual barrier along the east property boundary (note that Highway 400 is referenced as north -south). This may apply to 91 Sunnidale Road pending the MTO’s needs for 87 Sunnidale Road.