Township of Cramahe

Cramahe Industrial Park Sanitary System Upgrades

Municipal Class Environmental Assessment – Schedule B

D.M. Wills Project Number 13-2907

D.M. Wills Associates Limited
Partners in Engineering
Peterborough

September 2019

Prepared for:
Township of Cramahe

Summary of Revisions

Revision No.	Revision Title	Date of Release	Summary of Revisions
1	Final Draft	September 9, 2019	Revisions based on public comments received.

This report / proposal has been formatted considering the requirements of the Accessibility for Ontarians with Disabilities Act.

Table of Contents

Figures

Tables

Appendices

Executive Summary

D.M. Wills Associated Limited (Wills) was retained by the Corporation of the Township of Cramahe (Township) to complete a Schedule B - Municipal Class Environmental Assessment (Class EA) study to examine various sewer alignments for sanitary sewer servicing upgrades in the Colborne Industrial Park. The existing small diameter sanitary pipe system servicing a portion of the industrial lands outlets to the existing municipal gravity sewer on Percy Street. The Study Area (see **Figure 1**) was established to consider existing serviced properties, existing un-serviced properties and potential future development adjacent to the existing system.

Schedule B activities include wastewater management projects that establish, extend or enlarge a sewage collection system and all works necessary to connect the system to an existing sewage outlet where such facilities are not in an existing road allowance or an existing utility corridor. Additionally, Schedule B projects have the potential for some adverse environmental effects, and although subject to screening, require completion of Phase 1 and Phase 2 of the Class EA process prior to proceeding to detailed design and construction.

The problem / opportunity statement for the study was defined as:

> The existing sanitary sewer network within the Colborne Industrial Park is at or near capacity. Therefore, a sewage network upgrade is necessary to maintain service to the existing customers within the Industrial Park, and which also allows for additional development within the industrial zoned lands.

The list of alternative solutions to address the problem included:

- Alternative #1– Do Nothing – Existing Small Diameter Sanitary Sewer
- Alternative #2 – Easement from Industrial Park Avenue
- Alternative #3 – Sewage Pumping Station
- Alternative #4 – Easement from Elgin Street

The alternative solutions are shown in **Appendix D.**

Although **Alternative #1** – Do nothing - Existing Small bore does not address the problem statement, in accordance with the Class EA guidelines, it is included in the study so that the costs of maintaining the existing system could be compared against the other proposed alternatives.

Alternative #2 proposes to replace the existing sanitary sewer network in the Industrial Park with an expanded capacity sanitary network and also marginally increase the service area of the Industrial Park to service the entire existing industrially zoned area. The proposed Alternative #2 alignment is shown in **Appendix D**. The proposed alternative is to install sanitary mains on Purdy Road, and Industrial Park Road, which will converge at a new easement between Industrial Park Road and Percy Street to ultimately outlet to the existing sanitary system on Percy Street.

Alternative #3 proposes to replace the existing sanitary sewer network in the Industrial Park with an expanded capacity sanitary network in terms of pipe size (sanitary capacity) and area serviced. The proposed Alternative #3 alignment is shown in **Appendix D**. The proposed alternative is to install sanitary mains on Purdy Road, Industrial Park Road and Elgin Street North, out-letting to a proposed sewage pumping station on Elgin Street North which will pump sewage to the existing sanitary main located on Park Street East.

Alternative #4 proposes to replace the existing sanitary sewer network in the Industrial Park with an expanded capacity sanitary network in terms of pipe size (sanitary capacity) and area serviced. Alternative #4 alignment is shown in **Appendix D** and generally involves the installation of sanitary mains on Purdy Road, Industrial Park Road and Elgin Street North. This alignment will make use of a proposed easement between Elgin Street North and Percy Street, which is located on private property, currently owned by Linda Hinton. The proposed sanitary main will connect with the existing Colborne sanitary system on the on the west end of the proposed easement at Percy Street.

Following a detailed analysis of the alternatives, the preferred solution to address the problem / opportunity statement identified for the Colborne Industrial Park was **Alternative #4 – Easement from Elgin Street**.

The total serviced area including future potential areas of the four alternatives were compared and are as follows:

- Alternative #1 – 40.8 ha
- Alternative #2 – 180.4 ha
- Alternative #3 – 211.8 ha
- **Alternative #4 – 211.8 ha**

The estimated project Capital Costs for the alternatives are as follows:

- Alternative #1 – $1,000,000
- Alternative #2 – $3,800,000
- Alternative #3 – $5,230,000
- **Alternative #4 – $4,458,000**

There are no immediate capital costs associated with Alternative #1, however since the pipe is nearing the end of its useful life, it is expected that Alternative #1 will require pipe replacement within 10 years and is estimated at $1,000,000.

The estimated Operation and Maintenance (O & M) costs for the alternatives were compared, and are as follows:

- Alternative #1 – $20,000 / year
    - This does not account for annual private costs associated with maintaining the existing system.

- Alternative #2 – $5,000/ 5 years
- Alternative #3 – $15,000/ year plus $5,000/year
- **Alternative #4 – $5,000/ 5 years**

The total project cost including O & M costs for each alternative were calculated over a 20 year Net Present Value (NPV) and compared against the per hectare cost to service land for each alternative, and are as follows:

- Alternative #1 – $26,788.77 / ha
- Alternative #2 – $21,146.50/ ha
- Alternative #3 –$25,867.16 / ha
- **Alternative #4 – $21,118.17/ ha**

The NPV / ha cost for Alternative #1 doesn't include lost opportunity costs associated with the existing municipal investment in the Industrial Park or the impact of limitations on development and economic growth on lands currently owned by the Township. Alternative #1 does not permit additional development, which could have significant negative impact on potential economic growth within the Township. Considering Alternatives #2, #3, and #4, which do permit additional development, the cost per hectare of sanitary servicing is the least expensive with Alternative #4.

Although Alternative #4 is not the least expensive, it does provide the largest area for potential expansion, and lowest O & M costs while also addressing the problem statement.

Public consultation for the project included a Notice of Commencement, a Public Information Center (PIC) and a Notice of Completion. The public consultation component of the project is outlined in detail in **Section 6.0** of this report and all notices are included in **Appendix F.**

A PIC was held at the Cramahe Municipal Administrative Building in Colborne on March 21, 2018. There were nine attendees listed on the sign in sheet and a total of four comments were received. Of the comments received, three were in favour of Alternative #4, and one comment was a general comment relating to sanitary services.

A Notice of Study Completion was distributed to project stakeholders by regular mail on September 12, 2019 and advertised in the local newspaper (Northumberland News) on September 12, 2019. The Notice of Completion came into effect on September 12, 2019. Following the Notice of Completion there is a 30-day commenting period between September 12, 2019 and October 15, 2019.

Robert Jackson, P.Eng.
Project Manager / Lead Designer

Diana Keay, MCIP, RPP
Project Coordinator / Public Liaison

1.0 Introduction

The Township of Cramahe (Township) initiated a Municipal Class Environmental Assessment (Class EA) study in August 2017 to examine required sanitary system upgrades for the Colborne Industrial Park. D.M. Wills Associates Limited (Wills) was retained to assist the Township with the Class EA planning and preliminary design process.

The Township is located in Northumberland County and borders the Municipality of Trent Hills to the North, the Municipality of Brighton to the East, the Township of Alnwick Haldimand to the West and Lake Ontario to the South. The Township has a total population of 6,073 people based on the 2011 Canadian Census.

The Study Area is located in the Village of Colborne (Colborne) which is the main urban center of the Township. Colborne is known as being an important agricultural centre as far back as the 1800's. It's location on the banks of Lake Ontario and strategic location between Toronto and Kingston make it convenient for farmers to sell their produce in larger urban markets.

Colborne is located on the 401 Highway Transportation corridor between Toronto and Kingston and is an attractive commercial / industrial center. The Township is "open for business" and is actively working to bring additional employment into the Township. In alignment with the motto "open for business", the Township developed the Cramahe Industrial Park on the south side of the Highway 401 corridor.

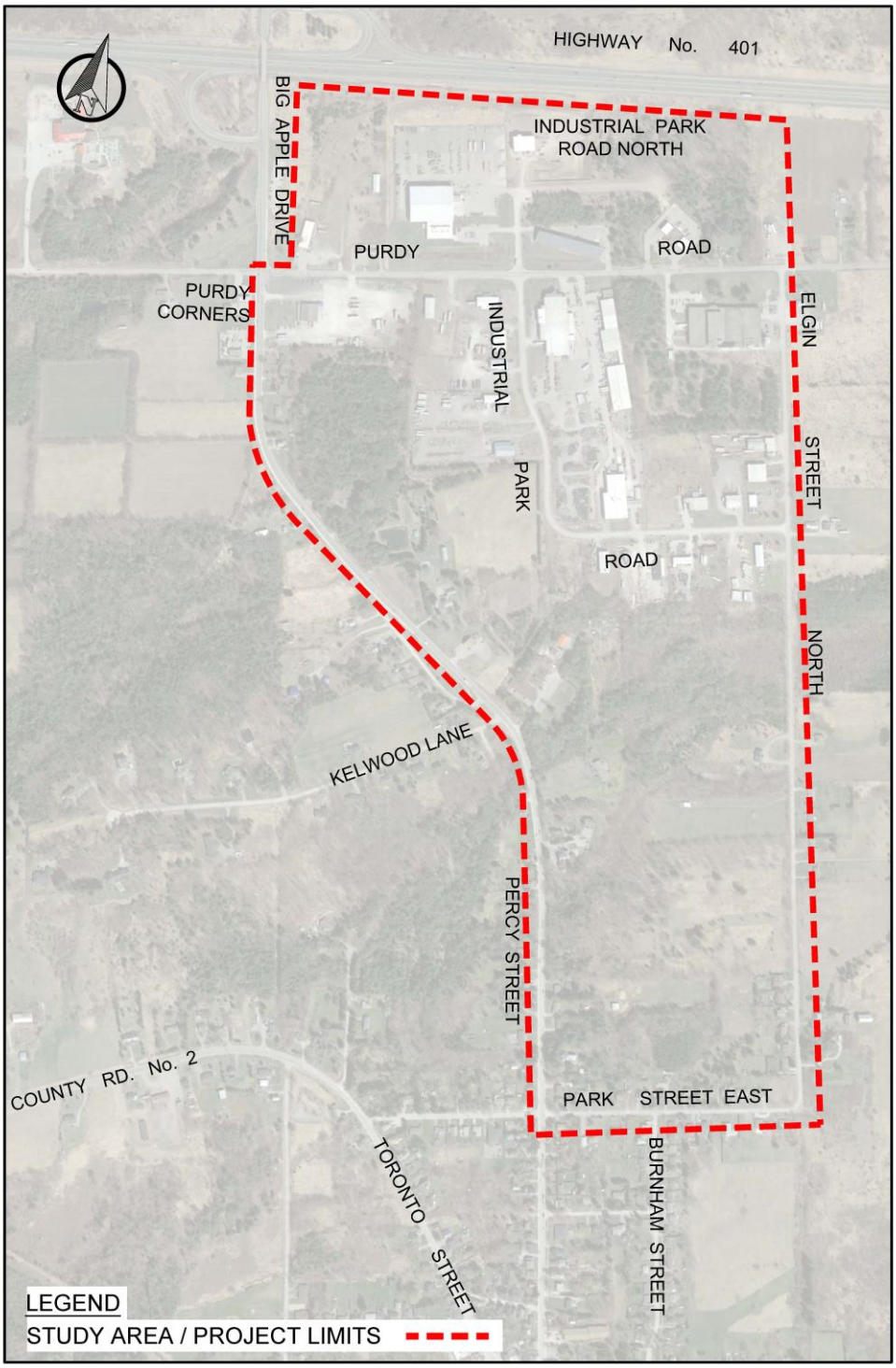
The Study Area was established based on the current sanitary system and is shown in **Figure 1**. The Study Area encompasses the Cramahe Industrial Park and areas which may be used to create additional sanitary connections from the Cramahe Industrial Park to the existing sanitary network in Colborne. The following report details the deficiencies in the existing sanitary network in the Cramahe Industrial Park and provides alternative solutions to address the existing deficiencies, as well as a consideration of the environmental, archeological and economic impacts of each alternative solution.

1.1 Report Organization

This report is intended to address the requirements of the Class EA planning and design process as outlined in the Municipal Class EA document (October 2000, as amended in 2007, 2011 and 2015) prepared by the Municipal Engineers Association.

This Class EA Report documents the planning process undertaken for the project, including stakeholder consultation activities, in determining the preferred solution to address the identified problem.

Figure 1 – Class EA Study Area



Municipal Class EA Process Overview:

- Background Information and Existing Conditions.
- Needs Assessment and Justification.
- Problem / Opportunity Statement.
- Identification of Alternative Solutions.
- General Inventory of Natural Social and Economic Environments.
- Evaluation of the Alternatives.
    - Environmental.
    - Social.
    - Economic.
- Selection of the Preferred Alternative.
- Impacts and Mitigation of the Preferred Alternative.
- Public, Stakeholder and Review Agency Consultation.
- Preferred Solution.

1.2 Project Team

The proponent for this project is the Township. Wills was retained by the Township to complete the Class EA. The Sub-consultant for the project includes Northeastern Archaeological Associates Ltd.

2.0 Municipal Class EA Process

The planning of major municipal projects or activities is subject to the Ontario Environmental Assessment Act, R.S.O. 1990, and requires the proponent to complete a Class EA, including an inventory and description of the existing environment in the area affected by the proposed activity.

The Class EA process was developed by the Municipal Engineers Association (MEA), in consultation with the Ministry of the Environment, Conservation and Parks (MECP), as an alternative method to Individual Environmental Assessments for recurring municipal projects that were similar in nature, usually limited in scale, and with a predictable range of environmental effects which were responsive to mitigating measures.

This project is proceeding based on the Class EA planning process according to the requirements and procedures outlined in the Municipal Class EA document, (October 2000, as amended in 2007, 2011 and 2015). The main components of the full planning and design process are incorporated in the following five phases:

Phase 1 Identify the problem (deficiency) or opportunity.

Phase 2 Identify alternative solutions to address the problem or opportunity by taking into consideration the existing environment, and establish the preferred solution taking into account public and review agency input.

Phase 3 Examine alternative methods of implementing the preferred solution, based upon the existing environment, public and review agency input, anticipated environmental effect and methods of minimizing negative effects and maximizing positive effects.

Phase 4 Document, in an Environmental Study Report, a summary of the rationale, and the planning, design and consultation process of the project as established through the above phases, and make such documentation available for scrutiny by review agencies and the public.

Phase 5 Complete contract drawings and documents, and proceed to construction and operation; monitor construction for adherence to environmental provisions and commitments. Where special conditions dictate, also monitor the operation of the completed facility.

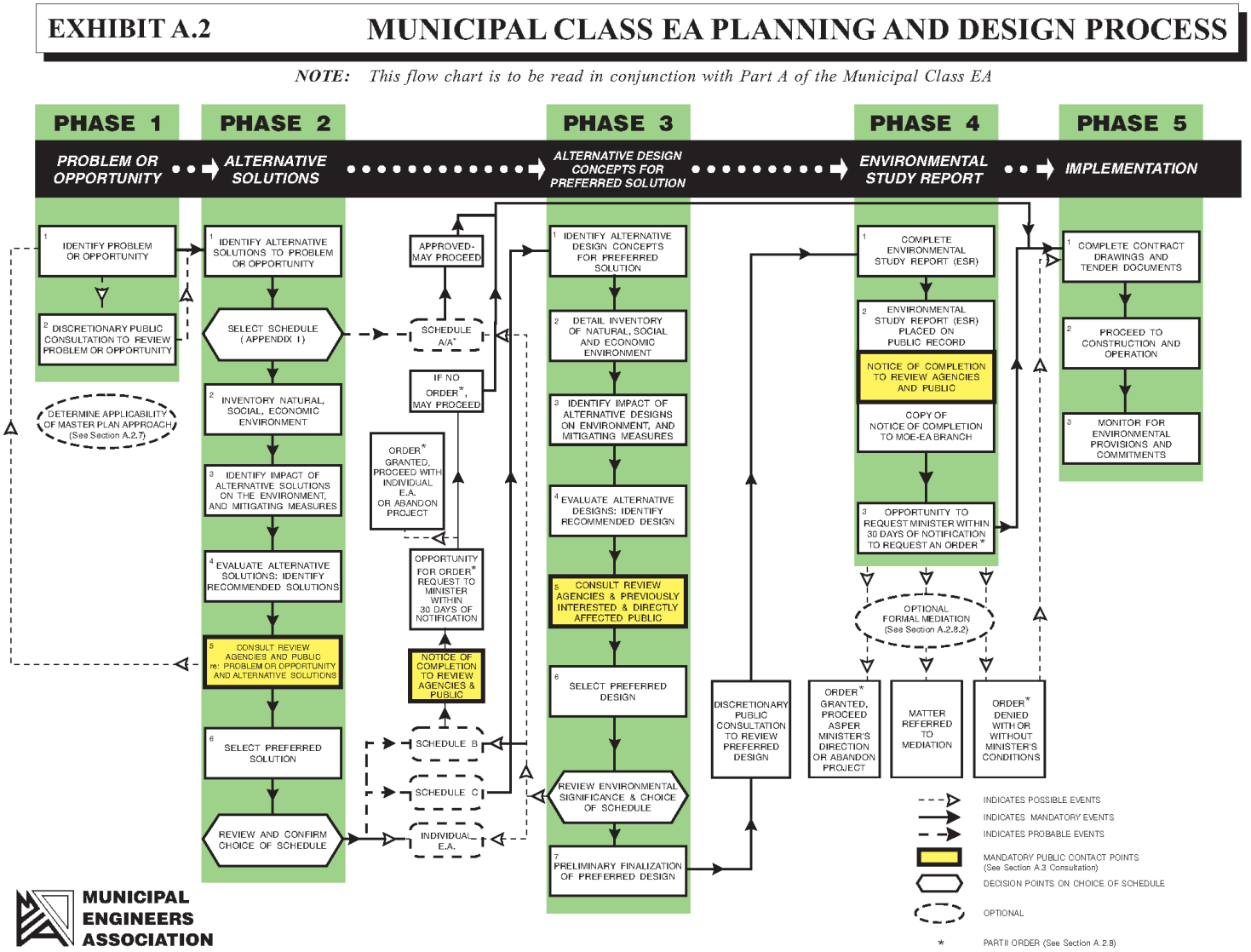
A flow chart describing the Class EA planning and design process involved in the above five (5) phases is shown in **Figure 2**. The amended Class EA process provides for the following designations of projects depending upon potential impacts:

Schedule A Projects are limited in scale, have minimal adverse environmental effects and include a number of municipal maintenance and operational activities. These projects are pre-approved and may proceed to implementation without following the full Class EA planning process. Schedule A projects generally include normal or emergency operational and maintenance activities.

Schedule A+ These projects are pre-approved and may proceed to implementation without following the full Class EA planning process, although the public is to be advised prior to implementation. The purpose of Schedule A+ projects is to ensure public notification of certain pre-approved projects and allow the public an opportunity to comment to Council.

Schedule B Projects have the potential for some adverse environmental effects. These projects are approved upon completion of Phases 1 and 2 and subject to screening. The process involves mandatory contact with directly affected public and relevant review agencies, to ensure they are aware of the project and that their concerns are addressed. If there are no outstanding concerns, then the proponent may proceed to implementation. Schedule B projects generally include improvements and minor expansions to existing facilities.

Figure 2 – Class EA Planning and Design Process Flow Chart



Schedule C Projects have the potential for significant environmental effects and must proceed under the full planning and documentation procedures specified in the Class EA document. Schedule C projects require that an Environmental Study Report be prepared and filed for review by the public and review agencies. Schedule C projects generally include the construction of new facilities and major expansions to existing facilities.

The Class EA process also provides an appeal process to change the project status. Under the provisions of Subsection 16 of the amended EA Act, there is an opportunity under the Class EA planning process for the Minister to review the status of a project. Members of the public, interest groups and review agencies may request the Minister to require a proponent to comply with Part II of the EA Act, before proceeding with a proposed undertaking.

This is what is known as a "Part II Order" (formerly called a 'bump-up request'). The Minister determines whether or not this is necessary with the Minister's decision being final. The procedure for dealing with concerns which may result in the Minister, by order, requiring the proponent to comply with Part II of the Act is outlined in the Municipal Class EA document.

The Municipal Class EA document identifies various potential sanitary upgrade / activities associated with the Colborne Industrial Park as a Schedule B project due to the following criteria:

> "Establish, extend or enlarge a sewage collection system and all works necessary to connect the system to an existing sewage outlet where such facilities are not in an existing road allowance or an existing utility corridor."
>
> "Water crossing by a new or replacement sewage facility except for the use of Trenchless Technology for water crossings."
>
> And
>
> "Construct new pumping station or increase pumping station capacity by adding or replacing equipment and appurtenances, where new equipment is located in a new building or structure."

As such, the Class EA for required sanitary system upgrades to the Colborne Industrial Park Area has proceeded as a Schedule B activity under the Class EA process, which requires completion of Phases 1 and 2.

3.0 Existing Conditions

This section provides the characteristics of the Study Area in order to provide a baseline description of the area. This section also provides context for site identification and evaluation. A baseline was established in order to be able to assess the impacts of each identified alternative solution.

3.1 Natural Environment

In order to assess the natural environment of the Study Area, field investigations were completed by Wills' biologists. The field investigations have been compiled in a report entitled "Colborne Industrial Park Sanitary Sewer Existing Conditions Assessment" which is included in **Appendix A**.

The following assessment tasks were conducted to establish a baseline of the existing conditions at the Study Area.

- A search for federal and provincial Species at Risk (SAR) in the Study Area.
- Background information collection on aquatic species present in Colborne Creek from the Ministry of Natural Resources and Forestry (MNRF).
- The completion of site assessments of the alignments where the following information was noted:
    - Terrestrial Habitat;
    - Incidental wildlife present;
    - Watercourses and aquatic habitat within or crossing the Study Area; and,
    - SAR.

The following provides a summary of the existing conditions in the Study Area. A more detailed assessment of the alternative solutions sites was conducted following the identification of specific sites for each alternative solution. These findings are outlined in **Section 6.1 Natural Environment Considerations.**

3.1.1 Species at Risk

A geographical search for rare species and associated habitat was conducted using the MNRF's Natural Heritage Information Centre (NHIC) database. A search of the NHIC 1 km square for the Study Area was completed for provincial SAR designation. No results were generated for any of alignment alternatives. Additionally, the MNRF was contacted for any SAR found in the area. The MNRF provided a list of SAR occurrences in the immediate (1 km) and general (5 km) area of the proposed works and attached as **Appendix A**.

The Fisheries and Oceans Canada (DFO) mapping for the area covered by Lower Trent Conservation was reviewed for any aquatic SAR listed under the Species at Risk Act (SARA). No listed species were noted for this watercourse.

3.1.2 Fisheries Information

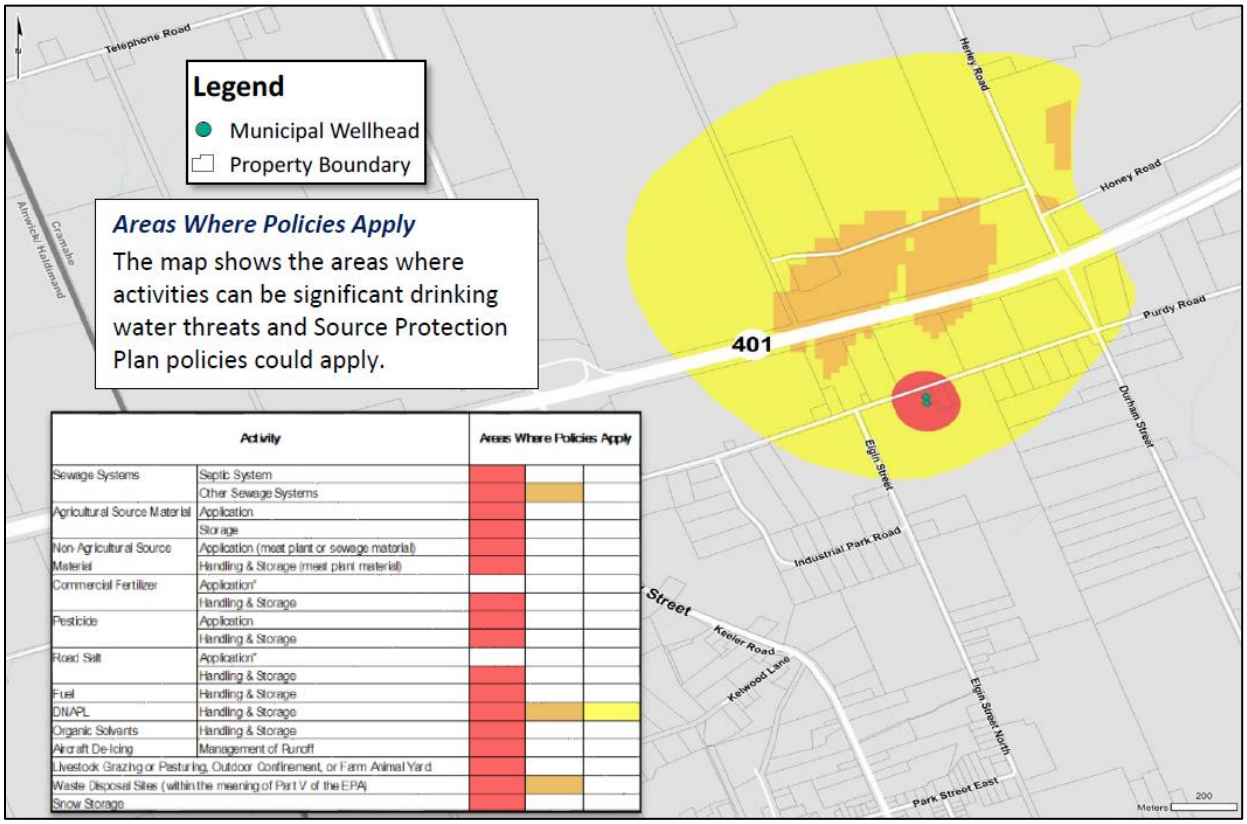
The MNRF was also contacted for any fisheries information for Colborne Creek and its tributaries within the Study Area. The MNRF provided a fish species list for this watercourse listed in Table 1 of **Appendix A.**

Both the north and south headwater tributaries appear to be associated with an unevaluated wetland that drains an area east of Elgin Street North. They join approximately 350 m downstream of Percy Street. This combined tributary flows into the main Colborne Creek just west of the Town of Colborne, approximately 1.4 km further downstream. Since the fish species list is for the entire watercourse, it can be assumed that the majority of species would be found in the lower reaches (downstream of Percy Street) where the Colborne Creek is larger, well defined and provides suitable habitat.

3.1.3 Source Water Protection

The municipal well for Colborne is located on Purdy Road. The source water protection area for the municipal well extends into the project boundaries as indicated in **Figure 3**. The full source water protection fact sheet for the Colborne municipal well is included in **Appendix A.**

Figure 3 – Source Water Protection



3.2 Cultural Environment

A Stage 1 Archaeological Assessment was completed for the Study Area by Northeastern Archaeological Associates Ltd. The full report is attached as **Appendix B**.

The Study Area is located in the Iroquois Plain physiographic region of southern Ontario (Chapman and Putman 1984). A search of the Ontario Archaeological Sites Database (maintained by the Ministry of Tourism, Culture, and Sport) was carried out for the Stage 1 Archaeological Assessment. The results of this database search indicated that there are no registered sites located in the Study Area or within a radius of 1 km. The database search indicated that the closest registered sites are more than 25 km away, near Weller's Bay. The lack of recorded sites nearby may be due to a lack of archaeological research in the area and does not preclude the possibility of historic or pre-contact cultural heritage resources being found in the Study Area.

A more detailed assessment of the areas associated with the alternative solutions was conducted following the identification of Study Area for each alternative solution. These findings are outlined in **Section 6.4 Social Considerations**.

3.3 Economic Environment

The Township is one of seven lower-tier municipalities that form the County of Northumberland. The Township was established by the amalgamation of the Township of Cramahe and the Village of Colborne. The Township is represented by a Mayor, Deputy Mayor, and three (3) Councilors. Colborne is the largest population center in the Township. The 2016 Canadian Federal Census recorded the population of Colborne at 1,577 persons.

The Township is actively working to attract and retain business. The Township has created a "Development Team" that works with business owners to expand their business and to attract new business. The Study Area is designated Employment Area and Rural as provided in **Figure 4**. The existing sanitary sewer system in the employment area is not sufficient to allow for additional development within the currently designated employment lands. This Study has been initiated in part to allow for further industrial development in the areas designated for employment.

3.4 Planning Considerations

Cramahe's Official Plan (OP), was adopted by Council in 1997 and approved by the Ministry of Municipal Affairs and Housing on March 26, 1998 with modifications. The purpose of the official plan is to set out broad and general policy direction and guidance on land use planning matters within the Township. The OP is currently undergoing a five (5) year update to bring the OP into compliance with current provincial legislation and policy. **Figure 5** illustrates the location of the Colborne Municipal Drinking System and the associated Wellhead Protection Area - A (WHPA - A) within Cramahe as provided in the Trent Source Protection Plan. Alternatives were evaluated based on current planning conditions and the potential for expansion of servicing options for future capacity.

Figure 4 – Official Plan Schedule "A" Land Use Plan

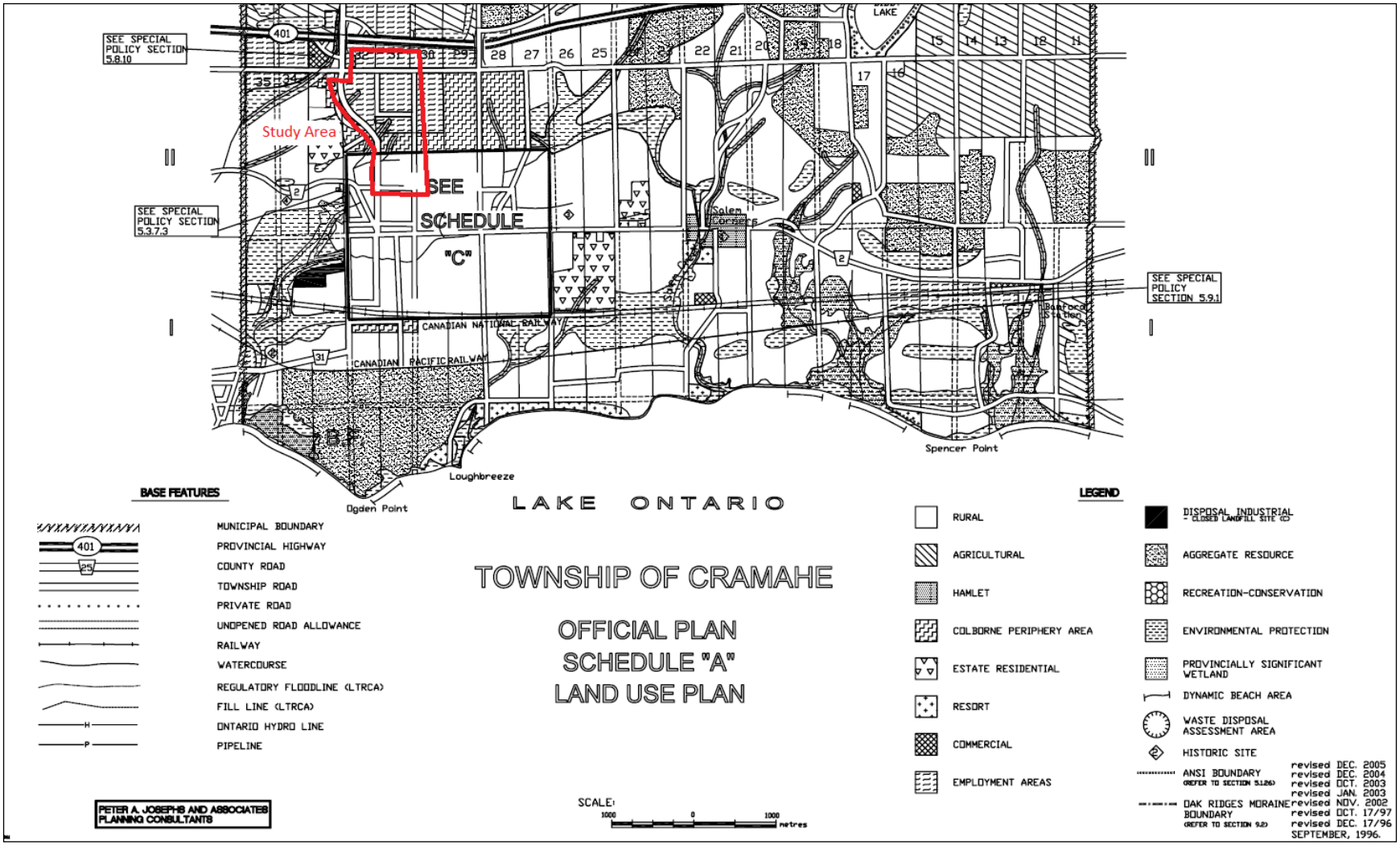
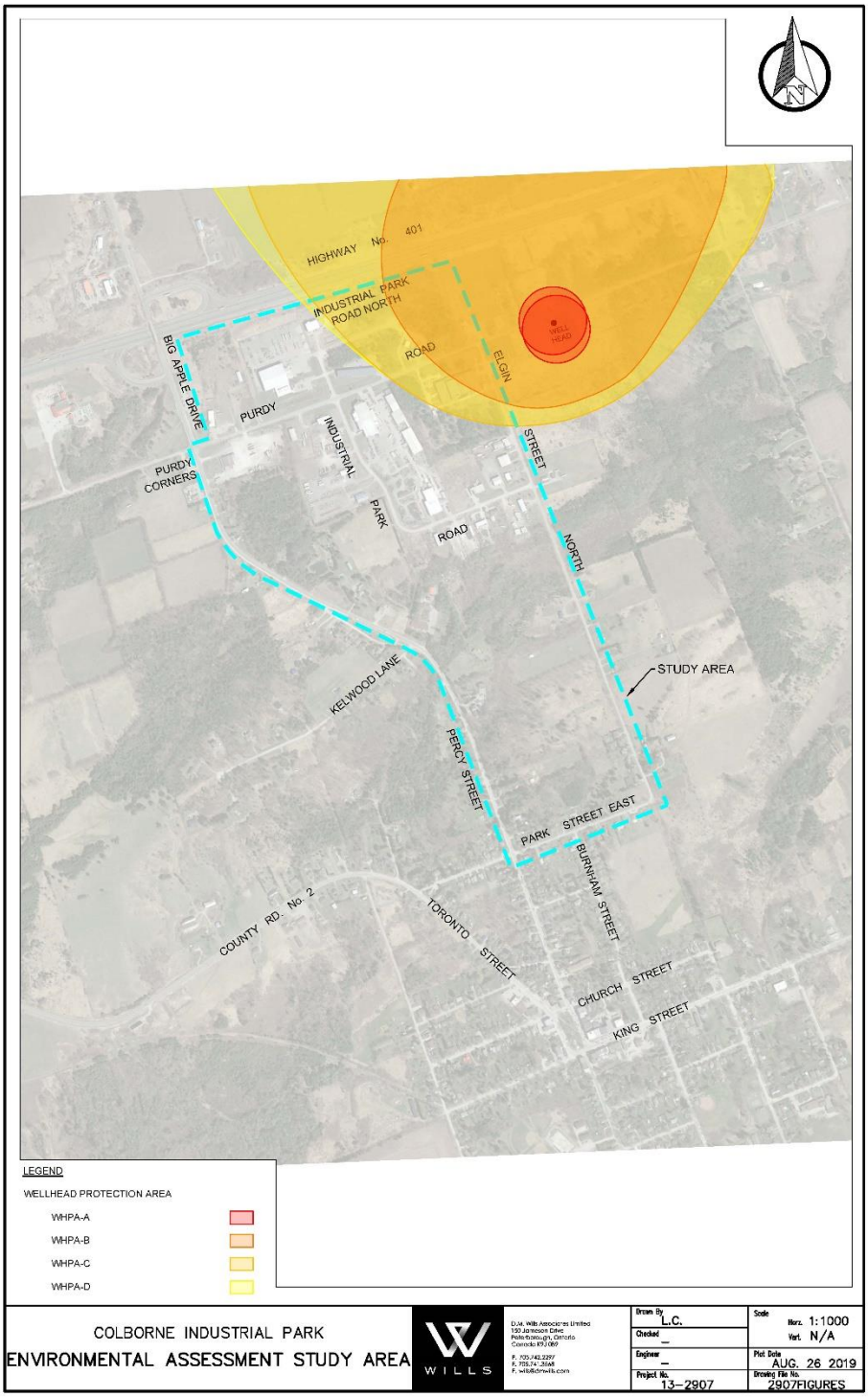


Figure 5 – Study Area imposed on WHPA Mapping



3.5 Existing Sanitary Servicing within the Study Area

A Small Diameter Sanitary Gravity Pipe (SDGP) network currently services part of the existing Industrial Park. The SDGP system is propriety technology designed by Clearford Water Systems (Clearford) which is headquartered in Ottawa, Ontario. The SDGP uses the following technology to convey wastewater to the Wastewater Treatment Plant (WWTP):

- Underground tanks that receive raw sewage from each connected source. Underground tanks are meant to collect the majority of the solid portion of the wastewater generated by each user and release effluent by gravity to the sanitary pipe network.
- SDGP's that convey the liquid portion of wastewater and approximately 25% of the suspended solids to the existing Colborne WWTP through a connection to the conventional sanitary network in Colborne on Percy Street.

The existing sanitary pipe network within the Colborne Industrial Park was designed and installed in 2005. The existing network is shown in **Figure 6.**

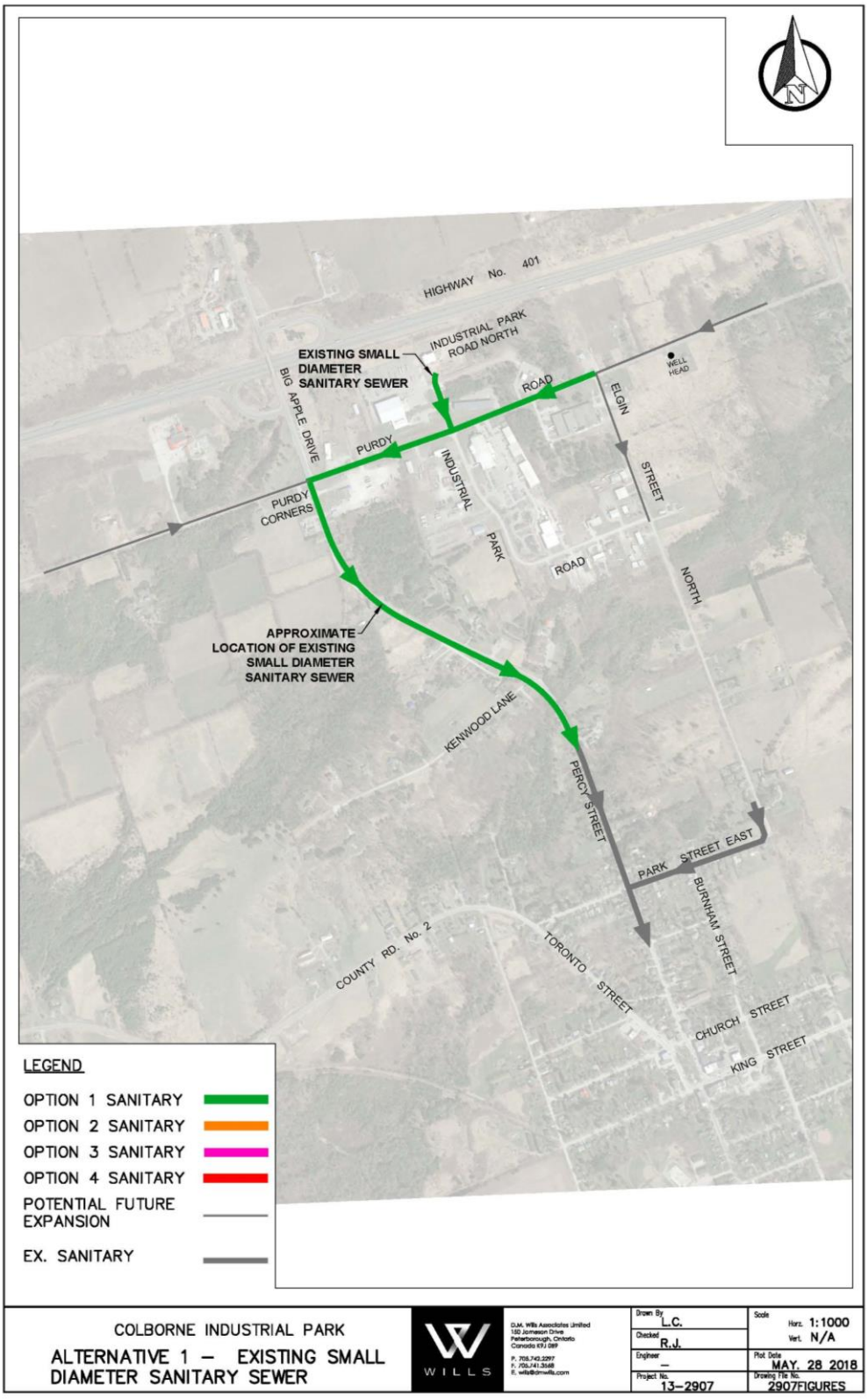
In 2017, Clearford was contracted by the Township to complete a report to verify the remaining capacity of the existing SDGP system; the report is located in **Appendix C.** Based on the report, the existing SDGP sizes are as follows:

- 100 mm Ø (nominal); Purdy Road.
- 150 mm Ø (nominal); Percy Street.

The following industries and businesses are connected to the SDGP:

- 301 Big Apple Drive; Ultramar.
- 289 Big Apple Drive; Tim Hortons.
- 292 Big Apple Drive; Durham Transport.
- 32 Industrial Park Road; Northumberland Waste Transfer Station.
- 116 Industrial Park Road; Ontario Agri-Food Venture Center / Real Flex Solar.
- 232 Purdy Road; Cramahe Fire / EMS Building.
- 209 Purdy Road; Cam Tran.
- 263 Purdy Road; CCC Plastics.
- 188 Purdy Road; Anixter Power Solutions.

Figure 6 – Existing Small Diameter Sanitary Sewer



The Clearford report concluded:

> "Based on Compiled flow information and the sewer hydraulic analysis, it appears that most segments of the sewer system are nearing their design peak flow conveyance capacity."
>
> "For the estimated average flow conditions, most segments appear to have 10-20% remaining capacity except for segment B-D along Purdy Road which may have reached or exceeded its capacity. "

The Clearford report made several recommendations, including the following:

> "Expansion of the Small Bore Sanitary (pipe) servicing in the Industrial Park would provide an opportunity to redesign the existing system, add additional capacity to accommodate future growth, and provide full sewer servicing to the entire area."

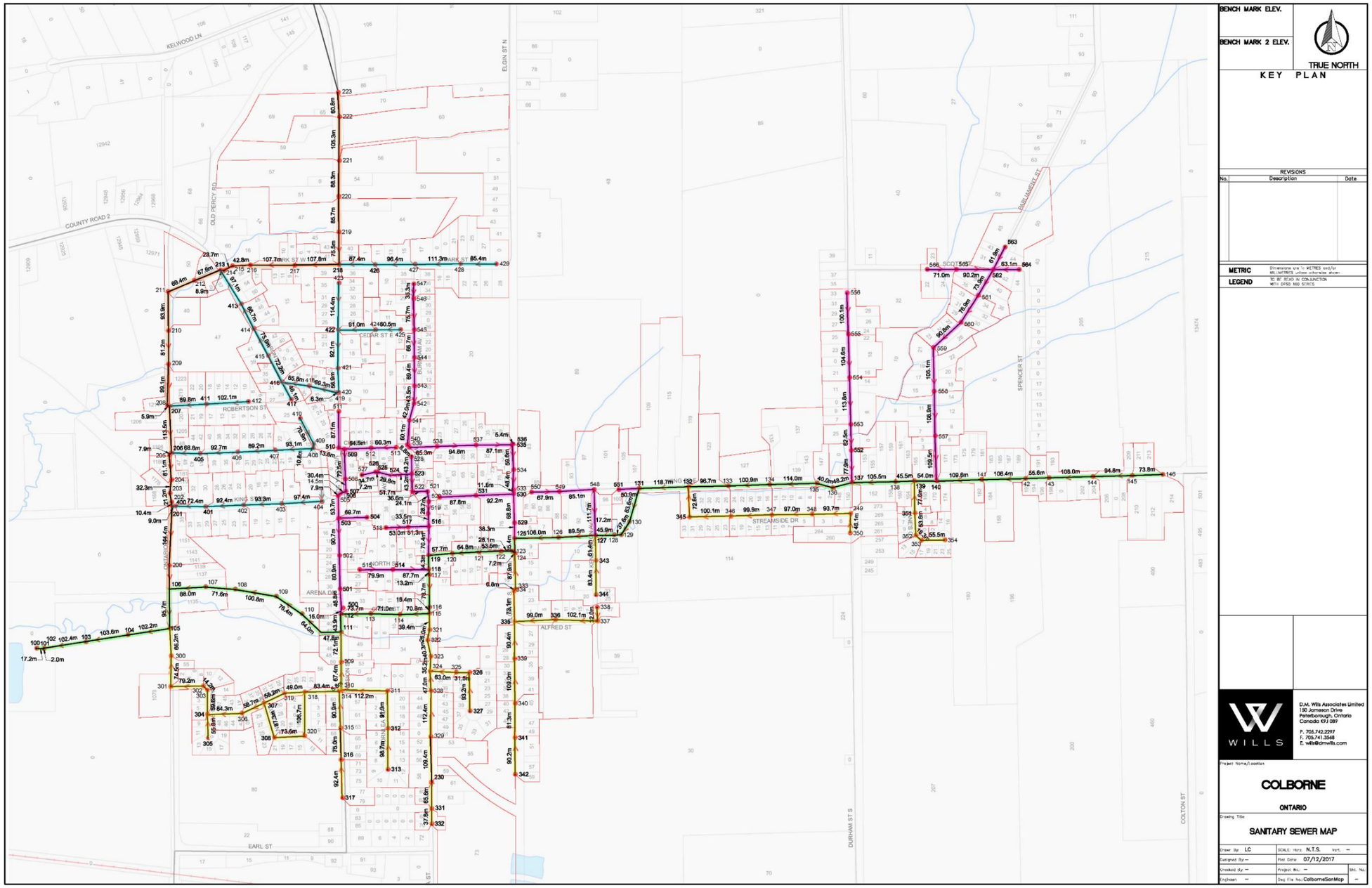
Based on the recommendations and conclusions of the Clearford Report, the existing SDGP is reaching or exceeding its sanitary conveyance design capacity. An expansion of the existing system alone would not add additional capacity to the existing system and a redesign of the SDGP would be required to expand sanitary service to the entire industrial zoned area.

3.6 Existing Conventional Gravity Sewer Pipe and Waste Water Treatment Plant

The Colborne sanitary sewer system collects and conveys wastewater flows to the Cramahe Township Wastewater Treatment Plant (WWTP), which has an environmental compliance approval average effluent objective limit of 1,745 m^3/day. The average daily flow received by the WWTP is 1,264.1 m^3/day based on the 2016 / 2017 sanitary flow records from the WWTP. It was noted that during dry periods the average flow of the WWTP can be as low as 700 m^3/day which indicates that there are large amounts of inflow and infiltration from groundwater and stormwater entering the sanitary network. At present, the Township is undertaking investigations into the sources of inflow and infiltration with the goal of reduction. The investigations are being completed in separate projects.

The SDGP system connects to the Colborne conventional diameter gravity sewer pipe on Percy Street, south of Kelwood Lane (see **Figure 6**). The total Colborne sanitary system is just over 15,000 m in cumulative length and is illustrated in **Figure 7.**

Figure 7 – Existing Colborne Sanitary Collection Network



4.0 Phase 1: Problem / Opportunity Statement

The Problem or Opportunity step of the Class EA planning and design process requires proponents to document why infrastructure improvements are needed and develop a problem or opportunity statement that clearly identifies what is being investigated.

Based on the need for upgrades to the Cramahe Industrial Park Sanitary System and the background information laid out in the above sections the problem / opportunity statement is as follows:

> The existing sanitary sewer network within the Colborne Industrial Park is at or near capacity. Therefore, a sewage network upgrade is necessary to maintain service to the existing customers within the industrial park, and which also allows for additional development within the designated employment lands.

5.0 Phase 2: Identification of Alternative Solutions

The first step in Phase 2 – Alternative Solutions of the Municipal Class EA planning and design process involves the identification of alternative solutions to potentially address the identified problem or opportunity.

The following alternatives solutions were considered:

Alternative #1 - "Do Nothing": Existing Sanitary Sewer

Alternative #1 includes maintaining the existing SDGP in the Industrial Park. A more detailed discussion and analysis of this alternative will be presented in **Section 6.0**. No capital construction is proposed.

Alternative #2 – Easement from Industrial Park Avenue

Alternative #2 proposes to replace the existing sanitary sewer network in the Colborne Industrial Park with an expanded capacity sanitary network and marginally increase the service to designated employment lands. The proposed Alternative #2 alignment is shown in **Appendix D**. Alternative #2 proposes to install sanitary mains on Purdy Road, and Industrial Park Road, which will converge at a new easement between Industrial Park Road and Percy Street to connect with the existing sanitary system on Percy Street. The proposed easement is required through the private land parcels currently owned by Elona Barth. A more detailed discussion and analysis of this alternative will be presented in **Section 6.0**.

Alternative #3 – Sewage Pumping Station

Alternative #3 proposes to replace the existing sanitary sewer network in the Industrial Park with an expanded capacity sanitary network in terms of pipe size (sanitary capacity) and area serviced. The proposed Alternative #3 alignment is shown in **Appendix D**. The proposed alternative is to install sanitary mains on Purdy Road, Industrial Park Road and Elgin Street North, out letting to a proposed sewage pumping station on Elgin Street North. The proposed pumping station will connect to a proposed forcemain installed along Elgin Street which outlets into the existing gravity system on Park Street East. A more detailed discussion and analysis of this alternative will be presented in **Section 6.0**.

Alternative #4 – Easement from Elgin Street

Alternative #4 proposes to replace the existing sanitary sewer network in the Colborne Industrial Park with an expanded capacity sanitary network in terms of pipe size (sanitary capacity) and area serviced. The proposed Alternative #4 alignment is shown in **Appendix D** and generally included the installation of sanitary mains on Purdy Road, Industrial Park Road and Elgin Street. This alternative is similar in serviced area to Alternative #3; however, a pump station is not required. This alignment will make use of a proposed easement between Elgin Street and Percy Street, which is located on private property currently owned by Linda Hinton. The proposed sanitary main will outlet to the existing Colborne sanitary system, which is located at the west end on the proposed easement at Percy Street. A more detailed discussion and analysis of this alternative will be presented in **Section 6.0**.

6.0 Evaluation of Alternatives

The following sections shall evaluate the four alternatives based on the impacts to the natural, cultural and economic environment as well as future development potential.

6.1 Natural Environment Considerations

6.1.1 Source Water Protection

Alternative #1 will have minimal impacts to the source water of the municipal well due to no construction activities occurring.

The installation of sanitary mains for Alternatives #2, #3 and #4 will not likely affect the source water for the municipal well because Dense Non-aqueous Phase Liquid (DNAPL's) are not released during normal construction activities. The contractor responsible for installing the sanitary infrastructure will be required to have a spill plan in place, and will not be permitted to wash vehicles and equipment or store substances which contain DNAPL's within the WHPA. A DNAPL fact sheet published by the Lower Trent Conservation Authority is located in **Appendix A**.

6.1.2 Existing Conditions Assessment – Natural Environment

The following sections will discuss the potential impacts that each alternative may have on the natural environment. An Existing Conditions Assessment is prepared for the studied alternatives and is included in **Appendix A**. A summary of the results is located below.

Alternative #1

The existing natural environment will not be affected further because no additional construction activities are proposed. The existing natural environment of Alternative #1 was not studied.

Alternative #2

Alternative #2 as defined in Section 5.0 is located within the existing Rights-of-Way's (ROW) of Industrial Park Road and Purdy Road except where the alignment crosses undeveloped land between Industrial Park Road and Percy Street. A study of the undeveloped land showed that the land is covered with vegetation and tree species including white birch, white cedar, black cherry and others. However no endangered or SAR vegetation species were identified.

The Existing Conditions Report noted that there is a natural drainage feature where a small watercourse (channel) drains through the undeveloped area. The channel has a width between 0.2 m and 2.2 m and depths between 0.09 m and 0.17 m. There were watercress plants located in the channel which indicates groundwater is responsible for part of the flows within the channel. The channel did not have any pooling features which could sustain overwintering fish species.

Signs of wildlife were noted, although no wildlife was spotted. A detailed description of the Site investigation and potential impacts is located in **Appendix A**.

Alternative #3

Alternative #3 is located within the existing ROW, however depending on the size of the proposed sanitary pumping station some land acquisition may be required adjacent to the ROW on Elgin Street North.

The Existing Condition Assessment noted that the land is generally cleared throughout the ROW but there is an unevaluated wetland outside of the road allowance in the low area on Elgin Street North. The wetland is noted to contain Sugar Maple, White Birch, cottontails and other species indicative to wetlands. There were no SAR noted during the site investigation.

The alignment crosses two watercourses on Elgin Street North in proximity to the wetland which are associated with a headwater tributary of Colborne Creek. The water courses are conveyed under the ROW by a 400 mm diameter culvert and double 600 m diameter culverts respectively. Should this alignment be selected as the preferred alternative, additional environmental investigation may be required if additional land is

required outside of the ROW to accommodate a sanitary pumping station. Additional information regarding the existing conditions is in **Appendix A**.

Alternative #4

Alternative #4 is located within the existing ROW, similar to Alternative #3; however, the proposed alignment for Alternative #4 crosses undeveloped land between Percy Street and Elgin Street North. Wills biologists studied the undeveloped land associated with this alternative and noted that the area can be divided into two vegetative communities and identified as the western and eastern portions. The western portion is a densely vegetated forest with various plant and tree species such as sugar maple, white pine, etc. The eastern portion is primarily grasses and open fields. A stream traverses the northwest portion of the undeveloped land which was determined to be too small to contain fish habitat. The landowner confirmed that the stream did dry up during the summer and fall months. Although no SAR were detected, Alternative #4 has moderate potential for the presence of Barn Swallow and Bobolink habitat.

6.2 Archaeological Considerations

As detailed in the Stage 1 Archaeological Assessment (located in **Appendix B**), the Colborne area has a well-documented and fairly intensive history of 19th Century Euro-Canadian settlement in addition to the following factors:

- There is an unregistered pre-contact archaeological site roughly 1 km east of the Study Area.
- The Study Area includes features (elevated topography next to wetlands and secondary watercourses) that would have made it suitable for aboriginal use and habitation.
- A 19th Century church and cemetery were built nearby.
- Five 19th century transportation corridors are within the Study Area.
- There are wetland zones and small creeks nearby.

These factors contribute to an assessment that finds the Study Area to have archaeological potential. A Stage 2 Archaeological Assessment is recommended for Alternatives# 2-4 due to the historic corridors and crossing undeveloped land. Alternative #3 also uses historic corridors with the addition of a pumping station that may be built on undeveloped land. No alternative presents a clear advantage over another with regard to archaeological feasibility.

With all alternatives requiring the same level of additional investigation, and presenting equal risk for delay and extra fees, archaeological considerations become equal factors in choosing a preferred alternative.

6.3 Development Potential Considerations

The Township identified potential future expansion of the serviceable area as an important component of the assessments of alternatives. Several areas adjacent to the Study Area have been identified as potential employment areas in the Official Plan and will therefore require municipal services in the future.

An expansion of sanitary servicing capacity will be required to service additional sanitary load in the Industrial Park. Without allowance for additional capacity within the Employment Area designated lands, there will be limited potential growth within and outside of the existing Industrial Park.

The capacity to service adjacent areas was included in the assessment of alternatives. The following provides an assessment of the alternatives potential for future expansion.

Future Expansion A

- Provide full diameter sanitary sewers for 800 m on Orchard Road west of the Percy Street intersection. There is some existing commercial on Orchard Road although the designation beyond the existing commercial is currently rural use. It is possible that in the future the designation will change to permit additional employment uses along Orchard Road.
- Any sanitary development along Orchard Road will require a sanitary lift station approximately 250 m west of the Percy Street intersection, where there is a natural low in the topography.
- Future Expansion A includes 22.1 ha of area.
- **Future Expansion A could be added to Alternative #2, #3 and #4.**

Future Expansion B

- Provide full diameter sanitary sewers for 600 m on Purdy Road east of the Elgin Street intersection. This land is currently designated Employment Area and Rural. There is potential for future additional employment uses.
- Future Expansion B includes 42.8 ha of area.
- **Future Expansion B could be added to Alternative #2, #3 and #4.**

Future Expansion C

- Provide sanitary sewers for 650 m on Kelwood Lane, which connects to the sanitary sewer pipe on Percy Street. Kelwood Lane is designated Estate Residential and Colborne Periphery and currently has approximately 16 homes.
- Future Expansion C includes a total of 19.7 ha of area.
- **Future Expansion C can be added to Alternative #2**.

6.4 Social Considerations

The following details the social considerations which the proposed alternatives will have on Colborne.

6.4.1 Service Disruptions

Proposed construction within existing road ROW will result in temporary traffic disruption to businesses during the construction period. Vehicular traffic will be re-routed around the construction zone, which could cause minor delays. Some short-term traffic detours would be required during the construction period.

Alternative #2 and #4 connect the sanitary system to Percy Street, which will cause some disruption to traffic between the 401 Highway and Colborne downtown during the construction period.

Alternatives #2, #3, and #4 include construction of sanitary infrastructure at the intersection of Percy Road, Purdy Road and Orchard Drive. This is a key intersection for local businesses that are located directly off the 401 Highway. There will be some disruption to traffic during the construction of sanitary infrastructure at this intersection.

The contractor will be responsible for handling and by-pass pumping sewage flows, therefore a disruption in sanitary sewage collection services would be minimal.

6.4.2 Recreation and Tourism

Colborne is a tourism center, with local attractions such as the Big Apple, and adjacent attractions such as Presqu'ile Provincial Park in Brighton which bring people into and through the community.

The traffic disruptions noted above will have a minor impact on local tourism during the construction period.

6.5 Economic Considerations

This section summarizes project capital costs (economic impacts), operation and maintenance costs as well as providing a 20-year Net Present Value (NPV) evaluation of the alternatives.

6.5.1 Capital Costs

One of the major economic impacts considered is the upfront Capital Construction Costs (Capital Cost). Preliminary Capital Cost estimates are included in **Appendix E**.

Costs presented are preliminary estimates only. They provide an order of magnitude cost for the comparison and evaluation of alternative solutions. Actual costs will be subject to confirmation of detailed design requirements, site-specific conditions, and regulatory requirements at the time of design and construction. The following will provide a summary of the proposed capital costs for each alternative.

Alternative #1

Naturally, the "Do Nothing" alternative involves no upfront capital costs. The existing system has required frequent flushing and maintenance, notably the removal of wire from inside the pipes that was causing blockages. Regular flushing will be required due to flat pipe grades and as the existing system approaches the end of its life, it will necessitate replacement of the existing pipe within 10 years, which is expected to cost $1,000,000 by using trenchless technologies.

Alternative #2

The preliminary cost estimate for construction of Alternative #2 is $3,800,000. There may be additional costs to obtain the land use agreement for the easement between Industrial Park Road and Percy Street. This alternative provides moderate potential for growth in the area. This system would involve very little maintenance for the life of the system.

Alternative #3

The preliminary cost estimate for construction of Alternative #3 is $5,230,000. This Alternative provides moderate potential for growth in the area. Most of the system would generally require very little maintenance however, the pumping station would require regular maintenance even under normal operating parameters.

Alternative #4

The preliminary cost estimate for construction of Alternative #4 is $4,458,000. There may be additional costs to obtain the land use agreement for the easement between Elgin Street North and Percy Street. This alternative provides good potential for growth in the area. This system would involve very little maintenance for the life of the system.

6.5.2 Operation and Maintenance Costs

The alternatives being considered use varied solutions to address the problem. Therefore, the operation and maintenance costs will be varied and have been estimated and factored into the evaluation. The following will address the Operation and Maintenance (O & M) costs of each alternative.

Alternative #1

The existing alternative has relatively high O & M costs. From discussions with the Township, the system is currently flushed several times a year amounting to a yearly maintenance cost of $20,000 (2018 dollars).

Alternative #2

The proposed gravity system in Alternative 2 will have relatively low O & M costs. Gravity systems typically have low O & M costs due to the energy required to move the sewage being provided by gravity. Periodic flushing is required for all gravity systems sanitary systems to remove debris that may be too heavy to be flushed during the day to day operation of the system. At the present time, the Township completes flushing on the existing gravity sewer within Colborne on an as needed basis. It is expected that the proposed Alternative #2 sanitary pipe will also be flushed on an as-needed basis so that $5,000 is required every five years will be required for spot flushing.

Alternative #3

Alternative #3 provides a combination of gravity and forced sewage pumping. This alternative will require the same periodic flushing as in Alternative#2, which is $5,000 every five years. Alternative #3 will require additional O & M costs for a pump station, including electricity, maintenance, and equipment replacement costs. Based on similarly sized sanitary pumping stations, a total yearly O & M cost for the pump station is estimated to be $15,000.

Alternative #4

Similar to Alternative #2, Alternative #4 will require periodic flushing of the gravity system with associated O & M cost of $5,000 every five years.

6.5.3 Net Present Value

To compare the four alternatives in terms of capital costs and maintenance costs, the total value of the project is considered over a 20 year period. The Net Present Value (NPV) is calculated as follows:

$$NPV = C_0 + \sum_{i=1}^{T} \frac{C_i}{(1+r)^i}$$

Where:

C_0 = Initial investment (capital cost)

C = Repeating Cost (O & M costs)

r = Discount Rate (inflation rate used at the inflation rate of 2.5% based on the Bank of Canada)

T = Time (where: Year 0 = 2019, Year 1 = 2020, and Year 20 = 2040)

A summary of the total project costs over a 20-year period is provided in **Table 2.**

Table 1 – Net Present Value

Alternative #	Capital Cost	O & M Costs	Net Present Value
1[1]	$ 1,000,000 [2]	$ 20,000 / year	**$ 1,092,981.65**
2	$ 3,8000,000	$ 5,000/ 5 years	**$ 3,814,828.95**
3	$ 5,230,000	$ 15,000/year plus $ 5,000/ 5 years	**$ 5,478,666.38**
4	$ 4,458,000	$ 5,000/ 5 years	**$ 4,472,828.95**

Notes:

1) Alternative #1 does not address the problem statement, but was included in the evaluation to demonstrate the economic impact of maintaining the status quo.
2) The shown Capital Cost is estimated for pipe replacement of the small diameter gravity pipe system within 10 years (approximately in the year 2030). The Capital Cost shown does not include the initial Capital Cost.

Based on the above table, Alternative #1 has the lowest NPV because the initial Capital Costs and past O & M costs have not been included. Alternative #1 also has the highest O & M costs of all the Alternatives.

Although Alternatives #2, #3, and #4 address the problem statement, the alternatives do not all have the same potential benefit. In order to compare not just the cost, but also the value of each alternative it should be noted that this value comparison does not include potential future tax base or employment opportunities within Colborne that would have a net positive financial impact on the community.

The total NPV is compared against the amount of developable land including potential future sanitary expansion areas. Therefore a NPV cost per hectare of serviceable land can be determined as shown in **Table 2.** The NPV per hectare cost is an indicator of the total cost for developing land, and can help determine which is the most cost effective alternative.

Table 2 – NPV Compared to Serviceable Area

Alternative #	NPV	Total Serviceable Area (including Potential Future Expansion)	NPV / ha
1[1]	$ 1,092,981.65	40.8 ha	**$ 26,788.77 / ha**
2	$ 3,814,828.95	180.4 ha	**$ 21,146.50 / ha**
3	$ 5,478,666.38	211.8 ha	**$ 25,867.16 / ha**
4	$ 4,472,828.95	211.8 ha	**$ 21,118.17 / ha**

Notes:

1) Alternative #1 does not address the problem statement, but was included in the evaluation to demonstrate the economic impact of maintaining the status quo.

Based on the results of Table 2, Alternative #4 is the most cost effective alternative for developing the existing industrial park and expanding sanitary service to surrounding areas.

6.6 Public, Stakeholder and Agency Consultation

A vital component of the Municipal Class EA process is public, stakeholder and review agency consultation. This section describes the consultation process with respect to the presentation of the problem and alterative solutions that was carried out as part of this study, prior to selecting the preferred alternative for the project.

6.6.1 Notice of Study Commencement

A Notice of Commencement was sent out by regular mail to a list of stakeholders in the Study Area as well as posted in the Northumberland News newspaper on March 1, 2018. A copy of the Notice of Commencement and the project mailing list is included in **Appendix F**.

6.6.2 Public Information Centre

The Public Information Center (PIC) took place on Wednesday March 21, 2019 from 6:00 P.M. to 9:00 P.M. at the Cramahe Municipal Administrative Building. The PIC provided the opportunity for the public to review the problem statement and alternative solutions and to provide the project team will feedback. The notice of PIC was sent by regular mail to private residents (homeowners) with properties in the Study Area as well as advertised in the Northumberland News. Information presented at the PIC is included in **Appendix G**.

Nine (9) people chose to sign the sign in sheet and four people chose to leave written comments. The following table summarizes the comments received.

Table 3 – Summary of Public Comments

Comment	Response
We do not want to have City water or sewer from Town. We have a dug well and sceptic [*sic*] works good. Water is very good. Toilet flushes great and we will not like to have to pay for upgraded for something that is not broken [sic]. We would like to be informed of any development or discussion on this mater [sic], day or night will be available [sic].	This is outside the scope of the project however, the Township of Cramahe staff will keep the members of the public informed of any decisions that may be made in terms of sewer or water connection.
Option #4 looks like it will be less disruptive and hopefully the lowest cost.	Option 4 is the preferred Alternative.
I prefer Option 4.	Option 4 is the preferred Alternative.
I prefer Option 4.	Option 4 is the preferred Alternative.

6.7 Evaluation Summary

The key features of the four alternatives are summarized in **Table 4.** The main considerations have been ranked for each alternative to help compare their effects within the Study Area. The ranking is as follows:

Most Favourable	Medium	Least Favourable

The above rankings, are relative to each other and do not constitute absolute rankings.

Table 4 – Summary of the Colborne Industrial Park Sanitary Alternatives Key Features and Issues

Requirement	Alternative #1	Alternative #2	Alternative #3	Alternative #4
Does the Alternative provide a solution to the problem?	No	Yes	Yes	Yes
Environmental Consideration	Short term, no environmental impact.	Some environmental impacts.	Some environmental impacts.	Some environmental impacts.
Archeological Consideration	No further archeological potential impacts.	High archeological potential.	High archeological potential.	High archeological potential.
Summary of Public Input	No responses received.	No responses received.	No responses received.	Three members of the public preferred this alternative.
Economic Consideration: Capital Cost	Lowest Capital Cost for future replacement.	Medium Capital Cost.	Highest Capital Cost.	Medium Capital Cost.
Economic Consideration: O & M Costs	Highest O & M Cost.	Lowest O & M Cost.	High O & M Cost.	Lowest O & M Cost.
20 year Net Present Value compared to Hectares of developable land.	Medium NPV per hectare of land developed.	Medium NPV per hectare of land developed.	Highest NPV per hectare of land developed.	Lowest NPV per hectare of land developed.
Development Potential	No Development Potential	Some Development Potential	Most Development Potential	Most Development Potential

7.0 Preferred Solution

Alternative #4 is selected as the preferred solution for the following reasons:

- There are no major environmental disadvantages by selecting one of alternatives #2, #3 or #4;
- There are no archeological disadvantages by selecting one of Alternatives #2, #3 and #4;
- Alternative #2-4 provide a solution to the problem;
- Alternative #4 has the highest public support;
- Alternative #4 offers the most future expansion potential;
- Alternative #4 has a medium Capital Construction Cost compared to Alternatives #2 and #3;
- Alternative #4 provides the lowest O & M cost; and,
- Alternative #4 has the lowest cost relative to the future development potential (NPV/ ha).

Generally alternative #4 offers the best value for servicing future developed lands compared to the other alternatives combined with a low O & M cost.

7.1 Additional Investigations

In conjunction with further design of the preferred solution, the following additional investigations are recommended.

7.1.1 Stage 2 Archaeological Assessment

The Stage 1 Archaeological Investigation recommends a Stage 2 Archeological Assessment be conducted in accordance with the 2011 Ministry of Tourism, Culture and Sport (MTCS) Standards and Guidelines for Consultant Archaeologists. The assessment must be conducted prior to construction activities to confirm archaeological potential. Should further investigation be required it will be noted in the Stage 2 Archaeological Assessment Report.

7.1.2 Geotechnical

A geotechnical investigation should be undertaken as part of the detailed design process. The geotechnical investigation should determine the following:

- Location and depth of bedrock.
- Depth of ground water table.
- Existing soil conditions.
- Compaction requirements.
- Safe trenching requirements.
- Road Structure requirements for disturbed areas.

7.1.3 Approvals

The following approvals are anticipated to be required:

- Environmental Compliance Approval (ECA).
    - Alterations and additions to sewage works require an ECA through the MECP.
- The contractor who is responsible for constructing the works may require a Road Cut permit from the Township.
- Input from the Lower Trent Conservation Authority (LTCA) is required during detailed design to limit the potential impact on adjacent unevaluated wetlands on Elgin Street North. The LTCA may require additional permits for work around wetlands.

7.2 Notice of Study Completion

The Environmental Assessment Report was completed on September 9, 2019, followed by the "Notice of Completion" mailed to all stakeholders on September 12, 2019, and published in the Northumberland News newspaper on September 12, 2019. A copy of this notice is included in **Appendix F**.

8.0 Impacts and Mitigation of Preferred Alternative

8.1 Environmental

Alternative #4, the preferred alternative, would require excavation of a 10 m wide section of land from Elgin Street North to Percy Street. Any clearing of trees or vegetation poses potential impacts on nesting birds and roosting bats. Potential impacts to the natural environment need to be planned for with appropriate mitigation measures.

The following section proposes mitigation measures to address the environmental impacts associated with the construction of the sewer expansion.

8.1.1 Breeding Birds

Impacts to breeding birds or their habitat can come directly from construction equipment or through construction activities such as removal, clearing, or grubbing of trees or riparian vegetation communities.

The following mitigation measures relating to breeding birds should be applied to any vegetation removal:

- Any tree / vegetation removal or destruction from construction activities or equipment must occur outside of the breeding bird timing window (April 1 to August 31).
- If tree / vegetation removal or destruction is necessary during the timing window, a nest sweep must be completed by a trained biologist prior to construction activities. The nest sweep must cover the entire area of excavation, any staging areas where vegetation exists, and any areas where heavy equipment will be passing through.
- If any nests are found subsequent to the nest sweep, construction activities should cease and a 20 m buffer should be applied to the area surrounding the nest. The buffer should remain until all young have fledged.
- In the event that a nest sweep is completed, all vegetation within this area must be cleared within 5 days, otherwise an additional nest sweep is required.

It is necessary that upon completion of the sewer installation, the terrestrial habitat shall be restored to its original state or better. This involves revegetating the impacted area with similar plants species as those that exist now.

8.1.2 Bats

Although no bats were identified by MNRF through correspondence or during field investigations, the potential for bat hibernacula exists in the Study Area. In order to mitigate any potential impacts, the following measures should be addressed:

- Inspection of work areas for bats should occur before construction.
- If found to utilize structures or areas of tree removal, the project should be registered with MNRF. Effective exclusionary methods and / or timing windows for construction should also be applied.

8.1.3 Aquatics

It is assumed that no in-water work will be completed for this project. Additionally, as per the LTCA Regulations Policy document, no development is to be completed within 15 m of a river or stream, regardless of whether or not they contain a watercourse. The valley extends from the stable top of bank, plus 15 m, to a similar point on the opposite side.

In addition, the following mitigation measures should be used during construction to control erosion and prevent sediment from entering the watercourse.

- A Sediment and Erosion Control Plan should be developed and implemented prior to construction.
- All equipment and materials used for the purpose of site preparation and project completion should be operated in a way that prevents the release of deleterious substances into the watercourse.
- Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance and keep an emergency spill kit on site.
- Plan activities near water such that materials such as paint, primers, blasting abrasives, rust solvents, degreasers, grout, poured concrete or other chemicals do not enter the watercourse.
- If replacement rock reinforcement / armouring is required to stabilize eroding or exposed areas, ensure that appropriately-sized, clean rock is used; and that rock is installed at a similar slope to maintain a uniform bank / shoreline and natural stream / shoreline alignment.

8.2 Economic

Construction activities occurring within the Colborne Industrial Park and commercial areas of Colborne may have an impact on local businesses and tourism. Advanced communication with project stakeholders relating to lane / road closures is recommended.

8.3 Future Considerations of the Colborne Sanitary System

The addition of flows from an expanded sewer network will consume the existing available capacity downstream of the Colborne WWTP and the existing sanitary collection system downstream of the Colborne Industrial Park.

It is recommended that the Township continue to monitor incoming sanitary flows at the WWTP to ensure that the WWTP remains in compliance with its environmental approvals. Prior to the WWTP being at capacity the Township may wish to trigger an expansion of the WWTP so that development of the Colborne Industrial Park will not be hindered by the capacity of the Colborne WWTP.

At this time, there are not concerns with the downstream capacity of the Colborne sanitary collection system, however, the Township should continue to monitor the flows as additional developments are added to the system. Proactively, the Township should complete an analysis of the downstream capacity of the sanitary network between the Colborne Industrial Park and the WWTP. Knowing the capacity of the network and the pinch points where the capacity will be exceeded first through the addition of flows from development will help the Township plan for upgrades to the system.

9.0 Next Steps

9.1 Submission of Project File Report

The Project File Report will be available for public review for a 30-day review period. During this time, public and agency stakeholders are encouraged to review outstanding issues with the study team.

9.2 Part II Order Requests

If concerns arise regarding this project which cannot be resolved in discussion with the proponent, a person or party may request that the MECP make an order for the project to comply with Part II of the Environmental Assessment Act (referred to as a Part II Order), which addresses individual environmental assessments. The Minister, at the address noted below, must receive requests in writing within 30-calendar days of the Notice of Study Completion.

Minister
Ministry of the Environment, Conservation and Parks
77 Wellesley Street West, 11th Floor
Toronto, Ontario
M7A 2T5
Minister.mecp@ontario.ca
Fax: 416-314-8452

Copies of the request must also be sent to the Director of the Environmental Assessment and Permissions Branch at the MECP and the Township of Cramahe at the addresses below:

Director, Environmental Assessment and Permissions Branch
Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5
Email: enviropermissions@ontario.ca

Township of Cramahe
Attention: Arryn McNichol, H.B.Comm, CPA, CGA, CMMIII, Interim Chief Administrative Officer - Treasurer
P.O. Box 357 1 Toronto Street
Colborne, Ontario
K0K 1S0
Phone: (905) 355-2821 (Ext 223)
Fax: (905) 355-3430
E-mail: AMcNichol@cramahetownship.ca

If there is no Part II Order Request received by October 2019, the Township intends on implementing the recommended alternative described in the Project File Report.

Appendix A

Natural Environment

Colborne Industrial Park
Sanitary System Upgrades

Existing Conditions Assessment

D.M. Wills Project Number 13-2907

D.M. Wills Associates Limited
Partners in Engineering
Peterborough

June 2018

Summary of Revisions

Revision No.	Revision Title	Date of Release	Summary of Revisions

This report / proposal has been formatted considering the requirements of the Accessibility for Ontarians with Disabilities Act (AODA).

Table of Contents

Figures

Tables

Appendices

1.0 Environmental Conditions

1.1 Proposed Alternatives

Four alternatives for the sanitary sewer connection between the proposed Colborne Industrial Park (Study Area) to the existing system were considered during the Environmental Assessment (EA) process. Assessment of natural features was not conducted for alternative 1 as it was a "Do Nothing" alternative therefore no features existed to be evaluated.

Existing environmental conditions were assessed for the three remaining alternatives. Alternatives 2 and 3 are located within the drainage area of two tributaries to Colborne Creek, a cold-water creek that flows to the west of Colborne and eventually flowing into Lake Ontario, east of Lakeport. Alternative 4 is to the south, located between Elgin Street North and Percy Street (**Figure 1**).

Alternative 2 consists of a proposed sewer link beginning at the southwest corner of Industrial Park Road. The pipe proposes to follow an existing property line between farmland to the west and an industrial lot to the east (**Figure 2**). South of the lot, the sewer would follow an existing watercourse as it flows to the south and then southwest out to Percy Street. Once reaching Percy Street, the sewer line would be installed under the road and connect with the existing sanitary sewer system, approximately 285 m to the south. This alternative would convey sewage by gravity to the existing system.

Alternative 3 would extend the sewer proposed on Elgin Street North and join it with the end of the existing sewer at the south end of Elgin Street North (**Figure 3**). This alternative would also require a sewage pumping station to force sewage up an incline in the topography on Elgin Street to connect with the existing sanitary system located on Percy Street.

Alternative 4 proposes to replace the existing sanitary sewer network in the Industrial Park with an expanded capacity sanitary network in terms of pipe size (sanitary capacity) and area serviced. This alignment will make use of a proposed easement between Elgin Street and Percy Street which is located on private property owned by Linda Hinton. The proposed sanitary main will connect with the existing Colborne sanitary system on the on the west side on the proposed easement on Percy Street (**Figure 4**).

2.0 Study Methodology

D.M. Wills Associates Limited's (Wills) biologists conducted assessments for the three alignments that have potential to cause aquatic and terrestrial impacts. Tasks performed included:

- A search for federal and provincial Species at Risk (SAR) in the Study Area.
- Background information collection on aquatic species present in Colborne Creek from Ministry of Natural Resources and Forestry (MNRF).
- The completion of site assessments of the alignments where the following information was noted:
    - Vegetation species present;
    - Incidental wildlife present; and
    - Watercourses within or crossing the Study Areas.

3.0 Background Information

3.1 Species at Risk

A geographical search for rare species and associated habitat was conducted using the MNRF's Natural Heritage Information Centre (NHIC) database. A search of the NHIC 1 km square for the Study Area was completed for provincial Species at Risk Ontario (SAR) designation. No results were generated for any of alignment alternatives. The MNRF was also contacted for any SAR found in the area. The MNRF provided a list of SAR occurrences in the immediate (1 km) and general (5 km) area of the proposed works (**Appendix A**).

The Fisheries and Oceans Canada (DFO) mapping for the area covered by Lower Trent Conservation was reviewed for any aquatic SAR listed under the Species at Risk Act (SARA). No listed species were noted for this watercourse.

3.2 Fisheries Information

The MNRF was also contacted for any fisheries information for Colborne Creek and its tributaries within the Study Area. The MNRF provided a fish species list for this watercourse and the species are listed in **Table 1**.

Both the North and South headwater tributaries appear to be associated with an unevaluated wetland that drains an area east of Elgin Street North. They join approximately 350 m downstream of Percy Street. This combined tributary flows into the main Colborne Creek just west of the Town of Colborne, approximately 1.4 km further downstream. Since the fish species list is for the entire watercourse, it can be assumed that the majority of species would be found in the lower reaches (downstream of Percy Street) where the Colborne Creek is larger, well defined and provides suitable habitat.

It is possible that the headwater tributaries support some of the Cyprinid (minnow) and stickleback species.

Figure 1 - Location of Alternatives 2, 3 and 4 Crossing Undeveloped Land

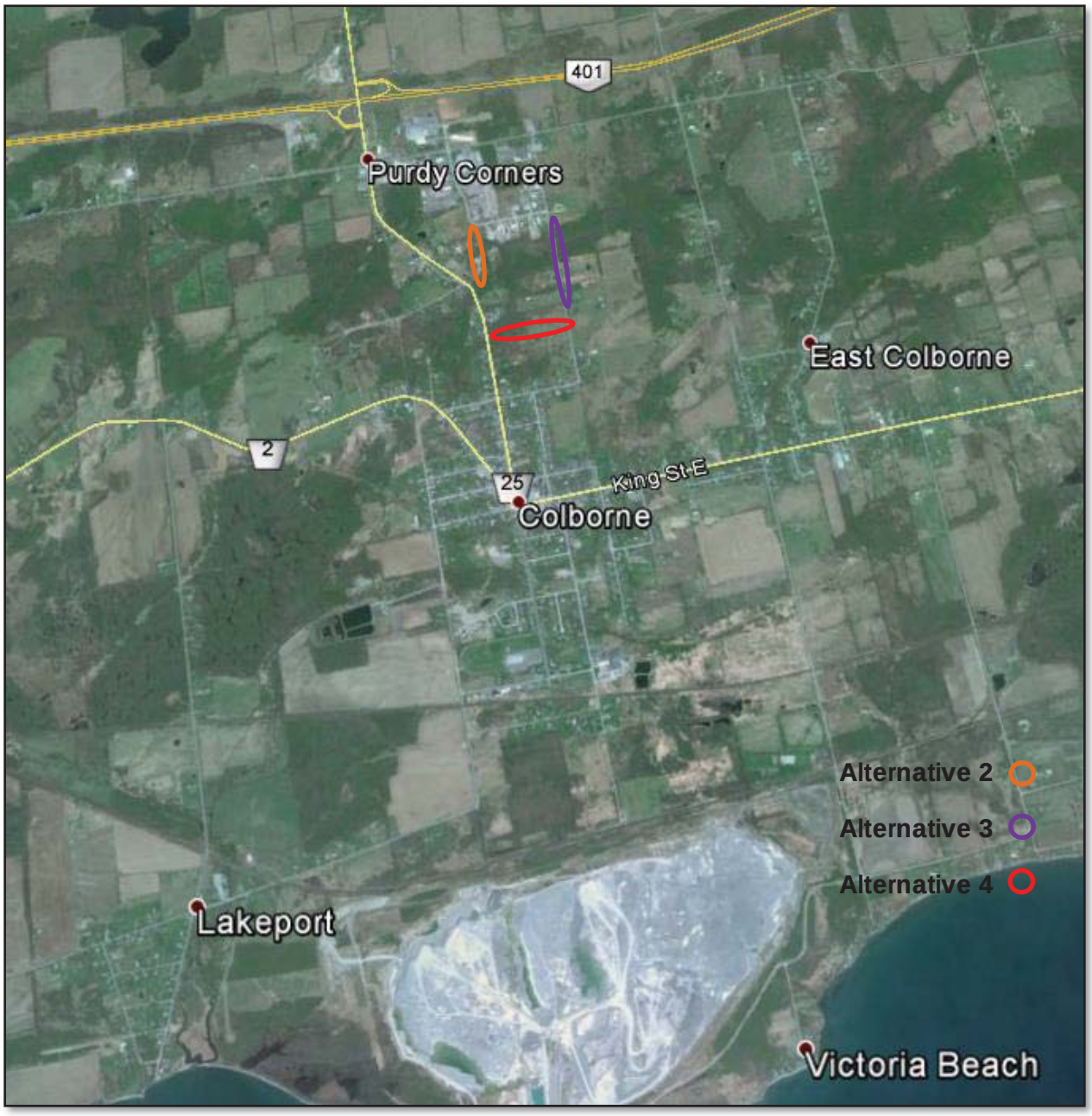


Table 1 - Fish Species List for Colbourne Creek

Common Name	Scientific Name
American Brook Lamprey	*Lethenteron appendix*
Sea Lamprey	*Petromyzon marinus*
Rainbow Trout	*Oncorhynchus mykiss*
Brook Trout	*Salvelinus fontinalis*
Rainbow Smelt	*Osmerus mordax*
White Sucker	*Catostomus commersonii*
Northern Redbelly Dace	*Chrosomus eos*
Golden shiner	*Notemigonus crysoleucas*
Bluntnose Minnow	*Pimephales notatus*
Fathead Minnow	*Pimephales promelas*
Eastern Blacknose Dace	*Rhinichthys atratulus*
Longnose Dace	*Rhinichthys cataractae*
Creek Chub	*Semotilus atromaculatus*
Brook Stickleback	*Culaea inconstans*
Rock Bass	*Amblopites rupestris*
Pumpkinseed	*Lepomis gibbosus*
Smallmouth Bass	*Micropterus dolomieu*
Logperch	*Percina caprodes*
Johnny Darter / Tessellated Darter	*Etheostoma sp.*
Mottled Sculpin	*Cottus bairdii*
Slimy Sculpin	*Cottus cognatus*

4.0 Existing Environmental Conditions

Wills staff conducted a field visit on December 2, 2014 for Alternatives 2 and 3. Due to the time of sampling, not all natural components could be assessed. A field visit was completed for Alternative 4 on May 16, 2018. No fish sampling was conducted at any of the locations. A habitat assessment was conducted at all locations and any wildlife observations were restricted to incidental observations.

4.1 Alternative 2 Alignment

4.1.1 Terrestrial Habitat

Along the alignment for alternative 2, several vegetation communities were noted. Beside the southwest corner lot on Industrial Park Road, a cedar hedgerow separated the industrial development from the farm property to the west (**Figure 2** and **Photo 1**); a small portion of this lot had been recently disturbed by infilling (**Photo 2**). The lot is predominantly an abandoned field with a variety of scattered tree and shrub species including Manitoba Maple (*Acer negundo*), Staghorn Sumac (*Rhus typhina*), Common Buckthorn (*Rhamnus cathartica*) and Eastern Red Cedar (*Juniperus virginiana*). Herbaceous species were dominated by grasses but goldenrod (*Solidago* sp.) and Poison Ivy (*Toxicodendron radicans*) were also present.

At the south end of the lot, the land sloped down into a small wet area. Additional tree species were noted on the slope including Speckled Alder (*Alnus incana*), Red Maple (*Acer rubrum*), Poplar (*Populus* sp.), White Pine (Pinus strobus) and Red Osier Dogwood (*Cornus sericea*).

Associated with the wet area was a small watercourse that drained the area behind the lots to the east. The proposed alignment followed the location of the North Headwater Tributary.

Figure 2 - Natural Features in the Vicinity of Alternative 2 Alignment

South of the wetland area, the alignment would pass through a woodlot (approximately 65 m in length). Through this wooded area, it appeared that a swath of trees was historically removed to provide space to construct the watercourse. Over time, vegetation has grown back in this cut area and Eastern White Cedar and White Birch (*Betula papyrifera*) saplings were noted. In addition, Red Osier Dogwood, Basswood (*Tilia americana*), Large Tooth Aspen (Populus grandidentata), Black Cherry (*Prunus serotina*), Staghorn Sumac, White Ash (Fraxinus americana) and Common Buckthorn were noted along the edge of the woods. Along the banks of the channel,

Purple Loosestrife (*Lythrum salicaria*), Hawkeweed (*Hieracium* sp.), aster (*Symphyotrichum* sp.), Wild Grape vine (*Vitis riparia*), grasses, Enchanter's Night Shade (*Circaea* sp.) and Highbush Cranberry (*Viburnum* sp.) were observed. The invasive Common Reed (*Phragmites* sp.) was also noted scattered throughout this area.

Between the woodlot and Percy Street (approximately 70 m in length), the area was highly disturbed because of infilling on the northwest side. In this area, the vegetation was dominated by herbaceous species including cattails (*Typha* sp.), asters, Coltsfoot (*Tussilago farfara*), goldenrod, Enchanters Nightshade (*Circaea canadensis*), Dog Strangling Vine (*Vincetoxicum rossicum*) and Purple Loosestrife. Scattered woody species were also present including Staghorn Sumac, willows and Speckled Alder.

Beside Percy Street, much of the existing road side ditch was obscured by dense growth of grasses, goldenrod, cattails, Sweet Clover (*Melilotus* sp.) and Canada Thistle (*Cirsium arvense*).

Although no wildlife was noted during the site visit, game trails were noted crossing the channel in several locations.

4.1.2 Aquatic Habitat

A small channel conveyed water from the back edge of the industrial lot to the east. At the bottom of the slope of the empty lot, the channel widened into a cattail wetland pocket where the channel became more diffuse with some braiding. Seepage was noted on the slope.

Once through the wetland pocket, the channel flowed into a small cedar woodlot where the watercourse returned to a single, well defined, meandering channel (**Photo 3**). Within the woodlot, the width of the watercourse ranged from 0.2 m to 0.25 m with depths between 0.09 and 0.17 m. Substrates consisted of sand, gravel and scattered cobble. Undercut banks were also noted.

At the downstream end of the woodlot, the channel widened to a width of 0.80 m (0.11 m deep with a sandy bottom) (**Photo 4**). A second channel, draining farm land behind the commercial property to the west, flowed into the Study Area channel. Downstream of this confluence, a small drop of approximately 0.55 m was noted in the channel and this was associated with a small bridge over the channel. From the edge of the woodlot to confluence with the roadside ditch, a distance of approximately 70 m, the channel form is straight with widths ranging from 1.8 to 2.2 m (**Photo 5**). Depths ranged from 0.06 to 0.14 m. Substrates consisted predominantly of silt and sand with pockets of gravel. Watercress (***Nasturtium officinale***) and scattered smartweed (*Polygonum* sp.) were noted throughout this reach of the watercourse. The presence of watercress suggests groundwater inputs occur in this section of the watercourse. On the west side of the channel, fill material had been placed immediately adjacent to the channel.

Beside Percy Street, the channel entered a roadside ditch which flowed in a southerly direction toward another Headwater Tributary (**Photo 6**). The channel dimensions were 0.42 m wide and 0.05 m deep. Once past the entrance to Hoselton Studios, the ditch conveyed water down a steep, rocky slope (**Photo 7**). At the bottom of the slope, the ditch flowed into another small tributary which drained a portion of the wetland area to the east. Water was then conveyed under Percy Street through a 930 mm Corrugated Steel Pipe (CSP) (**Photo 8**).

Although the watercourse may provide suitable habitat for fish, there was a lack of pool features that would provide overwintering habitat. In addition, the steep, rocky slope on the east side of Percy Street would likely create a barrier to any fish movement upstream. This watercourse, therefore, would be considered to be indirect fish habitat, providing flow and nutrients to habitat downstream.

4.2 Alternative 3 Alignment

4.2.1 Terrestrial Habitat

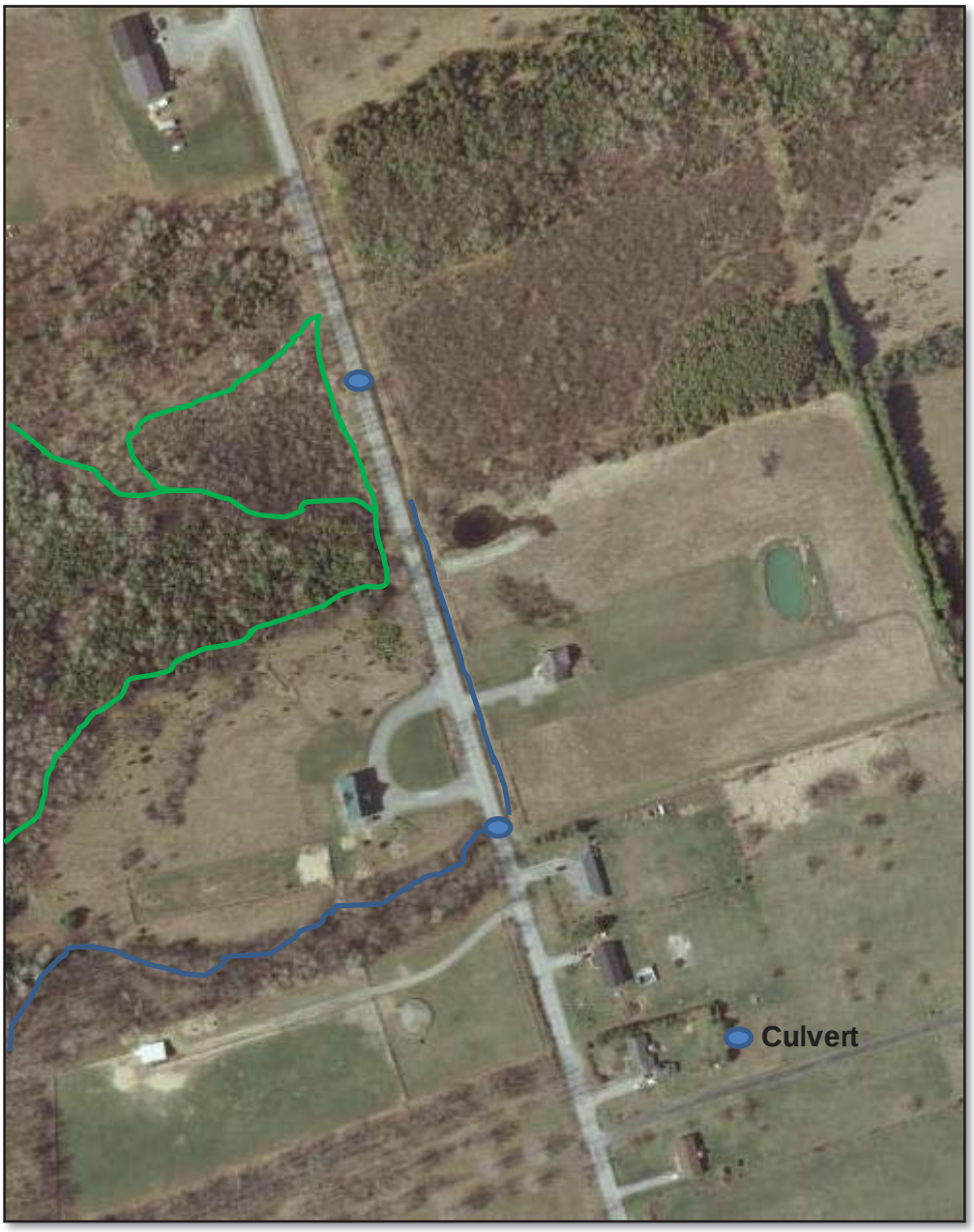
The alignment for Alternative 3 follows the west side of Elgin Street North. The majority of the land along this road within the Study Area has been cleared beyond the ROW.

For the most part, the wetland was densely vegetated beyond the ROW with a variety of species including Balsam Poplar, Black Cherry, Willow sp., Highbush Cranberry, Sugar Maple, Common Buckthorn, Eastern White Cedar, White Ash, aspen, White Birch, White Pine, grasses, cattails, ferns, goldenrod, Common Milkweed. The centre portion of the wetland appeared to be wetter with cattails and numerous dead trees (**Photo 9**).

Within the ROW of Elgin Street North, the vegetation was dominated by grasses that have been regularly mowed (approximately 1 m wide). Beyond the mowed area, goldenrod dominated the ground cover species. At the edge of the ROW, a variety of trees were present including Balsam Poplar, willows, and Black Walnut (*Juglans nigra*) (**Photo 10**). Sugar Maple (*Acer saccharum*), Red Oak (*Quercus rubra*), American Beech and White Birch were noted in the ROW in the southern part of the Study Area where the ground elevation was higher (**Photo 11**). These tree species are considered dry, upland species.

Black Cherry (*Prunus serotina*) and Common Buckthorn were noted in the valley associated with the South Headwater Tributary of Colbourne Creek.

Figure 3 - Natural Features in the Vicinity of Alternative 3 Alignment



4.2.2 Aquatic Habitat

In this part of Elgin Street, the road crossed two aquatic features that were well vegetated beyond the ROW: an unevaluated wetland area associated with a Headwater Tributary to Colborne Creek at the north end of the Study Area and a second tributary of Colborne Creek (South Headwater Tributary) near the middle of the Study Area (**Figure 3**).

In the wetland area, there were some small open water areas beyond the ROW but it was well vegetated for the most part. In the middle of the wetland, a 400 mm CSP was noted under Elgin Street North but the east end of the culvert was plugged (**Photo 12**). As a result, very little water was passing under the road. The west end of the culvert was not visible (**Photo 13**).

Between the two clearings in the southern part of the Study Area, double 600 mm CSP culverts conveyed water for the second headwater channel through a small, well-defined and well vegetated valley (**Figure 3** and **Photo 14**). The north and south culverts were perched by 0.15 m and 0.26 m, respectively (**Photo 15**).

4.3 Alternative 4 Alignment

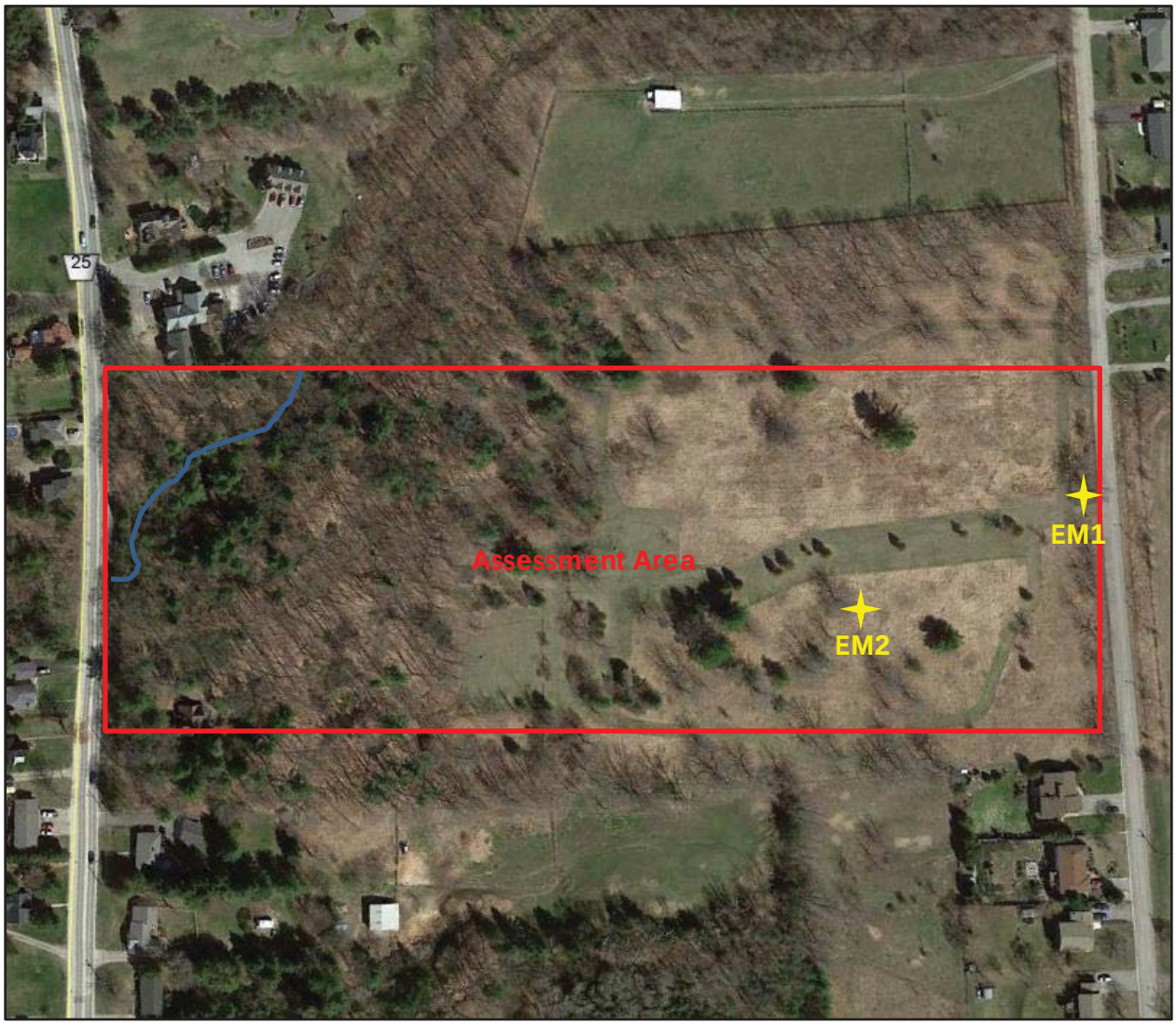
4.3.1 Terrestrial Habitat

The alignment for alternative 4 follows the west side of Elgin Street North then crosses over largely undeveloped lands to Percy Street to the west (**Figure 4**). This alignment requires an easement.

The Assessment Area can be divided into two separate vegetation communities. The western portion of the Assessment Area is a densely vegetated forest with various plant and tree species found throughout (**Photos 19-22**). Field investigations identified the following species in the canopy and sub-canopy of the forested area: Sugar Maple, White Pine, Eastern Hemlock, American Beech, White Spruce, Alternate-Leaf Dogwood, Staghorn Sumac, Manitoba Maple, Eastern White Cedar, Red Spruce, Red Oak and Speckled Alder. Plant species found throughout the understory were False Solomons Seal, Coltsfoot, Field Horsetail, Bracken Fern, Sheep Laurel, Kidney-leaf Buttercup, Canada Mayflower, White Trillium and Common Periwinkle.

The eastern portion of the Assessment Area is mainly dominated by various grass species with small stands of trees scattered throughout (**Photos 16-18** and **23**). Plant / tree species found were Dandelion, Riverbank Grape, Virginia Creeper, Goldenrod, Manitoba Maple, Black Walnut, Red Cedar, Dog Strangling Vine, Reed Canary Grass, Buckthorn, Crown Vetch, Eastern White Cedar, Wild Raspberry, Buckthorn, Staghorn Sumac, White Pine, Common Milkweed, Common Mullein, White Spruce, Field Horsetail, Bull Thistle, Sugar Maple, Sensitive Fern, Speckled Alder, Queen Anne's Lace and Large-tooth Aspen.

Figure 4 - Assessment Area for Alternative 4 Alignment



4.3.2 Aquatic Habitat

The northwestern portion of the Assessment Area contains a small stream running through in the southwestern direction (**Figure 4** and **Photos 21-22**). Although no fisheries sampling was completed, it did not appear as though the stream was of sufficient habitat to contain fish. The upper portions of the stream had minimal water flow. The length of the stream was briefly observed and no fish were seen during the field visit. After speaking with the property owner, Linda Hinton, she indicated that the stream did in fact dry up during the summer / fall months.

The watercourse does not appear to provide suitable habitat for fish as it lacks overwintering habitat and sufficient pool features. The watercourse, therefore, would be considered indirect fish habitat, providing flow and nutrients to habitat downstream.

4.4 Species at Risk

The MNRF was contacted and provided a list of potential SAR in the area. From this list, a SAR assessment was completed based on the existing terrestrial and aquatic habitat conditions along the three alignments. It was determined that for alternatives 2 and 3 the potential for SAR habitat is low for all species based on their habitat preferences (**Table 2**). Alternative 4 had a moderate potential for the presence of Barn Swallow and Bobolink habitat. Eastern Meadowlark had a high potential for their habitat as multiple individuals were observed during field investigations.

Table 2 - Species at Risk Observations in the Immediate and General Area of the Study Areas

Species	ESA Desig-nation*	Habitat Preferences	Habitat Potential**		
			Alternative 2	Alternative 3	Alternative 4
Bobolink *Dolichonyx oryzivorus*	THR	Inhabits hay or abandoned fields. A ground nester, it requires dense, tall grasses, and thatch, or decaying plant material, for cover.	L	L	M
Barn Swallow *Hirundo rustica*	THR	Barn Swallows live in close association with humans, and build their nests almost exclusively on human-made structures such as open barns, under bridges and in culverts.	L	L	M
Eastern Meadowlark *Sturnella magna*	THR	Inhabits pastures, hayfields, old and abandoned fields and native prairies and savannahs. A ground nester, it requires dense, tall grasses, and thatch, or decaying plant material, for cover.	L	L	H

Milksnake *Lampropeltis triangulum*	SC	Can be found in a variety of habitats but tend to use open habitats such as rocky outcrops, fields and forest edge. In rural areas this snake may be common, especially around barns	L	L	M
Blanding's Turtle Emydoidea blandingii	THR	Inhabits lakes, slow-moving streams and wetlands, preferring shallow wetland areas with abundant aquatic vegetation.	L	L	L
Snapping Turtle Chelydra serpentina	SC	This species prefers large bodies of water to small ponds containing dense vegetation.	L	L	L
Butternut Juglans cinerea	END	Prefers moist, well-drained soil and is often found along streams. It is also found on well-drained gravel sites and rarely on dry rocky soil.	L	L	L

* Designation: THR = Threatened, END = Endangered, SC = Special Concern
** Habitat potential: L = Low, M = Moderate, H = High

Overall, preliminary observations did not reveal any significant natural environment features along any of the alignments. Since Alternatives 2 and 3 would require work adjacent to headwater tributaries of Colborne Creek, a cold water watercourse, protection of the features to maintain their function would be necessary.

5.0 Mitigation Measures

Alternative 4, the preferred alternative, would require excavation of a 10 m wide section of land from Elgin Street North to Percy Street. Any clearing of trees or vegetation poses potential impacts on nesting birds and roosting bats. Potential impacts to the natural environment need to be planned for with appropriate mitigation measures.

The following section proposes mitigation measures to address the environmental impacts associated with the construction of the sewer expansion.

5.1 Breeding Birds

Impacts to breeding birds or their habitat can come directly from construction equipment or through construction activities such as removal, clearing, or grubbing of trees or riparian vegetation communities.

The following mitigation measures relating to breeding birds should be applied to any vegetation removal:

- Any tree / vegetation removal or destruction from construction activities or equipment must occur outside of the breeding bird timing window (April 1 to August 31).
- If tree / vegetation removal or destruction is necessary during the timing window, a nest sweep must be completed by a trained biologist prior to construction activities. The nest sweep must cover the entire area of excavation, any staging areas where vegetation exists, and any areas where heavy equipment will be passing through.
- If any nests are found subsequent to the nest sweep, construction activities should cease and a 20 m buffer should be applied to the area surrounding the nest. The buffer should remain until all young have fledged.
- In the event that a nest sweep is completed, all vegetation within this area must be cleared within 5 days, otherwise an additional nest sweep is required.

Given that two SAR species were observed during the field visit, it is necessary that upon completion of the sewer installation, the terrestrial habitat be restored to its original state or better. This involves revegetating the impacted area with similar plants species as those that exist now.

5.2 Bats

Although no bats were identified by MNRF during correspondence or through field investigations, the potential for bat hibernacula exists in the area. In order to mitigate any potential impacts, the following measures should be addressed:

- Inspection of work areas for bats should occur before construction.
- If found to utilize structures or areas of tree removal, the project should be registered with MNRF. Effective exclusionary methods and / or timing windows for construction should also be applied.

5.3 Aquatics

It is assumed that no in-water work will be completed for this project. Additionally, as per the Lower Trent Conservation Regulations Policy document, no development is to be completed within 15 m of a river or stream, regardless of whether or not they contain a watercourse. The valley extends from the stable top of bank, plus 15 m, to a similar point on the opposite side.

In addition, the following mitigation measures should be used during construction to control erosion and prevent sediment from entering the watercourse.

- A Sediment and Erosion Control Plan should be developed and implemented prior to construction.
- All equipment and materials used for the purpose of site preparation and project completion should be operated in a way that prevents the release of deleterious substances into the watercourse.
- Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance and keep an emergency spill kit on site.
- Plan activities near water such that materials such as paint, primers, blasting abrasives, rust solvents, degreasers, grout, poured concrete or other chemicals do not enter the watercourse.
- If replacement rock reinforcement / armouring is required to stabilize eroding or exposed areas, ensure that appropriately-sized, clean rock is used; and that rock is installed at a similar slope to maintain a uniform bank/shoreline and natural stream / shoreline alignment.
- Remove all construction materials from the site upon project completion.

6.0 Photographs

Alternative 2 Alignment
Photos taken Dec. 2, 2014

Photo 1
North end of alignment, immediately west of Industrial Park Road (north view).

Photo 2
North end of alignment, immediately west of Industrial Park Road (south view) (infilling in foreground).

Photo 3
Upstream view of North Headwater Tributary.

Photo 4
Upstream view of North Headwater Tributary just downstream of the edge of cedar woodlot.

Photo 5
Upstream view of North Headwater Tributary immediately east of Percy Street (historic infilling on north side of channel).

Photo 6
Downstream view of North Headwater Tributary flowing parallel to Percy Street beside Hoselton Sculptures.

Photo 7
North Headwater Tributary downstream of entrance culvert to Hoselton Sculptures.

Photo 8
Inlet of culvert under Percy Street (southwest view).

Alternative 3 Alignment

Photos taken Dec. 2, 2014

Photo 9
Wetland area to the west of Elgin Street North (west view).

Photo 10
West side of Elgin Street North, south of the wetland area.

Photo 11
North view of west side of Elgin Street North at south end of Study Area.

Photo 12
East end of blocked culvert under Elgin Street North.

Photo 13
West side of Elgin Street North in the vicinity of the cross culvert noted in Photo 12.

Photo 14
Downstream view of South Headwater Tributary on west side of Elgin Street North.

Photo 15
Upstream view of culvert outlets on west side of Elgin Street North.

Alternative 4 Alignment

Photos taken May 16, 2018

Photo 16
Area of open field, looking west from Elgin Street North.

Photo 17
Area of open field. Photo taken from the southeastern portion of the Study Area, looking north.

Photo 18
Area of open field. Photo taken from the southern portion of the Study Area, looking northwest.

Photo 19
Building with potential bat hibernacula, in the middle of the southern portion of the Study Area.

Photo 20
Forested area on the western portion of the Study Area.

Photo 21
Water flowing between a gully at the northwestern portion of the Study Area. Photo is looking east.

Photo 22
Water flowing between a gully at the northwestern portion of the Study Area. Photo is looking west.

Photo 23
Stand of Large-tooth Aspen found in the middle of the northern portion of the Study Area.

Photo 24
Property adjacent to the Study Area where Eastern Meadowlark calls were heard. Photo was taken looking northeast.

Photo 25
Property adjacent to the Study Area where Eastern Meadowlark calls were heard. Photo was taken looking southeast.

Appendix A

Correspondence with the MNRF

From:	Shawn Filteau
To:	"Formsma, Julie (MNRF)"
Subject:	Information Request
Date:	May-18-18 10:34:00 AM
Attachments:	image001.jpg Figure 1 - Regional Plan.pdf Figure 2 - Site Plan.pdf

---

Hi Julie,

I'm not sure if you're the correct person to send this to but maybe you could direct me to the right person, if not. I am looking for some additional information for a project that D.M. Wills is working on. We have been contracted by the Township of Cramahe to complete a Municipal Class Environmental Assessment for the replacement/expansion of a portion of the sanitary sewer system in the town of Colborne; please see attached map for location details.

The scope of work for the EA includes a Terrestrial Existing Conditions Report and an Impact Assessment. As such, I am looking for any information regarding Species at Risk (SAR) data records or otherwise natural heritage information you may have on file for this area or for any adjacent areas which may have implications on the Subject Area (e.g. wetland evaluation/delineation works, stream assessment works, OWES data records, etc.).

Following background review, there were no publicly available records (NHIC Make a Map) with respect to species occurrences as there was no grid applicable to the Subject Area.

If you have any questions regarding the above request, please don't hesitate to contact me.

Thanks,

Shawn

Wills_Logo

Shawn Filteau, BSc
Environmental Biologist

D.M. Wills Associates Ltd.
150 Jameson Drive · Peterborough, ON · K9J 0B9
Tel: (705) 742-2297 ext. 263 · Fax: (705) 741-3568

Appendix B

Archaeological Report

STAGE 1 ARCHAEOLOGICAL ASSESSMENT OF THE COLBORNE INDUSTRIAL PARK SANITARY SEWER PROJECT (OPTIONS 2, 3, and 4) CONSISTING OF THE ROAD ALLOWANCES FOR PARTS OF PURDY ROAD, ELGIN STREET NORTH, PERCY STREET, AND INDUSTRIAL PARK ROAD, AND PART OF LOTS 31 AND 32 OF CONCESSION 2, TOWNSHIP OF CRAMAHE, COUNTY OF NORTHUMERLAND

Original Report Prepared By:

Northeastern Archaeological Associates Ltd.
P.O. Box 493
Port Hope, ON
L1A 3Z4

Licensed to: Lawrence Jackson, Ph.D. (P-025)

PIF #: P025-0582-2017

April 27, 2018

EXECUTIVE SUMMARY

Northeastern Archaeological Associates Ltd. was contracted to conduct a Stage 1 archaeological assessment of the proposed Colborne Industrial Park Sanitary Sewer project in the north end of the town of Colborne in the Township of Cramahe, County of Northumberland. This assessment was conducted under PIF# P025-0582-2017 and in compliance with the 2011 *Standards and Guidelines for Consultant Archaeologists*, as used by the Ministry of Tourism, Culture & Sport (MTCS). This report is being submitted to the Township of Cramahe as part of the municipal class environmental assessment for this infrastructure project.

The subject property consists of three proposed corridors for sanitary sewer lines, referred to in this report as Option 2, Option 3, and Option 4. Each option's corridor is roughly 10m wide and falls within the boundaries of existing road allowances or right-of-ways (ROWs) as well as some sections of undisturbed non-ROW lands. Stage 1 research indicated that, although there has been extensive prior soil disturbance in all three of the options (since the majority of these three possible corridors are within the ROWs for Purdy Road, Industrial Park Road, Percy Street, and Elgin Street North), the grassy edges beyond the existing paved roads and gravel shoulders may be partially undisturbed; furthermore, a section of Option 2 and one on Option 4 cross grassy fields and wooded or poorly drained areas that appear to be relatively undisturbed. In general, the three options that make up the subject property for this sanitary sewer project can be considered to have archaeological potential, according to the current *Standards and Guidelines for Consultant Archaeologists* (MTC 2011), for the following reasons:

- there are wetland zones and small creeks within 200m of Options 2, 3, and 4 of the subject property;
- the subject property includes features that would have made it suitable for aboriginal use and habitation, as well, such as elevated topography that is adjacent to wetlands and secondary watercourses;
- there is an unregistered pre-contact archaeological site roughly 1 km east of Area B;
- three 19th-century transportation corridors (Purdy Road, Percy Street, and Elgin Street North) are within 200m of the subject property;
- a 19th-century church and cemetery, a schoolhouse, and three houses were built within 200m of the subject property;
- the surrounding region has a well-documented and fairly intensive history of 19th-century Euro-Canadian settlement;

Based on the results of the Stage 1 background research, it is recommended that a Stage 2 archaeological assessment be conducted on all undisturbed portions of Option 2, Option 3, or Option 4 (whichever one is eventually selected as the preferred option for this project). Areas of low archaeological potential (such as the existing paved road surfaces and gravel shoulders) may be exempted from Stage 2 testing as per Standards 2.a and 2.b of Section 2.1 of the *Standards and Guidelines for Consultant Archaeologists*

(MTC 2011), while the grassy outer edges of the ROWs, together with any of the non-ROW lands, are considered at this point to have archaeological potential until the degree of prior soil disturbance within their limits can be determined during a Stage 2 archaeological assessment. These potentially undisturbed sections of the subject property will need to be assessed by test-pit survey as per Standard 1.f, Section 2.1.2 of the *Standards and Guidelines* (MTC 2011), since those corridors are less than 10m wide. Test-pit survey must be conducted in accordance with Standards 1 to 7 of Section 2.1 and Standards 1 to 9 of Section 2.1.2 of the *Standards and Guidelines* (MTC 2011).

TABLE OF CONTENTS

Page

PROJECT PERSONNEL

Project Director	Lawrence Jackson *(Archaeological License # P-025)*
Report Preparation	Donna Morrison, M.A. *(Archaeological License # P-121)*
Graphics Preparation	Dale Bateman

1.0 DEVELOPMENT CONTEXT

In compliance with the requirements of the Ontario Ministry of Tourism, Culture, and Sport (MTCS) regarding land development (as stated in the 2011 *Standards and Guidelines for Consultant Archaeologists*), and the Environmental Assessment Act, a contract to carry out a Stage 1 archaeological assessment for Options 2, 3, and 4 of the Colborne Industrial Park Sanitary Sewer project was awarded to Northeastern Archaeological Associates Limited. This Stage 1 archaeological assessment report is being submitted to Cramahe Township as one of the supporting documents for the Municipal Class Environmental Assessment that is being conducted for this infrastructure project, in which the existing 3"-diameter sewer pipe system that currently services the Colborne Industrial Park will be replaced with a more modern and efficient gravity sewer system. The subject property for this archaeological assessment consists of three possible new routes for sanitary sewers, which are referred to throughout this report as "Option 2", "Option 3", and "Option 4". The proponent's "Option 1" referred to the possibility of just leaving the existing sanitary sewer system that way it currently is, and therefore it did not require archaeological assessment. The term "subject property", as used in this report, refers collectively to the combined area covered by Options 2, 3, and 4, which have some degree of overlap in their locations.

Options 2, 3, and 4 are all located just south of Highway 401, at the north end of the town of Colborne (see Maps 1 to 6 in Section 8.0), and they each consist of a narrow corridor roughly 10 metres wide. The majority of these route options fall within the limits of the heavily disturbed road allowances or right-of-ways (ROWs) for existing thoroughfares including Purdy Road, Elgin Street North, Percy Street, and Industrial Park Road; as such, these ROWs include the paved road surfaces, gravel shoulders, and ditches, as well as narrow strips of potentially undisturbed lands on either side of these features of the road beds. In addition to the ROWs, there are two sections of the proposed routes (one on Option 2 and one on Option 4) where the proposed sanitary sewer line would also have to cross through a section of undisturbed or undeveloped land, which would require an easement to be established for them.

Specifically, Option 2 includes: the Purdy Street ROW between Big Apple Drive and Elgin Street North; the ROW for Industrial Park Road; a short section of the ROW for Percy Street south of Kenwood Lane; and a section of undisturbed land between the southwest corner of Industrial Park Road and Percy Street (see Maps 1 & 4, Section 8.0).

Option 3 includes the same northern sections as Option 2 (*i.e.,* the Purdy Street ROW between Big Apple Drive and Elgin Street North and the ROW for Industrial Park Road) plus a section of the ROW for Elgin Street North that is south of the intersection with Industrial Park Road and north of Park Street East (see Maps 2 and 5 in Section 8.0). In addition to the proposed sanitary sewer corridor, Option 3 also includes plans for a sewage pumping station and a forcemain that would be built somewhere along this part of Elgin Street North, likely on lands adjacent to the ROW. The exact size and location of

the pumping station and forcemain are not currently known and would have to be determined at some point in the future during the detailed design phase of the project.

Option 4 includes the same northern sections as Options 2 and 3 (*i.e.,* the Purdy Street ROW between Big Apple Drive and Elgin Street North, as well as the ROW for Industrial Park Road), and also the same section of the ROW for Elgin Street North as with Option 3 (south of the intersection with Industrial Park Road and north of Park Street East) (see Maps 3 and 6 in Section 8.0). However, Option 4 does not include plans for a sewage pumping station or forcemain beside Elgin Street North, as Option 3 does, but it does include an additional 400m-long section that passes across an undisturbed field and wooded area between Elgin Street North and Percy Street; this section would require an easement to be established for it, since it is not within an existing ROW.

Project Director for this Stage 1 archaeological assessment is Lawrence Jackson and this report was written by Donna Morrison, with maps drafted by Dale Bateman. Maps are presented in Section 8.0. The PIF number for this Stage 1 assessment is P025-0582-2017. An optional Stage 1 site inspection visit was not conducted for this assessment.

2.0 HISTORICAL CONTEXT

2.1 Historical Information and Settlement History

The subject property is located in Cramahe Township, County of Northumberland. Cramahe Township was named after Hector Theophilus de Cramahe, an early Lieutenant-Governor of the Province of Quebec. The seat of the township, and the largest town, is Colborne, where the subject property is located. Cramahe was incorporated as a township in 1850, and in 1858 the village of Colborne seceded from the municipality as a separate township. However, in 2001, due to municipal restructuring, the two municipalities were re-amalgamated to form an expanded Township of Cramahe (Argyris 2000).

This area has a rich and varied Euro-Canadian history, beginning in 1793 when the first Loyalist settlers arrived from Vermont with the land agent, Joseph Keeler (Argyris 2000; Belden 1878). Their settlement was originally called Keeler's Creek but was later renamed as Colborne. Its first post office was opened in 1815, operating out of a store owned by Joseph Keeler. Other early enterprises included a bank and the Registry Office for the East Riding of Northumberland County. Located near the Lake Ontario shoreline, Colborne was also a port of entry into Canada, with two wharves owned by Mr. Keeler and a Mr. Campbell, respectively. The village also had a station on the Grand Trunk Railway line. Local businesses included two grist mills, a tannery, and a trade in white poplar that was shipped to the United States for use as paper (Belden 1878).

The 1878 *Belden & Company* historical atlas map for Cramahe Township shows the location of the lots and concessions as well as historical roads and buildings, if present, at that time. Based on the Belden map, the following information is noted for the subject property:

Option 2

Option 2 includes the lands within the road allowance between Concessions 2 and 3 of Cramahe Township (now Purdy Road), adjacent to Lots 31 and 32 in each of these two concessions (see Map 10 in Section 8.0). On the north side of Purdy Road, Lot 32, Concession 3 was originally split into two 100-acre parcels; the west parcel was owned in 1878 by E. H Purdy and the east parcel was owned then by W. Conklin. Both E.H. Purdy and W. Conklin had houses in the southwest corners of their parcels of land, both of which fronted on the north side of Purdy Road, adjacent to the ROW for Purdy Road (part of Option 2). Just across the road from E.H. Purdy's parcel of land, to the west, the 1878 Belden map shows the symbol for a church in the southeast corner of Lot 33. Although this church is no longer standing, there is a large cemetery at this location that was originally associated with the church. Both the church location and the cemetery are outside the limits of Option 2, however. Lot 31 in Concession 3, immediately east of Lot 32, had one owner in 1878 (Thomas Green), who owned all 200 acres of this lot and had a house well to the north of Purdy Road; however, there was also a schoolhouse in the southeast corner of Green's lot a that time, which fronted on the north side of Purdy Road adjacent to the Purdy Road ROW (part of Option 2). A section of Industrial Park Road that is the northernmost end of Option 2 also extends north from Purdy Road onto Lot 31 of Concession 3, just north of the schoolhouse.

On the south side of Purdy Road, Option 2 extends southward along the division between the northern halves of Lots 31 and 32 of Concession 2, both of which were owned in 1878 by J.S. Strong; this is now part of the ROW for Industrial Park Road. Option 2 then turns to the west across part of Lot 32 where it meets up with and extends southward down Percy Street. Strong had no houses that border on Option 2 lands, but at the southernmost end of Option 2 there was a separate small house lot on Lot 31, Concession 2 that fronted on the east side of Percy Street adjacent to the ROW for Percy Street.

In summary, there were no houses or other historic-period buildings or features directly on the Option 2 lands. However, on the lands immediately adjacent to the Options 2 lands north of Purdy Road, there was a church and its associated cemetery, two houses, and a schoolhouse. On the lands immediately adjacent to the Option 2 lands south of Purdy Road, there was only one house at the south end of the Percy Street ROW.

Option 3

The north end of Option 3 is identical to Option 2 north of Purdy Road (see Map 11 in Section 8.0). Therefore, this part of Option 3 had no houses or other historic-period buildings or features directly on it. However, on the lands immediately adjacent to the Options 3 lands north of Purdy Road (as with Option 2 north of Purdy Road), there was a church and its associated cemetery, two houses, and a schoolhouse.

On the south side of Purdy Road, Option 3 has some similarities to Option 2, in that it extends southward along the ROW for Industrial Park Road, which is between the

northern halves of Lots 31 and 32 of Concession 2, both of which were owned in 1878 by J.S. Strong. However, Option 3 takes a turn to the east, following the ROW for Industrial Park Road to where it intersects with Elgin Street North. At that point, Option 3 turns directly southward and extends along the ROW for Elgin Street North to just north of Park Street East. Based on the 1878 Belden map, there are no houses or other historic-period buildings or features directly on or adjacent to the Option 3 lands south of Purdy Road.

Option 4

The north end of Option 4 is identical to Options 2 and 3 north of Purdy Road (see Map 12 in Section 8.0). Therefore, this part of Option 4 had no houses or other historic-period buildings or features directly on it. However, on the lands immediately adjacent to the Options 4 lands north of Purdy Road (as with Options 2 and 3 north of Purdy Road), there was a church and its associated cemetery, two houses, and a schoolhouse.

On the south side of Purdy Road, Option 4 has some similarities to Options 2 and 3, in that it extends southward along the ROW for Industrial Park Road, which is between the northern halves of Lots 31 and 32 of Concession 2, both of which were owned in 1878 by J.S. Strong. As with Option 3, Option 4 takes a turn to the east, following the ROW for Industrial Park Road to where it intersects with Elgin Street North. At that point, Option 4 also turns directly southward and extends along the ROW for Elgin Street North to just north of Park Street East, as does Option 3. However, Option 4 has an extra extension that crosses over a parcel of land on Lot 31, Concession 2 that was owned in 1878 by a "Mrs. Burke", who owned most of the south half of that lot at that time. Based on the 1878 map, there were no houses or other historic-period buildings or features directly on or adjacent to the Option 4 lands south of Purdy Road.

In terms of significant 19th-century transportation corridors, Options 2, 3, and 4 consist of lands within the ROWs for Purdy Road, Elgin Street North, and Percy Street, all of which were important thoroughfares in the town in this area. Industrial Park Road does not appear to have been in existence in the 1870s, based on the Belden map, although it may have been a secondary unmarked roadway at that time.

As noted above, there are no houses or any other types of structures such as schools, churches, or mills shown within the limits of Options 2, 3, and 4. However, other properties adjacent to all three options had 19th-century houses, a school, a church, and a cemetery that were built in the 1800s. Furthermore, the subject property is just a few hundred metres north of the main part of the village of Colborne, which had many types of shops, churches, industrial features, and other normal parts of 19th-century villages. In addition, there were a number of villages and hamlets in the surrounding area, such as Castleton, Wicklow, Eddystone, and Grafton, which had similar industries, shops, and services. Therefore, this region has a lengthy history of Euro-Canadian settlement, including agricultural and residential use of these lands dating back to the late 1700s.

2.2 Land Use History of Subject Property

As described in Section 2.1, above, the majority of Options 2, 3, and 4 lie within the ROWs or road allowances for Purdy Road, Elgin Street North, and Percy Street, all of which have likely existed since the early-to-mid-1800s and have continued to be used in this way ever since. Industrial Park Road appears to have been built, or at least upgraded, during the 20th century. One section on Option 2 and one on Option 4 are not part of an existing ROW and both appear to have been part of undeveloped land that was partially used for agricultural purposes during the 1800s before it stopped being actively farmed; these sections currently consist of a grassy open fields that transition into wooded or poorly-drained areas with uneven topography on the east side of Percy Street. See Maps 7, 8, and 9 in Section 8.0 for satellite imagery showing these features.

3.0 ARCHAEOLOGICAL CONTEXT

3.1 Known Archaeological Sites In The Vicinity

A search of the Ontario Archaeological Sites Database (maintained by the *Ministry of Tourism, Culture, and Sport*) was carried out by MTCS Data Coordinator, Robert von Bitter. The results of this database search indicated that there are no registered sites located on the subject property or within a radius of 1 km. The closest known registered sites are roughly 5.5 km to the southwest of the subject property. They were discovered during the course of a Stage 2 archaeological assessment (Advance Archaeology 2006) and include two small scatters of Euro-Canadian material from the late 1800s/early 1900s (AlGl-1 and AlGl-2) and two precontact findspots of isolated non-diagnostic lithic flake tools made on Onondaga chert (AlGl-3 and AlGl-4).

The lack of recorded sites nearby may simply reflect a lack of archaeological research in the area and does not preclude the possibility of historic or precontact cultural heritage resources being found on the subject property. In fact, there is an unregistered pre-contact site about 1 km to the east of Elgin Street North, which was discovered by the landowner when he was doing some digging on his property (Argyris 2000). He gave the artifacts that he found (including a stone adze, a maul, a hammerstone, and a stone scraper) to the Anthropology Department at Trent University and was told that they were roughly 4,500-5,500 years old; however, the site has not had any archaeological fieldwork or assessment conducted on it (Argyris 2000).

3.2 Existing Conditions on the Subject Property

The subject property is located in the Iroquois Plain physiographic region of southern Ontario (Chapman and Putman 1984). The Iroquois Plain is actually the near-shore lakebed of glacial Lake Iroquois, which formed about 12,600 B.P. and was drained

by about 11,500 B.P., in the Ontario basin. Near-shore sediments consisted principally of large deposits of sand or clay near the entry points of interior drainages, which carried meltwaters and erosional deposits into the lake.

Locally, the subject property is within a large drumlinized till plain roughly 450m north of the main Lake Iroquois beach strand. There is an additional sand plain and strandline (a small embayment of Lake Iroquois) approximately 1km to the northeast (Ontario Dept. of Mines and Northern Affairs Map #2226; Chapman and Putnam 1984). The subject property is about 3.5km north of the current Lake Ontario shoreline. In terms of local water sources, there is a large wetland zone and associated secondary watercourse that crosses Options 2, 3, and 4 south of Industrial Park Road, extending from east of Elgin Street North across to west of Percy Street. Additional wetland zones and small and/or seasonal creeks are abundant in this general area, so there are at least three water sources within 300m of the subject property.

In terms of prior soil disturbance, Options 2, 3, and 4 all include existing paved roadways that have asphalt road surfaces, gravel shoulders, and existing infrastructure. Many parts of the subject property that are located on either side of the existing roads have also been subject to the excavation of drainage ditches and other grading operations. Despite the extensive road-construction disturbances that exist across most of the central portions of Options 2, 3, and 4, there may still be some small, relatively undisturbed zones within the narrow strips of land bordering the existing roads. With respect to the non-ROW lands on Options 2 and 4, they appear from satellite imagery to be fairly undisturbed and undeveloped land, part of which was probably used agriculturally in the past and has been left as a grassy open field, and part of which is wooded or poorly-drained and may never have been cleared for agricultural or other uses. Any zones within Options 2, 3, and 4 that may possibly be undisturbed would need to be examined and tested during future Stage 2 assessment in order to confirm the degree of prior soil disturbance that exists. This is also true for the possible pumping station and forcemain that are included in Option 3, but for which an exact size and location have not yet been determined. Once the details about these Option 3 features are finalized, the lands that they occupy should be examined prior to carrying out any Stage 2 fieldwork, if that Option is selected as the preferred option for this project.

4.0 ANALYSIS AND CONCLUSIONS

Despite high levels of prior soil disturbance on many parts of the subject property, the Stage 1 assessment indicates that, overall, Options 2, 3, and 4 are in locations with archaeological potential, based on several factors:

- there are several secondary water sources (e.g., wetland zones and small creeks) within 200m of the subject property;

- the subject property also includes features that would have made it suitable for aboriginal use and habitation, such as elevated topography that is adjacent to wetlands and secondary watercourses;

- there is an unregistered pre-contact archaeological site roughly 1 km east of Elgin Street North;

- three significant 19th-century transportation corridors (Percy Street, Elgin Street North, and Purdy Road) are within 200m of the subject property;

- a 19th-century church and cemetery, a schoolhouse, and three houses were built within 200m of the subject property; and

- the surrounding region has a well-documented and fairly intensive history of 19th-century Euro-Canadian settlement;

Together, these factors indicate that there is high potential for the presence of historic and pre-contact archaeological sites or cultural heritage resources on parts of the subject property. However, any sections of the property with extensive prior soil disturbance, permanently standing water, or very steep slopes (*i.e.,* with a grade higher than 20%) may be considered to be of low archaeological potential. The majority of Options 2, 3, and 4 have been extensively disturbed during prior road construction and upgrade operations, but the outer (possibly undisturbed) edges of the ROWs as well as non-ROW undisturbed lands still hold the potential for the presence of buried cultural heritage resources. The zones of archaeological potential identified in this Stage 1 assessment are shown on Maps 13, 14, and 15 of Section 8.0.

In conclusion, while much of Options 2, 3, and 4 is considered to be of low archaeological potential due to extensive prior road construction disturbance that will exempt those lands from Stage 2 assessment as per Standard 1.3.2 of the *Standards and Guidelines for Consultant Archaeologists* (MTC 2011), the edges of the roadways should be checked to confirm if any parts are relatively undisturbed and therefore require Stage 2 assessment due to having archaeological potential. If it is confirmed that there are some potentially undisturbed sections along the outer edges of the ROWs, they will need to be assessed by test-pit survey as per Standard 1.f, Section 2.1.2 of the *Standards and Guidelines* (MTC 2011), as will the undisturbed non-ROW lands, since those corridors are less than 10m wide. Test-pit survey must be conducted in accordance with Standards 1 to 9 of Section 2.1.2 of the *Standards and Guidelines* (MTC 2011).

5.0 RECOMMENDATIONS

Based on the results of this Stage 1 assessment, the following recommendations are made:

(1) That a Stage 2 archaeological assessment be conducted on all undisturbed portions of Option 2, Option 3, or Option 4 (whichever one is eventually selected as the preferred option for this project). These undisturbed areas are considered to be of high archaeological potential and are shaded in green on Maps 13, 14, and 15 in Section 8.0 of this report.

(2) That the Stage 2 archaeological assessment of the high-potential zones (shaded in green on Maps 13, 14, and 15 in Section 8.0) consist of test-pit survey, as per Standards 1 to 7 of Section 2.1 and Standards 1 to 9 of Section 2.1.2 of the *Standards and Guidelines for Consultant Archaeologists* (MTC 2011). Areas of low archaeological potential (such as the existing paved roadways shaded in grey on Maps 13, 14, and 15, Section 8.0) may be exempt from Stage 2 testing as per Standards 2.a and 2.b of Section 2.1 of the *Standards and Guidelines for Consultant Archaeologists* (MTC 2011), but the ground conditions and degree of prior soil disturbance adjacent to the roads and on all non-ROW lands will need to be verified at the time of the Stage 2 archaeological assessment in order to determine the appropriate Stage 2 assessment technique to be used, if any.

6.0 ADVICE ON COMPLIANCE WITH LEGISLATION

a. This report is submitted to the Minister of Tourism, Culture, and Sport as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Tourism, Culture, and Sports, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

b. It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

c. 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 the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the *Ontario Heritage Act*.

d. The *Cemeteries Act*, R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.

7.0 REFERENCES CITED

Advance Archaeology
2006 *Stage 2 and 3 Archaeological Assessment of McQuillan Lands Subdivision (Phase 1), Part of Lot 5, Concessions B and C; Lots 6 and 7, Concession C; and Part of Lots 6 and 7, Concession B, Township of Haldimand, Northumberland County*. Assessment report submitted to Ontario Ministry of Culture under CIF #s P121-014 [2005] and P121-017-2006. October 23, 2006.

Argyris, Eileen
2000 *How Firm A Foundation: A History of the Township of Cramahe and the Village of Colborne*. A project of the Millennium Committee, Village of Colborne and Township of Cramahe. Boston Mills Press. Erin, Ontario.

Belden, H. and Company
1878 *Illustrated Historical Atlas of the Counties of Northumberland and Durham, Ontario*. Toronto.

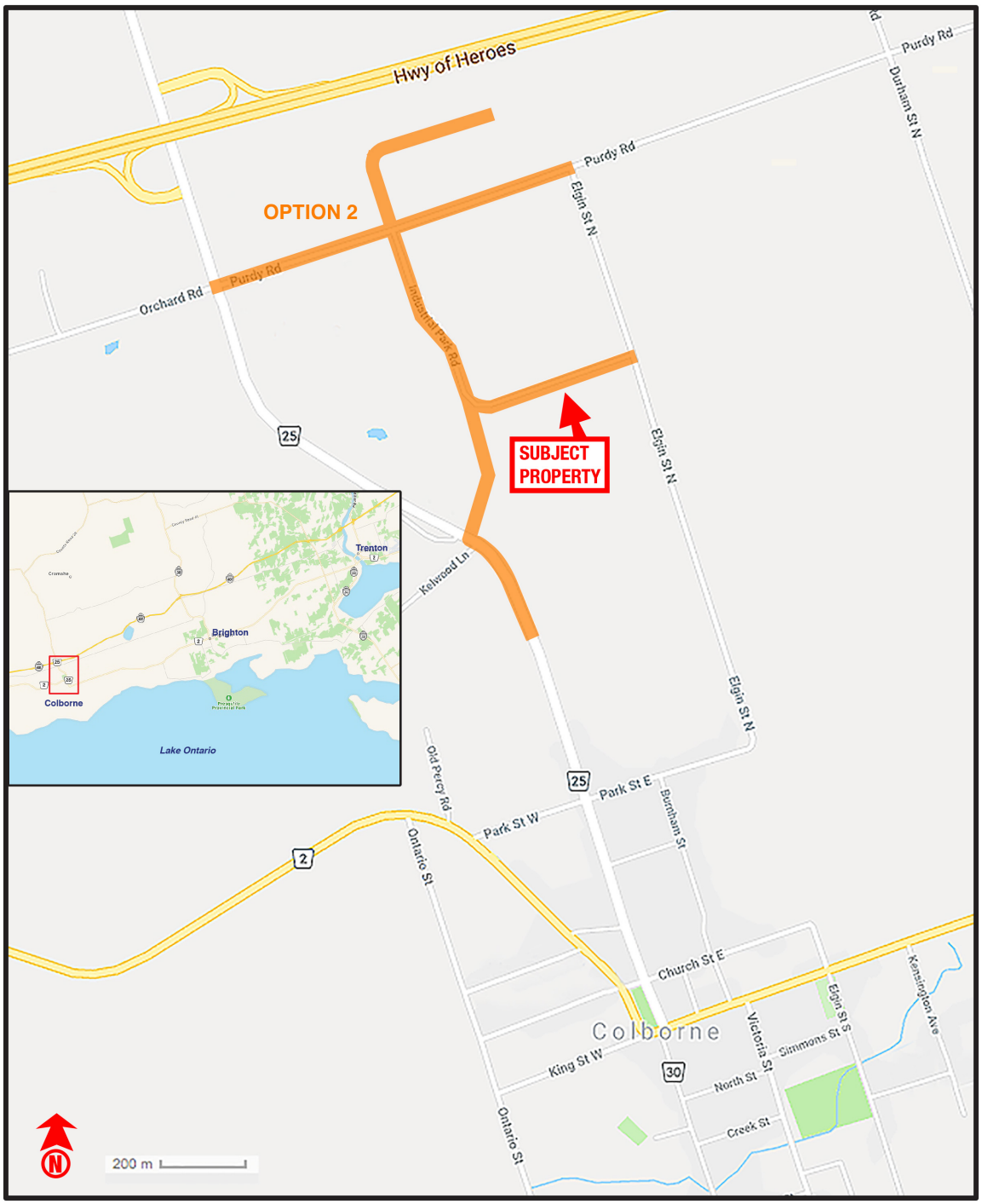
Chapman, L.J. and D. F. Putnam
1984 *The Physiography of Southern Ontario*. Third Edition. Ontario Geological Survey Special Volume 2.

MTC (Ministry of Tourism and Culture)
2011 *Standards and Guidelines for Consultant Archaeologists.* Queen's Printer for Ontario. Toronto.

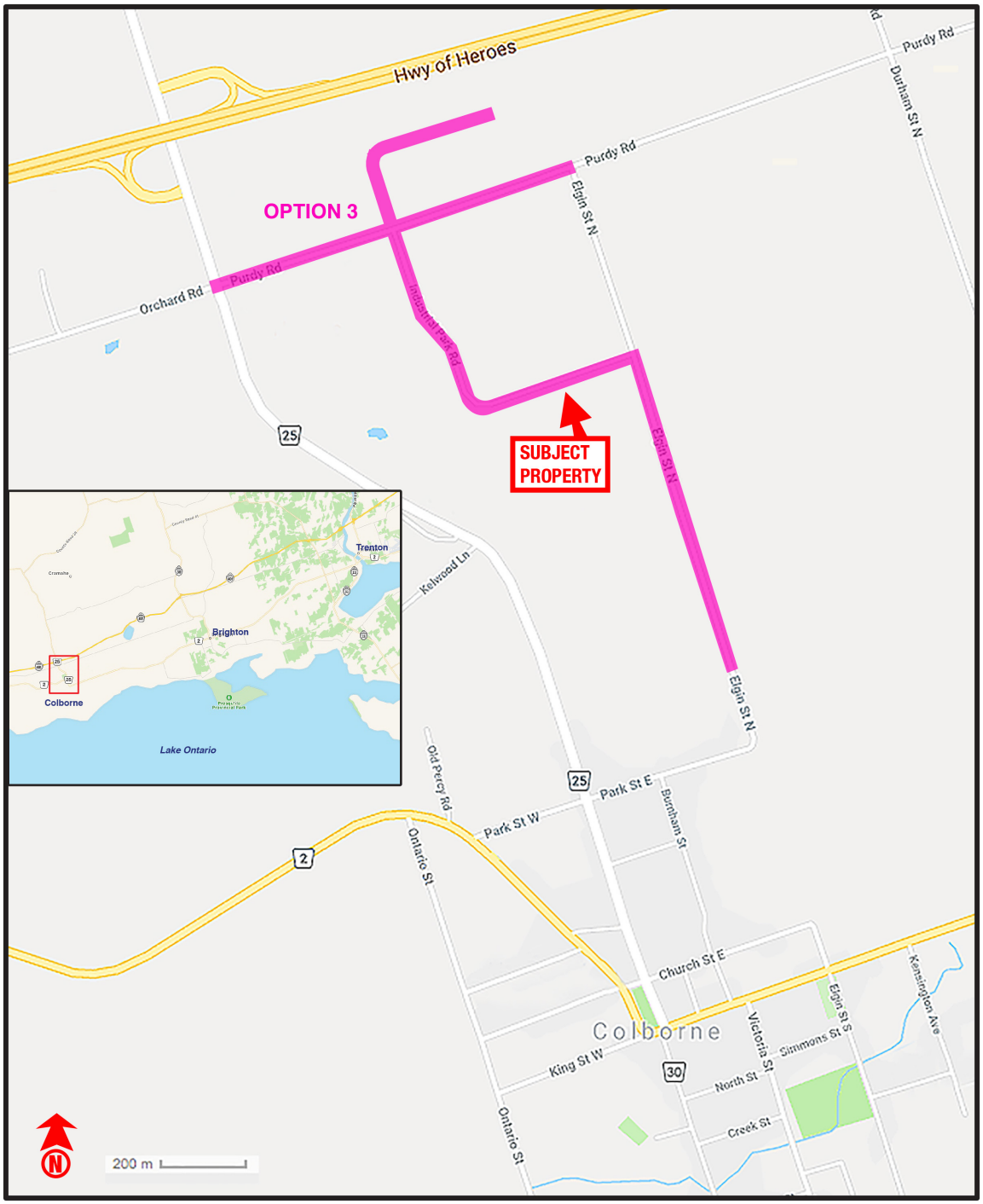
Ontario Department of Mines and Northern Affairs, and Ontario Research Foundation
1984 Map # 2226: *Physiography of the South Central Portion of Southern Ontario*.

Ontario Ministry of Natural Resources
1984 Ontario Geological Survey Map P.2715**:** *Physiography of Southern Ontario*. Toronto.

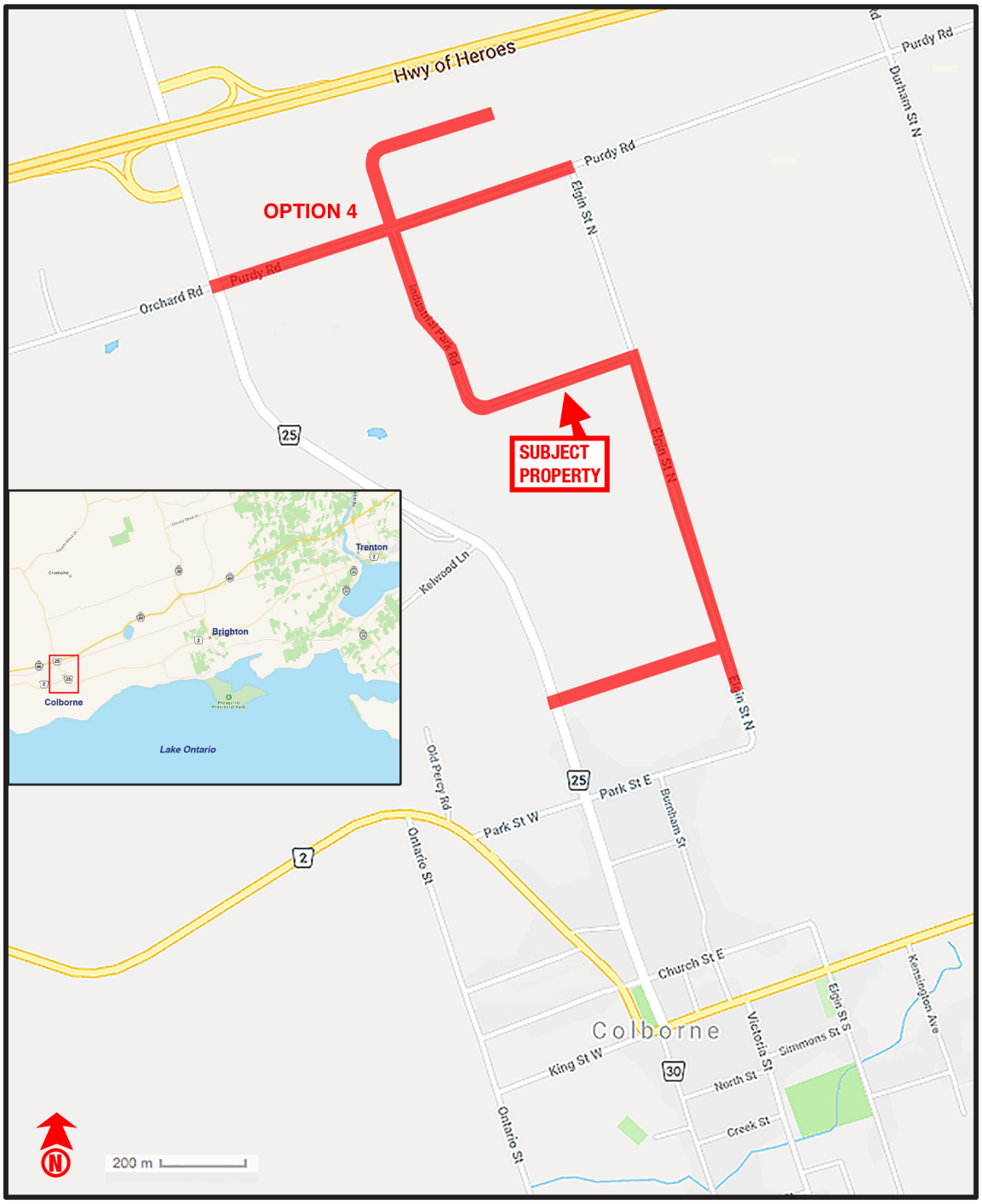
8.0 MAPS



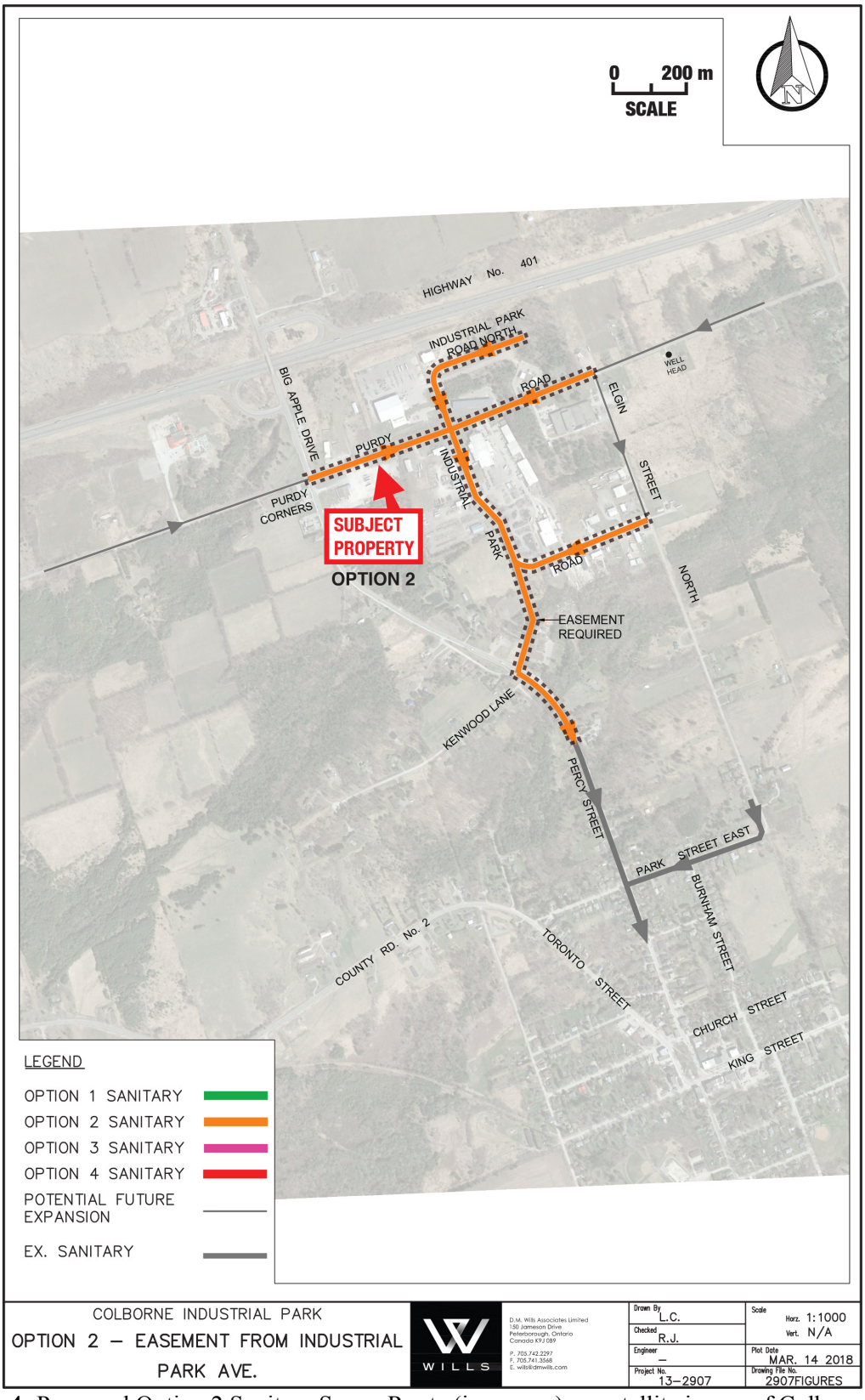
Map 1: Location of proposed Option 2 sanitary sewer route at the north end of Colborne.



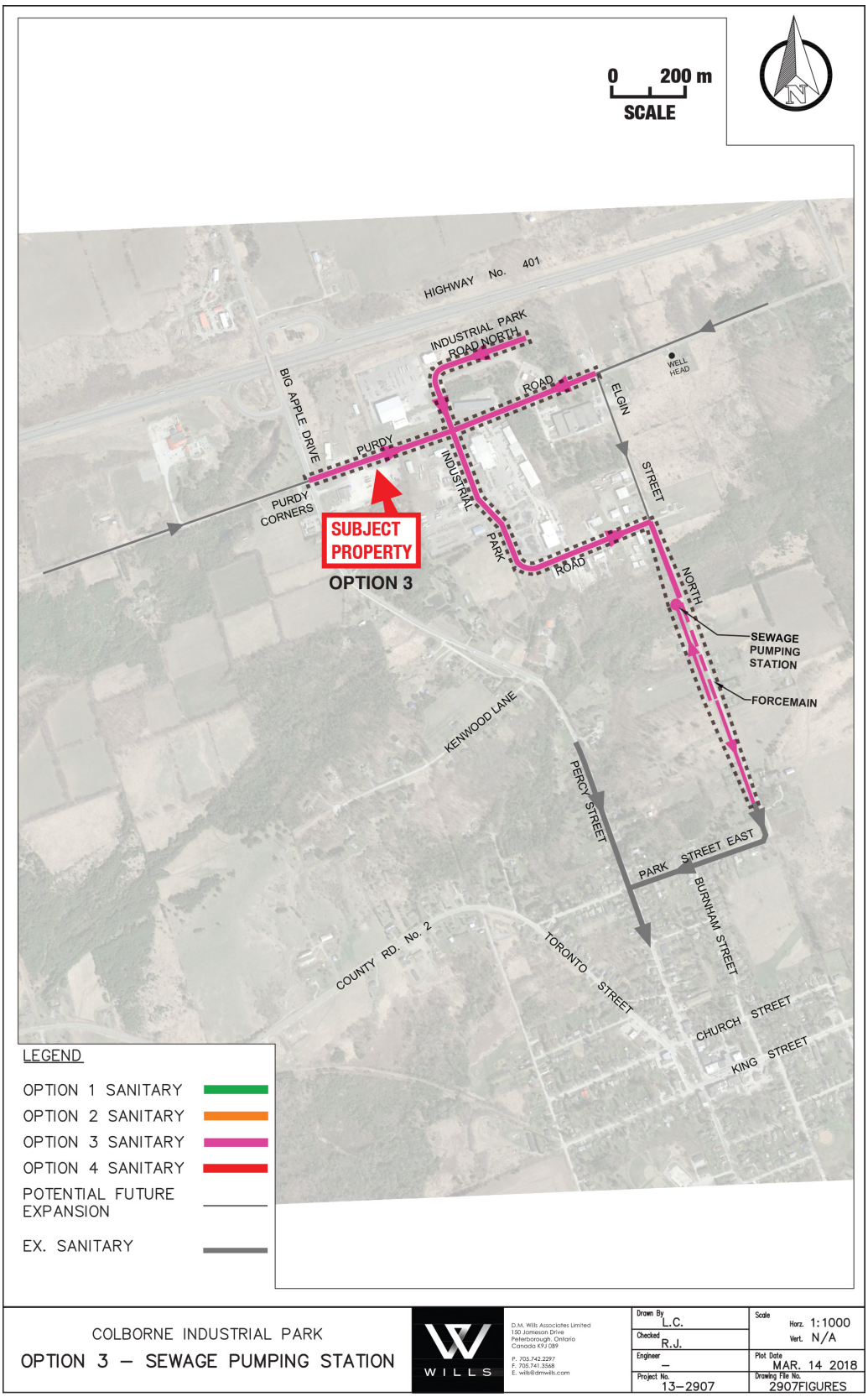
Map 2: Location of proposed Option 3 sanitary sewer route at the north end of Colborne.



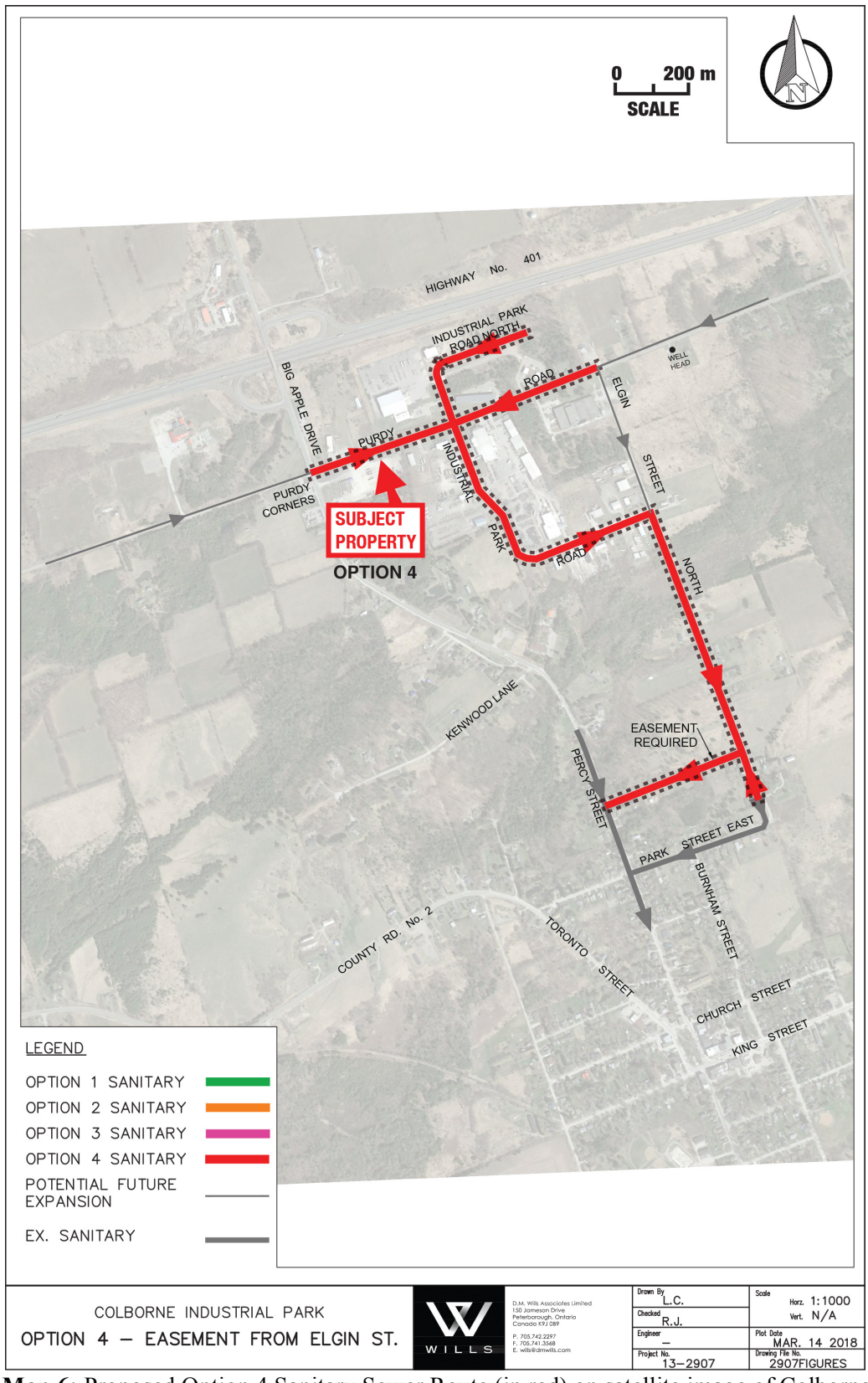
Map 3: Location of proposed Option 4 sanitary sewer route at the north end of Colborne.



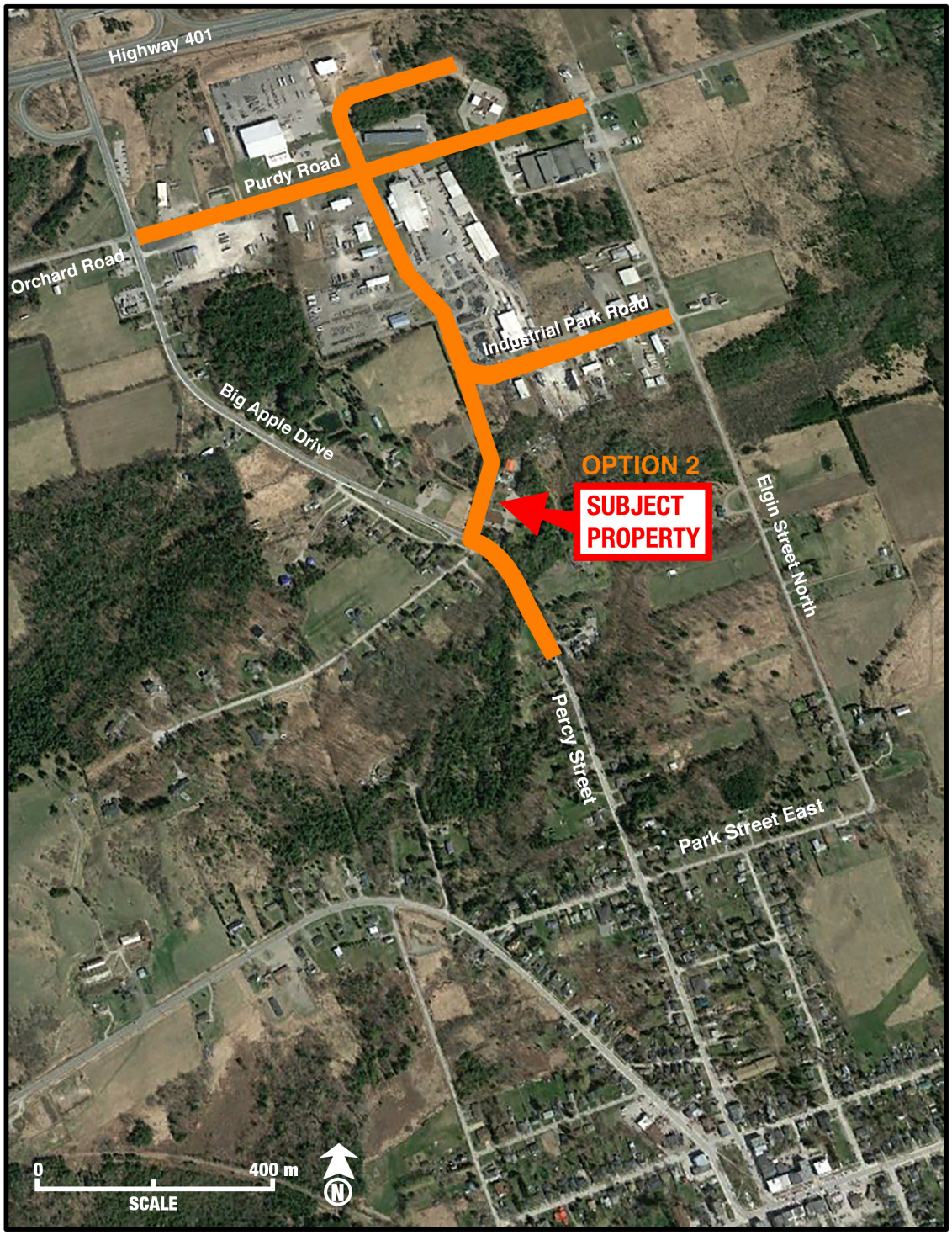
Map 4: Proposed Option 2 Sanitary Sewer Route (in orange) on satellite image of Colborne
(After base map provided by D.M. Wills & Associates Ltd.)



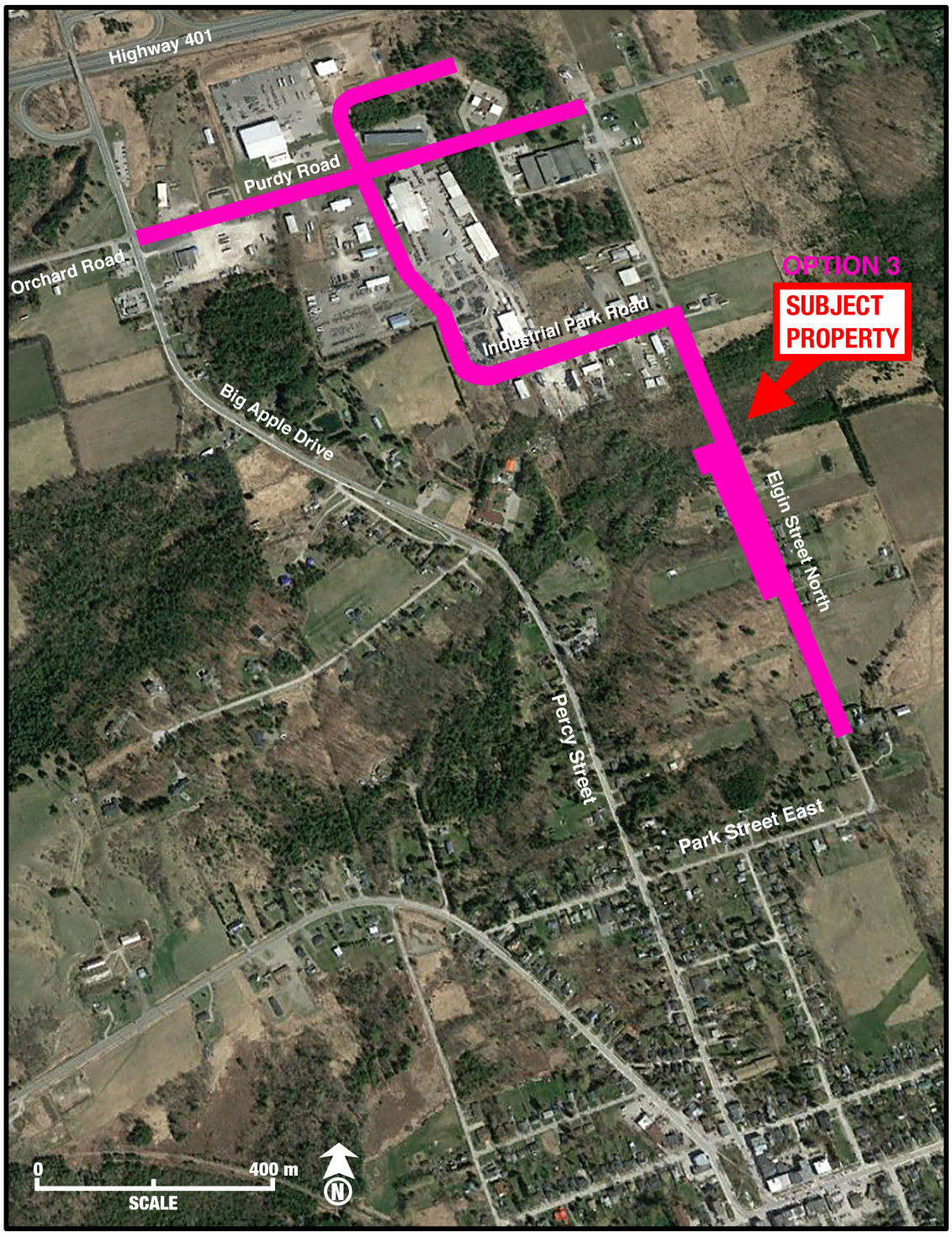
Map 5: Proposed Option 3 Sanitary Sewer Route (in pink) on satellite image of Colborne
(After base map provided by D.M. Wills & Associates Ltd.)



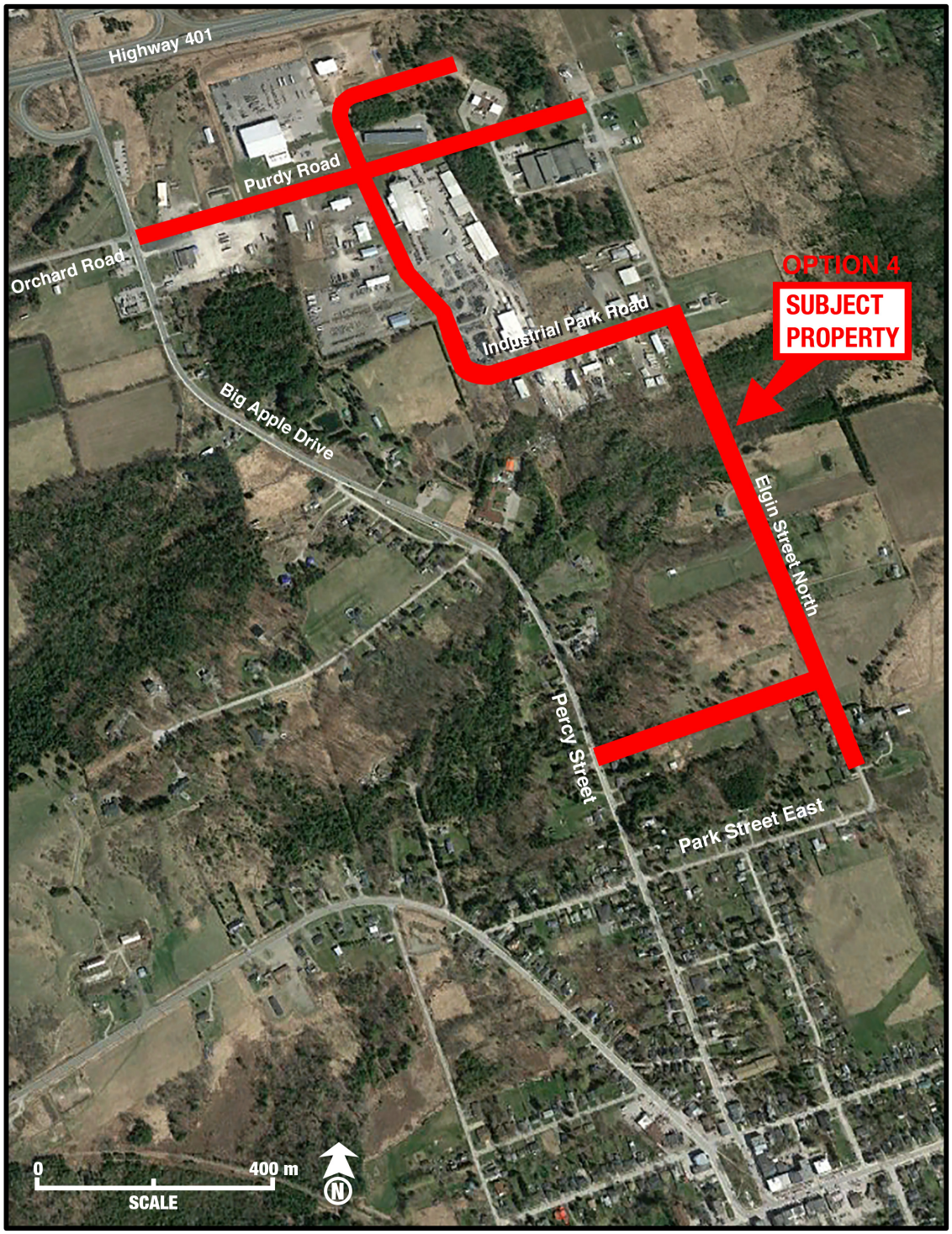
Map 6: Proposed Option 4 Sanitary Sewer Route (in red) on satellite image of Colborne
(After base map provided by D.M. Wills & Associates Ltd.)



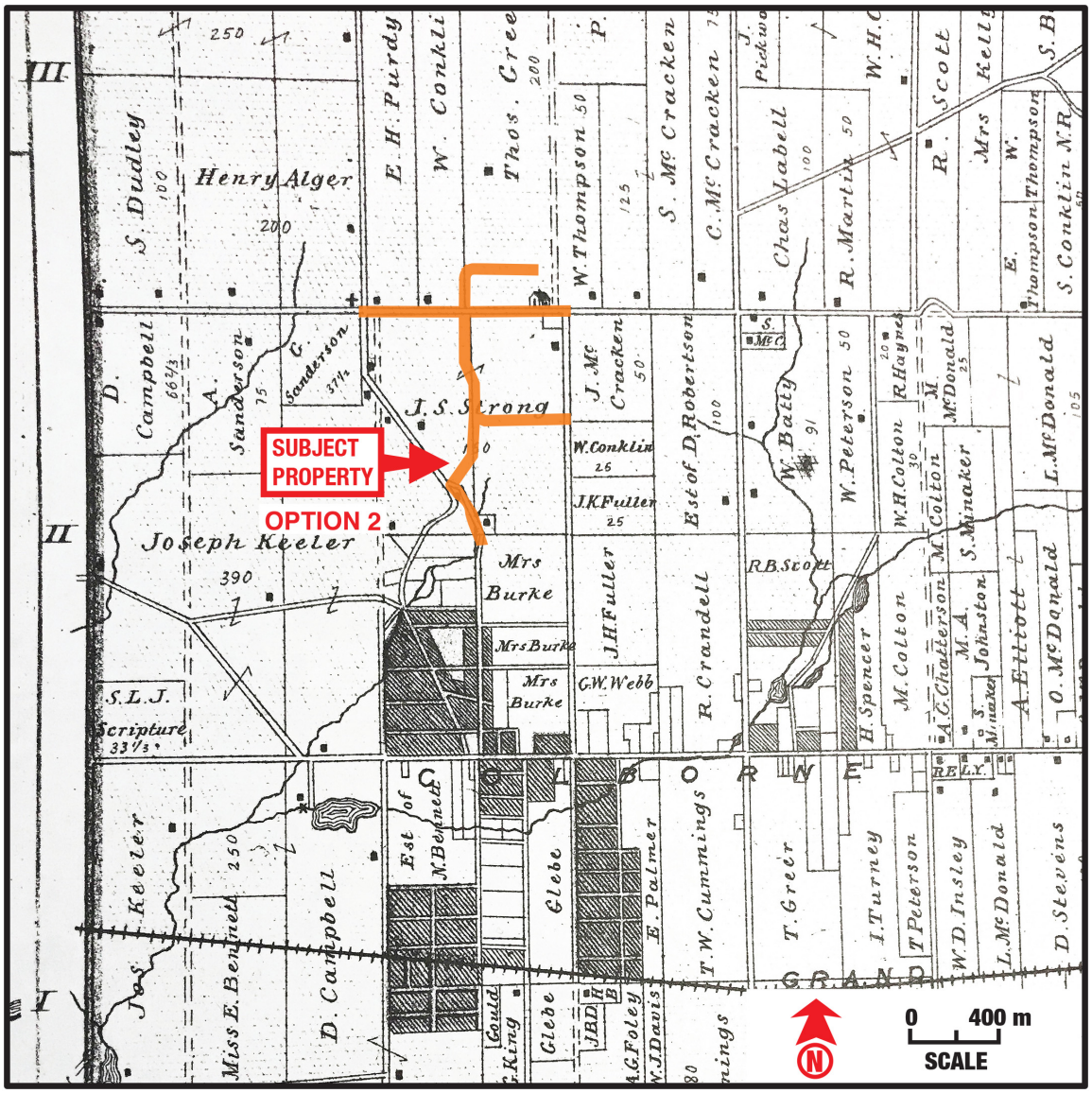
Map 7: Satellite image showing location of Option 2 shaded in orange.



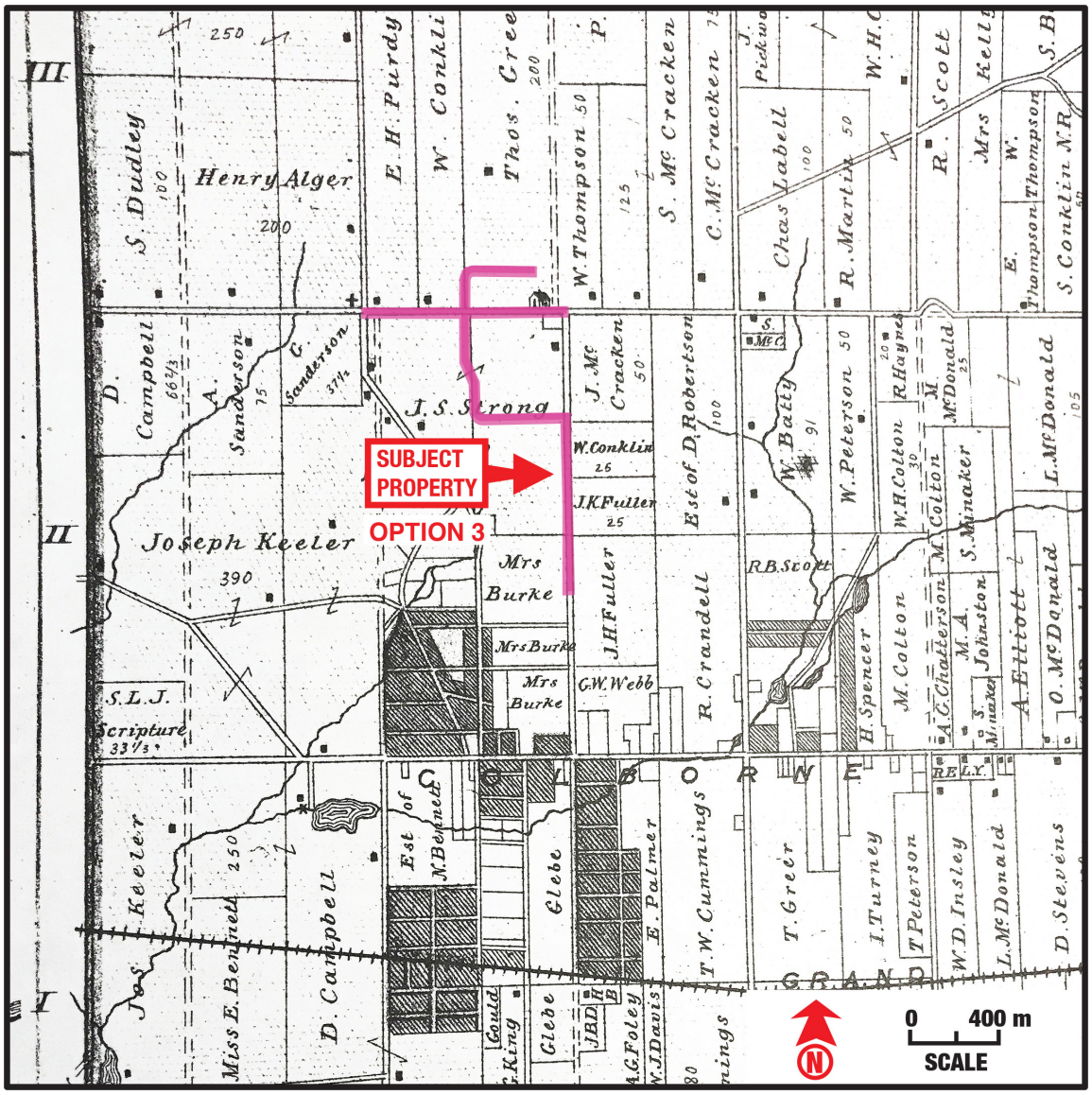
Map 8: Satellite image showing location of Option 3 shaded in pink.
Locations of possible future sewage pumping station and forcemain have been added at the estimated section of Elgin Street, but this is subject to change and will require future verification.



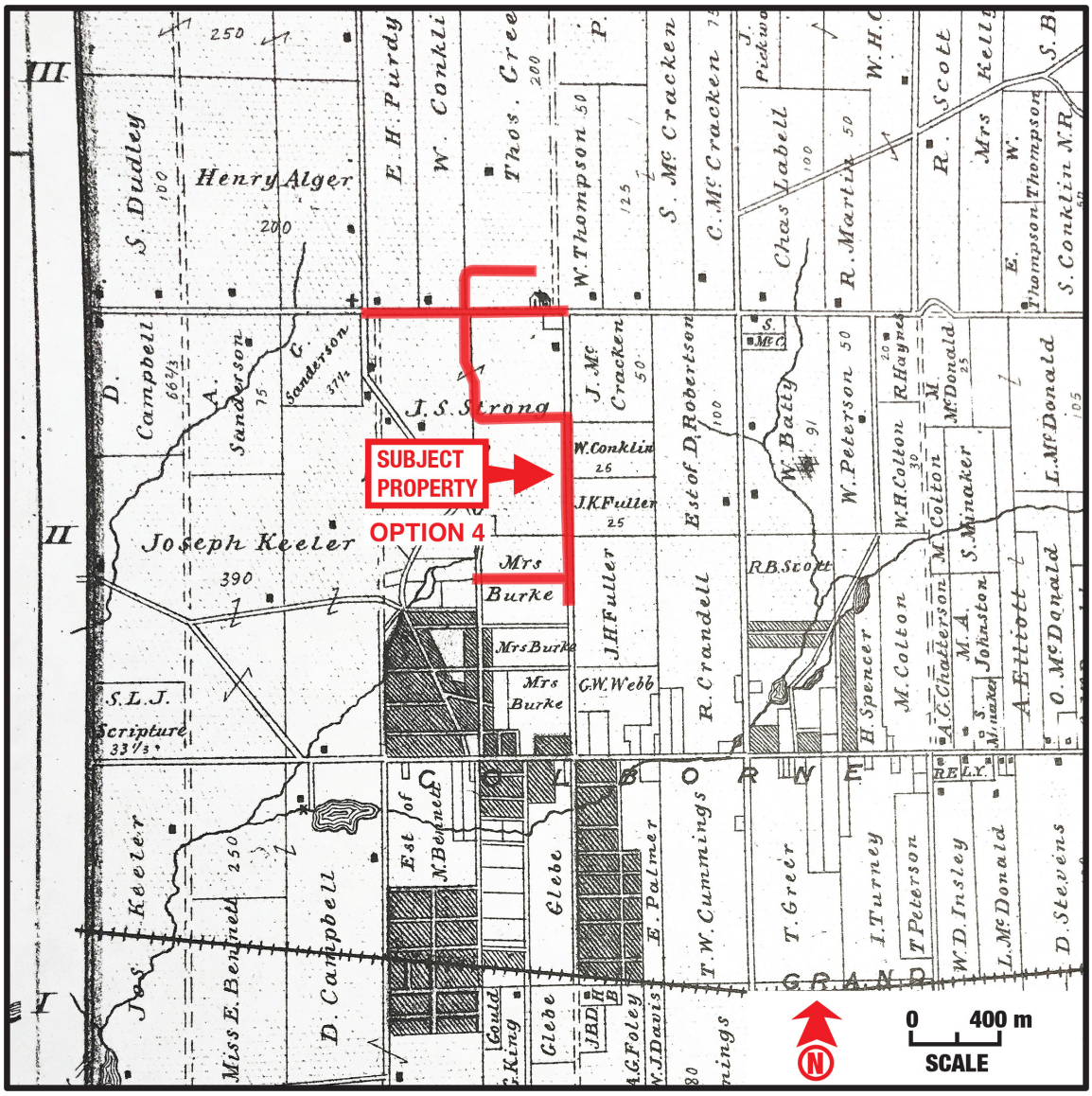
Map 9: Satellite image showing location of Option 4 shaded in red.



Map 10: Historical Atlas Map of Cramahe Township, Showing Approximate Location of Option 2 in orange (*after* Belden & Co. 1878).

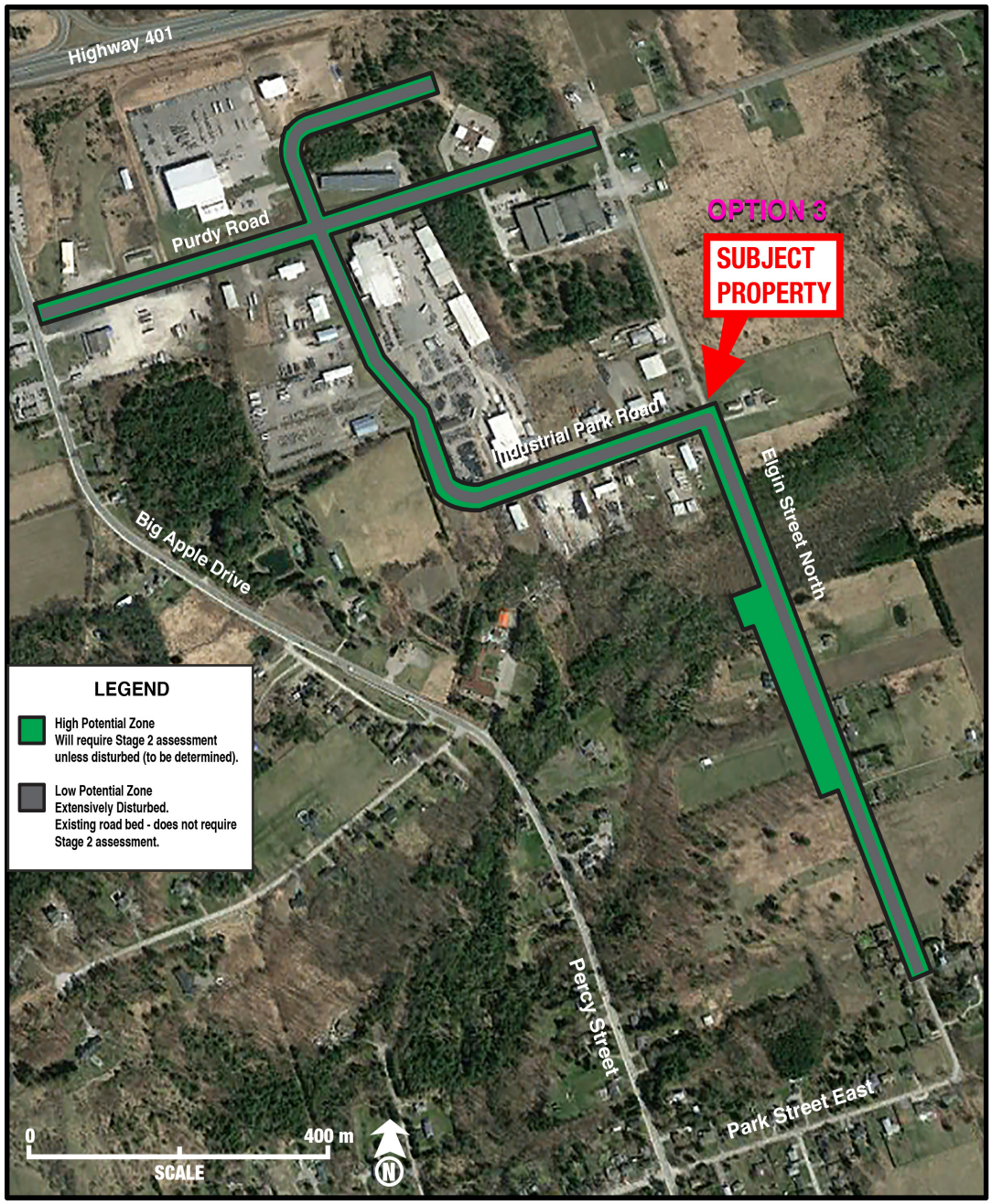


Map 11: Historical Atlas Map of Cramahe Township, Showing Approximate Location of Option 3 in pink (*after* Belden & Co. 1878).



Map 12: Historical Atlas Map of Cramahe Township, Showing Approximate Location of Option 4 in red (*after* Belden & Co. 1878).

Map 13: Zones of Archaeological Potential for Option 2.



Map 14: Zones of Archaeological Potential for Option 3.

Map 15: Zones of Archaeological Potential for Option 4.

Appendix C

Clearford Report

100 – 515 Legget Drive
Ottawa, ON
K2K 3G4

Tel: 613 599 6474
Fax: 613 599 7478
Toll free: 866 231 1104

CLEARFORD

CLI No. 04001

July 28, 2017

Mr. Craig Brooks
CAO, Township of Cramahe
1 Toronto Street
P.O. Box 357
Colborne, ON K0K 1S0

Re: Sanitary Sewer Capacity Assessment Brief for Colborne Industrial Park
Township of Cramahe, County of Northumberland

Mr. Brooks,

We are pleased to submit the results for the sanitary sewer capacity assessment study of the existing small bore sewer (SBS®) system at the Colborne Industrial Park in the Township of Cramahe. We have followed the previously submitted Work Plan and Site Work Schedule to assess current usage, performance, and to estimate remaining capacity in the SBS system to assist the Township with planning for future build-out of the Industrial Park.

Executive Summary

While originally designed as a “dry” industrial park, the service area now includes properties with industrial water processes and highway rest-stop type facilities that may be contributing greater peak wastewater flows than originally designed for in the SBS system. Historical sewer backups may have been caused by these large peak flows, together with blockages from wire that was found coiled inside the sewer pipes, which has now been removed.

A hydraulic analysis of the existing sewer network was performed using estimated average and peak flow values for each property. Flows were estimated from compiled information including original design values, water records, and business information collected during a field investigation. The results suggest that for the estimated average flow conditions, most segments appear to have 10-20% remaining capacity except for a segment along Purdy Road which may have reached or exceeded its capacity.

It is our opinion, with the information available at this time, that the existing SBS system may have reached its conveyance capacity, especially in accommodating large peak flows from "wet" properties in the Industrial Park.

The accuracy of the hydraulic analysis is limited in that it assumes that the flowrate for each business is averaged equally over the course of the work day. In order to more accurately assess existing flows and the remaining sewer capacity, flow monitoring equipment can be installed in the sewer to measure the actual magnitude and time variation of flow in the system.

While the existing system may have reached its design capacity, the SBS network can be redesigned and expanded to accommodate existing properties and future growth in the Industrial Park and surrounding development areas. We estimate that tripling the total capacity of the SBS system could be implemented for roughly $750,000-$1.25 million.

Background

Clearford Water Systems Inc., formerly R.W. Connelly Associates Inc. and Innovative Water and Sewer Systems Inc., has been involved in the design and construction of the sanitary SBS system from its inception in 2004. Since that time, Clearford has worked with the Township to provide engineering support during operation and expansion of the serviced commercial and industrial lands along Big Apple Drive, Purdy Road, and Industrial Park Road, as shown in Figure 1 (attached).

It is noted that the SBS system was originally designed as a "dry" industrial park, requiring sewage collection and treatment for typical domestic or office-type wastewater only, not for businesses that produce process or industrial wastewater. However, the Industrial Park area has developed over the years to include businesses with industrial water processes (manufacturing and washing) and highway rest-stop type facilities (fast food and gas station). The impact of each new connection on the SBS system was evaluated during the design of the connections based on estimated wastewater generation rates (typical average and peak design flows) for the new facilities from information provided by the facility Owner or Engineer.

In early 2017, the Township approached Clearford to investigate capacity in the existing SBS system after issues were reported about the performance of the system. Several sewer backups occurred into the north building at Cam Tran and one at Durham Transport, both on Purdy Road. Additionally, the Township reported finding and removing significant lengths of wire from inside the SBS pipe network over the past couple of years. The wire was reported to be coiled up inside the pipe and was likely causing blockages of wastewater flow in the small-diameter sewer. There does not appear to be any record of what type of wire nor why it was placed inside the sewer pipes.

Capacity Assessment Study

Metered potable water supply records from July to December 2016 were provided by the Township for businesses in the Industrial Park (refer to Appendix A) to be used for estimating

the quantity of wastewater being discharge to the sewer system. It was determined that additional work would be required to more accurately assess the performance and remaining capacity of the sewer system. Clearford engineering staff conducted a field investigation to collect information from June 7-9, 2017 accompanied by the Township's Operations Foreman, Phil Kelly.

Field Investigation Scope of Work:

- Review all design, as-built and shop drawings from the Colborne Industrial Park SBS system installation and subsequent lot connections;
- Work with Township staff to prepare a site visit and survey plan prior to travelling to Cramahe;
- Site visit and survey (accompanied by Township staff) of connected facilities in the Industrial Park to estimate actual wastewater discharge to the SBS system;
- Develop an updated hydraulic sewer design sheet for the existing SBS system;
- Identify piping segments where capacity exists and what flow can be added.

Exclusions:

- Flow monitoring of existing sewers and lot connections;
- Sanitary servicing planning for build-out of service area;
- SBS system design for future expansion.

Results

The following properties are known to be connected to the sanitary SBS system:

- 263 Purdy Road – CCC Plastics;
- 232 Purdy Road – Cramahe Fire Hall/EMS Building;
- 203 Purdy Road – Cam Tran;
- 209 Purdy Road – Cam Tran (formerly Cambro Lasertek and Grafton Utility Supply);
- 32 Industrial Park Road North – Northumberland (Cheer) Waste Transfer Station;
- 116 Industrial Park Road North – Real-Flex Solar/Ontario Agri-Food Venture Centre;
- 188 Purdy Road – Anixter Power Solutions (formerly HD Supply);
- 292 Big Apple Drive – Durham Transport;
- 301 Big Apple Drive – Ultramar (formerly Petro-Canada);
- 289 Big Apple Drive – Tim Hortons.

It is noted that the SBS system was originally designed for an assumed number of employees (ultimately 373 people) in the Industrial Park, including a future sanitary SBS main along Industrial Park Road (south of Purdy Road), a future connection for the Big Apple at 262 Orchard Drive, plus a provision for 24 connected residences along Percy Street. However, it is our understanding that the Big Apple and 24 residential connections were not made; therefore, they have been excluded from the current capacity assessment.

The water records supplied by the Township were compiled along with the original design information by Clearford, and information from the field investigation to get a better estimate of the actual wastewater generated by each connected property. Refer to Appendix B for Information Sheets for each connected property.

Estimated average flow rates were calculated based on the compiled information about water usage, number of employees, operating hours, and special activities. These values are presented along with the original design flow values in Table 1 below. Additionally, the original design and estimated peak flow values are presented in Table 2. The assumed flows used in the capacity analysis are the maximum of the design and estimated values. Refer to Appendix C for the assumptions associated with the compiled average and peak flows.

Table 1: Compiled Average Flows

Pipe Reach [1]	Connections [2]	Design (L/s) [3]	Estimated (L/s) [4]	Assumed (L/s) [5]
A-B	CCC Plastics	0.16	0.13	0.16
A-B	Fire/EMS Building	0.10	0.10	0.10
A-B	Cam Tran (Grafton)	0.31	0.73	0.73
H-B	Waste Transfer	0.02	0.02	0.02
H-B	Real-Flex	0.78	0.005	0.78
B-J	Cam Tran	0.04	0.16	0.16
J-D	Anixter (HD Supply)	0.16	0.03	0.16
J-D	Durham Transport	0.06	0.06	0.06
E-D	Big Apple	0.92	-	-
D-F	Ultramar	0.25	0.83	0.83
D-F	Tim Hortons	0.22	0.46	0.46

Notes:
1) Refer to Figure 1 for SBS Network Schematic showing pipe reaches and property connections.
2) Refer to Appendix C for assumptions associated with the compiled flows.
3) “Design” flows are calculated based on original design information for each connection.
4) “Estimated” flows are calculated based on compiled information from the current study.
5) “Assumed” flows are the larger of the design and estimated flow values.

Table 2: Compiled Peak Flows [1]

Pipe Reach [2]	Connections [3]	Design (L/s) [4]	Estimated (L/s) [5]	Assumed (L/s) [6]
A-B	CCC Plastics	0.46	0.26	0.46
A-B	Fire/EMS Building	1.32	1.32	1.32
A-B	Cam Tran (Grafton)	0.79	1.63	1.63
H-B	Waste Transfer	0.48	0.48	0.48
H-B	Real-Flex	1.56	0.01	1.56
B-J	Cam Tran	0.08	0.31	0.31
J-D	Anixter (HD Supply)	0.31	0.06	0.31
J-D	Durham Transport	0.29	0.29	0.29
E-D	Big Apple	1.83	-	-
D-F	Ultramar	1.98	3.14	3.14
D-F	Tim Hortons	3.68	4.17	4.17

Notes:
1) Peak flow is the total of the average flow multiplied by the peaking factor plus the special peak flow.
2) Refer to Figure 1 for SBS Network Schematic showing pipe reaches and property connections.
3) Refer to Appendix C for assumptions associated with the compiled flows.
4) “Design” flows are calculated based on original design information for each connection.
5) “Estimated” flows are calculated based on compiled information from the current study.
6) “Assumed” flows are the larger of the design and estimated flow values.

Data was not available to determine actual peak flow values or the timing for the discharge of peak flows from each connected property. To estimate the peak flow conditions, a peaking factor (PF) of 2 was applied to the assumed average flows, unless otherwise specified in the original design, plus any transient “special” peak flows. While this PF is adequate for typical commercial and industrial land uses, it may not represent the actual peak flow from some properties in the Industrial Park. Industrial processes and rest-stop type facilities often generate highly variable wastewater flows with large peak flows. It is possible that the actual peak flows exceed the design values; flow monitoring of the sewer connections is the only reliable way to determine the actual wastewater flow discharged by a given property, but that is beyond the scope of the current investigation.

SBS Hydraulic Analysis

The average and peak flow values in Table 1 and Table 2 were used for the sewer capacity analysis. The hydraulic sewer design sheet for the SBS system was updated for two scenarios, the average and peak flow conditions, as presented in Appendix D. The hydraulic conveyance capacity of each pipe segment was evaluated based on as-built sewer slope information (Plan & Profile drawings P-1 to P-8, dated September 2004, copies included in Appendix E).

It is noted that while minimum sewer slopes were specified for construction, it appears from the as-built information that these minimum slopes were not always achieved for all segments of the installed SBS system, as highlighted in Figure 2 below. Therefore, some segments may experience temporary localized backups during certain peak flow conditions.

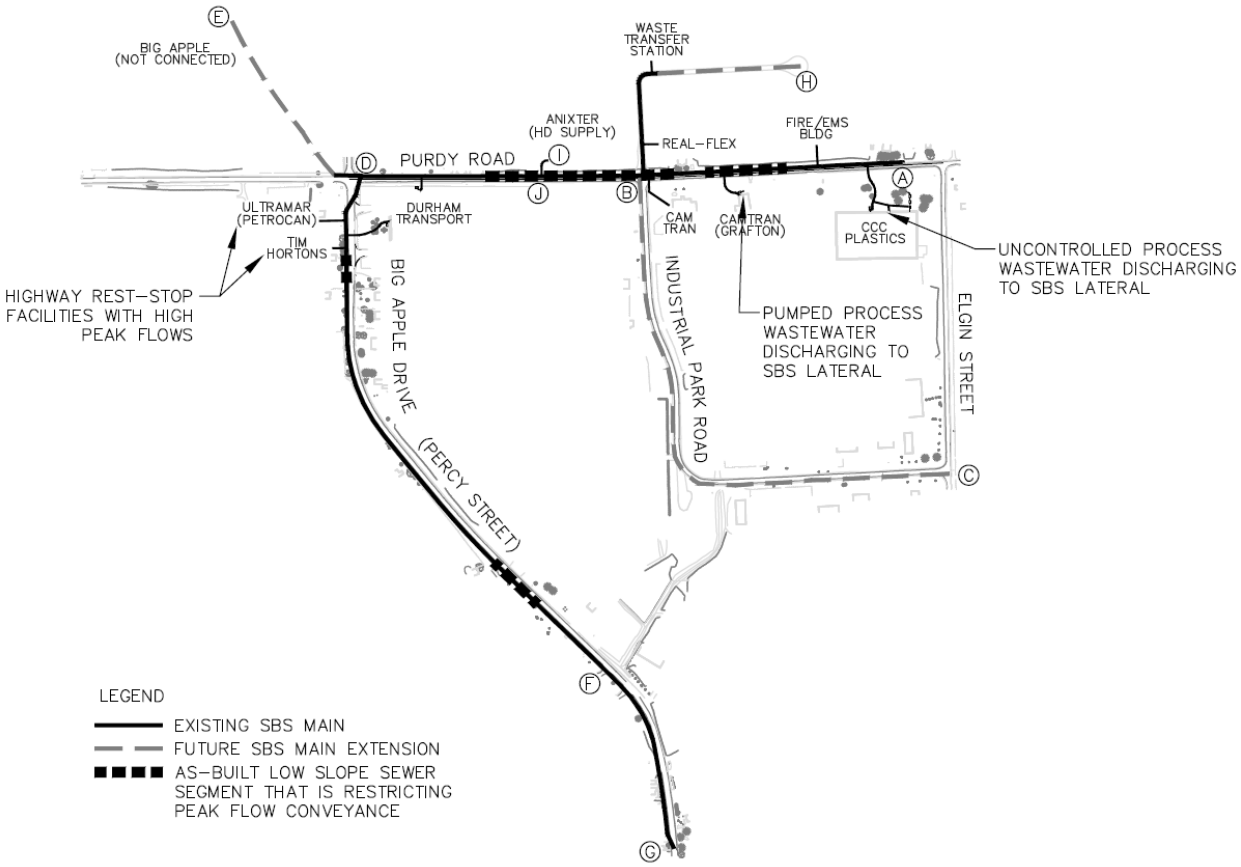


Figure 2: Capacity Study SBS Network Notes

From the analysis, it appears that sewer segment B-D along Purdy Road has the most restrictive hydraulic capacity as a result of some segments of sewer being installed at low slopes. If the actual flow exceeds the conveyance capacity of the sewer, wastewater is more likely to back-up into nearby property connections immediately upstream of the low-slope sewer segment—in this case, the Cam Tran connections at 203 and 209 Purdy Road, which corresponds with reported issues.

For SBS systems, it is preferable to maintain peak flows under 60% of the full pipe capacity. The peak flow analysis shows that all of the SBS pipe segments are at risk of surcharging given the compiled flow information. However, the Township has reported only a few occurrences of backups in the system, which may be related to the wire in the sewer pipe. This suggests that the assumed magnitude of peak flows and the modelled timing of their release may not be representative of actual peak flow conditions in the system.

Therefore, insufficient information is available at this time to estimate the precise remaining conveyance capacity in the existing sewer network with complete certainty. However, based on the average flow analysis, it is possible that the existing system has reached its capacity for the upper section (Purdy Road and Industrial Park Road) because of the restricted capacity of some sewer segments.

Localized Surcharges

As noted, there are some segments of sewer that were installed with low slopes that may cause temporary localized backups during certain peak flow conditions (refer to Figure 2). It is also possible that large peak flow discharges could be locally pressurizing the SBS main and raising the hydraulic grade line in the sewer such that other connections cannot discharge to the SBS main or wastewater is backing up into the connections. Generally, the interceptor tanks act as a buffer for flow surcharges coming from either direction (i.e., from the building to the sewer, or from the sewer to the building). However, two properties have connections that do not pass through buffering interceptor tanks:

- CCC Plastics – process water is pumped through a filter inside of the building to the discharge line that connects to the SBS lateral downstream of the interceptor tank, which could surcharge the lateral and sewer main but is unlikely to cause a back-up into the building due to elevation difference in the process discharge line;

- Cam Tran (209 Purdy Road) – the central and south building servicing expansions use pumped interceptor tanks to convey wastewater to the original SBS lateral downstream of the interceptor tank, which could surcharge the lateral and sewer main and cause a back-up into the original building (formerly Grafton) interceptor tank.

It is noted that newer connections are less likely to be affected because of improved site grading that locates the interceptor tank at a higher elevation relative to the SBS main. For older connections, tanks were installed at lower elevations in order to maintain existing grading on each site, making those connections more susceptible to backups from the sewer lateral and main. The Township may wish to recommend the installation of wastewater backflow prevention check valves at those buildings to help mitigate the risk of backups.

Conclusions

i) Historical sewer backups may have been caused, at least in part, by significant lengths of wire coiled up inside the SBS pipe, which have now been removed.

ii) It appears from the as-built information that some sewer segments were installed at less than the minimum specified slope. As a result, there is restricted hydraulic conveyance capacity in some segments that may contribute to temporary localized sewer backups during certain peak flow conditions.

iii) Some users may be using more of the system's hydraulic capacity than allocated in the original design, and large peak flows may be causing localized sewer surcharges that could contribute to backups into property connections.

iv) The calculated average and peak flows are estimates based on the compiled information, and may not represent the actual wastewater flows currently being discharged to the SBS system.

v) Based on the compiled flow information and the sewer hydraulic analysis, it appears that most segments of the sewer system are nearing their design peak flow conveyance capacity.

vi) For the estimated average flow conditions, most segments appear to have 10-20% remaining capacity except for the segment B-D along Purdy Road which may have reached or exceeded its capacity.

Recommendations

a) CCTV inspection of the sewers can be used to determine if any more wire remains in the pipe. This will also allow for observation of the condition of sewer pipes after 13 years of operation, and help to identify "sagging" sections that may also be contributing to flow restrictions in the existing sewer.

b) Installation of equipment to continuously monitor flow in the sewer mains and individual connections would generate data that reflects the actual magnitude and time variation of flow in the system. This information can be used to more accurately identify the remaining sewer capacity.

c) The installation of wastewater backflow prevention check valves at low-lying buildings will help to mitigate the risk of sewer backups that may cause property damage.

d) Expansion of SBS servicing in the Industrial Park would provide an opportunity to redesign the existing system, add additional capacity to accommodate future growth, and provide full sewer servicing to the entire area. One option shown in Figure 3 below consists of new SBS mains installed along Elgin Street (segment A-C) and Industrial Park Road (segment C-B), which are then connected directly to Big Apple Drive (Percy Street) near Keeler Road (pipe segment F-G). This new main could be sized to redirect large industrial flows away from the existing SBS main, relieving capacity in the existing main and potentially tripling the total capacity of the entire SBS system. Capacity would then be created for business expansions, infill development, and greater sanitary servicing coverage for existing properties and new developments in the area. We estimate that this option could be implemented for roughly $750,000-$1.25 million.

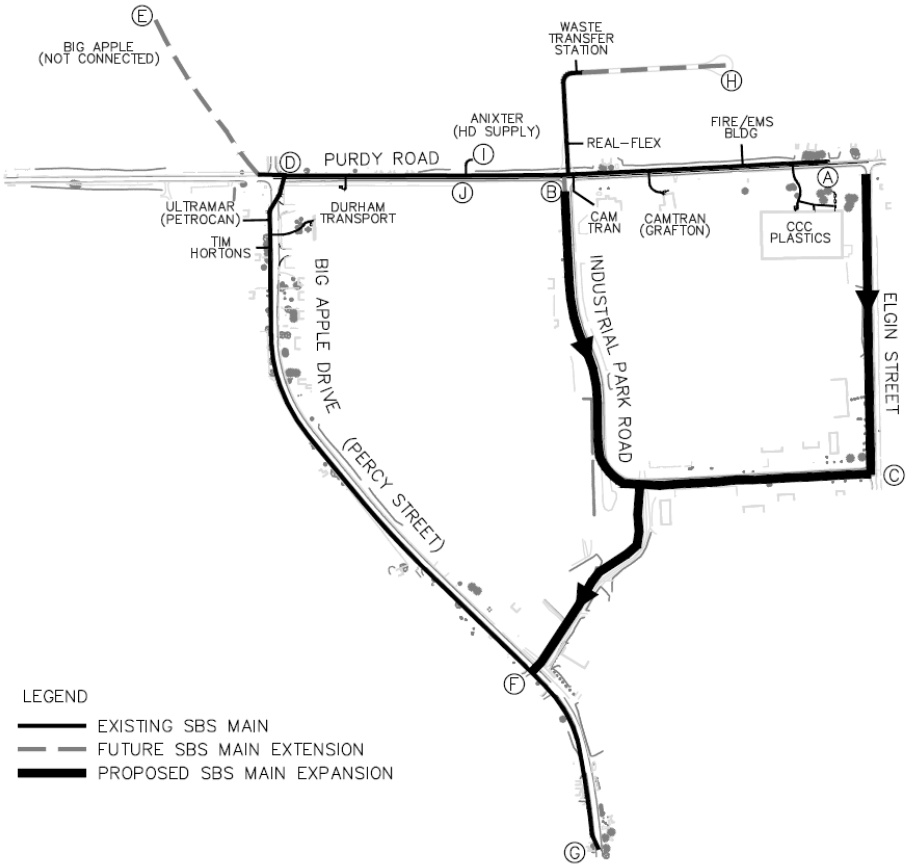


Figure 3: Proposed SBS Network Expansion

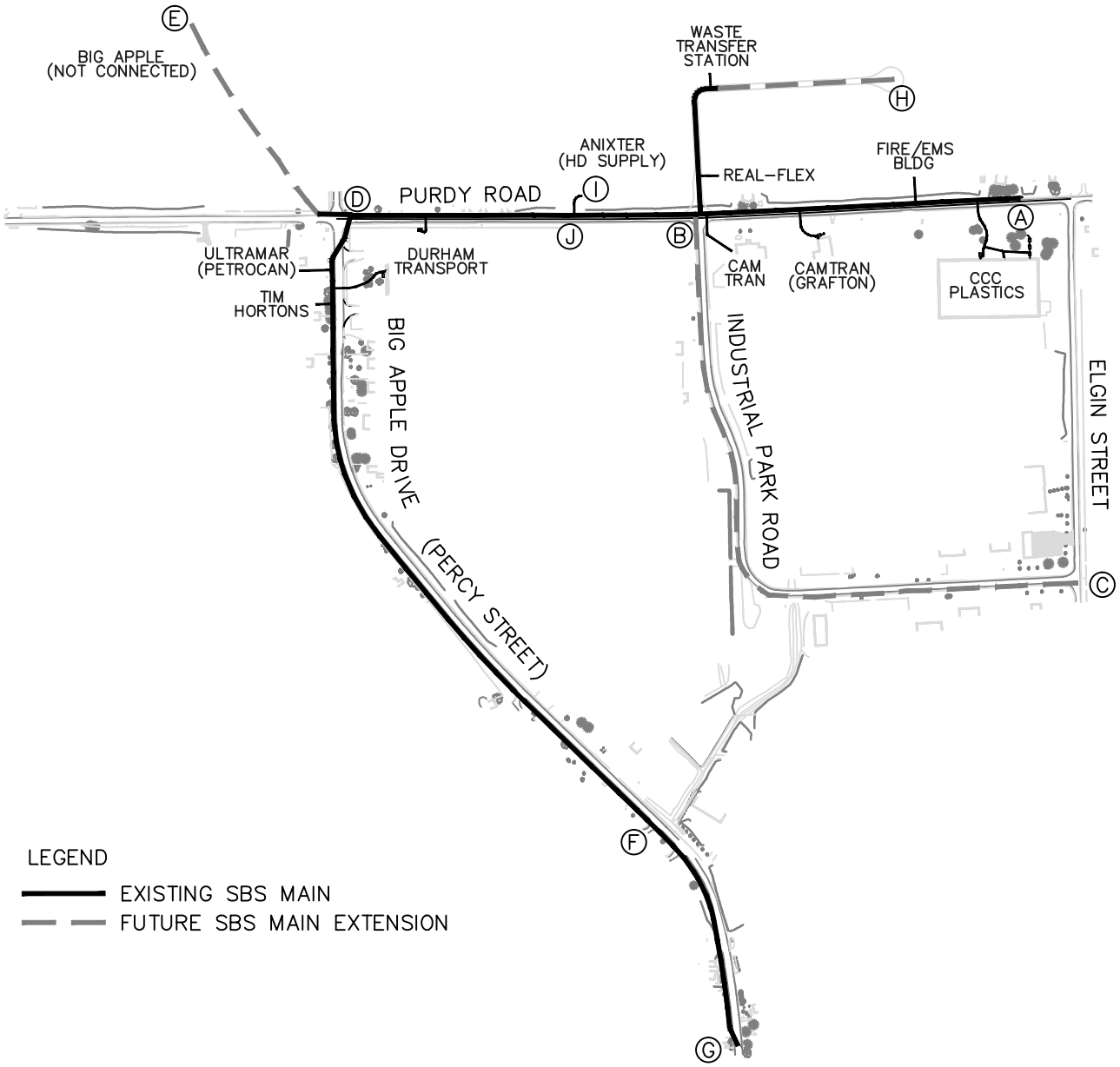
If you have any questions or would like to discuss anything further, please do not hesitate to call at (613) 599-6474.

Regards,

Gillian Dumencu

Gillian Dumencu, P.Eng.

Attach.: Figure 1 - Sanitary SBS Network Schematic
Appendix A - Property Water Records
Appendix B - Property Information Sheets
Appendix C - Compiled Flow Information
Appendix D - SBS Hydraulic Design Sheets
Appendix E - As-Built Plan & Profile Drawings



NOTES:	No.	REVISIONS	DATE	INITIAL
	01	ISSUED WITH CAPACITY STUDY	1□0□21	GD

PROJECT No.: 04001
CONTRACT No.:
DATE: 201□0□21
DESIGNED BY: GD
DRAWING No.: □IG 1
DRAWN BY: GD
A SIZE HOR.:
CHECKED BY: YW
ISSUE No.: 01
SCALE: N.T.S.
FILE PATH:

PROJECT
COLBORNE INDUSTRIAL PARK
CRAMAHE TOWNSHIP□ONTARIO

DRAWING TITLE
□IGURE 1 □SANITARY
SBS NETWORK SCHEMATIC

CLEARFORD
□1□L□□□□□Dr□□□S□□□100
O□□□□□O□□r o□K2K □G4
T□□□1□□□□□□4□4 □□□□□1□□□□□4□□
To□□r□□□□□□□2□1□1104
□□□.□□□r□ord.□o□

Appendix A

Property Water Records

CANADA COLOURS & CHEMICALS (LTD)

Account #209428-00
263 Purdy Rd.

Meter No.	Read Date	Reading (Hi)	Read Type	Usage (Hi)	Unit	m3	d	m3/d
60087590	01/12/2016	889	MR	7	M	7	27	0.26
60087590	04/11/2016	882	MR	4	M	4	29	0.14
60087590	06/10/2016	878	MR	7	M	7	29	0.24
60087590	07/09/2016	871	MR	8	M	8	34	0.24
60087590	04/08/2016	863	MR	6	M	6	28	0.21
60087590	07/07/2016	857	MR	8	M			

Typical Daily Water Usage: 0.2 assumes 24/7 operation

Account #209429-00
263 Purdy Rd.

Meter No.	Read Date	Reading (Hi)	Read Type	Usage (Hi)	Unit	gal	d	gal/d	m3/d
31597667	01/12/2016	38633	MR	126000	G	126000	27	4667	21.2
31597667	04/11/2016	38507	MR	120000	G	244000	58	4207	19.1
31597667	07/09/2016	38263	MR	156000	G	156000	34	4588	20.9
31597667	04/08/2016	38107	MR	139000	G	139000	28	4964	22.6
31597667	07/07/2016	37968	MR	177000	G	-419000	3		
31597667	04/07/2016	38387	MR	124000	G				

Typical Daily Water Usage: 21 assumes 24/7 operation

CAM TRANS CO LTD

Account #209430-01
209 Purdy Rd.

Meter No.	Read Date	Reading (Hi)	Read Type	Usage (Hi)	Unit	m3	d	m3/d
77421655	01/12/2016	5731	MR	49	M			
51675394	01/12/2016	47778	MR	570	M	619	28	22.1
51675394	03/11/2016	47208	MR	610	M	610	2	305
77421655	01/11/2016	5682	MR	61	M	61	55	1.1
51675394	07/09/2016	46027	MR	458	M			
77421655	07/09/2016	5507	CE	49	M	507	34	14.9
77421655	04/08/2016	5458	MR	48	M			
51675394	04/08/2016	45569	MR	292	M	340	28	12.1
51675394	07/07/2016	45277	MR	589	M			
77421655	07/07/2016	5410	MR	52	M	641	3	214
77421655	04/07/2016	5621	MR	114	M			
51675394	04/07/2016	46598	MR	571	M	685		

Typical Daily Water Usage: 23 assumes 24/7 operation

Account #209431-00
203 Purdy Rd.

Meter No.	Read Date	Reading (Hi)	Read Type	Usage (Hi)	Unit			
42190243	01/12/2016	3477	MR	130	M	130	27	4.8
42190243	04/11/2016	3464	MR	130	M	130	58	2.2
42190243	07/09/2016	3439	MR	140	M	140	34	4.1
42190243	04/08/2016	3425	MR	80	M	80	28	2.9
42190243	07/07/2016	3417	MR	170	M	170		
42190243	04/07/2016	3451	MR	120	M			

Typical Daily Water Usage: 4 assumes 24/7 operation

Account #209438-00
218 Industrial Park Rd.

Meter No.	Read Date	Reading (Hi)	Read Type	Usage (Hi)	Usage (L			
52854947	01/12/2016	405	MR	19	0	19	28	0.68
52854947	03/11/2016	386	MR	23	0	23	56	0.41
52854947	08/09/2016	337	MR	24	0	24	35	0.69
52854947	04/08/2016	313	MR	21	0	21	28	0.75
52854947	07/07/2016	292	MR	27	0	27		
52854947	04/07/2016	363	MR	26	0			

Typical Daily Water Usage: 0.7 assumes 24/7 operation

REAL FLEX SOLAR #4 CORP

Account #211712-00
116 Industrial Park Dr.

Meter No.	Read Date	Reading (Hi)	Read Type	Usage (Hi)	Unit
60852520	01/12/2016	51	MR	3	M
60852520	04/11/2016	48	MR	3	M
60852520	07/09/2016	42	MR	2	M
60852520	04/08/2016	40	MR	3	M
60852520	07/07/2016	37	MR	5	M
60852520	04/07/2016	45	MR	3	M

m3	d	m3/d
3	27	0.11
6	58	0.10
2	34	0.06
3	28	0.11
-8	3	

Typical Daily Water Usage: 0.1 assumes 24/7 operation

ANIXTER (H.D. SUPPLY UTILITIES)

Account #210695-00
188 Purdy Rd.

Meter No.	Read Date	Reading (Hi)	Read Type	Usage (Hi)	Unit
60581301	01/12/2016	1896	MR	60	M
60581301	04/11/2016	1836	MR	20	M
60581301	07/09/2016	1797	MR	19	M
60581301	04/08/2016	1778	MR	17	M
60581301	07/07/2016	1761	MR	59	M
60581301	04/07/2016	1816	MR	19	M

m3	d	m3/d
60	27	2.22
39	58	0.67
19	34	0.56
17	28	0.61
-55	3	

Typical Daily Water Usage: 0.6 assumes 24/7 operation

DURHAM TRANSPORT

Account #209416-00
292 Big Apple Dr.

Meter No.	Read Date	Reading (Hi)	Read Type	Usage (Hi)	Unit
60124797	01/12/2016	2965	MR	30	M
60124797	04/11/2016	2962	MR	0	M
60124797	03/10/2016	2962	MR	0	M
60124797	07/09/2016	2962	CE	120	M
60124797	04/08/2016	2950	MR	0	M
60124797	07/07/2016	2950	MR	0	M

m3	d	m3/d
30	27	1.11
0	32	0
0	26	0
120	34	3.53
0	28	0

Typical Daily Water Usage: 3.5 assumes 24/7 operation

ULTRAMAR (2008255 ONTARIO INC)

Account #209417-02
301 Big Apple Dr.

Meter No.	Read Date	Reading (Hi)	Read Type	Usage (Hi)	Unit
44831388	01/12/2016	25568	MR	61	M
44831388	04/11/2016	25507	MR	132	M
44831388	03/10/2016	25375	MR	3	M
44831388	07/09/2016	25372	MR	111	M
44831388	04/08/2016	25261	MR	146	M

m3	d	m3/d
61	27	2.3
132	32	4.1
3	26	0.1
111	34	3.3

Typical Daily Water Usage: 2.6 assumes 24/7 operation

TIM HORTON'S-JERI JOYCE

Account #210932-00
289 Big Apple Dr.

Meter No.	Read Date	Reading (Hi)	Read Type	Usage (Hi)	Unit	m3	d	m3/d
60621617	01/12/2016	20600	MR	4	M	4	27	0.1
60621617	04/11/2016	20596	MR	5	M	239	57	4.2
60621617	08/09/2016	20357	MR	456	M	456	35	13.0
60621617	04/08/2016	19901	MR	379	M	379	28	13.5
60621617	07/07/2016	19522	MR	437	M	-1069	3	
60621617	04/07/2016	20591	MR	234	M			

Typical Daily Water Usage: 13 assumes 24/7 operation

Appendix B

Property Information Sheets

Cramahe SBS Capacity Study
CLI No. 04001
June 2017

CCC Plastics
Location
June 8 2017 at 2pm and June 9 2017 at 9am
Visit Date & Time
Contact Person: Paul Anderson, Tom Simpson

	Design	Field Survey Notes
Employees	78 pers	80 total staff - 40 during day, 10-12 overnight
Operating Hours		"24/7"
Number of Shifts		
Duration of Shift		
Historical Water Usage	17 m3/d (2003 estimated avg)	
Current Water Records	21 m3/d (total)	
Estimated Domestic WW	5.85 m3/d	
Estimated Process WW	2.5 m3/d	
Tank Size	3.6 m3	15 m3 (east) and 3.6 m3 (west)

Notes:

50% loss of process water to evaporation/windage in cooling towers

Per email from Tom Simpson on June 9, 2017:
Metered quantities from Jan 4, 2016 to Jan 3, 2017
Water supplied to building: 1,613,300 UK gal
Water lost from tower cooling/evaporation: 80 gal/h*24 h/d*365 d/y = 700,800 UK gal
Process water usage: 384,829 UK gal

Process water is filtered prior to entering sewer, but does not pass through an interceptor tank
Process water pumped at nominal rate of 35 gal/min, level operated (per email 2017/07/25)
Township reports finding plastic beads in wastewater downstream of CCC

If more sales, facility is capable of expanding production and potentially doubling sewer discharge
New warehouse in Site Plan stage - minor impact to wastewater generation (+2 empl)

Questions:

1. What are the domestic fixtures generating wastewater to the municipal sanitary sewer?
Mainly washrooms - 30 people shower every day (half in morning and half in evening)

2. What are the industrial processes generating wastewater to the municipal sanitary sewer?
Cooling; Water-based pelletizing units (causing suspension of small plastic beads in wastewater - filter supposed to remove before discharging to sewer)

3. What occupancy and process conditions generate the most wastewater? Over what period?
Process tank pump discharging at 35 gal/min; draining tanks and backwash cycle (per email 2017/07/25)

4. Are there any operational changes that could affect the amount or quality of wastewater?
Occasional 2-week periods (typ. in the summer or December) for maintenance result in higher than normal flow; Operational activities, such as changing colours, result in higher than normal flow; Planned warehouse addition

Gillian Dumencu

From: Tom Simpson <tom.simpson@ccc-group.com>
Sent: July-25-17 11:26 AM
To: Gillian Dumencu
Subject: RE: Canada Colors discharge

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Gillian,

Sorry for the delay in response. Not sure how much I can help here but below is the information I can provide.

The Process discharges direct to the small bore pipe and has no set time table. The major contributors to this stream are change overs on the lines with underwater pelletizing units installed. Line 1, Line 8 and just recently Line 9. Line 9 has not had an impact as of yet as it is not online in any capacity. Line 8 has a 300 gal tank and line 1 has a 100 gal tank. When these are drained they pass through the waste tank and filters direct to the small bore line. It is common to get 2-3 days between emptying these tanks. It all depends on order makeup. Unless we have a maintenance issue the tank would never be emptied more than once in a 24 hr period.

If given the time to perform maintenance on the tower and process tanks (1 time per year) we would drain them . This usually happens in July or Aug but has been deferred to Dec when the plant is busy.

The discharge from the process waste tank is labelled at 35 US gal/minute. The tank operates with a float and not a set time so discharge is whenever the tank sees a high level. The discharge rate is effected greatly by the condition of the bag filters which prevent particulate from passing. As it builds up the flow rate drops.

Time table:	East Septic Tank	West Septic Tank
Washrooms	21 personnel 8:00-5:00pm	19 personnel 6:00am to 4:00pm
	2 personnel 5:00-12:00	10 personnel 4:00pm to 6:00am
	1 person 12:00-7:00am	
Showers		10 personnel 7:00am
		3 personnel 2:00pm
		5 personnel 4:00 pm
		10 personnel 7:00pm

Process Discharge Direct ot Small Bore:
- Line 8…300 gal… Max once /24 hrs to Min once /3 days
- Line 1…100 gal… Very random due to order makeup (possibly 2 times in 12 hours to once in 3-4 days)
- Line 9…300 gal… Not online yet
- Tower Tank (1150 gal) once per year (approx. 3hrs to drain)
- Process Tank (1250 gal) once per year (approx. 2hrs to drain)
- Water Softeners backwash and rinse every 4000 gals (undetermined quantity of water)

Line 1…100 gal tank is very random due to the fact that orders range in size and that the machine is not fully staffed. We run 12hr continental shifts and only 2 sometimes 3 shift have an operator for this line.

There is no meter on the discharge line.

The pump info is as follows:

Manufacture:	Plaid Equipment
Model:	03-10707-130001-1422
S/N	04-84008 A
Q	35 US gal/min TDH 46’
Impeller:	6.70”

Hope this helps.
Tom

From: Gillian Dumencu [mailto:gdumencu@clearford.com]
Sent: July-11-17 2:02 PM
To: Tom Simpson
Cc: Paul Anderson
Subject: RE: Canada Colors discharge

Hi Tom, Paul,

Wondering if you’ve had a chance to consider the questions sent last week?

Regards,

Gillian Dumencu, P.Eng.
Senior Engineer, Clearford Water Systems Inc.
Phone: 613-599-6474 x314
CLEARFORD WATER SYSTEMS INC. A 2016 TSX Venture 50 Company

From: Gillian Dumencu
Sent: July-04-17 12:54 PM
To: 'Tom Simpson'
Cc: 'paul.anderson@ccc-group.com'; Craig Brooks; Wilf Stefan
Subject: RE: Canada Colors discharge

Hi Tom,

We are trying to better estimate the distribution of wastewater flow over the course of the day (frequency, time of day, duration, and quantity) to relate it to sewer hydraulic capacity. We appreciate your time to answer a few more questions that will help in the assessment.

There is an attached sketch of your site servicing for reference.

1. Can you make a timetable of typical and peak (maximum) wastewater discharge events and going to which discharge line (east, west or process)? For example, 15 people use showers every day (7 days a week) from 7-8:00 am going to the east discharge line, an 11m3 tank is emptied over 20 minutes twice per day to the process line.

2. Can you confirm the actual pump rate (or pump model) and time (on/off) settings for the process wastewater discharge line (i.e., the line going to the municipal sanitary sewer)?

3. Can you provide actual pump cycle, tank level (if applicable) or flow meter data for the process wastewater discharge line to the sewer?

Thanks in advance, and please don't hesitate to call if you'd prefer to talk through it over the phone.

Regards,

Gillian Dumencu, P.Eng.
Senior Engineer, Clearford Water Systems Inc.
Phone: 613-599-6474 x314

From: Tom Simpson [mailto:tom.simpson@ccc-group.com]
Sent: June-27-17 9:00 AM
To: Gillian Dumencu
Subject: RE: Canada Colors discharge

Hi Gillian,
We do not use water in our end product. The water is used for cooling purposes only. Your assumption of evapouration , windage and humane consumption is correct. All other loss is to sewer.
Tom

From: Gillian Dumencu [mailto:gdumencu@clearford.com]
Sent: June-26-17 2:22 PM
To: Tom Simpson
Cc: Paul Anderson
Subject: RE: Canada Colors discharge

Hi Tom,

I can't recall from our conversation a couple of weeks ago if we discussed water consumption in your process. Do any of your products contain water from the municipal line, for example packaged water-based solutions?

Is it accurate to say the only water "losses" (ie, not going to the sewer) for the entire CCC facility are evaporation/windage from the tower and normal human consumption for drinking?

Regards,

Gillian Dumencu, P.Eng.
Senior Engineer, Clearford Water Systems Inc.
Phone: 613-599-6474 x314

From: Tom Simpson [mailto:tom.simpson@ccc-group.com]
Sent: June-09-17 10:45 AM
To: Gillian Dumencu
Subject: Canada Colors discharge

Hi Gillian,
Please find below the info we discussed in our meeting this morning.

Tower water usage Jan 4/16 to Jan 3/17……. 944328 gals (UK) (evapouration/windage loss approx. 80 gals /hour)
Incoming meter readings for the same period were …. East 1,534,500 gal….west 79300 gals
Process water comes from the east side.. the west side has only the office washrooms, lunchroom and a slop sink for the Janitor.
Process water usage for the same period is…….east 2479 gallons…West 382,350 gallons.
All water from process should in theory find it's way to discharge.

In 2015 there was no service done to the water tanks so there was no complete draining for that year.
In 2016 we drained the west process and tower tanks on Dec 28th

Hope this helps
Tom Simpson

Tom Simpson | Mgr, Maintenance Operations | **TF** 7236 **T** 905 355 7236 **M** 905 375 5818 **F** 905 355 3297
CCC Plastics | 263 Purdy Road, P.O. Box 10, Colborne, ON, K0K 1S0

Cramahe SBS Capacity Study
CLI No. 04001
June 2017

Cramahe Fire Hall/EMS
Location
June 8 2017 at 1pm
Visit Date & Time
Contact Person: Brandon Northrup

	Design	Field Survey Notes
Employees	10 pers/shift	4 pers/shift (chief plus paramedics)
Operating Hours	24 hr, 7 d	
Number of Shifts	2 /day	
Duration of Shift	12 hr	
Historical Water Usage		
Current Water Records		
Estimated Domestic WW	2.25 m3/d	
Estimated Process WW	2 m3/d	
Tank Size	13.6 m3	

Notes:

Volunteer fire fighters only (full-time fire chief); regular paramedics
Fire approx. 250-300 calls /year (truck wash after each)

Questions:

1. What are the domestic fixtures generating wastewater to the municipal sanitary sewer?
Showers, gym, kitchen, cleaning basins, laundry (esp. paramedic)

2. What are the industrial processes generating wastewater to the municipal sanitary sewer?
Truck washing - once per day

3. What occupancy and process conditions generate the most wastewater? Over what period?
Up to 300 people for special events

4. Are there any operational changes that could affect the amount or quality of wastewater?
Regular gatherings for training (First Aid), etc.

Cramahe SBS Capacity Study
CLI No. 04001
June 2017

Cam Tran
Location
June 8 2017 at 3pm
Visit Date & Time
Contact Person: Mike Bonn, Dave Reinhardus

	Design	Field Survey Notes
Employees	40+40 pers	160 pers
Operating Hours		10-hr days; Mon.-Thurs., sometimes Fri.
Number of Shifts		
Duration of Shift		
Historical Water Usage	1 m3/d (2003 estimated avg)	
Current Water Records	28 m3/d	Rough estimate half to sewer
Estimated Domestic WW	6 m3/d	
Estimated Process WW	0.15 m3/d	
Tank Size	5.7 m3	2 x 5.7 m3; 18 m3 (pumped); 4.5 m3 to 18 m3 (pumped)

Notes:

Two original domestic wastewater tanks (separate Cam Tran and Bel-Con, formerly Grafton)
Added staged pumped tank by Clearford (Bel-Con)
2014 expansion to staged pumped system for south building by Clearford

Backups to cafeteria at front of building approx. Aug. 2015, Aug. 2016, again Sep. 2016 (2:30 am)
Occasional poor flushing in corner building, one time backup

Pump set to 4 min. on at 25 gal/min and 10 min. off (could be 40 gal/min per email 2017/07/20)
Process water to balancing tank designed to pump overnight (could be pumping everything during the day per email 2017/07/20)

Observed paving over SAP cleanout across street at their driveway (in front of Real-Flex?)

Provided copy of sampling results for rinse water to sewer from July 2012

Questions:

1. What are the domestic fixtures generating wastewater to the municipal sanitary sewer?
Cafeteria kitchen, toilets, showers

2. What are the industrial processes generating wastewater to the municipal sanitary sewer?
Washing of parts, metal

3. What occupancy and process conditions generate the most wastewater? Over what period?
Cafeteria serves approx. 30 ppl breakfast (8:30-10:00) and 75 ppl for lunch (11:30-1:00)

4. Are there any operational changes that could affect the amount or quality of wastewater?
No weeks busier than others. No plans (no space) for expansion anytime soon.

Gillian Dumencu

From: Mike Bonn <MikeBonn@CAMTRAN.COM>
Sent: July-20-17 10:23 AM
To: Gillian Dumencu
Subject: RE: Cramahe sewer capacity study - questions

Gillian:

I have answered as best I can – see below.

Mike Bonn P. Eng. | Senior Operations Leader

P: 905 355 3224 ext. 373 | **F:** 905 355 2273 | **C:** 613 743 5642
203 Purdy Road, Colborne, ON, K0K 1S0
www.camtran.com

From: Gillian Dumencu [mailto:gdumencu@clearford.com]
Sent: July-04-17 12:55 PM
To: Mike Bonn
Cc: Craig Brooks; Wilf Stefan
Subject: Cramahe sewer capacity study - questions

Hi Mike,

As you will recall from our visit on June 8, Clearford is undertaking a capacity assessment for the sanitary sewers in the Colborne Industrial Park on behalf of Cramahe Township.

We are trying to better estimate the distribution of wastewater flow over the course of the day (frequency, time of day, duration, and quantity) to relate it to sewer hydraulic capacity. We appreciate your time to answer a few follow-up questions that will help in the assessment.

There is an attached sketch of your site servicing for reference.

1. There are two pumped tanks, one for the south building (installed 2014) and one for the central process building (installed 2008). Can you confirm the actual pump rate and time (on/off) settings for each of the pumped tanks? Central Building pump rate is 40 gal/min. When tank hits high level, it turns on 4 min, then off minimum 10 minutes. South building feeds central building, so it's output is included in the Central building output. During what hours of the day do the pumps run for each tank? Pumps are active between 6:00am and 5:00pm Monday to Thursday. 6:00am-2:30pm Fridays (when working OT) and Are there different normal and high level pump settings? There are not different settings.

2. Can you provide actual flow, pump cycle or tank level data for each pumped tank? We do not collect that data.

3. Are there any large flows or intense periods of wastewater generation going to the north or west building tanks that discharge by gravity to the sanitary sewer main? No It is our understanding that these buildings generate mainly washroom and shower wastewater plus the cafeteria. Can you quantify the wastewater generation and distribution from the cafeteria, for example, how many people served per meal during what times of day? Approximately 30 people for breakfast between 8:30-10:00 and 75 for lunch between 11:30 and 1:00. I would estimate that less than 1 third of these would use the washrooms while there, but that is just a guess.

Thanks in advance, and please don't hesitate to call if you'd prefer to talk through it over the phone.

Regards,

Gillian Dumencu, P.Eng.
Senior Engineer

CLEARFORD WATER SYSTEMS INC. A 2016 TSX Venture 50 Company
Clearford Water Systems Inc.
515 Legget Drive, Suite 100
Ottawa, ON, K2K 3G4
Email: gdumencu@clearford.com
Phone: 613-599-6474 ext 314
Fax: 613-599-7478
Website: www.clearford.com

Cramahe SBS Capacity Study
CLI No. 04001
June 2017

Northumberland (Cheer) Waste Transfer Station
Location
NO VISIT
Visit Date & Time
Contact Person: None

	Design	Field Survey Notes
Employees		
Operating Hours		
Number of Shifts		
Duration of Shift		
Historical Water Usage		
Current Water Records		
Estimated Domestic WW	0.95 m3/d	
Estimated Process WW		
Tank Size	4.5 m3	

Notes:

Questions:

1. What are the domestic fixtures generating wastewater to the municipal sanitary sewer?

2. What are the industrial processes generating wastewater to the municipal sanitary sewer?

3. What occupancy and process conditions generate the most wastewater? Over what period?

4. Are there any operational changes that could affect the amount or quality of wastewater?

Cramahe SBS Capacity Study
CLI No. 04001
June 2017

Real-Flex Solar/Ontario Agri-Food Venture Centre
Location
June 8 2017 at 9am
Visit Date & Time
Contact Person: Joe Mullin

	Design	Field Survey Notes
Employees	55 pers	9 at busiest time
Operating Hours		8:30-4:30
Number of Shifts	1 /day	Possibly add another shift that goes until 11pm
Duration of Shift		
Historical Water Usage		
Current Water Records	0.1 m3/d	
Estimated Domestic WW	4.125 m3/d	
Estimated Process WW	24 m3/d	
Tank Size	13.9 m3 (domestic) 27.3 m3 (process)	

Notes:

7300 ft² of building remains unleased

Processing less than 200 gal/day - less than they expected

No backups

Manager plans on monitoring effluent parameters - not concerned with current production levels

Questions:

1. What are the domestic fixtures generating wastewater to the municipal sanitary sewer?
Mostly kitchen use, floor drains

2. What are the industrial processes generating wastewater to the municipal sanitary sewer?
Commercial kitchen, produce washing, cleaning/sanitizing

3. What occupancy and process conditions generate the most wastewater? Over what period?

4. Are there any operational changes that could affect the amount or quality of wastewater?
More washing, new food product processing (always changing)

Cramahe SBS Capacity Study
CLI No. 04001
June 2017

Anixter Power
Location
June 7 2017 at 3pm
Visit Date & Time
Contact Person: Ernie

	Design	Field Survey Notes
Employees	75 pers	No more than 40 people on a regular day
Operating Hours		Warehouse 6-6, Office 8-4:30; Mon.-Fri. (sometimes Sat.)
Number of Shifts		
Duration of Shift		
Historical Water Usage		
Current Water Records	0.9 m3/d	
Estimated Domestic WW	5.625 m3/d	
Estimated Process WW		
Tank Size	18 m3	

Notes:

Only a warehouse - no processing

No plans to expand significantly

Truck wash goes to storm pond

Questions:

1. What are the domestic fixtures generating wastewater to the municipal sanitary sewer?
6 toilets, 3 urinals, kitchen w/ dishwasher

2. What are the industrial processes generating wastewater to the municipal sanitary sewer?

3. What occupancy and process conditions generate the most wastewater? Over what period?
Typical domestic flow from office

4. Are there any operational changes that could affect the amount or quality of wastewater?
None

Cramahe SBS Capacity Study
CLI No. 04001
June 2017

Durham Transport
Location
June 8 2017 at 10am
Visit Date & Time
Contact Person:

	Design	Field Survey Notes
Employees	30 pers	10 pers
Operating Hours		8-5; Mon.-Fri.
Number of Shifts		
Duration of Shift		
Historical Water Usage	0.55 m3/d (2003 estimated avg)	
Current Water Records	1.02 m3/d	
Estimated Domestic WW	2.25 m3/d	
Estimated Process WW	3 m3/d	
Tank Size	5.7 m3	

Notes:

Tank not required for process water
9 m3 tank (oil/grit separator) for floor drain and truck wash discharging to Purdy Dr.

Twp staff (Phil) thinks 5.7 m3 tank discharges to Purdy, not Big Apple (Percy)

Previous flooding (approx. 6 months ago) - water coming out of floor drains in shop
No issues since tracer wire removed from sewer main

Questions:

1. What are the domestic fixtures generating wastewater to the municipal sanitary sewer?
2 washrooms

2. What are the industrial processes generating wastewater to the municipal sanitary sewer?

3. What occupancy and process conditions generate the most wastewater? Over what period?

4. Are there any operational changes that could affect the amount or quality of wastewater?
No plans for expansion

Cramahe SBS Capacity Study
CLI No. 04001
June 2017

Tim Hortons
Location
June 7 2017 at 2pm
Visit Date & Time
Contact Person: Ron

	Design	Field Survey Notes
Employees		Up to 12
Operating Hours		"24/7"
Number of Shifts		
Duration of Shift		
Historical Water Usage		
Current Water Records		
Estimated Domestic WW	8 m3/d	
Estimated Process WW	20 m3/d (peak domestic)	
Tank Size	30 m3	

Notes:

We suspect an additional tank was installed but we have no records or design info
Field inspection suggests only one tank

Approx. 1500 customers/day average, 20% increase in summer
Busier weekdays than weekends

Questions:

1. What are the domestic fixtures generating wastewater to the municipal sanitary sewer?
3 Washrooms - staff, male, and female

2. What are the industrial processes generating wastewater to the municipal sanitary sewer?
None - old food goes to garbage, grease trap emptied regularly

3. What occupancy and process conditions generate the most wastewater? Over what period?
Customers using washroom

4. Are there any operational changes that could affect the amount or quality of wastewater?
Toilet paper accumulates so pump out is required every 1-2 months (Bumblebee pumping from Trenton); Hwy rest stop high volume scenario caused backups but no issues recently

Cramahe SBS Capacity Study
CLI No. 04001
June 2017

Gas Station
Location
NO VISIT
Visit Date & Time
Contact Person: None

	Design	Field Survey Notes
Employees	3 pers	
Operating Hours		
Number of Shifts		
Duration of Shift		
Historical Water Usage	7.6 m3/d (2003 estimated avg)	
Current Water Records	2.5 m3/d	
Estimated Domestic WW		
Estimated Process WW	7.3 m3/d (car wash)	
Tank Size	5.7 m3 (domestic) Grit tanks (car wash)	

Notes:

Tanks not shown on As-Built PP dwg
Confirmed tanks at site per IWSSI Clarifier Tank Installation Checklist sheet (Petro Can)

All existing servicing to be decommissioned/abandoned for new development per proposed Site Plan

Questions:

1. What are the domestic fixtures generating wastewater to the municipal sanitary sewer?

2. What are the industrial processes generating wastewater to the municipal sanitary sewer?

3. What occupancy and process conditions generate the most wastewater? Over what period?

4. Are there any operational changes that could affect the amount or quality of wastewater?

Appendix C

Compiled Flow Information

Cramahe-Colborne Industrial Park - 2017 Capacity Assessment - Compiled Flow Information

			Water Records			Design				Estimated				Assumed		
Pipe Reach	User	Comments	Avg Use (m3/d)	Avg Use (L/s)	Notes	Avg Flow (L/s)	Special Peak (L/s)	Peak Flow (L/s)	Notes	Avg Flow (L/s)	Special Peak (L/s)	Peak Flow (L/s)	Notes	Avg Flow (L/s)	Special Peak (L/s)	Peak Flow (L/s)
A-B	CCC Plastics	Office and process	21	0.24	Assuming 24-hr workday, 7 days/wk	0.16	0.14	0.46	Assuming design flow, 10-hr workday	0.13	-	0.26	Assuming water record less tower evap @80 gal/hr, avg across yr/wk/24hr	0.16	0.14	0.46
A-B	EMS Building	Facilities and truck wash	N/A	N/A	No water record available	0.10	1.11	1.32	Assuming max day design and peak flows	0.10	1.11	1.32	Assuming max day design and peak flows	0.10	1.11	1.32
A-B	Cam Tran (Grafton)	Office and process	24	1.46	Assuming 8-hr workday, 4 days/wk	0.31	0.17	0.79	Assuming design flow, 10-hr workday	0.73	0.17	1.63	Assuming 50% of water record, 8-hr workday, 4 days/wk	0.73	0.17	1.63
H-B	Waste Transfer Station	Washroom and floor drain	N/A	N/A	No water record available	0.02	0.45	0.48	Assuming design flow, 10-hr workday	0.02	0.45	0.48	Same as design flow (no water record available)	0.02	0.45	0.48
H-B	Real-Flex Building	Office and food processing	0.1	0.005	Assuming 8-hr workday, 5 days/wk	0.78	-	1.56	Assuming design flow, 10-hr workday	0.005	-	0.01	Assuming water record all flow, 8-hr workday, 5 days/wk	0.78	-	1.56
B-J	Cam Tran	Office and process	4	0.24	Assuming 8-hr workday, 4 days/wk	0.04	-	0.08	Assuming design flow, 10-hr workday	0.16	-	0.31	Assuming employees per site investigation, 8-hr workday	0.16	-	0.31
J-D	Anixter (HD Supply)	Office and warehouse	0.6	0.03	Assuming 8-hr workday, 5 days/wk	0.16	-	0.31	Assuming design flow, 10-hr workday	0.03	-	0.06	Assuming water record all flow, 8-hr workday, 5 days/wk	0.16	-	0.31
J-D	Durham Transport	Office and truck wash	3.5	0.17	Assuming 8-hr workday, 5 days/wk	0.06	0.17	0.29	Assuming design flow, 10-hr workday	0.06	0.17	0.29	Same as design flow (water record inconsistent)	0.06	0.17	0.29
E-D	Big Apple	Highway rest-stop	N/A	N/A	No water record available	0.92	-	1.83	Assuming design flow, 10-hr workday	-	-	-	Excluded from analysis	-	-	-
D-F	Ultramar	Washrooms and restaurant	2.6	0.09	Assuming 8-hr workday, 7 days/wk	0.25	1.48	1.98	Assuming avg day design flow, 10-hr workday	0.83	1.48	3.14	Assuming max day design and peak flows for prop. development, avg over 12 hrs	0.83	1.48	3.14
D-F	Tim Hortons	Restaurant	13	0.45	Assuming 8-hr workday, 7 days/wk	0.22	3.24	3.68	Assuming avg day design flow, 10-hr workday	0.46	3.24	4.17	Assuming max day design and peak flows, avg over 12 hrs	0.46	3.24	4.17
						3.03		12.80		2.53		11.67		3.46		13.68

Appendix D

SBS Hydraulic Design Sheets

Cramahe-Colborne Industrial Park - SBS Hydraulic Design Sheet - 2017 Capacity Assessment - Assumed Average Flow Conditions

		Location			Residential		Commercial			Design Flow	Sewer Parameters						Flow Design							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Phase	Pipe Reach	Location	From	To	Residential Connections	Cumulative Residential Connections	Commercial Avg Flow (L/s)	Cumulative Commercial Avg Flow (L/s)	Commercial Special Peak Flow (L/s)	Avg Design Flow, Q (L/s)	Length (m)	U/S Elevation (m)	D/S Elevation (m)	Overall Pipe Slope (%)	Min. Pipe Slope (%)	Pipe Dia. (mm)	Pipe Capacity, Qf (L/s)	Flow Design Ratio, Q/Qf	Velocity Design Ratio, V/Vf	Full Flow Velocity, Vf (m/s)	Design Velocity, V (m/s)	Time in Pipe (min)	Cumulative Time in Pipe (min)	Comments
2017 Updated for Capacity Study	1	A-B	2+870	2+430	0	0	1.00	1.00		1.00	440.0	166.40	164.41	0.45%	0.35%	100.8	3.12	0.32	0.75	0.39	0.29	25.08	25.08	Start of Run - existing (2004)
	2	C-B	C	2+430	0	0		0.00		0.00	20.0	164.51	164.41	0.50%	0.40%	193.3	18.94	0.00	0.00	0.65	0.00	#DIV/0!	#DIV/0!	Start of Run - proposed
	3	H-B	H	2+430	0	0	0.80	0.80		0.80	383.5	170.00	164.41	1.46%	1.33%	72.7	2.55	0.31	0.75	0.61	0.46	13.94	13.94	Start of Run - existing (2008)
	4	B-J	2+430	2+235	0	0	0.16	1.95		1.95	235.0	164.41	163.51	0.38%	0.33%	100.8	3.05	**0.64**	0.94	0.38	0.36	10.95	36.03	Receiving from A, C and H
	5	I-J	I	2+235	0	0	0.16	0.16		0.16	89.0	166.50	163.51	3.36%	3.36%	72.7	4.05	0.04	0.37	0.97	0.36	4.10	4.10	Start of Run - existing (2008)
	6	J-D	2+235	2+020	0	0	0.06	2.17		2.17	215.0	163.51	162.06	0.67%	0.25%	100.8	2.64	**0.82**	1.00	0.33	0.33	10.81	46.84	Receiving from J
	7	E-D	E	2+020	0	0	0.00	0.00		0.00	20.0	162.16	162.06	0.50%	0.50%	72.7	1.56	0.00	0.00	0.38	0.00	#DIV/0!	#DIV/0!	Start of Run - proposed
	8	D-F	4+008	3+126	0	0	1.29	3.46		3.46	882.0	162.06	144.95	1.94%	0.50%	148.5	10.48	0.33	0.76	0.61	0.46	31.96	78.80	Receiving from D
	9	F-G	3+126	2+836	0	0		3.46		3.46	290.0	144.95	128.79	5.57%	0.32%	148.5	8.45	0.41	0.81	0.49	0.39	12.27	91.07	Receiving from F

DESIGN ASSUMPTIONS:

		Residential:	Commercial:
n	= Manning's coefficient =	0.013	
R	= Maximum peak flow design ratio =	60%	
v	= Minimum flow velocity =	0.15 m/s	
q	= Average daily per capita flow =	350 L/person/day	75 L/empl/shift
		3.1 pers/residence	10 hr/shift
I	= Average extraneous flow (new) =	0 L/cap/d	0 L/cap/d
M	= Peaking Factor =	2 for SBS	2 for SBS

Commercial Flow Assumptions:

Pipe Reach	User	Average Flow (L/s)	Special Peak Flow	Comments
A-B	CCC Plastics	0.16	0.14	Domestic + Process Water
A-B	EMS Building	0.10	1.11	Domestic + Truck Wash
A-B	Cam Tran (formerly Grafton)	0.73	0.17	Domestic + Process Water
H-B	Waste Transfer Station	0.02	0.45	Domestic + Floor Drain
H-B	Real-Flex Building	0.78	-	Domestic + Food Processing
B-J	Cam Tran	0.16	-	Domestic
I-J	Anixter (formerly HD Supply)	0.16	-	Domestic
J-D	Durham Transport	0.06	0.17	Domestic + Wash Water
E-D	Big Apple Complex	-	-	Excluded from analysis
D-F	Gas Station/Restaurant	0.83	1.48	Domestic + Rest Stop
D-F	Tim Hortons	0.46	3.24	Domestic + Restaurant

PROJECT:
Cramahe-Colborne Industrial Park-Updated for Capacity Study

DESIGNED BY:
G.Dumencu

LOCATION:
Township of Cramahe, Ontario

DATE:
2008/04/21

PROJECT NO.
04001

CHECKED BY:
Y.Wang

WATERSHED:
Colborne Wastewater Treatment Plant

REVISED:
2017/07/19

CLEARFORD
100-515 Legget Drive, Ottawa ON, K2K 3G4
Tel: 613-599-6474, Fax: 613-599-7478, Toll-Free: 1-866-231-1104

NOTES:

1 This original design was based on the commercial developments meeting the requirements of the "dry" Industrial Park.
2 The wastewater generation rate is based on 75 L/employee (from OBC Table 8.2.1.3.B "Other Occupancies) for 10-hour shift, unless otherwise specified.
3 This design is based on a peaking factor of 2, unless otherwise specified.
4 Special peak flows are considered as temporary localized flows that are not carried to downstream pipe segments.

Cramahe-Colborne Industrial Park - SBS Hydraulic Design Sheet - 2017 Capacity Assessment - Assumed Peak Flow Conditions

		Location			Residential		Commercial			Design Flow	Sewer Parameters						Flow Design							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Phase	Pipe Reach	Location	From	To	Residential Connections	Cumulative Residential Connections	Commercial Avg Flow (L/s)	Cumulative Commercial Avg Flow (L/s)	Commercial Special Peak Flow (L/s)	Peak Design Flow, Qp (L/s)	Length (m)	U/S Elevation (m)	D/S Elevation (m)	Overall Pipe Slope (%)	Min. Pipe Slope (%)	Pipe Dia. (mm)	Pipe Capacity, Qf (L/s)	Peak Flow Design Ratio, Qp/Qf	Velocity Design Ratio, Vp/Vf	Full Flow Velocity, Vf (m/s)	Peak Design Velocity, Vp (m/s)	Time in Pipe (min)	Cumulative Time in Pipe (min)	Comments
2017 Updated for Capacity Study	1	A-B	2+870	2+430	0	0	1.00	1.00	1.42	3.41	440.0	166.40	164.41	0.45%	0.35%	100.8	3.12	**1.09**	1.05	0.39	0.41	17.86	17.86	Start of Run - existing (2004)
	2	C-B	C	2+430	0	0		0.00		0.00	20.0	164.51	164.41	0.50%	0.40%	193.3	18.94	0.00	0.00	0.65	0.00	#DIV/0!	#DIV/0!	Start of Run - proposed
	3	H-B	H	2+430	0	0	0.80	0.80	0.45	2.05	383.5	170.00	164.41	1.46%	1.33%	72.7	2.55	**0.80**	1.00	0.61	0.61	10.45	10.45	Start of Run - existing (2008)
	4	B-J	2+430	2+235	0	0	0.16	1.95	0.00	3.90	235.0	164.41	163.51	0.38%	0.33%	100.8	3.05	**1.28**	1.05	0.38	0.40	9.78	27.64	Receiving from A, C and H
	5	I-J	I	2+235	0	0	0.16	0.16	0.00	0.31	89.0	166.50	163.51	3.36%	3.36%	72.7	4.05	0.08	0.48	0.97	0.47	3.17	3.17	Start of Run - existing (2008)
	6	J-D	2+235	2+020	0	0	0.06	2.17	0.17	4.50	215.0	163.51	162.06	0.67%	0.25%	100.8	2.64	**1.71**	1.05	0.33	0.35	10.33	37.97	Receiving from J
	7	E-D	E	2+020	0	0	0.00	0.00	0.00	0.00	20.0	162.16	162.06	0.50%	0.50%	72.7	1.56	0.00	0.00	0.38	0.00	#DIV/0!	#DIV/0!	Start of Run - proposed
	8	D-F	4+008	3+126	0	0	1.29	3.46	4.72	11.64	882.0	162.06	144.95	1.94%	0.50%	148.5	10.48	**1.11**	1.05	0.61	0.64	23.14	61.11	Receiving from D
	9	F-G	3+126	2+836	0	0		3.46		6.92	290.0	144.95	128.79	5.57%	0.32%	148.5	8.45	**0.82**	1.00	0.49	0.49	9.90	71.01	Receiving from F

DESIGN ASSUMPTIONS:

		Residential:	Commercial:
n	= Manning's coefficient =	0.013	
R	= Maximum peak flow design ratio =	60%	
v	= Minimum flow velocity =	0.15 m/s	
q	= Average daily per capita flow =	350 L/person/day	75 L/empl/shift
		3.1 pers/residence	10 hr/shift
I	= Average extraneous flow (new) =	0 L/cap/d	0 L/cap/d
M	= Peaking Factor =	2 for SBS	2 for SBS

Commercial Flow Assumptions:

Pipe Reach	User	Average Flow (L/s)	Special Peak Flow	Comments
A-B	CCC Plastics	0.16	0.14	Domestic + Process Water
A-B	EMS Building	0.10	1.11	Domestic + Truck Wash
A-B	Cam Tran (formerly Grafton)	0.73	0.17	Domestic + Process Water
H-B	Waste Transfer Station	0.02	0.45	Domestic + Floor Drain
H-B	Real-Flex Building	0.78	-	Domestic + Food Processing
B-J	Cam Tran	0.16	-	Domestic
I-J	Anixter (formerly HD Supply)	0.16	-	Domestic
J-D	Durham Transport	0.06	0.17	Domestic + Wash Water
E-D	Big Apple Complex	-	-	Excluded from analysis
D-F	Gas Station/Restaurant	0.83	1.48	Domestic + Rest Stop
D-F	Tim Hortons	0.46	3.24	Domestic + Restaurant

PROJECT:
Cramahe-Colborne Industrial Park-Updated for Capacity Study

DESIGNED BY:
G.Dumencu

LOCATION:
Township of Cramahe, Ontario

DATE:
2008/04/21

PROJECT NO.
04001

CHECKED BY:
Y.Wang

WATERSHED:
Colborne Wastewater Treatment Plant

REVISED:
2017/07/19

CLEARFORD
100-515 Legget Drive, Ottawa ON, K2K 3G4
Tel: 613-599-6474, Fax: 613-599-7478, Toll-Free: 1-866-231-1104

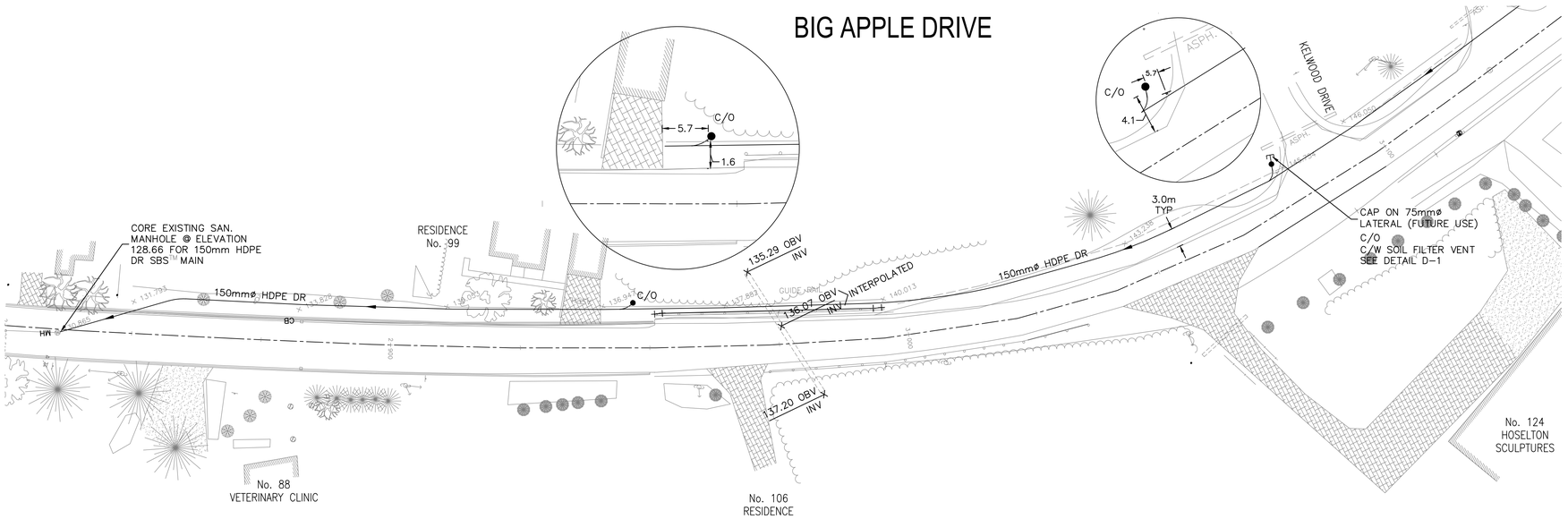
NOTES:

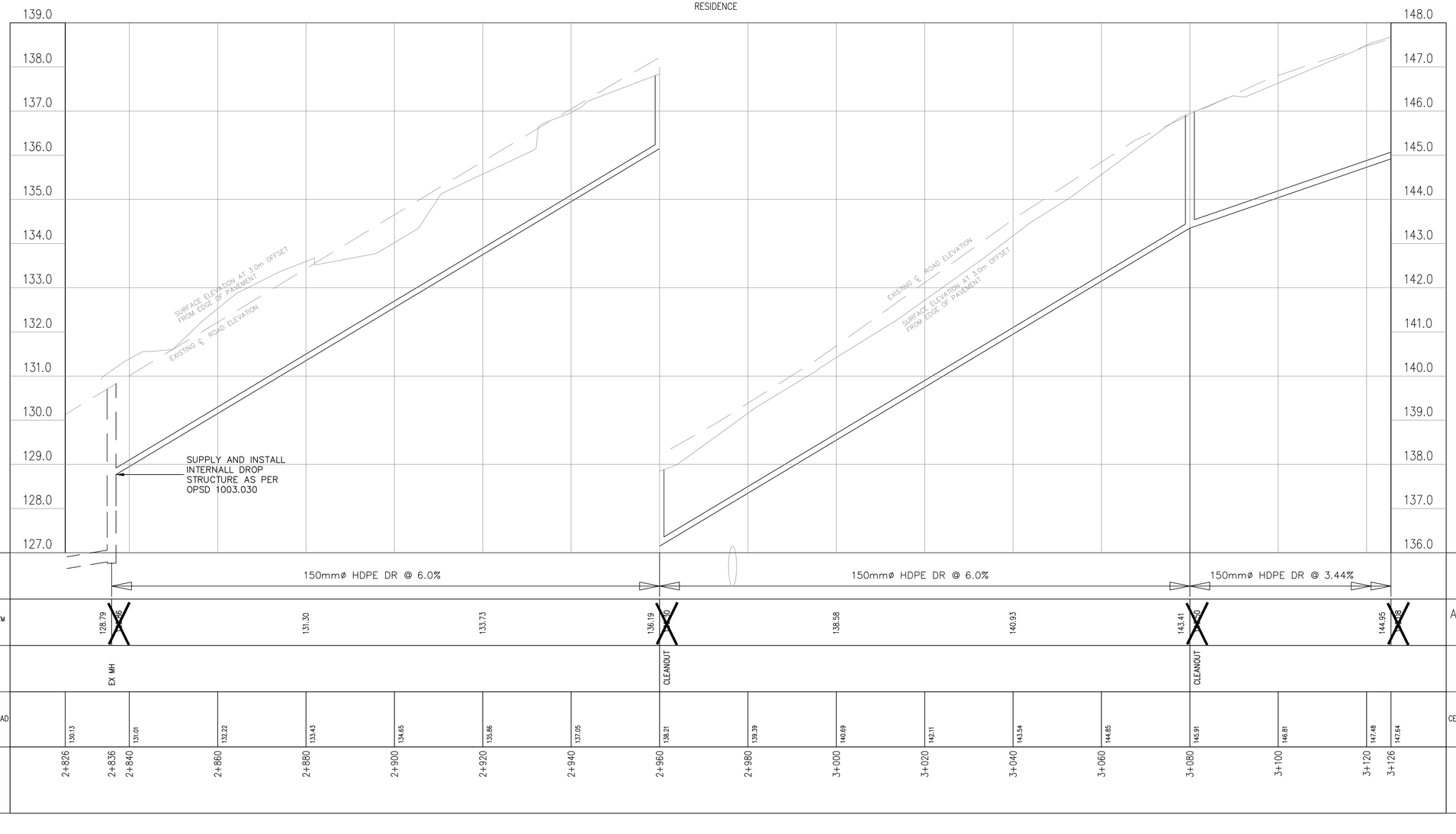
1. This original design was based on the commercial developments meeting the requirements of the "dry" Industrial Park.
2. The wastewater generation rate is based on 75 L/employee (from OBC Table 8.2.1.3.B "Other Occupancies) for 10-hour shift, unless otherwise specified.
3. This design is based on a peaking factor of 2, unless otherwise specified.
4. Special peak flows are considered as temporary localized flows that are not carried to downstream pipe segments.

Appendix E

As-Built Plan & Profile Drawings

BIG APPLE DRIVE





METRIC
All dimensions shown are in metres or millimetres unless otherwise shown

DRAWINGS NOT TO BE SCALED

REVISIONS

No.	Date	Description
1.	JULY 18/03	ISSUED FOR COMMENT
2.	AUG 22/03	ISSUED FOR APPROVAL
3.	SEP 03/04	AS-BUILT PLANS ISSUED

ALL INFORMATION TO BE VERIFIED ON SITE PRIOR TO COMMENCING ANY WORK. ANY DESCREPENCIES ARE TO BE REPORTED TO THE CONSULTANT IMMEDIATELY.

ALL UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. THE CONTRACTOR SHALL CONFIRM THE LOCATION ON SITE AND ASSUME ALL LIABILITY FOR DAMAGE TO ALL UTILITIES.

EXCLUDING THE BENCHMARK AND DESCRIPTION FOR THIS PROJECT, NO OTHER ELEVATIONS ARE TO BE USED A REFERENCE ELEVATION FOR ANY PURPOSE.

LEGEND

AS-BUILT

R. W. Connelly Associates
CONSULTING ENGINEERS AND PLANNERS
236 WESTBROOK ROAD, CARP, ON K0A 1L0
TEL:(613)831-9906 FAX:(613)831-0669 TOLL FREE 1-866-231-1104

Innovative Water & Sewer Systems Inc.
Taking Water and Wastewater into the 21st Century
236 WESTBROOK ROAD, CARP, ON K0A 1L0
Tel: (613)831-9906 Fax: (613)831-0669
Toll Free 1-866-231-1104 www.IWSSI.com

REGISTERED PROFESSIONAL ENGINEER
R. W. CONNELLY
PROVINCE OF ONTARIO

O:\MARK\Jogs2.tif

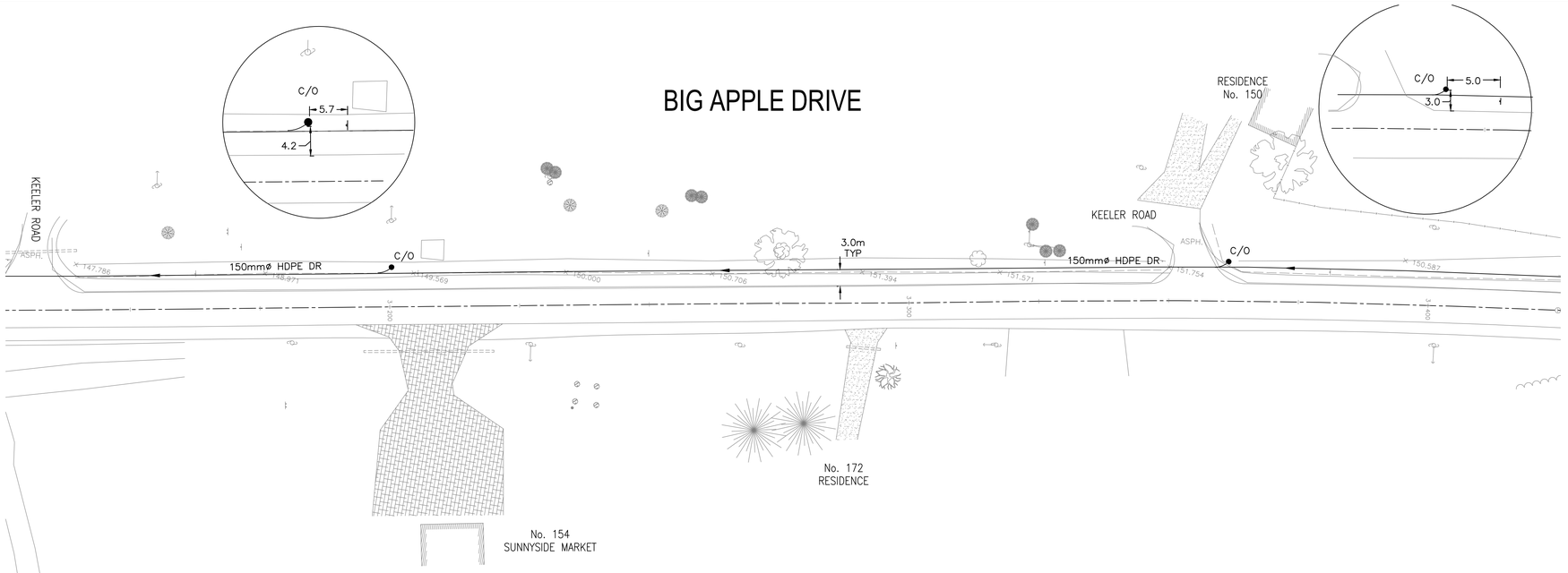
Township of Cramahe
In the heart of App.

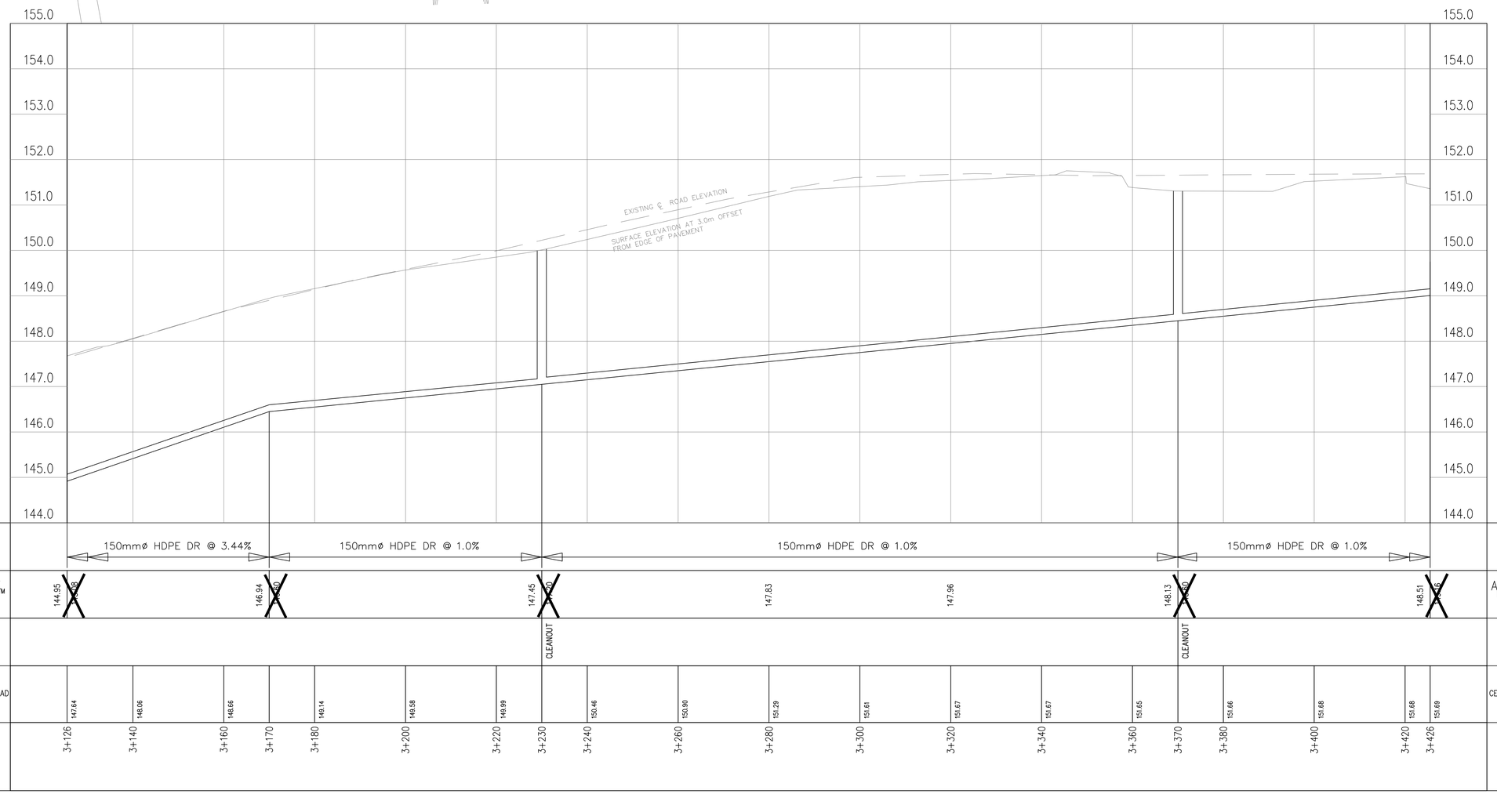
CRAMAHE TOWNSHIP
TOWN OF COLBORNE
INDUSTRIAL PARK
SMALL BORE SEWER™
SANITARY EXPANSION

PLAN AND PROFILE
2+826 TO 3+126
BIG APPLE DRIVE

Drawn by: MarCAD	Project No: 300
Base Plan by: JEWELL	Date: JUNE 2003
Designed by: JLS	Scale – Hor: 1:500 Vert: 1:50
Approved by: RWC	Contract No:
	Drawing No: P1

BIG APPLE DRIVE





METRIC
All dimensions shown are in metres or millimetres unless otherwise shown

DRAWINGS NOT TO BE SCALED

REVISIONS

No.	Date	Description
1.	JULY 18/03	ISSUED FOR COMMENT
2.	AUG 22/03	ISSUED FOR APPROVAL
3.	SEP 03/04	AS-BUILT PLANS ISSUED

ALL INFORMATION TO BE VERIFIED ON SITE PRIOR TO COMMENCING ANY WORK. ANY DISCREPENCIES ARE TO BE REPORTED TO THE CONSULTANT IMMEDIATELY.

ALL UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. THE CONTRACTOR SHALL CONFIRM THE LOCATION ON SITE AND ASSUME ALL LIABILITY FOR DAMAGE TO ALL UTILITIES.

EXCLUDING THE BENCHMARK AND DESCRIPTION FOR THIS PROJECT, NO OTHER ELEVATIONS ARE TO BE USED A REFERENCE ELEVATION FOR ANY PURPOSE.

LEGEND

AS-BUILT

R. W. Connelly Associates
CONSULTING ENGINEERS AND PLANNERS
236 WESTBROOK ROAD, CARP, ON K0A 1L0
TEL: (613)831-9906 FAX: (613)831-0669 TOLL FREE 1-866-231-1104

Innovative Water & Sewer Systems Inc.
Taking Water and Wastewater into the 21st Century
236 WESTBROOK ROAD, CARP, ON K0A 1L0
Tel: (613)831-9906 Fax: (613)831-0669
Toll Free 1-866-231-1104 www.IWSSI.com

REGISTERED PROFESSIONAL ENGINEER
R. W. CONNELLY
PROVINCE OF ONTARIO

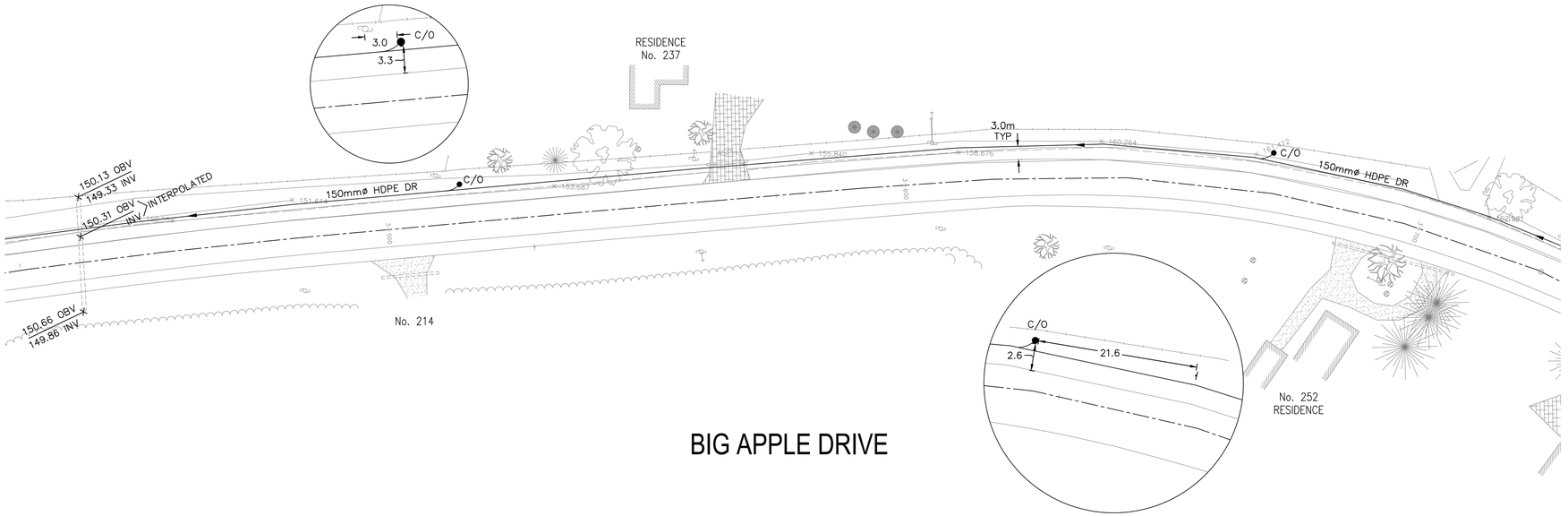
C:\MAPK\top2.tif

Township of Cramahe
In the heart of App.

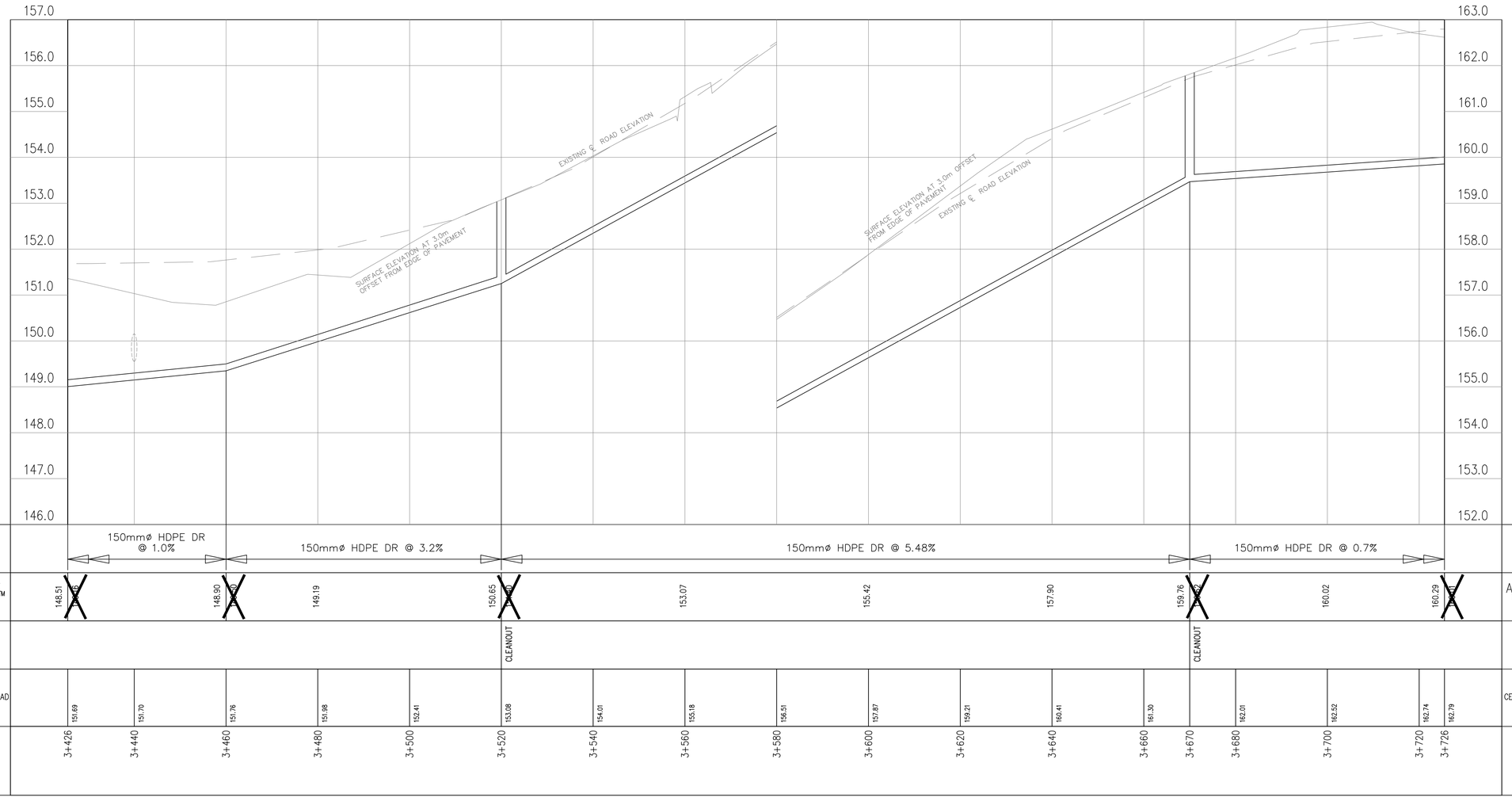
CRAMAHE TOWNSHIP
TOWN OF COLBORNE
INDUSTRIAL PARK
SMALL BORE SEWER™
SANITARY EXPANSION

PLAN AND PRO□ILE
□□12□ TO □□42□
BIG APPLE DRIVE

Drawn by: MarCAD	Project No: 300
Base Plan by: JEWELL	Date: JUNE 2003
Designed by: JLS	Scale – Hor: 1:500 Vert: 1:50
Approved by: RWC	Contract No:
	Drawing No: P□2



BIG APPLE DRIVE



METRIC
All dimensions shown are in metres or millimetres unless otherwise shown

DRAWINGS NOT TO BE SCALED

REVISIONS

No.	Date	Description
1.	JULY 18/03	ISSUED FOR COMMENT
2.	AUG 22/03	ISSUED FOR APPROVAL
3.	SEP 03/04	AS-BUILT PLANS ISSUED

ALL INFORMATION TO BE VERIFIED ON SITE PRIOR TO COMMENCING ANY WORK. ANY DISCREPENCIES ARE TO BE REPORTED TO THE CONSULTANT IMMEDIATELY.

ALL UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. THE CONTRACTOR SHALL CONFIRM THE LOCATION ON SITE AND ASSUME ALL LIABILITY FOR DAMAGE TO ALL UTILITIES.

EXCLUDING THE BENCHMARK AND DESCRIPTION FOR THIS PROJECT, NO OTHER ELEVATIONS ARE TO BE USED A REFERENCE ELEVATION FOR ANY PURPOSE.

LEGEND

AS-BUILT

R. W. Connelly Associates
CONSULTING ENGINEERS AND PLANNERS
236 WESTBROOK ROAD, CARP, ON K0A 1L0
TEL:(613)831-9906 FAX:(613)831-0669 TOLL FREE 1-866-231-1104

Innovative Water & Sewer Systems Inc.
Taking Water and Wastewater into the 21st Century
236 WESTBROOK ROAD, CARP, ON K0A 1L0
Tel: (613)831-9906 Fax: (613)831-0669
Toll Free 1-866-231-1104 www.iWSSI.com

REGISTERED PROFESSIONAL ENGINEER
R. W. CONNELLY
PROVINCE OF ONTARIO

Township of Cramahe
In the heart of App.

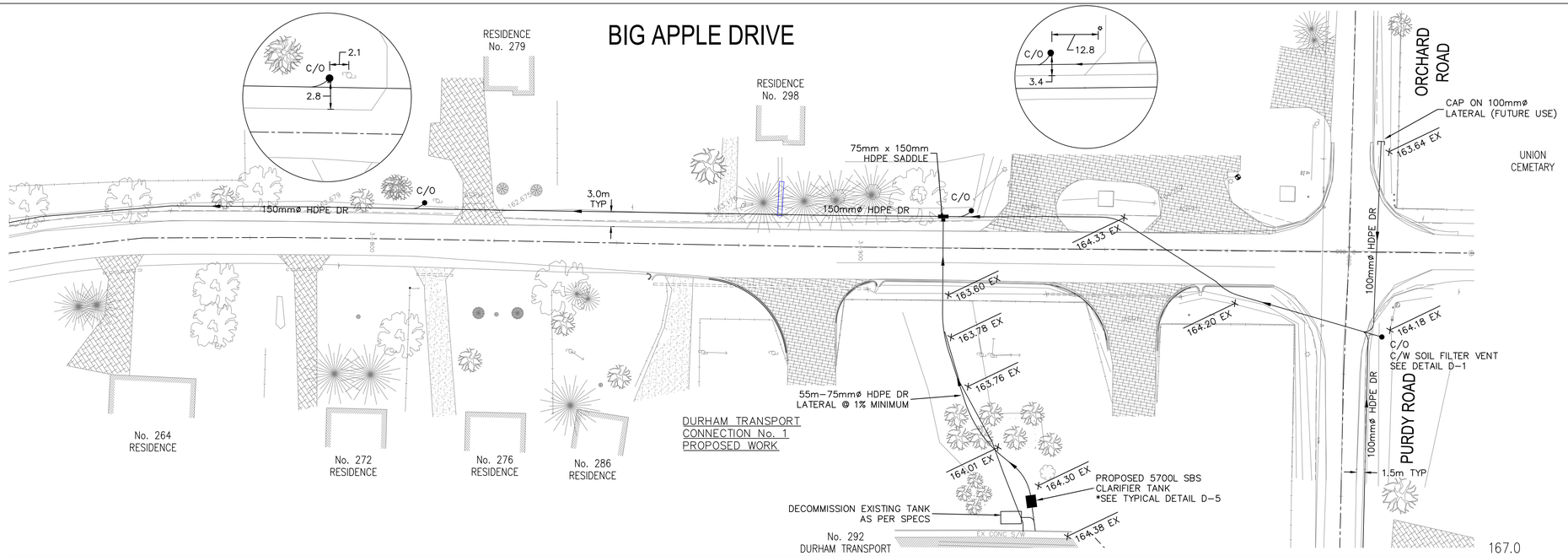
C:\MARK\Jxp2.tif

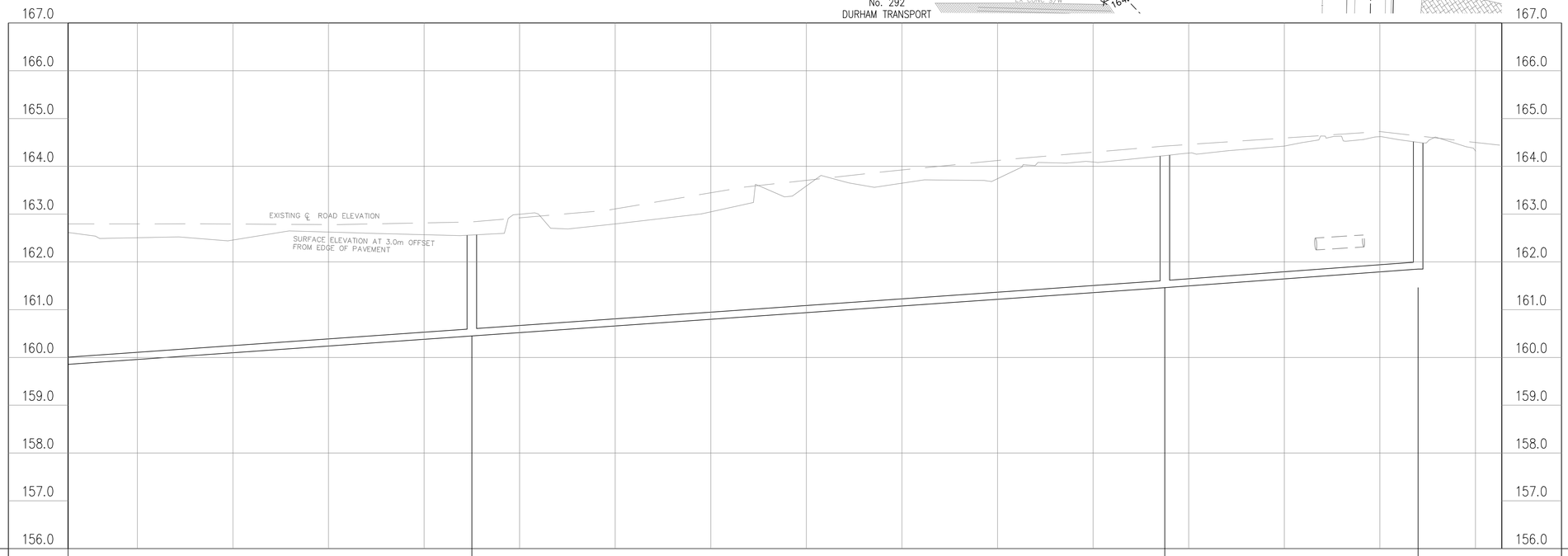
CRAMAHE TOWNSHIP
TOWN OF COLBORNE
INDUSTRIAL PARK
SMALL BORE SEWER™
SANITARY EXPANSION

PLAN AND PRO□ILE
□□42□ TO □□□2□
BIG APPLE DRIVE

Drawn by: MarCAD	Project No: 300
Base Plan by: JEWELL	Date: JUNE 2003
Designed by: JLS	Scale – Hor: 1:500 Vert: 1:50
Approved by: RWC	Contract No:
	Drawing No: P□□

BIG APPLE DRIVE





METRIC
All dimensions shown are in metres or millimetres unless otherwise shown

DRAWINGS NOT TO BE SCALED

REVISIONS

No.	Date	Description
1.	JULY 18/03	ISSUED FOR COMMENT
2.	AUG 22/03	ISSUED FOR APPROVAL
3.	SEP 03/04	AS-BUILT PLANS ISSUED

ALL INFORMATION TO BE VERIFIED ON SITE PRIOR TO COMMENCING ANY WORK. ANY DISCREPENCIES ARE TO BE REPORTED TO THE CONSULTANT IMMEDIATELY.

ALL UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. THE CONTRACTOR SHALL CONFIRM THE LOCATION ON SITE AND ASSUME ALL LIABILITY FOR DAMAGE TO ALL UTILITIES.

EXCLUDING THE BENCHMARK AND DESCRIPTION FOR THIS PROJECT, NO OTHER ELEVATIONS ARE TO BE USED A REFERENCE ELEVATION FOR ANY PURPOSE.

LEGEND

AS-BUILT

R. W. Connelly Associates
CONSULTING ENGINEERS AND PLANNERS
236 WESTBROOK ROAD, CARP, ON K0A 1L0
TEL:(613)831-9906 FAX:(613)831-0669 TOLL FREE 1-866-231-1104

Innovative Water & Sewer Systems Inc.
Taking Water and Wastewater into the 21st Century
236 WESTBROOK ROAD, CARP, ON K0A 1L0
Tel: (613)831-9906 Fax: (613)831-0669
Toll Free 1-866-231-1104 www.iWSSI.com

REGISTERED PROFESSIONAL ENGINEER
R. W. CONNELLY
PROVINCE OF ONTARIO

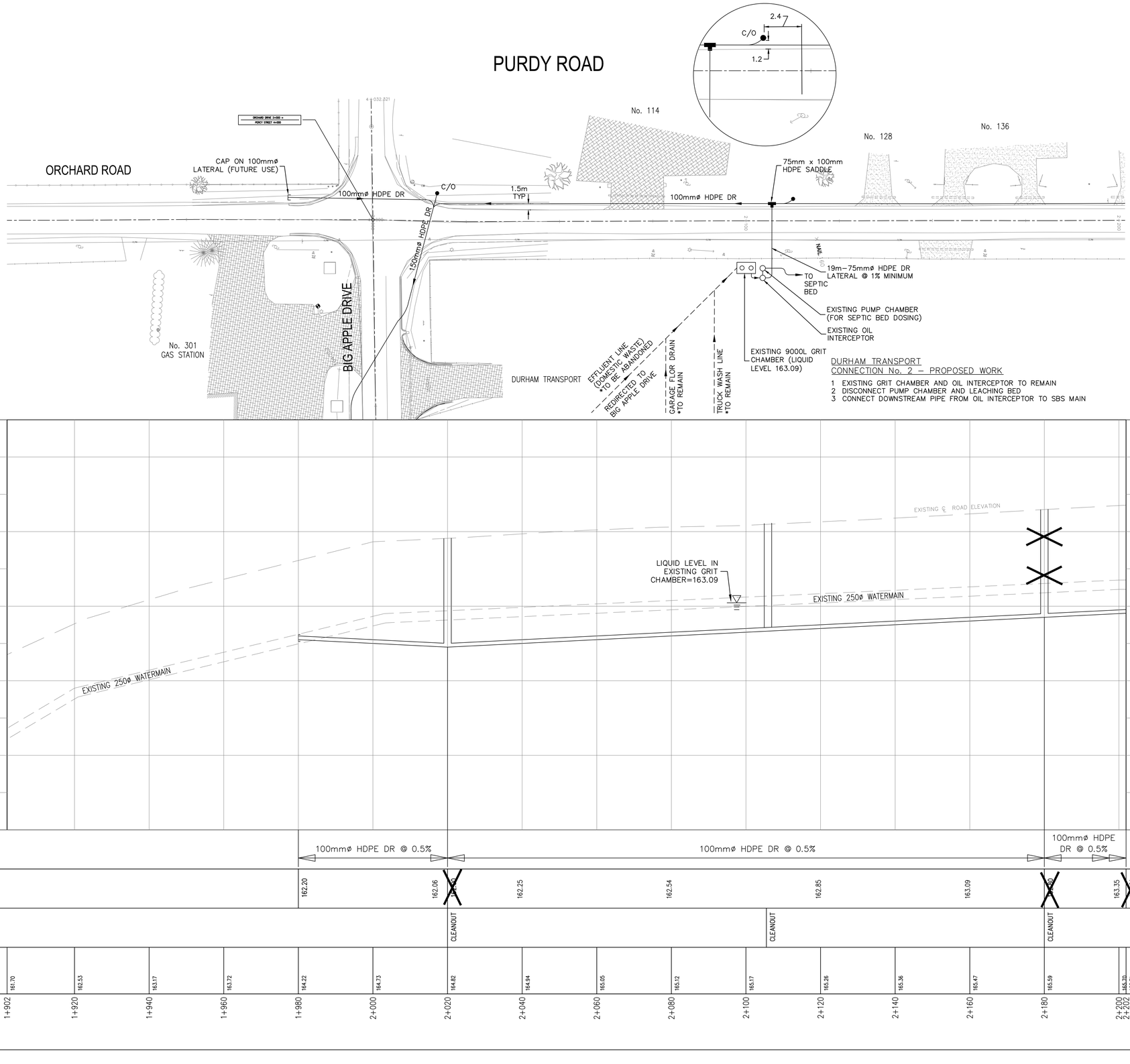
C:\MARK\Jeg2.tif

Township of Cramahe
In the heart of App.

CRAMAHE TOWNSHIP
TOWN OF COLBORNE
INDUSTRIAL PARK
SMALL BORE SEWER™
SANITARY EXPANSION

PLAN AND PROFILE
□□□2□ TO 4□02□
BIG APPLE DRIVE

Drawn by: MarCAD	Project No: 300
Base Plan by: JEWELL	Date: JUNE 2003
Designed by: JLS	Scale – Hor: 1:500 Vert: 1:50
Approved by: RWC	Contract No:
	Drawing No: P□4



METRIC
All dimensions shown are in metres or millimetres unless otherwise shown

DRAWINGS NOT TO BE SCALED

REVISIONS

No.	Date	Description
1.	JULY 18/03	ISSUED FOR COMMENT
2.	AUG 22/03	ISSUED FOR APPROVAL
3.	SEP 03/04	AS-BUILT PLANS ISSUED

ALL INFORMATION TO BE VERIFIED ON SITE PRIOR TO COMMENCING ANY WORK. ANY DESCREPENCIES ARE TO BE REPORTED TO THE CONSULTANT IMMEDIATELY.

ALL UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. THE CONTRACTOR SHALL CONFIRM THE LOCATION ON SITE AND ASSUME ALL LIABILITY FOR DAMAGE TO ALL UTILITIES.

EXCLUDING THE BENCHMARK AND DESCRIPTION FOR THIS PROJECT, NO OTHER ELEVATIONS ARE TO BE USED A REFERENCE ELEVATION FOR ANY PURPOSE.

LEGEND

AS-BUILT

R. W. Connelly Associates
CONSULTING ENGINEERS AND PLANNERS
236 WESTBROOK ROAD, CARP, ON K0A 1L0
TEL:(613)831-9906 FAX:(613)831-0669 TOLL FREE 1-866-231-1104

Innovative Water & Sewer Systems Inc.
Taking Water and Wastewater into the 21st Century
236 WESTBROOK ROAD, CARP, ON K0A 1L0
Tel:(613)831-9906 Fax:(613)831-0669
Toll Free 1-866-231-1104 www.IWSSI.com

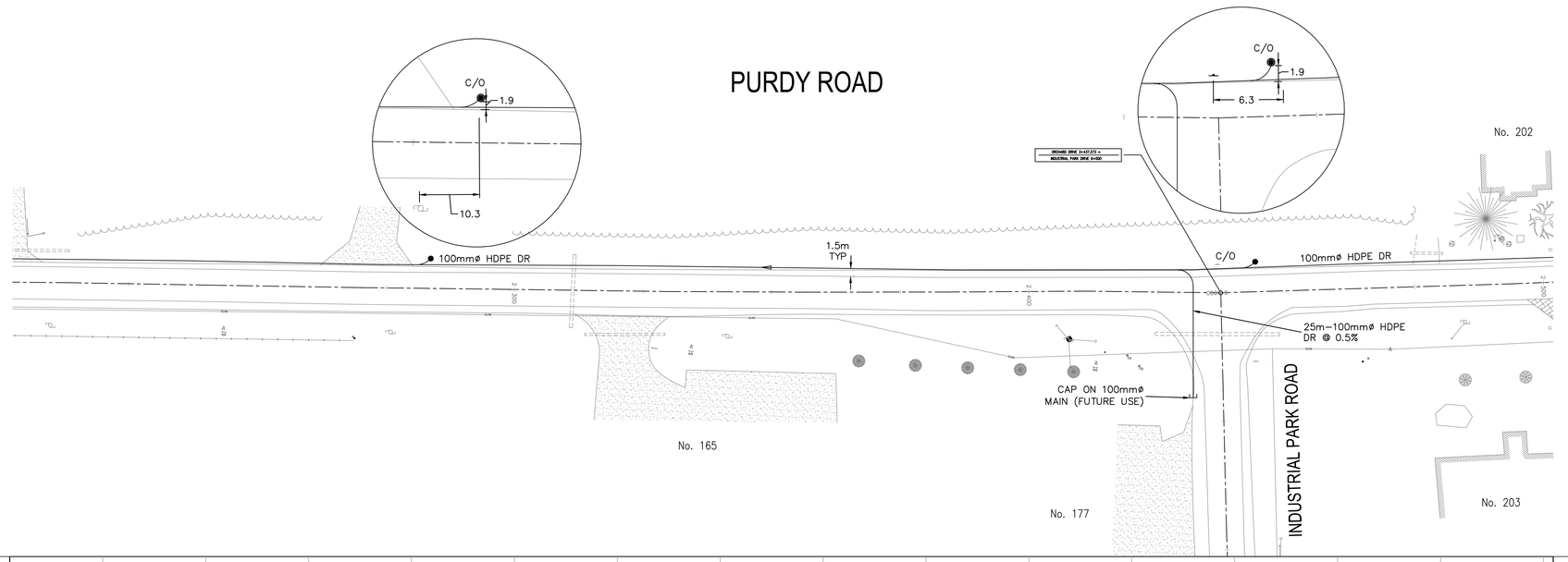
REGISTERED PROFESSIONAL ENGINEER
R. W. CONNELLY
PROVINCE OF ONTARIO

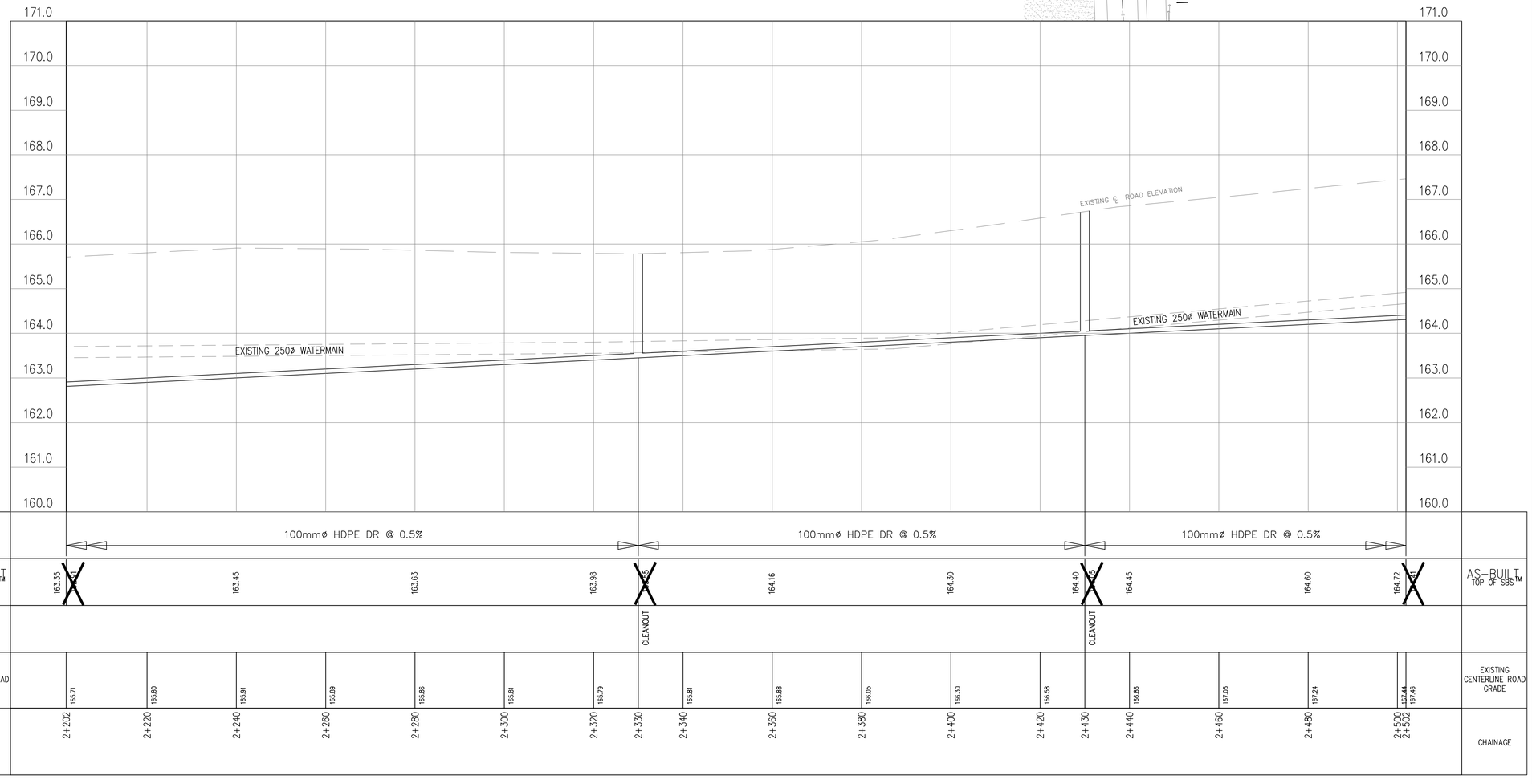
Township of Cramahe
In the heart of App.

CRAMAHE TOWNSHIP
TOWN OF COLBORNE
INDUSTRIAL PARK
SMALL BORE SEWER™
SANITARY EXPANSION

PLAN AND PROFILE
1+002 TO 2+202
PURDY ROAD

Drawn by: MarCAD	Project No: 300
Base Plan by: JEWELL	Date: JUNE 2003
Designed by: JLS	Scale – Hor: 1:500 Vert: 1:50
Approved by: RWC	Contract No: / Drawing No: P□□





METRIC
All dimensions shown are in metres or millimetres unless otherwise shown

DRAWINGS NOT TO BE SCALED

REVISIONS

No.	Date	Description
1.	JULY 18/03	ISSUED FOR COMMENT
2.	AUG 22/03	ISSUED FOR APPROVAL
3.	SEP 03/04	AS-BUILT PLANS ISSUED

ALL INFORMATION TO BE VERIFIED ON SITE PRIOR TO COMMENCING ANY WORK. ANY DESCREPENCIES ARE TO BE REPORTED TO THE CONSULTANT IMMEDIATELY.

ALL UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. THE CONTRACTOR SHALL CONFIRM THE LOCATION ON SITE AND ASSUME ALL LIABILITY FOR DAMAGE TO ALL UTILITIES.

EXCLUDING THE BENCHMARK AND DESCRIPTION FOR THIS PROJECT, NO OTHER ELEVATIONS ARE TO BE USED A REFERENCE ELEVATION FOR ANY PURPOSE.

LEGEND

AS-BUILT

R. W. Connelly Associates
CONSULTING ENGINEERS AND PLANNERS
236 WESTBROOK ROAD, CARP, ON K0A 1L0
TEL:(613)831-9906 FAX:(613)831-0669 TOLL FREE 1-866-231-1104

Innovative Water & Sewer Systems Inc.
Taking Water and Wastewater into the 21st Century
236 WESTBROOK ROAD, CARP, ON K0A 1L0
Tel:(613)831-9906 Fax:(613)831-0669
Toll Free 1-866-231-1104 www.IWSSI.com

REGISTERED PROFESSIONAL ENGINEER
R. W. CONNELLY
PROVINCE OF ONTARIO

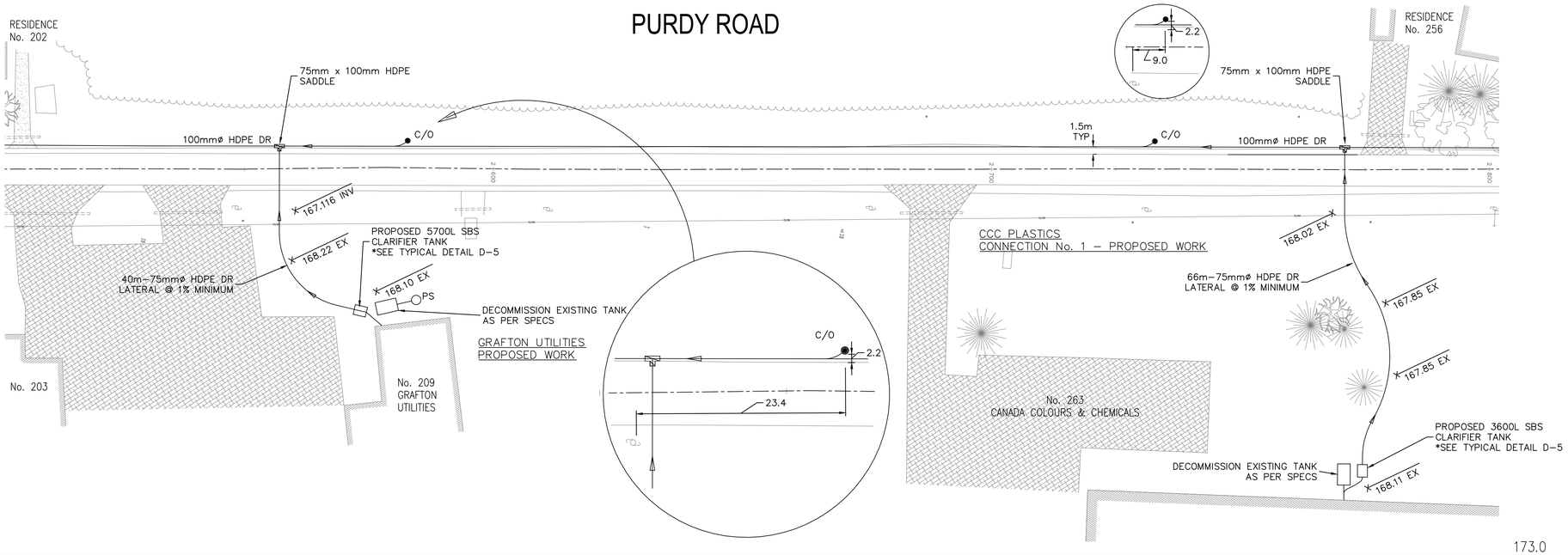
Township of Cramahe
In the heart of App.

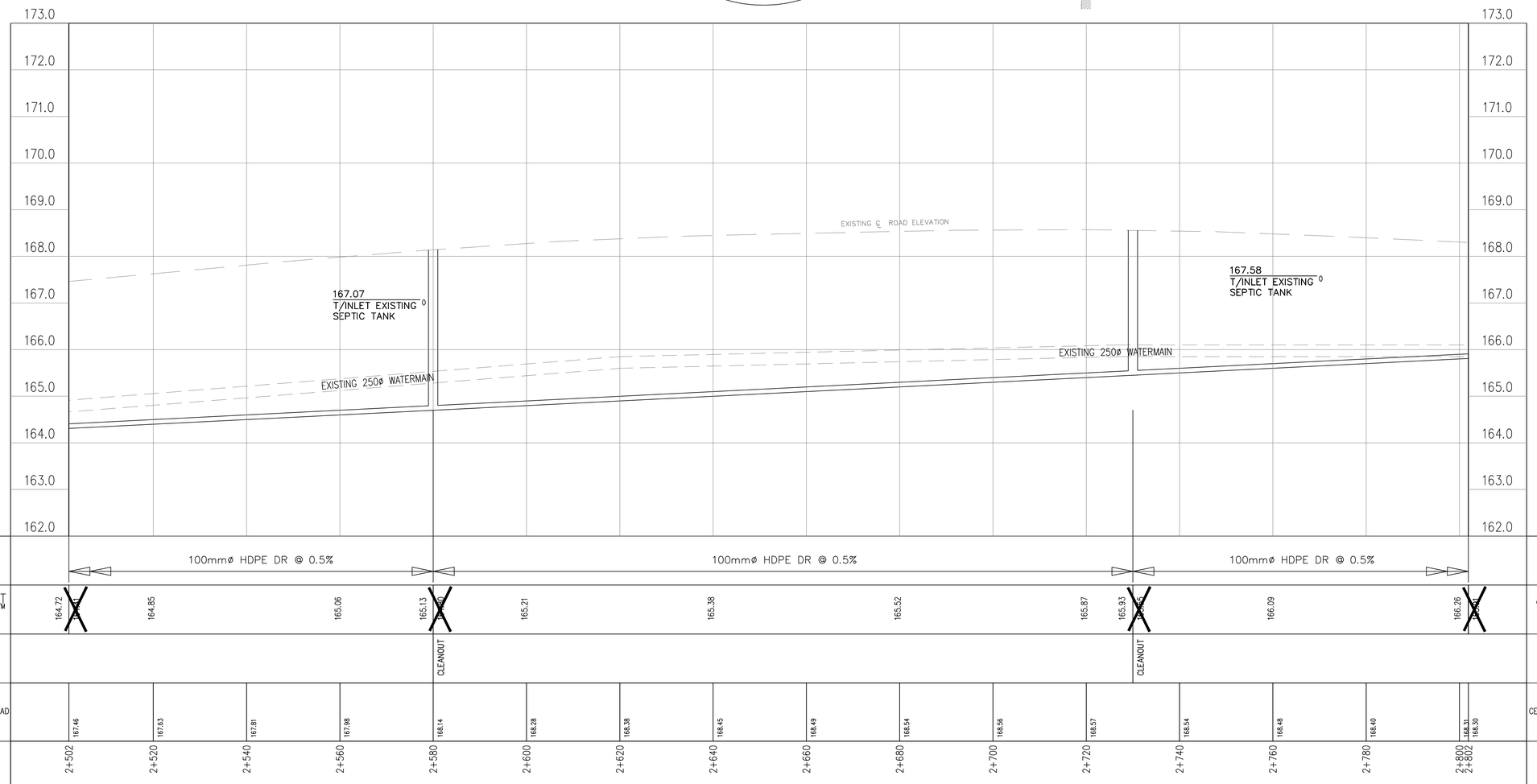
CRAMAHE TOWNSHIP
TOWN OF COLBORNE
INDUSTRIAL PARK
SMALL BORE SEWER™
SANITARY EXPANSION

PLAN AND PROFILE
2□202 TO 2□□02
PURDY ROAD

Drawn by: MarCAD	Project No: 300
Base Plan by: JEWELL	Date: JUNE 2003
Designed by: JLS	Scale – Hor: 1:500 Vert: 1:50
Approved by: RWC	Contract No:
	Drawing No: P□□

PURDY ROAD





METRIC
All dimensions shown are in metres or millimetres unless otherwise shown

DRAWINGS NOT TO BE SCALED

REVISIONS

No.	Date	Description
1.	JULY 18/03	ISSUED FOR COMMENT
2.	AUG 22/03	ISSUED FOR APPROVAL
3.	SEP 03/04	AS-BUILT PLANS ISSUED

ALL INFORMATION TO BE VERIFIED ON SITE PRIOR TO COMMENCING ANY WORK. ANY DISCREPENCIES ARE TO BE REPORTED TO THE CONSULTANT IMMEDIATELY.

ALL UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. THE CONTRACTOR SHALL CONFIRM THE LOCATION ON SITE AND ASSUME ALL LIABILITY FOR DAMAGE TO ALL UTILITIES.

EXCLUDING THE BENCHMARK AND DESCRIPTION FOR THIS PROJECT, NO OTHER ELEVATIONS ARE TO BE USED A REFERENCE ELEVATION FOR ANY PURPOSE.

LEGEND

AS-BUILT

R. W. Connelly Associates
CONSULTING ENGINEERS AND PLANNERS
236 WESTBROOK ROAD, CARP, ON K0A 1L0
TEL:(613)831-9906 FAX:(613)831-0669 TOLL FREE 1-866-231-1104

Innovative Water & Sewer Systems Inc.
Taking Water and Wastewater into the 21st Century
236 WESTBROOK ROAD, CARP, ON K0A 1L0
Tel: (613)831-9906 Fax: (613)831-0669
Toll Free 1-866-231-1104 www.iWSSI.com

REGISTERED PROFESSIONAL ENGINEER
R. W. CONNELLY
PROVINCE OF ONTARIO

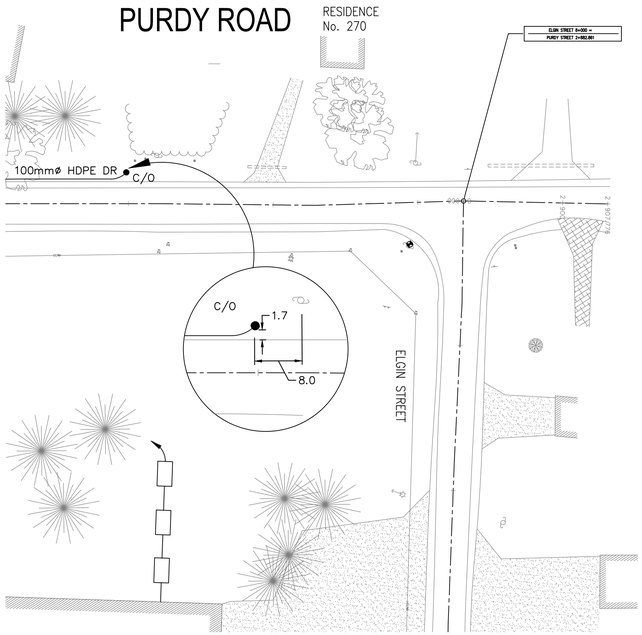
C:\MAR\1\xpg2.tif

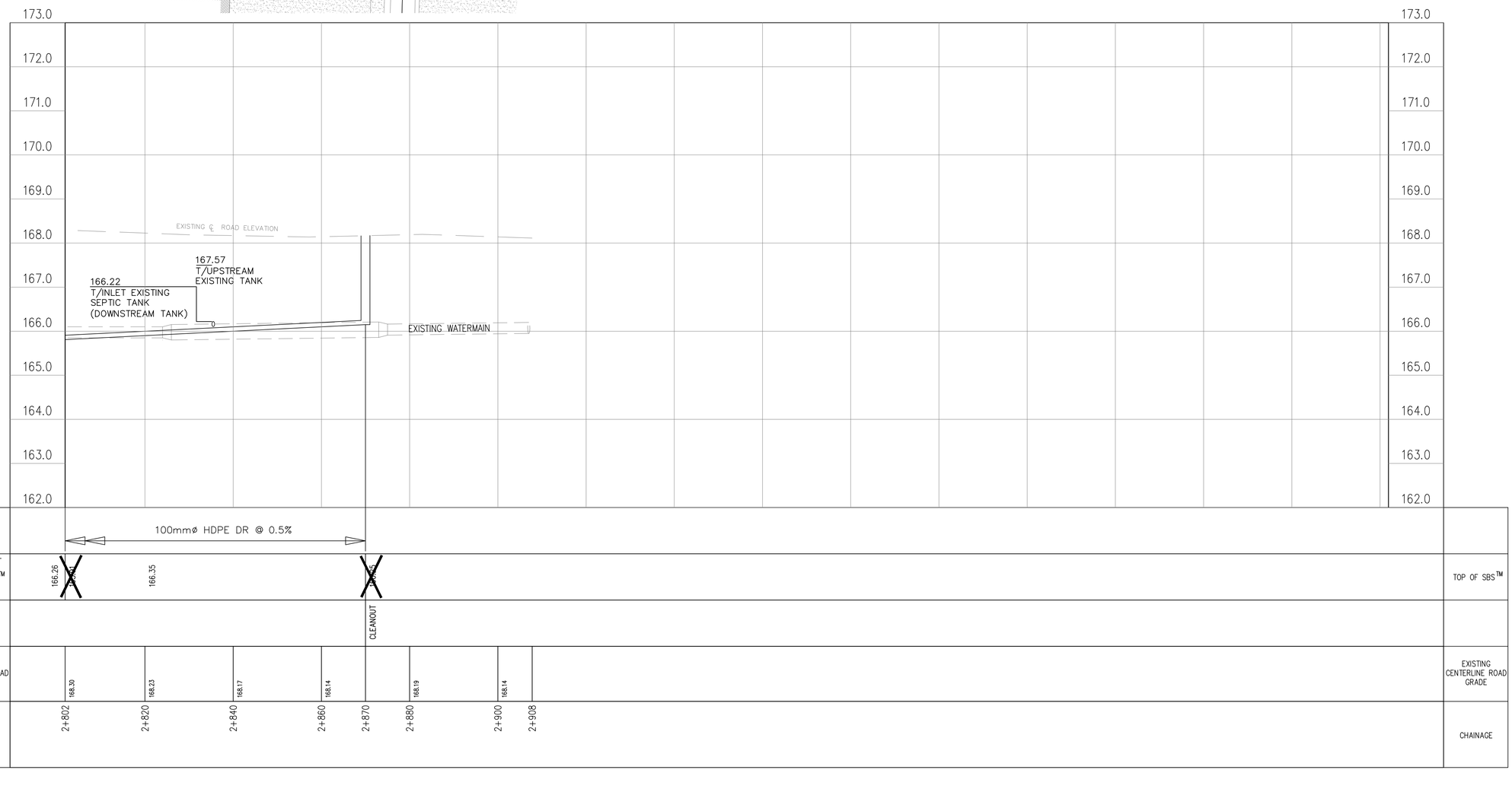
Township of Cramahe
In the heart of App.

CRAMAHE TOWNSHIP
TOWN OF COLBORNE
INDUSTRIAL PARK
SMALL BORE SEWER™
SANITARY EXPANSION

PLAN AND PRO□ILE
2□□02 TO 2□□02
PURDY ROAD

Drawn by: MarCAD	Project No: 300
Base Plan by: JEWELL	Date: JUNE 2003
Designed by: JLS	Scale - Hor: 1:500 Vert: 1:50
Approved by: RWC	Contract No:
	Drawing No: P□□





METRIC
All dimensions shown are in metres or millimetres unless otherwise shown

DRAWINGS NOT TO BE SCALED

REVISIONS

No.	Date	Description
1.	JULY 18/03	ISSUED FOR COMMENT
2.	AUG 22/03	ISSUED FOR APPROVAL
3.	SEP 03/04	AS-BUILT PLANS ISSUED

ALL INFORMATION TO BE VERIFIED ON SITE PRIOR TO COMMENCING ANY WORK. ANY DISCREPENCIES ARE TO BE REPORTED TO THE CONSULTANT IMMEDIATELY.

ALL UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. THE CONTRACTOR SHALL CONFIRM THE LOCATION ON SITE AND ASSUME ALL LIABILITY FOR DAMAGE TO ALL UTILITIES.

EXCLUDING THE BENCHMARK AND DESCRIPTION FOR THIS PROJECT, NO OTHER ELEVATIONS ARE TO BE USED A REFERENCE ELEVATION FOR ANY PURPOSE.

LEGEND

AS-BUILT

R. W. Connelly Associates
CONSULTING ENGINEERS AND PLANNERS
236 WESTBROOK ROAD, CARP, ON K0A 1L0
TEL:(613)831-9906 FAX:(613)831-0669 TOLL FREE 1-866-231-1104

Innovative Water & Sewer Systems Inc.
Taking Water and Wastewater into the 21st Century
236 WESTBROOK ROAD, CARP, ON K0A 1L0
Tel: (613)831-9906 Fax: (613)831-0669
Toll Free 1-866-231-1104 www.iWSSI.com

REGISTERED PROFESSIONAL ENGINEER
R. W. CONNELLY
PROVINCE OF ONTARIO

G:\MARK\wpd2.tif

Township of Cramahe
In the heart of App.

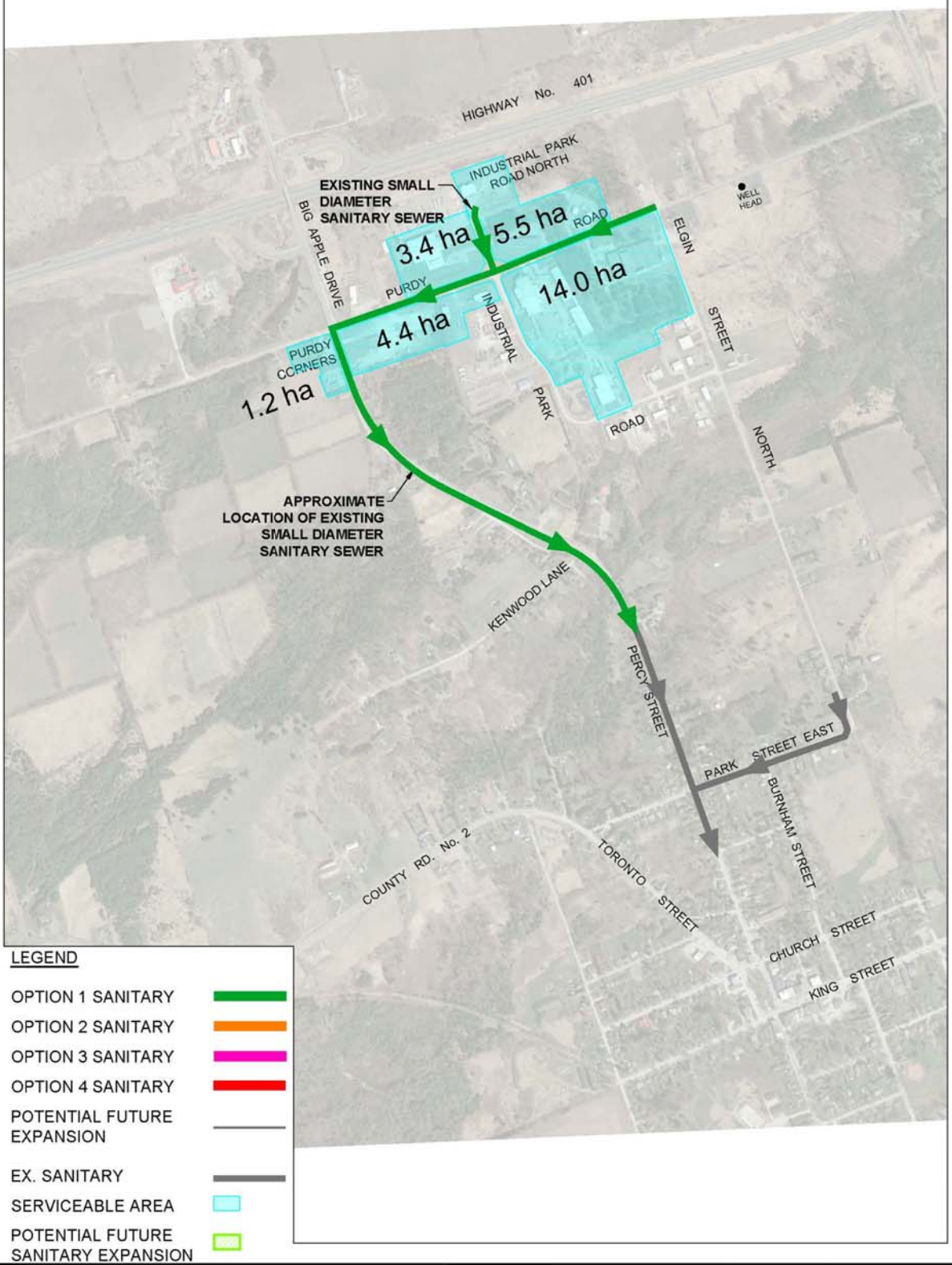
CRAMAHE TOWNSHIP
TOWN OF COLBORNE
INDUSTRIAL PARK
SMALL BORE SEWER™
SANITARY EXPANSION

PLAN AND PRO□ILE
2□□02 TO 2□□0□
PURDY ROAD

Drawn by: MarCAD	Project No: 300	
Base Plan by: JEWELL	Date: JUNE 2003	
Designed by: JLS	Scale – Hor: 1:500 Vert: 1:50	
Approved by: RWC	Contract No:	Drawing No: P□□

Appendix D

Alignment Plans

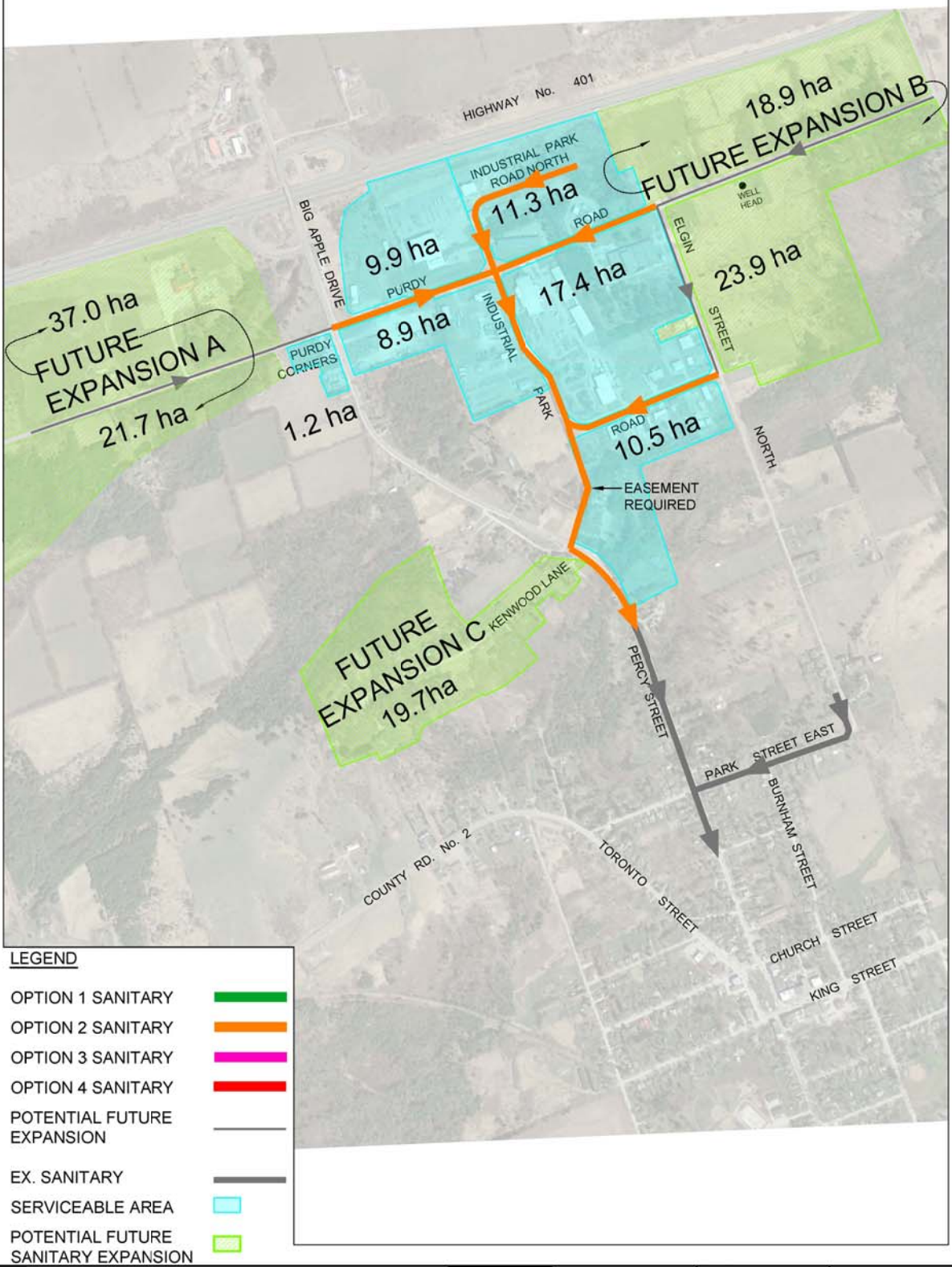


COLBORNE INDUSTRIAL PARK

OPTION 1 – EXISTING SMALL DIAMETER SANITARY SEWER

D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9
P. 705.742.2297
F. 705.741.3568
E. wills@dmwills.com

Drawn By: L.C.	Scale: Horz. 1:1000, Vert. N/A
Checked: R.J.	
Engineer: —	Plot Date: SEP. 10 2018
Project No.: 13-2907	Drawing File No.: 2907FIGURES



COLBORNE INDUSTRIAL PARK

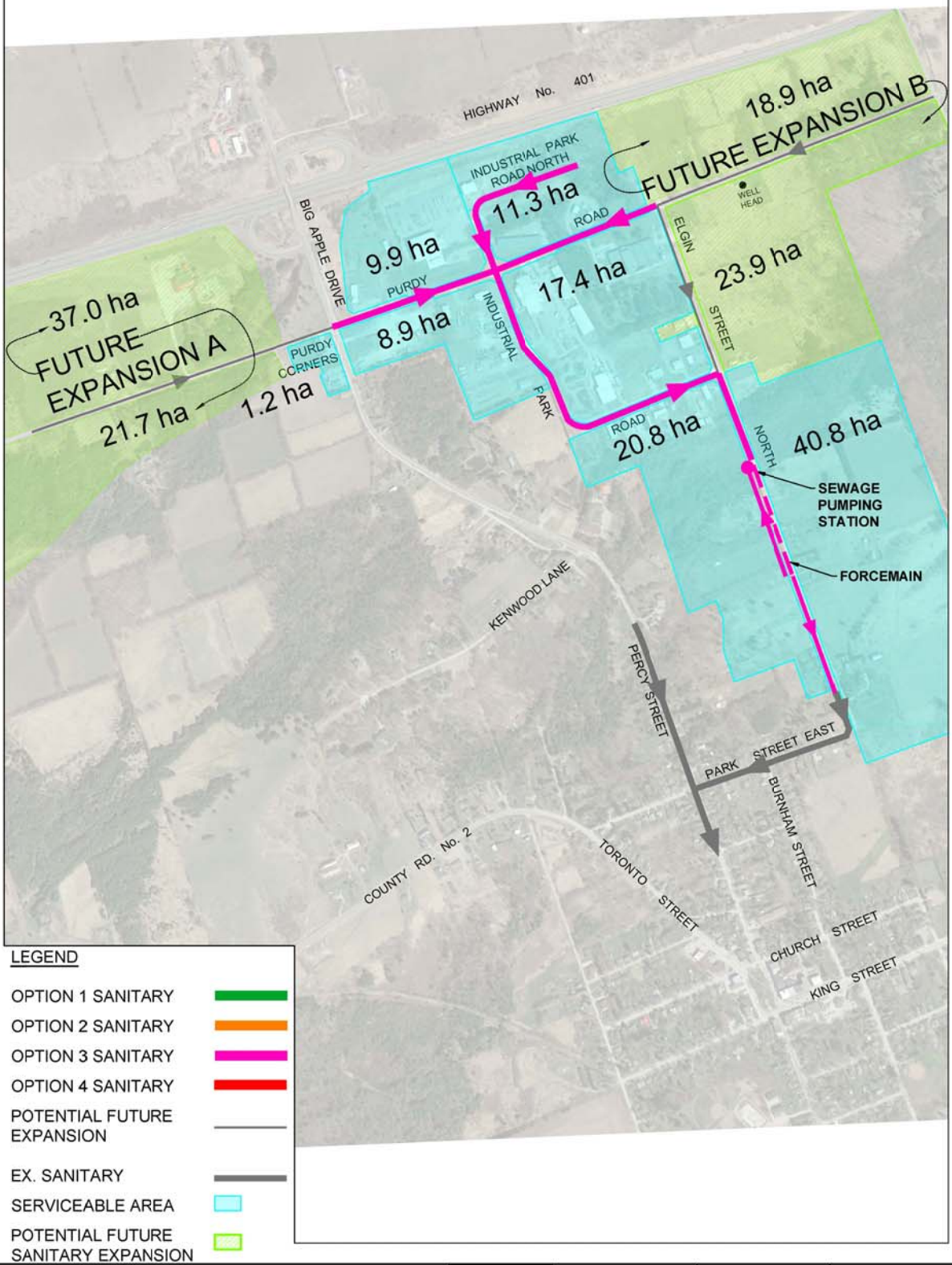
OPTION 2 – EASEMENT FROM INDUSTRIAL PARK AVE.

WILLS

D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9

P. 705.742.2297
F. 705.741.3568
E. wills@dmwills.com

Drawn By: L.C.	Scale: Horz. 1:1000, Vert. N/A
Checked: R.J.	
Engineer: –	Plot Date: SEP. 10 2018
Project No.: 13–2907	Drawing File No.: 2907FIGURES

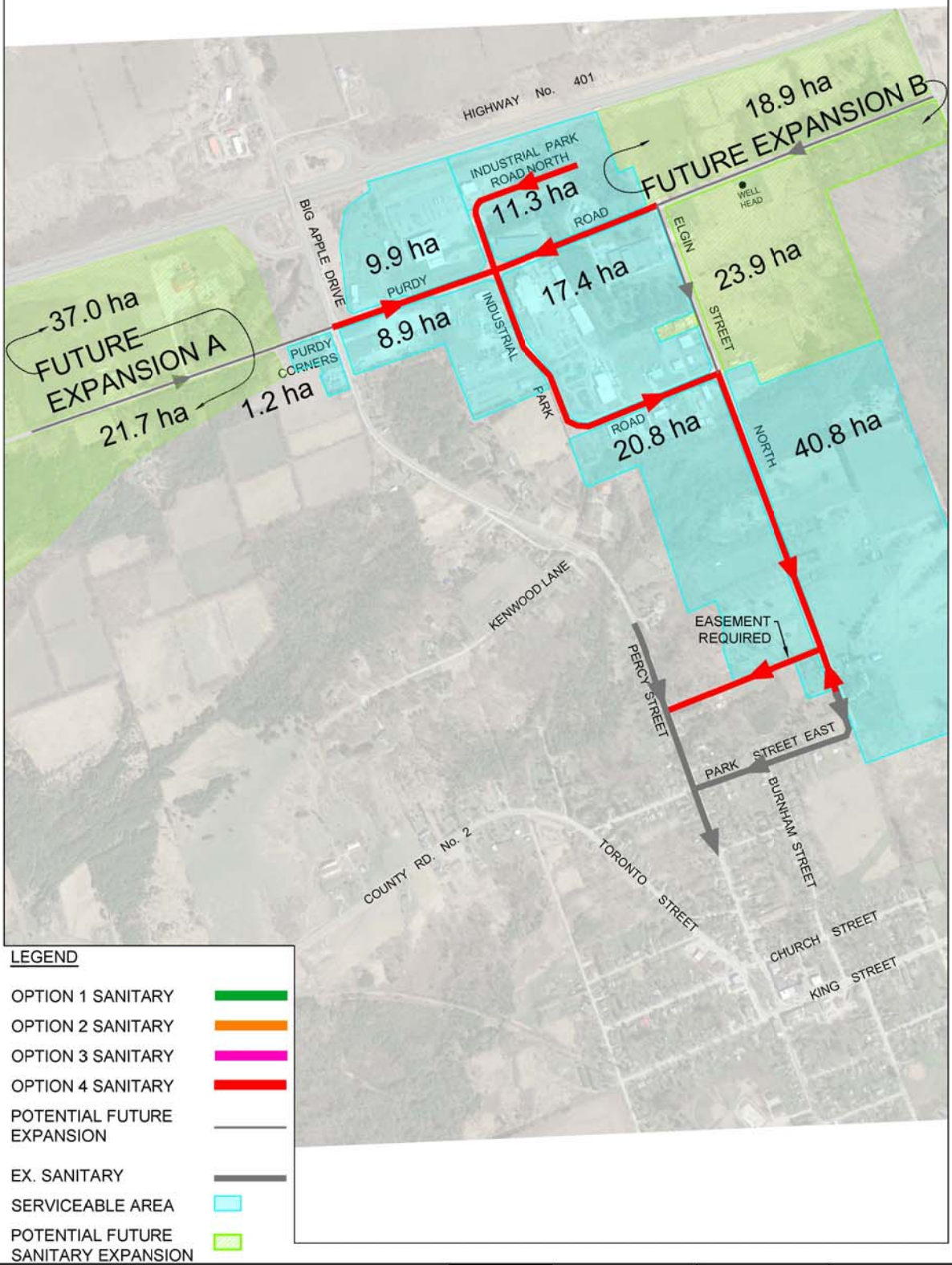


COLBORNE INDUSTRIAL PARK

OPTION 3 – SEWAGE PUMPING STATION

D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9
P. 705.742.2297
F. 705.741.3568
E. wills@dmwills.com

Drawn By: L.C.	Scale: Horz. 1:1000, Vert. N/A
Checked: R.J.	
Engineer: –	Plot Date: SEP. 10 2018
Project No.: 13–2907	Drawing File No.: 2907FIGURES



COLBORNE INDUSTRIAL PARK

OPTION 4 – EASEMENT FROM ELGIN ST.

D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9
P. 705.742.2297
F. 705.741.3568
E. wills@dmwills.com

Drawn By: L.C.	Scale: Horz. 1:1000, Vert. N/A
Checked: R.J.	
Engineer: —	Plot Date: SEP. 10 2018
Project No.: 13-2907	Drawing File No.: 2907FIGURES

Appendix E

Preliminary Cost Estimates

Industrial Park Sanitary System Upgrades
Municipal Class EA
Colborne, ON

Created: RJ
Checked: LC

PRELIMINARY CAPITAL COST ESTIMATE SUMMARY

		June 11, 2018
ALTERNATIVE	**DESCRIPTION**	**TOTAL CAPITAL COST**
1	DO NOTHING	N/A
2	EASEMENT FROM INDUSTRIAL PARK AVENUE	$ 3,800,000.00
3	SANITARY PUMPING STATION	$ 5,230,000.00
4	EASEMENT FROM ELGIN STREET NORTH	$ 4,458,000.00

Industrial Park Sanitary System Upgrades
Municipal Class EA
Colborne, ON

Created: LC
Checked: RJ
Date: 11-Jun-18

ALTERNATIVE 2 - EASEMENT FROM INDUSTRIAL PARK AVENUE

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL
201	Mobilization and Demobilization	1	LS	$ 10,000	$ 10,000
202	Bonding and Insurance	1	LS	$ 5,000	$ 5,000
203	Traffic Control	1	LS	$ 5,000	$ 5,000
204	Dust Control	1000	kg	$ 2	$ 2,000
205	Catch Basin Filters	5	ea	$ 50	$ 250
206	Silt Fence	260	m	$ 10	$ 2,600
207	Clearing and Grubbing	1	LS	$ 10,000	$ 10,000
208	Provisional Sanitary Bypass Pumping (22,900 US gal/d)	5	Days	$ 2,000	$ 10,000
209	Rock Excavation (Provisional)	100	m^3	$ 150	$ 15,000
210	Pulverize Asphalt in Place[4]	7100	m	$ 5	$ 35,500
211	Sewer Main[2]				
a)	300mm PVC SDR 35[5]	3600	m	$ 400	$ 1,440,000
212	Sanitary Service Laterals[6]	420	m	$ 350	$ 147,000
213	Maintenance Hole (1200mm) Including Frame and Grate	40	ea	$ 5,000	$ 200,000
214	Connect to Existing MH on Percy St.	1	ea	$ 5,000	$ 5,000
215	Flushing and CCTV Inspection	3600	m	$ 2	$ 7,200
216	Roadway Granulars[1,3]				
a)	Granular A (150mm)	12000	m^2	$ 10	$ 120,000
b)	Granular B (300mm)	12000	m^2	$ 18	$ 216,000
217	Asphalt[1,3]				
a)	Base (50mm HL8)	12000	m^2	$ 15	$ 180,000
b)	Surface (40mm HL3)	12000	m^2	$ 25	$ 300,000
218	Topsoil and Seed	5000	m^2	$ 8	$ 40,000
				SUBTOTAL	**$ 2,750,000**
				Engineering 15%	$ 413,000
				Contingency 20%	$ 633,000
				TOTAL	**$ 3,800,000**

Notes:

1) Road restoration assumed for all municipal streets.
2) Sewer main alignment is assumed to be in the centerline of roadways
3) Pavement structure is assumed. Additional geotechnical investigations will be required in detailed dsign,.
4) Asphalt pulverization in place is assumed prior to road excavation.
5) Watermain installation with trench box to reduce the amount of disturbance to existing road structure.
6) Sanitary service laterals are proposed for the existing indutrial park only.

Industrial Park Sanitary System Upgrades
Municipal Class EA
Colborne, ON

Created: LC
Checked: RJ
Date: 11-Jun-18

ALTERNATIVE 3 - SANITARY PUMPING STATION

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL
301	Mobilization and Demobilization	1	LS	$ 10,000	$ 10,000
302	Bonding and Insurance	1	LS	$ 5,000	$ 5,000
303	Traffic Control	1	LS	$ 5,000	$ 5,000
304	Dust Control	1000	kg	$ 2	$ 2,000
305	Catch Basin Filters	5	ea	$ 50	$ 250
306	Silt Fence	410	m	$ 10	$ 4,100
307	Clearing and Grubbing	1	LS	$ 10,000	$ 10,000
308	Provisional: Sanitary Bypass Pumping (22,900 Us gal/d)	5	Days	$ 2,000	$ 10,000
309	Rock Excavation (Provisional)	100	m^3	$ 150	$ 15,000
310	Pulverize Asphalt in Place[6]	14000	m^2	$ 5	$ 70,000
311	Sewer Main[2]				
a)	300mm PVC SDR 35[7]	3400	m	$ 400	$ 1,360,000
312	Sanitary Service Laterals[8]	420	m	$ 350	$ 147,000
313	Maintenance Hole (1200mm) Including Frame and Grate	40	ea	$ 5,000	$ 200,000
314	Pumping Station[5]	1	LS	$ 750,000	$ 750,000
315	Provisional: Land Acquisition [3]	0.2	ha	$ 50,000	$ 10,000
316	200mm PVC DR 18 Forcemain	615	m	$ 350	$ 215,250
317	Connect to Existing MH	1	ea	$ 5,000	$ 5,000
318	Flushing and CCTV Inspection	3200	m	$ 2	$ 6,400
319	Roadway Granulars[1,4]				
a)	Granular A (150mm)	14000	m^2	$ 10	$ 140,000
b)	Granular B (300mm)	14000	m^2	$ 18	$ 252,000
320	Asphalt[1,4]				
a)	Base (50mm HL8)[4]	14000	m^2	$ 15	$ 210,000
b)	Surface (40mm HL3)[4]	14000	m^2	$ 25	$ 350,000
321	Topsoil and Seed	1000	m^2	$ 8	$ 8,000
				SUBTOTAL	**$ 3,790,000**
			Engineering	15%	$ 570,000
			Contingency	20%	$ 870,000
				TOTAL	**$ 5,230,000**

Notes:

1) Road restoration assumed for all municipal streets.
2) Sewer main alignment is assumed to be in the centerline of roadways
3) Land Acquisition may be required due to the size of the pump station
4) Pavement structure is assumed. Additional geotechnical investigations will be required in detailed dsign,.
5) The pump station cost is based on a maximum pumping capacity of 30 L/s.
6) Asphalt Pulverization in place is assumed prior to road excavation.
7) Watermain installation with trench box to reduce the amount of disturbance to existing road structure.
8) Sanitary service laterals are proposed for the existing indutrial park only.

Industrial Park Sanitary System Upgrades
Municipal Class EA
Colborne, ON

Created: LC
Checked: RJ
Date: 11-Jun-18

ALTERNATIVE 4 - EASEMENT FROM ELGIN STREET NORTH

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL
401	Mobilization and Demobilization	1	LS	$ 10,000	$ 10,000
402	Bonding and Insurance	1	LS	$ 5,000	$ 5,000
403	Traffic Control	1	LS	$ 5,000	$ 5,000
404	Dust Control	1000	kg	$ 2	$ 2,000
405	Catch Basin Filters	5	ea	$ 100	$ 1,000
406	Silt Fence	410	m	$ 10	$ 4,000
407	Clearing and Grubbing	1	LS	$ 10,000	$ 10,000
408	Provisional: Sanitary Bypass Pumping (22,900 Us gal/d)	5	Days	$ 2,000	$ 10,000
409	Rock Excavation (Provisional)	100	m^3	$ 150	$ 15,000
410	Pulverize Asphalt in Place[4]	14000	m^2	$ 5	$ 70,000
411	Sewer Main[2]				
a)	300mm PVC SDR 35[5]	4300	m	$ 400	$ 1,720,000
412	Sanitary Service Laterals[6]	420	m	$ 350	$ 147,000
413	MH (1200mm) Including Frame and Grate	45	ea	$ 5,000	$ 225,000
414	Connect to Existing MH	1	ea	$ 5,000	$ 5,000
415	Flushing and CCTV Inspection	4300	m	$ 2	$ 9,000
	Roadway Granulars[1,4]				
a)	Granular A (150mm)	14000	m^2	$ 10	$ 140,000
b)	Granular B (300mm)	14000	m^2	$ 18	$ 252,000
416	Asphalt[1,3]				
a)	Base (50mm HL8)	14000	m^2	$ 15	$ 210,000
b)	Surface (40mm HL3)	14000	m^2	$ 25	$ 350,000
417	Topsoil and Seed	4500	m^2	$ 8	$ 36,000
				SUBTOTAL	**$ 3,230,000**
			Engineering	15%	$ 485,000
			Contingency	20%	$ 743,000
				TOTAL	**$ 4,458,000**

Notes:

1) Road restoration assumed for all municipal streets.
2) Sewer main alignment is assumed to be in the centerline of roadways
3) Pavement structure is assumed. Additional geotechnical investigations will be required in detailed dsign,.
4) Asphalt pulverization in place is assumed prior to road excavation.
5) Watermain installation with trench box to reduce the amount of disturbance to existing road structure.
6) Sanitary service laterals are proposed for the existing indutrial park only.

Appendix F

Public Notifications

Notice of Study Commencement – Revised PIC Timing

Township of Cramahe
Sanitary Sewer System Upgrades
Colborne Industrial Park
Municipal Class Environmental Assessment
Schedule B (Phase 1 & 2)

The Township of Cramahe has initiated a Municipal Class Environmental Assessment (Class EA) study to examine the required upgrades to the Sanitary Sewage Collection System within the Colborne Industrial Park area. The Colborne Industrial Park is located between Purdy Road to the north, Industrial Park Road to the west and Elgin Street North to the East.

The current sanitary system is near full capacity limiting the potential for future development. Upgrades to the existing sanitary sewer system are considered necessary to address current operational issues and to ensure adequate sewage capacity is provided to meet future demands of the development area within the Colborne Industrial Park and lands northwest of Purdy Corners, south of Highway 401.

Analysis & Evaluation

The planning of this project is proceeding as a Schedule B undertaking in accordance with the requirements of the Municipal Class Environmental Assessment, October 2000, as amended in 2007, 2011, and 2015, and prepared by the Municipal Engineers Association.

This Class EA study will include the identification and assessment of alternative solutions to address the identified problems or opportunities including the evaluation of anticipated impacts on the social, cultural, natural and economic environment.

Public & Review Agency Consultation

Public input during the planning process of this project is encouraged.

A Public Information Centre (PIC) has been schedules for Wednesday, March 21, 2018 from **6:00pm to 9:00pm (Updated)** in the Cramahe Municipal Administrative Building located at 1 Toronto St. Colborne, Ontario. The PIC will provide an opportunity for interested residents to obtain additional information and for the Township and its representatives to answer questions related to the project.

As the project proceeds, information packages will be sent out to all relevant review agencies and interested stakeholders.

As part of the study, a Class EA - Schedule B - Phase 1 & 2 Report will be prepared and placed on the public record for review and comment.

For further information or to provide comments on the Class EA for the Colborne Industrial Park Sanitary Sewer System Upgrades, please contact the Township of Cramahe or its consultant at the following addresses.

Township of Cramahe
P.O. Box 357
1 Toronto Street
Colborne, ON K0K 1S0
Craig Brooks
Chief Administrative Officer
Phone: (905) 355-2846 (Ext 224)
Fax: (905) 355-2674
E-mail: cbrooks@cramhetownship.ca

D.M. Wills Associates Ltd.

150 Jameson Drive
Peterborough, ON K9J 0B9
Robert Jackson, P.Eng.
Project Manager
Phone: (705) 742-2297, Ext. 235
Fax: (705) 741-3568
E-mail: RJackson@dmwills.com

This Revised Notice of Study Commencement issued March 9, 2018.

Notice of Study Completion
Township of Cramahe
Sanitary Sewer System Upgrades
Colborne Industrial Park
Municipal Class Environmental Assessment
Schedule B (Phase 1 and 2)

The Township of Cramahe has initiated a Municipal Class Environmental Assessment (Class EA) study to examine the required upgrades to the Sanitary Sewage Collection System within the Colborne Industrial Park area. The Colborne Industrial Park is located between Purdy Road to the north, Industrial Park Road to the west and Elgin Street North to the east.

The current sanitary system is near full capacity limiting the potential for future development. Upgrades to the existing sanitary sewer system are considered necessary to address current operational issues and to ensure adequate sewage capacity is provided to meet future demands of the development area within the Colborne Industrial Park and lands northwest of Purdy Corners, south of Highway 401.

The preferred solution is Alternative #4 in the Municipal Class EA document which is to replace the existing sanitary sewer network in the Industrial Park with an expanded capacity sanitary network in terms of pipe size (sanitary capacity) and area serviced. This includes the installation of sanitary mains on Purdy Road, Industrial Park Road and Elgin Street.

A Schedule B - Phase 1 and 2 Report has been prepared for this project. The report describes the problem/opportunity, the assessment of alternatives and the preferred solution, as well as public, stakeholder and review agency consultation during the study.

This Notice of Completion places the Phase 1 and 2 Report on public record for review. The report is available for viewing on-line at www.cramahe.ca (under the Municipal Government tab, and under Projects, Plans, and Reports) or in person during normal business hours at the following location.

- Township of Cramahe (Municipal Office) – P.O. Box 357, 1 Toronto Street, Colborne, ON, K0K 1S0

The 30 day public review period will commence on September 12, 2019. Interested parties may provide written comments on the Class EA for the Colborne Industrial Park Sanitary Sewer System Upgrades to the Township of Cramahe or its consultant (D.M. Wills Associates Limited) at the following addresses.

Township of Cramahe
P.O. Box 357
1 Toronto Street
Colborne, ON, K0K 1S0
Arryn McNichol, H.B.Comm, CPA, CGA, CMIII
Interim Chief Administrative Officer - Treasurer
Phone: (905) 355-2821 (Ext 223)
Fax: (905) 355-3430
E-mail: AMcNichol@cramhetownship.ca

D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, ON, K9J 0B9
Robert Jackson, P.Eng.
Project Manager
Phone: (705) 742-2297, Ext. 235
Fax: (705) 748-9944
E-mail: rjackson@dmwills.com

Subject to comments received as a result of this Notice of Completion, and receipt of other approvals as required, the Township of Cramahe intends to proceed with detailed design and construction of this project. Comments must be submitted not later than October 15, 2019.

If concerns with respect to this project, cannot be resolved through discussions with the Township of Cramahe, there is an opportunity for members of the public, review agencies or other interested parties to request that the Minister of Environment Conservation and Parks (MECP) issue a Part II Order for the project. A request for Part II Order must be received by the Minister and Director – Environmental Approvals Branch of the MECP, not later than October 15, 2019 (within 30 days of this Notice) at the addresses below.

Minister of the Environment Conservation and Parks
77 Wellesley Street West, 11th Floor, Toronto, ON, M7A 2T5

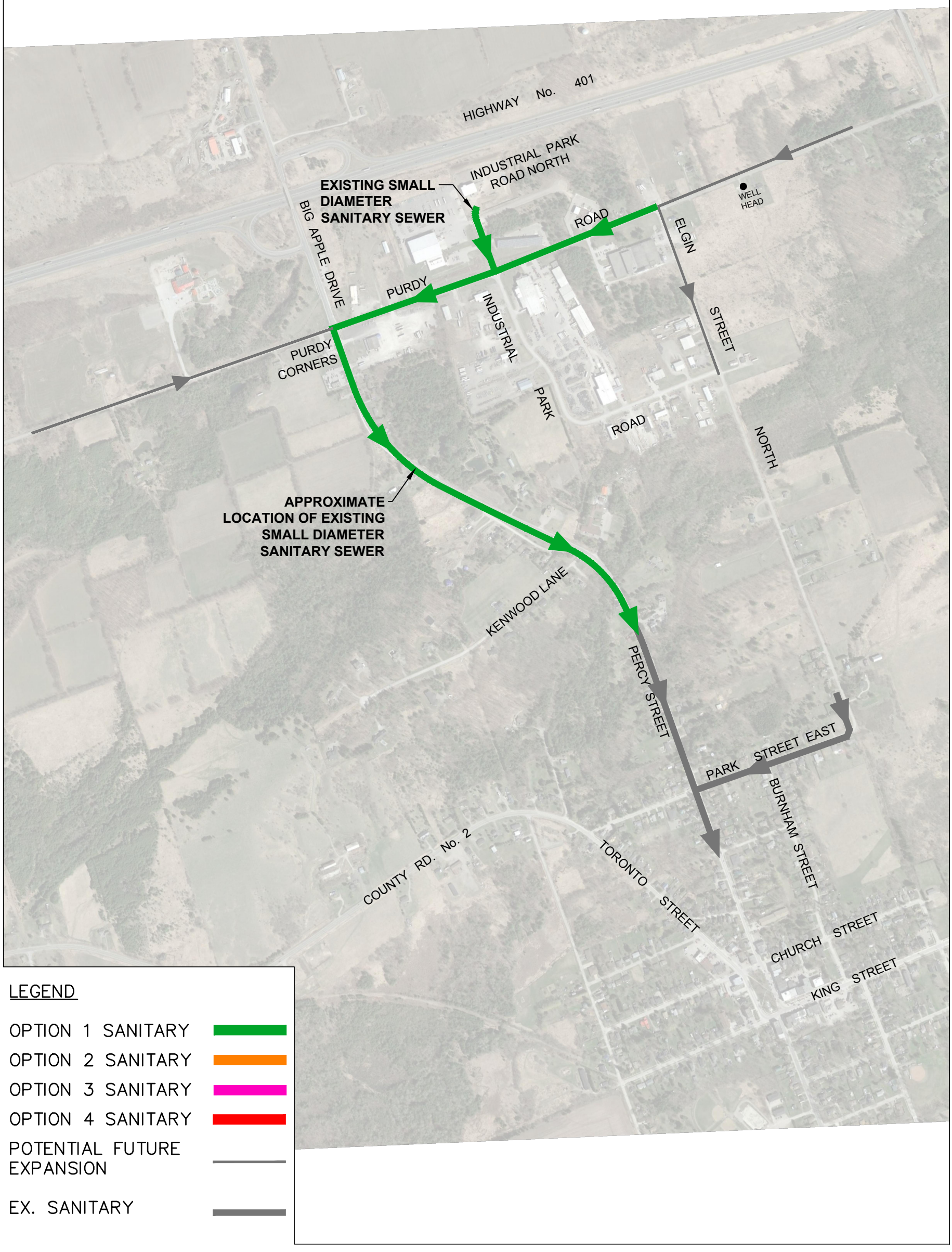
Director – Environmental Approvals Branch – Ministry of the Environment Conservation and Parks
135 St. Clair Avenue West, 1st Floor, Toronto, ON, M4V 1P5

A copy of the request for Part II Order must also be sent to Township of Cramahe (P.O. Box 357, 1 Toronto Street, Colborne, ON, K0K 1SO - Attention: Arryn McNichol, Interim CAO - Treasurer, Township of Cramahe).

This Notice of Completion issued September 12, 2019.

Appendix G

Public Comments and PIC Presentation Materials



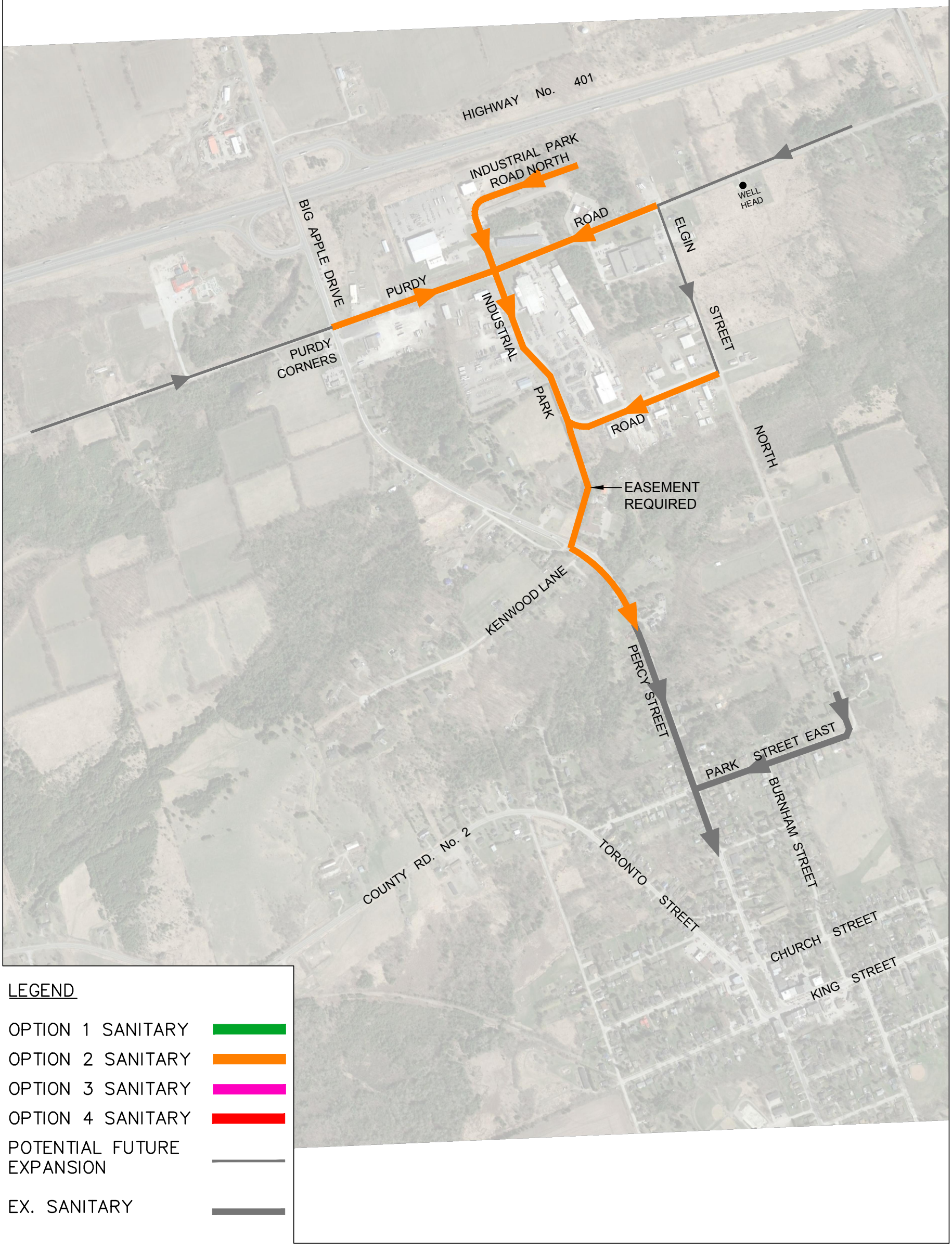
COLBORNE INDUSTRIAL PARK

ALTERNATIVE 1 – EXISTING SMALL DIAMETER SANITARY SEWER

D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9

P. 705.742.2297
F. 705.741.3568
E. wills@dmwills.com

Drawn By: L.C.	Scale: Horz. 1:1000, Vert. N/A
Checked: R.J.	
Engineer: –	Plot Date: MAY. 28 2018
Project No.: 13–2907	Drawing File No.: 2907FIGURES



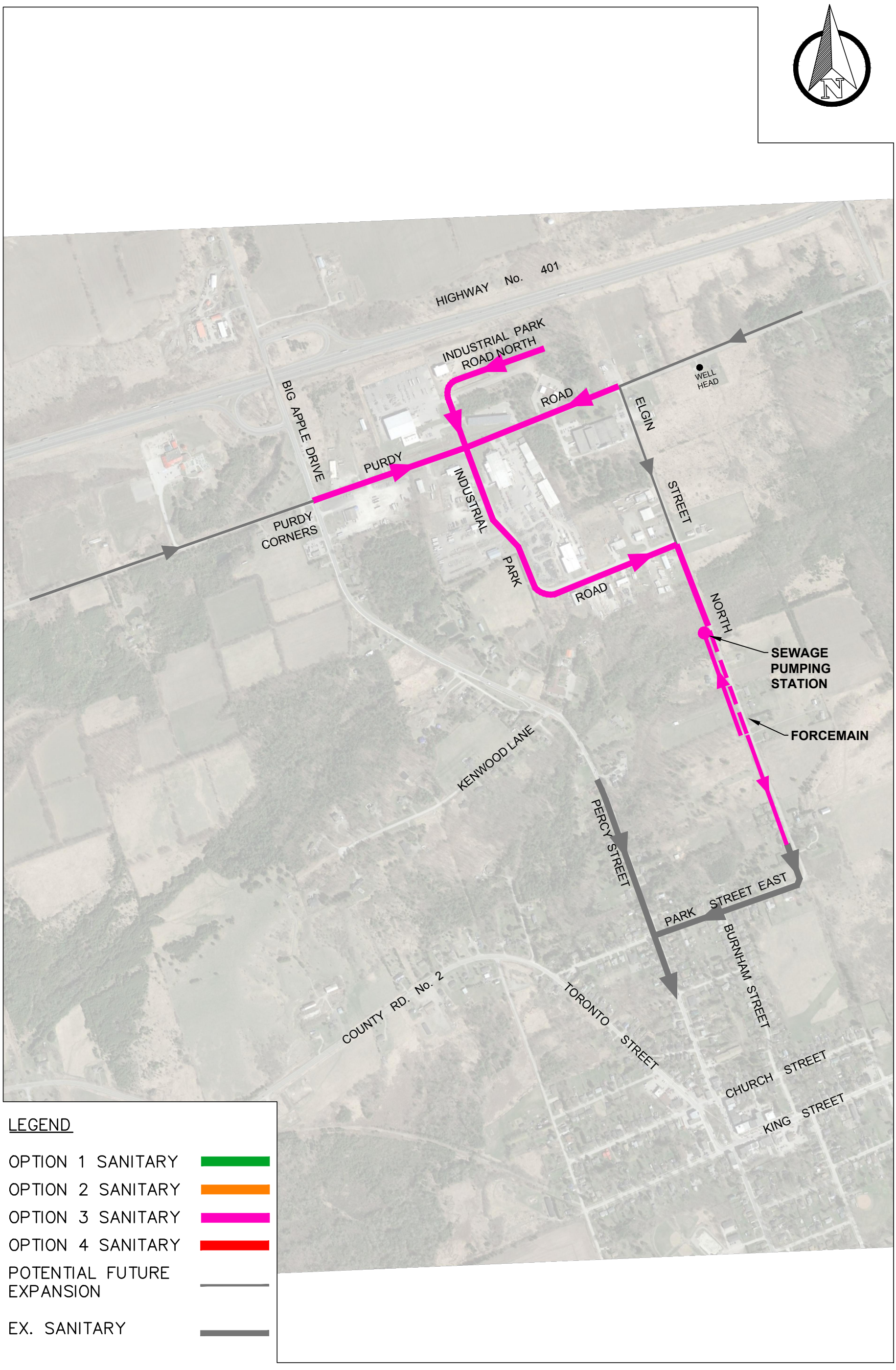
COLBORNE INDUSTRIAL PARK

OPTION 2 – EASEMENT FROM INDUSTRIAL PARK AVE.

D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9

P. 705.742.2297
F. 705.741.3568
E. wills@dmwills.com

Drawn By: L.C.	Scale: Horz. 1:1000, Vert. N/A
Checked: R.J.	
Engineer: –	Plot Date: MAY. 04 2018
Project No.: 13–2907	Drawing File No.: 2907FIGURES



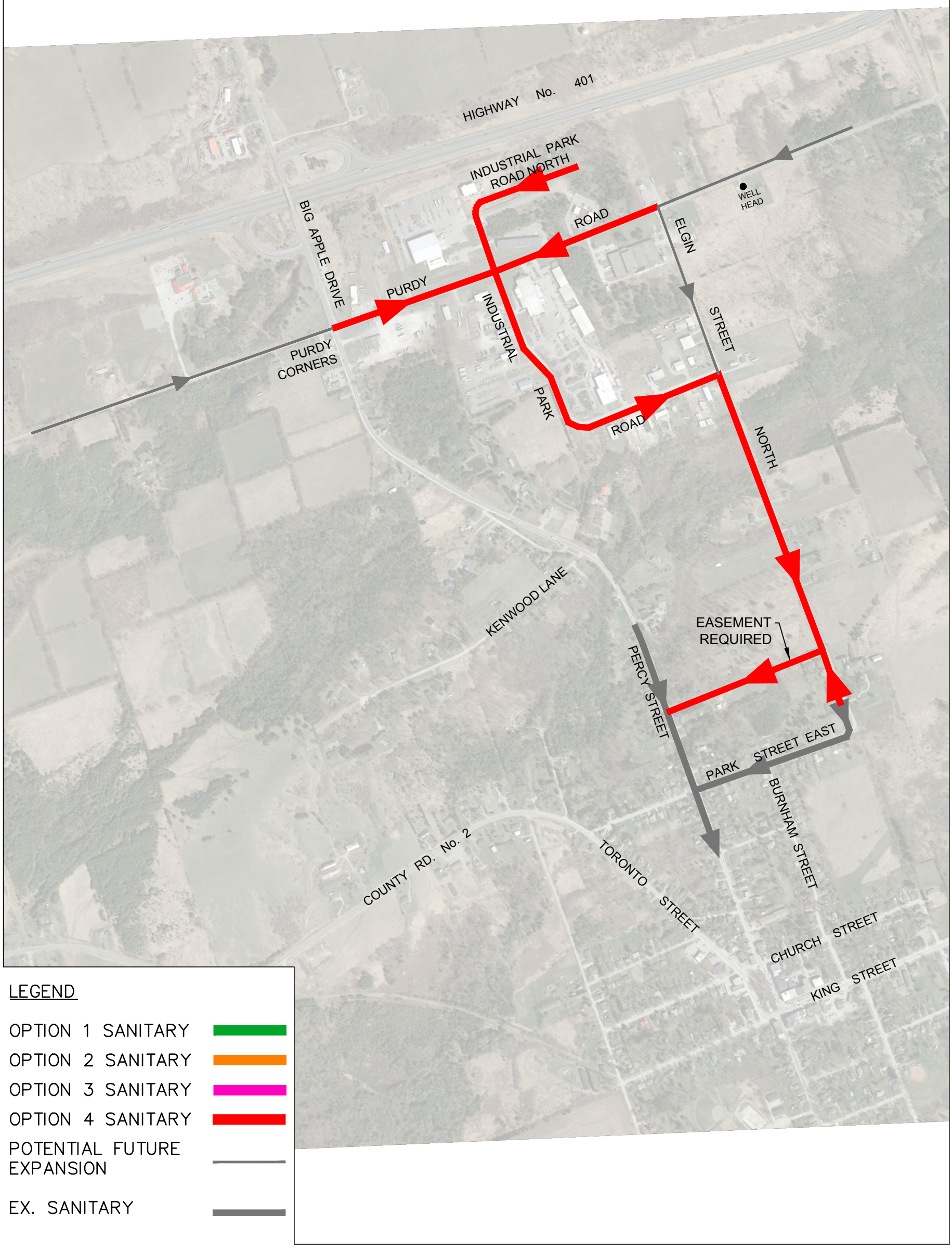
COLBORNE INDUSTRIAL PARK

OPTION 3 – SEWAGE PUMPING STATION

D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9

P. 705.742.2297
F. 705.741.3568
E. wills@dmwills.com

Drawn By: L.C.	Scale: Horz. 1:1000, Vert. N/A
Checked: R.J.	
Engineer: –	Plot Date: MAY. 04 2018
Project No.: 13–2907	Drawing File No.: 2907FIGURES



COLBORNE INDUSTRIAL PARK

OPTION 4 – EASEMENT FROM ELGIN ST.

D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9

P. 705.742.2297
F. 705.741.3568
E. wills@dmwills.com

Drawn By: L.C.	Scale: Horz. 1:1000, Vert. N/A
Checked: R.J.	
Engineer: –	Plot Date: MAY. 04 2018
Project No.: 13–2907	Drawing File No.: 2907FIGURES

CRAMAHE
It's In Our Nature

Township of Cramahe

Public Information Centre

Colborne Industrial Park

March-21-18

Comment Sheet

Comments:

WE DO NOT WANT TO HAVE CITY WATER OR ~~(SEPTIC)~~ SWEREGE FROM TOWN -

WE HAVE A DUG WELL AND SEPTIC WORKS GOOD WATER IS VERY GOOD TOILTE FLUSHES GREAT AND WILL NOT LIKE TO HAVE TO PAY FOR UPGRADED FOR SOMTHING THAT IS NOT BROKEN.

WE WOULD LIKE TO BE INFORMED OF ANY DEV. AND OR DISSISONS. ON THIS MATTER - DAY OR NIGHT WILL [redacted] BE AVAL. 905 396 7407

NAME: GATORS + SANDY DORE **TELEPHONE:** 905 396 7407

ADDRESS: 256 PURDY RD. **E-MAIL:** GATORS.09@HOTMAIL.COM

Please forward written comments by 18-04-2018

D.M. Wills Associates Ltd.
150 Jameson Drive
Peterborough, ON · K9J 0B9
Tel: (705) 742-2297
Fax: (705) 741-3568

CRAMAHE
It's In Our Nature

Township of Cramahe

Public Information Centre

Colborne Industrial Park

March-21-18

Comment Sheet

Comments:

Option 4 looks like it will be less disruptive and hopefully the lowest cost.

NAME: _____ **TELEPHONE:** _____

ADDRESS: _____ **E-MAIL:** _____

Please forward written comments by 18-04-2018

D.M. Wills Associates Ltd.
150 Jameson Drive
Peterborough, ON · K9J 0B9
Tel: (705) 742-2297
Fax: (705) 741-3568

CRAMAHE
It's In Our Nature

Township of Cramahe

Public Information Centre

Colborne Industrial Park

March-21-18

Comment Sheet

Comments:

I prefer #4

NAME: HEIDI WAYLAND **TELEPHONE:** 289-251-1325

ADDRESS: 70 ELGIN ST. N. **E-MAIL:**

Please forward written comments by 18-04-2018

D.M. Wills Associates Ltd.
150 Jameson Drive
Peterborough, ON · K9J 0B9
Tel: (705) 742-2297
Fax: (705) 741-3568

CRAMAHE
It's In Our Nature

Township of Cramahe

Public Information Centre

Colborne Industrial Park

March-21-18

Comment Sheet

Comments:

I PREFER option 4

NAME: Ed Geens **TELEPHONE:** 355 3994

ADDRESS: 51 ELGINSTR N **E-MAIL:** edgeens@eagle.ca

Please forward written comments by 18-04-2018

D.M. Wills Associates Ltd.
150 Jameson Drive
Peterborough, ON · K9J 0B9
Tel: (705) 742-2297
Fax: (705) 741-3568

CRAMAHE
It's In Our Nature

Township of Cramahe
Public Information Centre
Colborne Industrial Park

WILLS

March-21-18

SIGN IN SHEET

NAME	ADDRESS	PHONE	EMAIL
GRITT + ERNIE KOEHL		905-349-2392	koehl@sympatico.ca
ED Dekerser		9053553847	
Don Clark		905-355 2409	
Alex Saunders	373 Blyth Park Rd. Colborne	905-355 7730	Vajsa com @ hotmail.com
CAREY MITCHELL	49 ELGIN STN P.O BOX 504.		
DOUG HARRISON	29 CHURCH ST E	905-355-2471	
GATICS DORE'	256 PURDY RD	905 396 7407	GATORS.09@HOTMAIL.COM
HEIDI WAYLAND	70 ELGIN ST N	289-251-1320.	
LINDA HINTON	56 PERCY ST.	905-355-5600	