MUNICIPALITY OF KINCARDINE

KINCARDINE BUSINESS PARK SERVICING MASTER PLAN

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KINCARDINE BUSINESS PARK SERVICING MASTER PLAN

August 28, 2017

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EXECUTIVE SUMMARY

The Municipality of Kincardine initiated a Master Plan study to identify the infrastructure needs associated with the continued development of the Kincardine Business Park. The Business Park as designated by the Official Plan, includes the first four farm lots east of Highway 21 and south of Highway 9. The northern two-thirds of the western-most lot has been serviced and developed. In the past, proposals for development in the Business Park have been reviewed on an individual basis, requiring the completion of numerous studies as a result. To identify strategies for a coordinated approach for development and servicing in the remainder of the Business Park, the Municipality retained B. M. Ross and Associates to conduct a Servicing Master Plan study.

The intent of the Servicing Master Plan is to identify and evaluate strategies for the provision of transportation, water, wastewater and stormwater management infrastructure. Master Plans are long range plans that integrate infrastructure requirements for existing land uses and environmental planning principles. This Master Plan documents the processes followed to complete Phases 1 and 2 of the Municipal Class EA process for the projects associated with servicing in the Business Park. It includes the following major components:

- An overview of the general project area;
- A technical review of existing infrastructure and servicing requirements for future development;
- A summary of future requirements for transportation, water, wastewater and stormwater management infrastructure;
- A description of alternative solutions considered for resolving the defined problem or opportunity;
- A summary of the consultation undertaken with the public, stakeholders, and review agencies;
- A synopsis of the decision-making process conducted to select the preferred alternatives for each servicing component; and
- A detailed description of the preferred servicing alternatives.

There is approximately 52 ha of land available for development within the Kincardine Business Park, as identified in the Municipality of Kincardine Official Plan. Zoning policies for the Business Park will permit highway commercial, large format retail and light industrial land uses. There is significant potential for commercial and light industrial development within the Business Park; however, development potential is contingent on the availability of municipal services.

Engineering Review of Existing Services

An engineering review of existing infrastructure in the vicinity of the Business Park was undertaken. The review included examinations of transportation, water, sanitary sewage, and stormwater infrastructure. A traffic impact study was completed to determine the impacts of continued development within the Park on the intersections at Highway 21, 9/Broadway Street, Durham and Millenium Way. Future traffic levels, based on predicted future land-uses, were calculated and used to determine the impacts to traffic flow in and adjacent to the Business Park. Given future traffic levels it is recommended: that traffic signals be installed at the intersection of Highway 21 and Russell Street when build-out of the Business Park reaches 50%; northbound right hand turn lanes be installed on Highway 21 at Russell and Durham Streets when build-out reaches 50%; and left turn signals for westbound and northbound movements from Highway 21 and Broadway Street and westbound movements from Highway 21 at Durham Street. Additionally, it was recommended that as development becomes more finalized, that the need for an eastbound turn lane at the intersection of Highway 9 and Durham Street, and need to expand Highway 21 to four lanes between Russell Street and Highway 9, be investigated.

Current development in the Business Park is serviced from a 300 mm watermain on Durham Street. There is also an existing 300 mm watermain on Russell Street that could potentially supply the Business Park area. It is expected the existing water infrastructure in Kincardine can supply the Business Park lands while maintaining fire flow supply and quantity, but a booster pumping station will be required to service the higher elevation areas.

Sewage flows from existing development in the Business Park are accommodated within the Durham Street sewer outlet, flowing to the Park Street Sewage Pumping Station. An analysis of the existing sewage collection system and potential future flows identified that there is limited capacity for future Business Park development within the Durham Street sewer; and installation of a new Russell Street trunk sewer will be required for servicing of the Business Park as well as upgrades to the Park Street Sewage Pumping Station.

The existing drainage for the general watershed area of the Business Park is typically in an east-west direction towards the Highway 21 road corridor. Currently stormwater for the developed area is managed via dry ponds and other on-site methods and conveyed to the outlet locations under Highway 21.

Phase 1 – Problem/Opportunity Identification

The first phase of the Class EA process involves the identification of the problems or opportunities that need addressed. The following Opportunity Statement has been identified to provide direction for the study:

Policies within the Town of Kincardine Official Plan direct commercial and industrial growth to the Business Park; however, only the northwest area of the Park is currently serviced by municipal road, water, sanitary sewer, and stormwater infrastructure. At present, there is an opportunity to develop a servicing strategy for the remainder of Business Park that is

integrated and coordinated with existing municipal infrastructure and to allow for future development.

Phase 2 – Identification of Practical Alternative Solutions

The second phase of the Master Plan/Class EA process involves the identification and evaluation of practical alternative solutions to address to the defined opportunity. The alternatives included below build upon the findings of the engineering investigations conducted during Master Plan process, with the intent to identify practical and feasible servicing strategies for the Business Park. It is recognized that the road pattern will determine the location of water and wastewater infrastructure and stormwater piping, as these services will be located within the road allowances and the identified easements. Given this, the identification and evaluation of practical alternatives for water, sanitary sewer and stormwater infrastructure does not include routes located outside of the potential road networks.

Transportation Alternatives

Two alternative road layouts for the provision of transportation services to the remainder of the Business Park were identified: TR1 and TR2.

- **TR1** - This road layout concept is based on the initial road pattern developed and recommended by the County of Bruce Planning Department. In this alternative, additional access to the Business Park is provided from Highway 21 via an extension of Russell Street, and from Highway 9 via an extension of Durham Street. Russell Street will extend approximately 400 m east into the Park before turning north and extending towards Highway 9. Durham Street will extend from the current intersection with Millenium Way, east and then north to intersect with Highway 9.
- **TR2** - This road layout was developed based on consultation and comments received from the Ministry of Transportation (MTO) in the review of Road Pattern TR1. The MTO noted possible issues with 'Private Road' between Russell Street and Millenium Way, suggesting that Private Road is located too close to the intersection of Highway 21 and Russell Street. Future left-turn movements from Russell Street onto Private Drive may slow and possibly block traffic flow through the Highway 21 and Russell Street intersection. Given this concern, this road pattern has an alternative alignment of Russell Street, with Russell Street curving north to connect with Millenium Way.

Recently, MTO has noted that they prefer the TR1 alignment.

Water Servicing Alternatives

- **W1 – Extend municipal water servicing to the remainder of the Business Park** - This alternative proposes extending the Kincardine Drinking Water System to service the remainder of the Business Park.
- **W2 – Private or Communal Servicing**- This option proposes either individual water supply wells or a communal system servicing future development within the Business Park. This option is not considered a practical or feasible alternative for the provision of water to future development in the Business Park.
- **W3 – Do nothing.**

Sewage Collection Alternatives

- **S1 – Extend municipal sanitary sewage services to the remainder of the Business Park** - This alternative proposes to extend the Kincardine sanitary sewage collection system to service the remainder of the Business Park. Future development in the Business Park will be conveyed to the Russell Street sewer and Park Street Sewage Pumping Station (SPS). To accommodate future flows from the Business Park, a new trunk sewer on Russell Street, from Highway 21 to Scott Street, will be required. To accommodate expected peak sewage flows resulting from continued development in the Business Park, it was determined that increased capacity at the Park Street SPS is required. Given the need to increase capacity at the Park Street SPS to accommodate servicing within the Business Park, this alternative includes the consideration of following solutions for the necessary SPS improvements:
    - **S1.1 – Install larger pumps in the existing dry pit and use the existing forcemain at the Park Street SPS;**
    - **S1.2 – Retain the existing pumps and twin the existing forcemain at the Park Street SPS; and**
    - **S1.3 – Replace the existing pumps and twin the existing forcemain at the Park Street SPS.**
- **S2 – Private or Communal Wastewater Servicing** - This option proposes either individual septic systems or a communal system to treat and dispose of sewage for new development within the Business Park. This option is not considered a practical or feasible alternative for the provision of water to future development in the Business Park.
- **S3 – Do nothing.**

Stormwater Servicing Alternatives

- **SW1 - Extend/add municipal stormwater facilities to service the remainder of the Business Park** - In addition to the existing stormwater detention pond (Pond 1), two additional stormwater ponds and conveyance pipes are proposed to service the remainder of the Business Park.
- **SW2 - Individual, lot-level stormwater services** - This alternative would see the installation of stormwater services for individual properties in the Business Park, installed as development occurs.
- **SW3 – Do nothing.**

Evaluation and Selection of Preferred Alternatives

The outcome of the evaluation of the identified alternatives is the selection of the preferred strategies for transportation, water, sanitary sewage and stormwater servicing for the remainder of the Kincardine Business Park. The preferred servicing strategies are:

- TR1 – Road Pattern 1;
- W1 - Extending municipal water services to the remainder of the Business Park;
- S1 – Extending municipal sanitary sewage services to the remainder of the Business Park;
    - S1.1 – Construct a new trunk sewer on Russell Street and install larger pumps to increase capacity at the Park Street SPS; and
- SW1 – Extending and adding municipal stormwater services for the remainder of the Business Park

The following are the key attributes associated with identifying these strategies as the preferred options:

- The preferred servicing strategies address the opportunity to provide services in a manner that is integrated and coordinated with the existing infrastructure in the Business Park;
- Will allow future development, as envisioned in the Official Plan, in the remainder of the Business Park;
- Most of the services will be located within road allowances to maximize the amount of developable land available; and
- With respect to the Park Street SPS, the installation of larger pumps is the most economical option that provides additional capacity. It also has the least potential for environmental impacts.

Consultation

The consultation program developed for this study was directed towards stakeholders, adjacent property owners and provincial review agencies. Comments received during the public meeting and meeting with stakeholders reflected a positive attitude towards the provision of municipal services in the Business Park.

Phasing and Implementation

As an outcome of this assessment, a series of projects have been identified to implement the master Plan. These projects are classified as Schedule 'A', 'A+', or 'B' activities under the terms of the Class EA document. The majority of schedule 'A', 'A+' and 'B' activities have been assessed in conjunction with the current Master Plan process and do not require additional Class EA review prior to implementation.

It is anticipated by the Municipality that the completion of the development of the Business Park will take a number of years and will therefore need to follow a phased-in infrastructure plan. Further discussions need to be undertaken with the various property owners to ascertain what areas of the Business Park may need to proceed in advance of others.

Prior to the implementation of the preferred servicing strategy, a Stage 2 Archaeological Assessment must be completed for the areas identified through the Stage 1 Assessment. Additionally, no construction work is permitted within 70 m of the Clements Site until a Stage 3 Assessment is completed for that site.

The technical investigation of water servicing in the Business Park identified the potential need for a booster pumping system for later phases of development. It is anticipated a booster pumping station will be sited in the vicinity of Millenium Way and Durham Street. Prior to constructing a booster pumping station, it is recommended the Municipality establish a pressure monitoring system to track system operation as development proceeds to better determine the appropriate timing for construction of the pressure boosting facilities. Given that the timing of the construction of the booster pumping station is dependent on development and the site should be reviewed further, it is suggested that a separate Schedule B Municipal Class EA be completed for this component.

Master Plan Recommendations

The following represents the key study recommendations developed following the evaluation of alternatives as part of the Master Plan process:

- That Road Concept 1 be adopted as the preferred transportation strategy to provide service for future development within the Business Park;
- That extending the Kincardine Drinking Water System and Kincardine Sanitary Sewage Collection System be adopted as the preferred strategy for water and sanitary servicing within the Business Park;

- That construction of two additional extended detention wet pond facilities and storm sewer conveyance system be adopted as the preferred stormwater management strategy within the Business Park;
- Implementation of the Master Plan will require further archaeological assessment to evaluate the potential for archaeological resources in the Business Park;
- Schedule 'A', 'A+' and 'B' projects, as identified in Table 11.1 have undergone sufficient investigation and evaluation to complete Phases 1 and 2 of the Class EA process and therefore are approved through the Master Plan process;
- Implementation of the Master Plan should be conducted with reference to the project phasing strategy detailed in Section 9 of this report;
- Impact mitigation measures discussed in Section 11 of this report should be incorporated into the detailed construction plans for each proposed activity, as appropriate; and
- Recommended components of the preferred servicing strategy should be considered for incorporation into the next Official Plan update for the Municipality of Kincardine.

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1.0 INTRODUCTION

1.1 Purpose of the Study

The Municipality of Kincardine initiated a Master Plan study to identify the infrastructure needs associated with the continued development of the Kincardine Business Park. The Business Park, as designated by the Official Plan, includes the first four farm lots east of Highway 21 and south of Highway 9. The first, and most westerly lot, was purchased and developed by the Municipality. The northern two-thirds of the first lot was divided into parcels, which have since been sold as serviced land. In 2004, a developer came forward with a proposal to develop the second and third lot and since that time, there have been numerous smaller proposals for commercial development. Individual reviews for previous development proposals have been requested and a number of different studies completed as a result.

The purpose of this Master Plan study is to outline how the remaining Business Park lands can be serviced with transportation, water, wastewater and stormwater management infrastructure and to identify strategies to coordinate construction with other municipal improvements. This report documents the Master Planning process followed and includes the following major components:

- An overview of the general project area;
- A technical review of existing infrastructure and servicing requirements for future development;
- A summary of future requirements for transportation, water, wastewater and stormwater management infrastructure;
- A description of alternative solutions considered for resolving the defined problem or opportunity;
- A synopsis of the decision-making process conducted to select the preferred alternatives for each servicing component; and
- A detailed description of the preferred servicing alternatives.

The Servicing Master Plan established through this process sets out a preferred long-term strategy for infrastructure within the Kincardine Business Park. In this regard, the Master Plan will become the basis for, and be used in support of, future investigations for specific projects required to implement this strategy.

1.2 General Description of Master Plans

Master Plans are long range plans that integrate infrastructure requirements for existing and future land uses with environmental assessment planning principles. These types of plans are often used when considering a group of related projects or integrated systems, such as infrastructure systems, and allow needs to be defined over a broader context, such as a large geographic area. Master Plans typically exhibit the following characteristics:

- Address the key principles of successful environmental planning;
- Provide a strategic level assessment of various options to better address overall system needs, potential impacts and mitigation;
- Address at least the first two phases of the Municipal Class EA process;
- Allow for an integrated process with other planning initiatives;
- Are generally long-term in nature;
- Apply a system-wide approach to planning, which relates infrastructure either geographically or by a particular function;
- Recommend an infrastructure servicing plan which can be implemented through the completion of separate projects; and
- Include a description of the specific projects needed to implement the Master Plan.

1.3 Integration with the MEA Process

1.3.1 Class EA Project Phases

The Kincardine Business Park Servicing Master Plan has been completed in accordance with the planning and design process of the Municipal Class Environmental Assessment (Class EA). The Class EA is an approved planning document that describes the environmental assessment process proponents must follow in order to meet the requirements of the Environmental Assessment Act (EA Act) (Municipal Engineers Association, 2000).

The Class EA approach allows for the evaluation of alternative methods of carrying out a project, and identifies potential environmental impacts. The planning process for a Class EA is divided into five project phases, which are described below and illustrated in Figure 1.1:

- Phase 1 – Problem/opportunity identification;
- Phase 2 – Evaluation of alternative solutions to the defined problems/opportunities and a selection of a preferred solution;
- Phase 3 - Identification and evaluation of alternative design concepts in selection of a preferred design concept;
- Phase 4 – Preparation and submission of an Environmental Study Report (ESR) for public and government agency review; and
- Phase 5 – Implementation of the preferred alternative and monitoring of any impacts.

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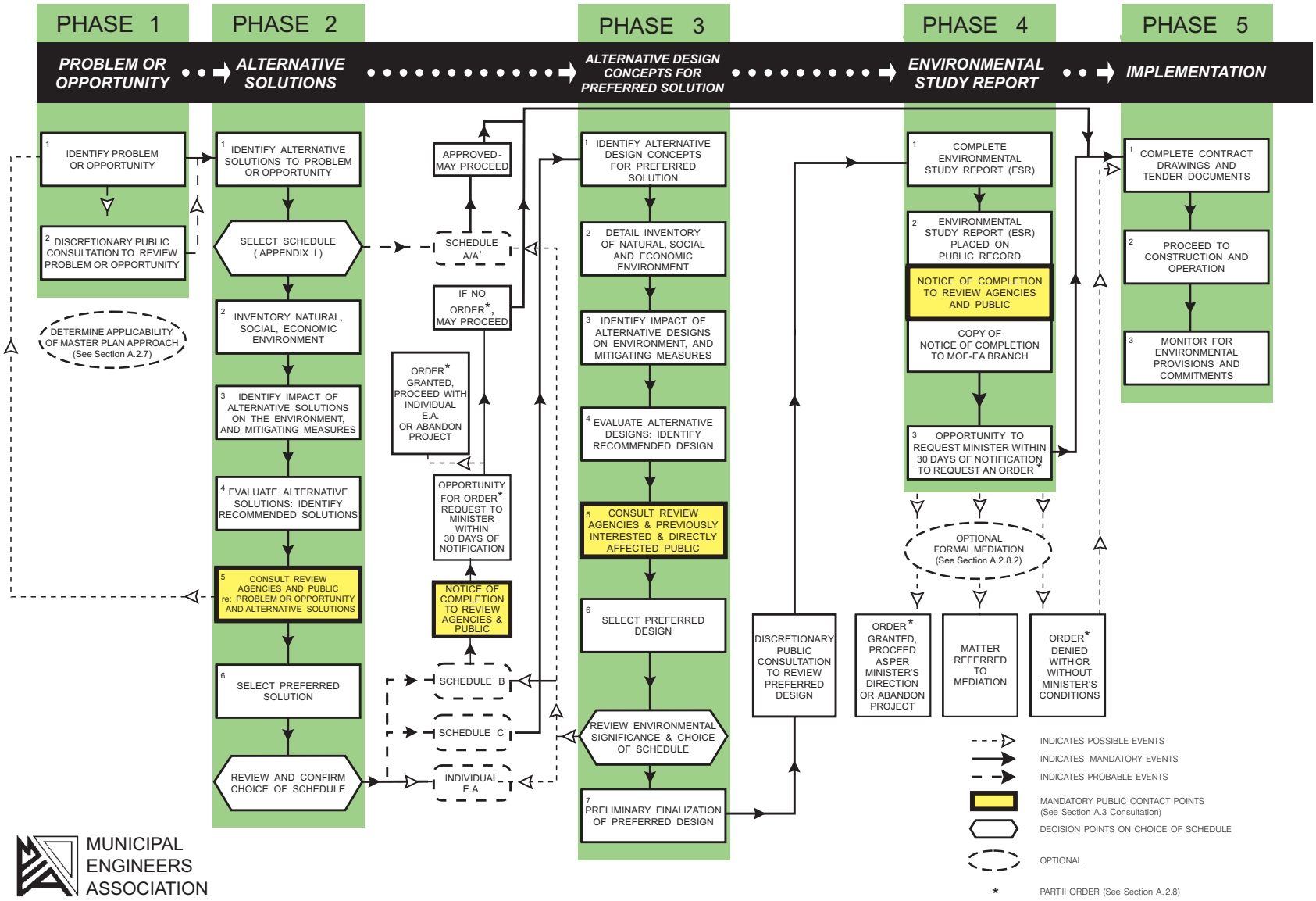
NOTE: *This flow chart is to be read in conjunction with Part A of the Municipal Class EA*



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SERVICING MASTER PLAN FOR KINCARDINE BUSINESS PARK

(COMMUNITY OF KINCARDINE)

CLASS EA PROCESS

DATE APRIL 2017	PROJECT No. 08055
SCALE none	FIGURE No. 1.1

1.3.2 Classification of Project Schedules

Projects associated with Master Plans are classified to different project schedules according to the potential complexity and the degree of environmental impacts that could be associated with the project. There are four levels of schedules:

- Schedule A – Projects that are approved with no need to follow the Class EA process;
- Schedule A+ - Projects that are pre-approved but require some form of public notification;
- Schedule B- Projects that are approved following the completion of a screening process that incorporates Phases 1 and 2 of the Class EA process, as a minimum; and
- Schedule C – Projects that are approved subject to following the full Class EA process.

The Class EA process is self-regulatory and municipalities are expected to identify the appropriate level of environmental assessment based upon the projects they are considering.

1.4 Master Plan Framework

1.4.1 Master Plan Approaches

The Class EA document provides proponents with four approaches for conducting Master Plan investigations, given the broad nature and scope of these studies. Proponents are encouraged to adapt and tailor the Master Planning process to suit the needs of the study being undertaken, provided that at a minimum, the assessment involves an evaluation of servicing deficiencies followed by a review of possible solutions (i.e., Phases 1 and 2 of the Class EA process).

Table 1.1 summarizes the primary components associated with the four Master Plan approaches outlined within the Municipal Class EA document.

Table 1.1 Summary of Master Planning Approaches

Approach	Key Characteristics	Project Implementation
#1	• Master Plan prepared at the conclusion of Phases 1 and 2 of the Class EA process. • Completed at a broad level of assessment. • Serves as a basis for future investigations associated with specific Schedule B and C projects.	• Schedule B and C projects would require further Class EA investigations.
#2	• Master Plan prepared at the conclusion of Phases 1 and 2 of the MEA Class EA process. • More detailed level of investigation and consultation completed, such that it satisfies requirements for Schedule B screenings. • Final public notice for Master Plan serves as Notice of Completion for individual Schedule B projects.	• Schedule B projects are approved. • Schedule C projects must complete Phase 3 and 4 of the Class EA process.
#3	• Master Plan prepared at the conclusion of Phase 4 of the Class EA process. • Level of review and consultation encompasses Phases 1 to 4 of the Class EA process. • Final public notice for Master Plan serves as Notice of Completion for Schedule B and C projects reviewed through the Master Plan.	• Class EA investigations are not required for projects reviewed through the Master Plan.
#4	• Integration of Master Plan with associated Planning Act approvals. • Establishes need and justification in a very broad context. • Best suited when planning for a significant geographical area in the long term.	• Depending on the level of investigation associated with the Master Plan, Class EA investigations may be required for specific projects.

1.4.2 Applied Approach

For the purposes of the Kincardine Business Park Servicing Master Plan, it was determined during the course of the investigation that Approach 2 would be the most appropriate planning framework to utilize for this assessment. This Master Plan will document the processes followed to complete Phases 1 and 2 of the Municipal Class EA and demonstrate a sufficient level of

investigation, consultation and documentation to fulfil the requirements of the identified Schedule B projects.

The decision to apply Approach 2 for this Master Plan was based upon the following rationale:

- The level of review and consultation completed in conjunction with the Master Plan was sufficient to satisfy the Municipal Class EA process associated with Schedule B activities; and
- Utilization of this approach will permit implementation of Schedule B projects upon completion of the Master Plan.

Upon completion, the Master Plan document will form the basis for additional assessment required in support of any Schedule C projects identified as part of the preferred infrastructure plan. Schedule B projects will be pre-approved based upon consultation completed as part of the Master Plan. Any Schedule C projects would be required to fulfill Phases 3 and 4 of the Class EA process and file an Environmental Study Report for public review.

1.4.3 Approval Requirements

The Kincardine Business Park Master Plan is subject to approval from the Council of the Municipality of Kincardine, but does not require formal approval under the EA Act. Schedule B activities reviewed in conjunction with the Master Plan are subject to formal approval, therefore, the Completion Notice issued at the conclusion of the Master Plan will also serve as a Notice of Study Completion for the Schedule B activities identified within. The Master Plan will be made available for public review. Subject to consideration of the proposed works and any comments received through consultation, the Master Plan will be approved by Municipal Council.

If significant environmental impacts are identified during subsequent Class EA process to implement Schedule B projects specified within the Master plan, a person/party may request that the Municipality of Kincardine voluntarily elevate the project(s) to a higher level of environmental assessment. If the proponent declines, or if it is believed that the concerns are not properly dealt with, any individual or organization has the right to request that the Minister of the Environment make an order for the project(s) to comply with Part II of the EA Act which addresses individual environmental assessments. This request must be submitted to the Minister within 30 days of the publication of the Notice of Completion of the Class EA process for any specific project.

2.0 STUDY AREA REVIEW

2.1 Town of Kincardine

The Town of Kincardine is located within the Municipality of Kincardine, in the County of Bruce. The Municipality was formed on January 1, 1999 through the amalgamation of the former Bruce and Kincardine Townships and Town of Kincardine. In general, the Municipality is comprised of one large urban centre (the former Town of Kincardine), a considerable amount of development along the Lake Huron shoreline, and a number of small settlements dispersed through a primarily rural landscape.

The Town of Kincardine has a population of 8,315 (Statistics Canada, 2017) and a land base of approximately 10 km^2. Kincardine is located in the southern area of the Municipality, at the intersections of Provincial Highways 9 and 21, as shown in Figure 2.1. It is approximately 50 km north of Goderich and 120 northwest of the city of Waterloo. Presently, the Town serves as the commercial centre for the Municipality of Kincardine and the surrounding area.

In the past, development in the Town has typically occurred between Lake Huron and Highway 21; however, in recent years there has been a number of large scale highway commercial developments east of Highway 21 within the Kincardine Business Park.

2.2 Study Area Description – Kincardine Business Park

The Kincardine Business Park is located southeast of the intersections of Highways 9 and 21. The southern extent of the Business Park is bounded by the Holtby Drain. The extent of the Business Park, as designated in the Municipality of Kincardine Official Plan, is shown in Figure 2.2.

The Kincardine Business Park is comprised of the first four farm lots south and east of Highways 9 and 21, respectively. The Business Park encompasses an area of approximately 75 hectares, of which approximately 52 ha for future development, with the remainder being already developed or undevelopable. There are a number of highway commercial developments existing in the Business Park, primarily in the northern portion of the first farm lot east of Highway 21. Existing developments in the Business Park include: a grocery store, bank, restaurants, large automotive and service retailer, two hotels and professional offices. The remainder of the Business Park is privately owned and used primarily for agricultural purposes. Presently, access to the Business Park from Highway 21 is via Durham Street. Access to the northwestern area of the Park, nearest Highway 21, is provided by Millenium Way. Both roads are currently two-lane, urban streets with speed limits of 50 km/h.

The undeveloped areas of the Business Park are typified by low rolling hills, either used for agricultural purposes or vegetated mainly with grasses and other herbaceous growth.

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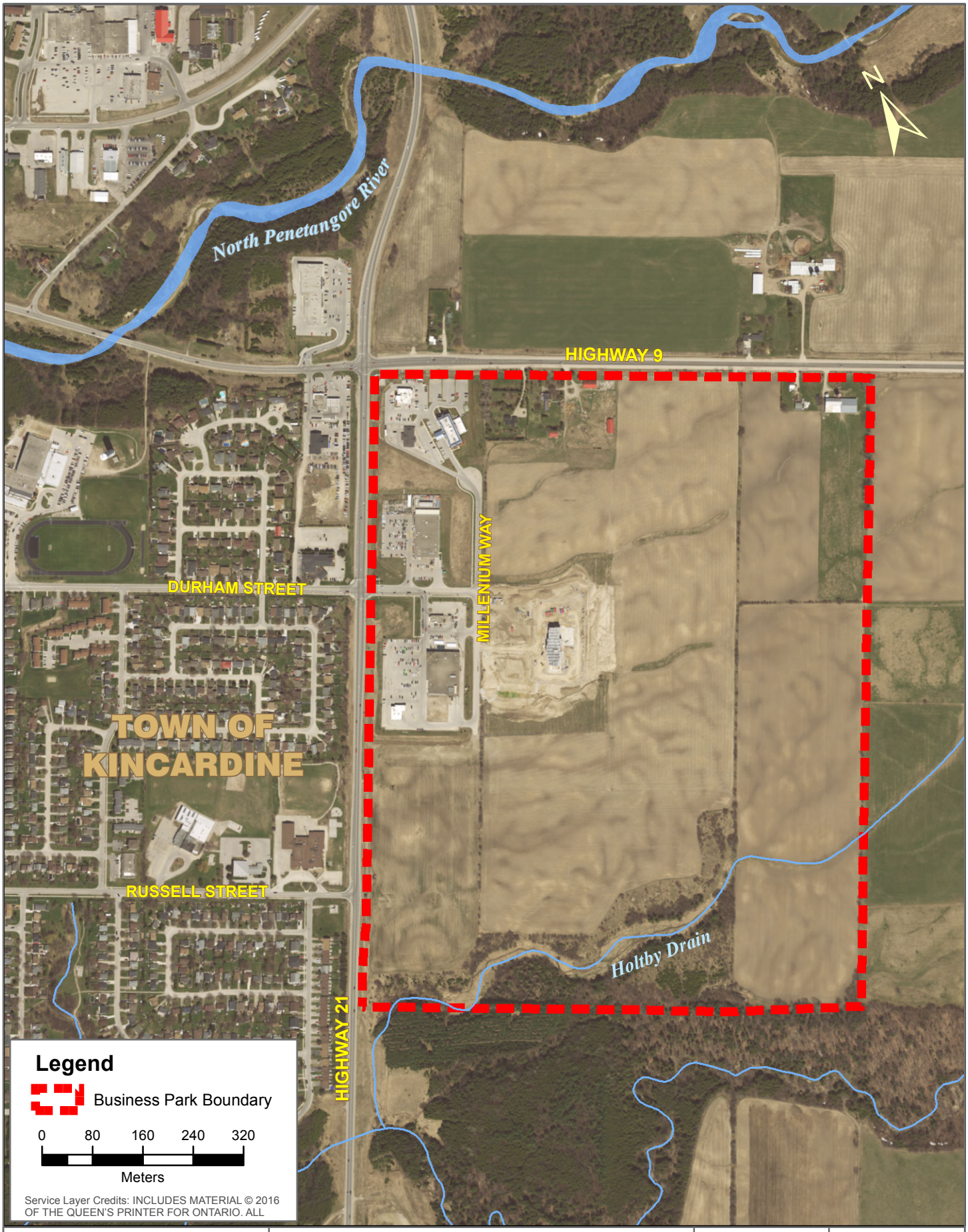
(COMMUNITY OF KINCARDINE)
STUDY AREA LOCATION

DATE	PROJECT No.
April 2017	08055
SCALE	FIGURE No.
1:250,000	2.1



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SERVICING MASTER PLAN FOR
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PROJECT STUDY AREA

DATE	PROJECT No.
April 2017	08055
SCALE	FIGURE No.
1:8,000	2.2

2.3 Environmental Setting

2.3.1 General Physiography

The study area (Kincardine Business Park) is located within the physiographic region known as the Huron Slope. The Huron Slope encompasses the lands between the Algonquin shore cliff to the west and Wyoming Moraine to the east. It is a clay plain, modified by a narrow strip of sand and the twin beaches of glacial Lake Warren on the eastern side. The till in the area is formed from brown calcareous clay and has minimal pebbles and boulders. It is approximately 1.5 m to 3 m thick, and overlays brown, stratified clay. The plain is deeply trenched by the Penetangore River as it flows through Kincardine to outlet at Lake Huron.

The Penetangore River drains approximately 192 km^2 of land, east of Kincardine, including the Kincardine Business Park via the Holtby Drain. The natural heritage features of the area are shown in Figure 2.3.

2.3.2 Natural Heritage Features: Areas of Natural and Scientific Interest (ANSI)

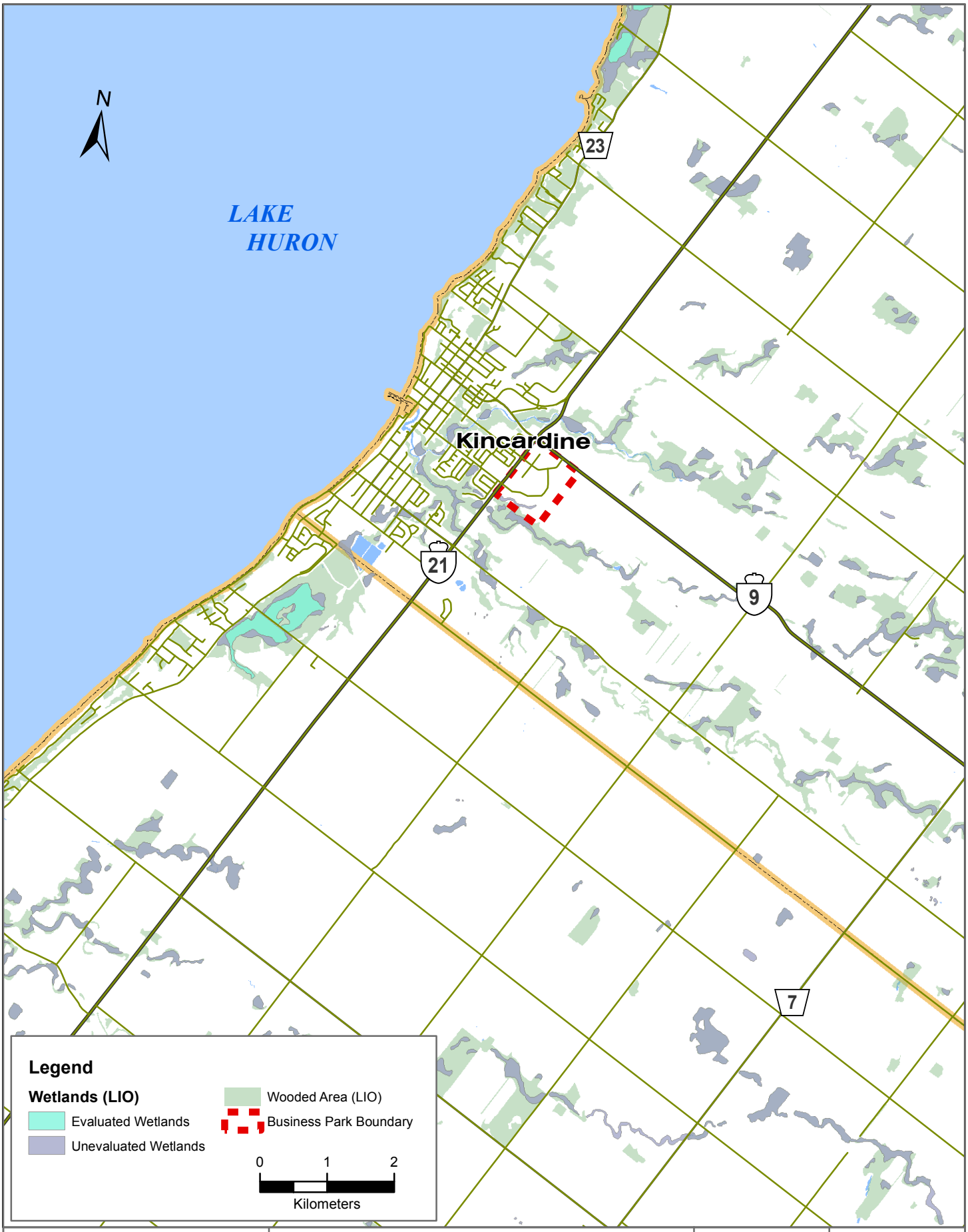
A review of the Natural Heritage Area mapping (https://www.ontario.ca/page/make-natural-heritage-area-map) provided by the Ministry of Natural Resources and Forestry, indicated that there are no Areas of Natural and Scientific Interest (ANSI) within 10 km of the study area (Ministry of Natural Resources and Forestry, 2017).

2.4 Species at Risk

An evaluation for the presence of significant species and their associated habitats within the study area has been incorporated into the project planning process. A review of available information on species and habitat occurrences determined that the study area may contain species and/or associates habitats that are legally protected under Provincial and Federal species at risk legislation.

The protection for species at risk and their associated habitats is directed by the following federal and provincial legislation:

- The Federal *Species at Risk Act, 2002* (SARA) provides for the recovery and legal protection of listed wildlife species and associated critical habitats that are extirpated, endangered, threatened or of special concern and secures the necessary actions for their recovery; and
- The Provincial *Endangered Species Act, 2007* (ESA) provides legal protection of endangered and threatened species and their associated habitat in Ontario. Under the legislation, measures to support their recovery are also defined.



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NATURAL HERITAGE AREAS

DATE	PROJECT No.
April 2017	08055
SCALE	FIGURE No.
1:75,000	2.3

Based on the information available for the occurrence of species at risk and their associated habitats from the following sources, a summary of federally and provincially recognized species with the potential to be present within the project study area are listed in Table 2.1:

- Ministry of Natural Resources and Forestry, Species at Risk by Area
  - Source: https://www.ontario.ca/environment-and-energy/species-risk-area
- Natural Heritage Information Centre, Make a Natural Heritage Map
  - Study area located within NHIC 1km grid: 17MJ5868
  - Source: https://www.ontario.ca/page/make-natural-heritage-area-map
- Environment Canada, Species at Risk Public Registry, Species Search
  - Source: http://www.sararegistry.gc.ca/search/SpeciesSearch_e.cfm

Table 2.1 Potential Species at Risk within the Bruce County and the Study Area

	Species		**Status Designation**		**Suitable Habitat in the Study Area**
	Common Name	*Scientific Name*	*SARA** Schedule 1 *(Federal)*	*ESA*** *(Provincial)*	
Birds	Bald Eagle	*Haliateetus leucocephalus*	-	Special Concern	No
	Barn Swallow	*Hirundo rustica*	-	Threatened	No
	Black Tern	*Chlidonias niger*	-	Special Concern	No
	Bobolink	*Dolichonyx oryzivorus*	-	Threatened	Potential
	Cerulean Warbler	*Setophaga cerulea*	Special Concern	Threatened	No
	Eastern Meadowlark	*Sturnella magna*	-	Threatened	Potential
	Eastern Whip-poor-will	*Antrostomus vociferus*	Threatened	Threatened	No
	Golden-winged Warbler	*Wermivora chrysoptera*	Threatened	Special Concern	No
	Henslow`s Sparrow	*Ammodramus henslowii*	Endangered	Endangered	No
	King Rail	*Rallus elegans*	Endangered	Endangered	No
	Least Bittern	*Ixobrychus exilis*	Threatened	Threatened	No
	Loggerhead Shrike	*Lanius ludovicianus migrans*	Endangered	Endangered	No
	Peregrine Falcon	*Falco peregrinus*	Special Concern	Special Concern	No
	Piping Plover	*Charadrius melodus*	Endangered	Endangered	No
	Short-eared Owl	*Asio flammeus*	Special Concern	Special Concern	No
Fish and Mussels	Lake Sturgeon	*Acipenser fulvescens*	Threatened	Threatened	No
	Northern Brook Lamprey	*Ichthyomyzon fossor*	Special Concern	Special Concern	No
	Redside Dace	*Clinostomus elongatus*	-	Endangered	No

Table 2.1 Potential Species at Risk within the Bruce County and the Study Area

	Species		Status Designation		Suitable Habitat in the Study Area
	Common Name	*Scientific Name*	*SARA** Schedule 1 *(Federal)*	*ESA*** *(Provincial)*	
Insects	Hungerford`s Crawling Water Beetle	*Brychius hungerfordi*	-	Endangered	No
	Rusty-patched Bumble Bee	*Bombus affinis*	Special Concern	Endangered	No
Mammals	American Badger, jacksoni supspecies	*Taxidea taxus jacksoni*	Endangered	Endangered	No
Plants and Lichens	American Ginseng	*Panax quiquefolius*	Endangered	Endangered	No
	American Hart`s-tongue Fern	*Asplenium scolopendrium var. americanum*	Special Concern	Special Concern	No
	Broad Beech Fern		-	Special Concern	No
	Dwarf Lake Iris	*Iris lacustris*	Special Concern	Special Concern	No
	Eastern Prairie Fringed Orchid	*Platanthera leucophaea*	Endangered	Endangered	No
	Gattinger`s Agalinis	*Agalinis gattingeri*	Endangered	Endangered	No
	Hill`s Pondweed	*Potamogeton hillii*	Special Concern	Special Concern	No
	Hill`s Thistle	*Cirsium hillii*	Threatened	Threatened	No
	Houghton`s Goldenrod	*Solidago houghtonii*	Special Concern	Threatened	No
	Lakeside Daisy	*Tetraneuris herbacea*	Threatened	Threatened	No
	Pitcher`s Thistle	*Cirsium pitcheri*	Endangered	Threatened	No
	Tuberous Indian-Plantain	*Arnoglossum plantagineum*	Special Concern	Special Concern	No
Snakes and Lizards	Eastern Ribbonsnake	*Thamniphis sauritus*	Special Concern	Special Concern	No
	Massasauga Rattlesnake	*Sistrunrus catenatus*	Threatened	Threatened	No
	Queensnake	*Regina septemvittata*	Endangered	Endangered	No
Turtles	Blanding`s Turtle	*Emydoidea blandingii*	Endangered	Threatened	No
	Northern Map Turtle	*Graptemys geographica*	Special Concern	Special Concern	No
	Snapping Turtle	*Chelydra serpentina*	Special Concern	Special Concern	No

Species in bold are those identified as potentially occurring within 1km of the study area based on historical observation records

Notes:

* As determined by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) under the Species at Risk Act (SARA), 2002 legislation. Species listed are designated as 'Schedule 1' species and are legally protected under the act.

** As determined by the Committee on the Status of Species at Risk in Ontario (COSSARO) under the Endangered Species Act (ESA), 2007 legislation.

The study area is located within the County of Bruce, which incorporates a large area and a wide variety of environs that include terrestrial and aquatic habitat. Species listed in Table 2.1 were generated based on their occurrence within the entire county, and may not necessarily occur within the study area. Based on review of the MNRF Natural Heritage Information Centre data, no historical observations of species at risk occur within the study area and surrounding areas. It is noted that the study area incorporates areas of urban development, with the remainder of the Business Park currently used for agricultural purposes. The agricultural lands have historically been utilized for cropping purposes, following a wheat-soybean-corn rotation. Given the crop rotation pattern and existing development, it is suspected there is limited habitat opportunity.

2.5 Breeding Bird Habitat

The Atlas of Breeding Birds of Ontario (2001 - 2005) was used to identify the bird species with confirmed, probable and possible breeding habitat in proximity to the study area (Bird Studies Canada, 2009). The study area lies within of the 200 km^2 area identified by the Atlas as Squares 17MJ58 and 17MJ59, in Region 8: Bruce Region. Within the squares, a total of 59 birds, including at risk species such as the Chimney Swift, Eastern Whip-poor-will, Least Bittern, and Loggerhead Shrike, have confirmed breeding status in the survey region. An additional 52 species were categorized as having probable breeding status and 38 are considered to have possible breeding status in the area (Bird Studies Canada, 2009).

The survey area includes key habitat for the identified species, such as forests (in all stages of growth), riverine areas, agricultural areas, wetlands and shoreline areas. The project area forms a relatively small portion of this region and habitat opportunities are limited in the Business Park based on existing development and crop rotation practices in the undeveloped areas.

2.6 Cultural Heritage and Archaeological Resources

To evaluate the potential for archaeological resources within the Kincardine Business Park study area, a Stage 1 Archaeological Assessment was completed by Timmins Martelle Heritage Consultants Inc. (TMHC) in April 2014. Given the size of the study area and the number of private land owners in the Business Park, it was the intent of the Stage 1 Archaeological Assessment to provide an overview of archaeological potential for planning considerations and additional studies completed as part of future environmental assessments. The Stage 1 Archaeological Assessment is included with this report in Appendix 1.

A Stage 1 Archaeological Assessment was completed for the Business Park to gather information on the known and potential archaeological resources in the study area. The study area was identified as having potential for archaeological resources, given:

- Proximity to watercourses (Holtby Drain);
- Proximity to early transportation routes (Highway 21 and Highway 9 – the Durham Road);
- Proximity to the 19th century settled town core of Kincardine; and

- The presence of registered and known archaeological sites.

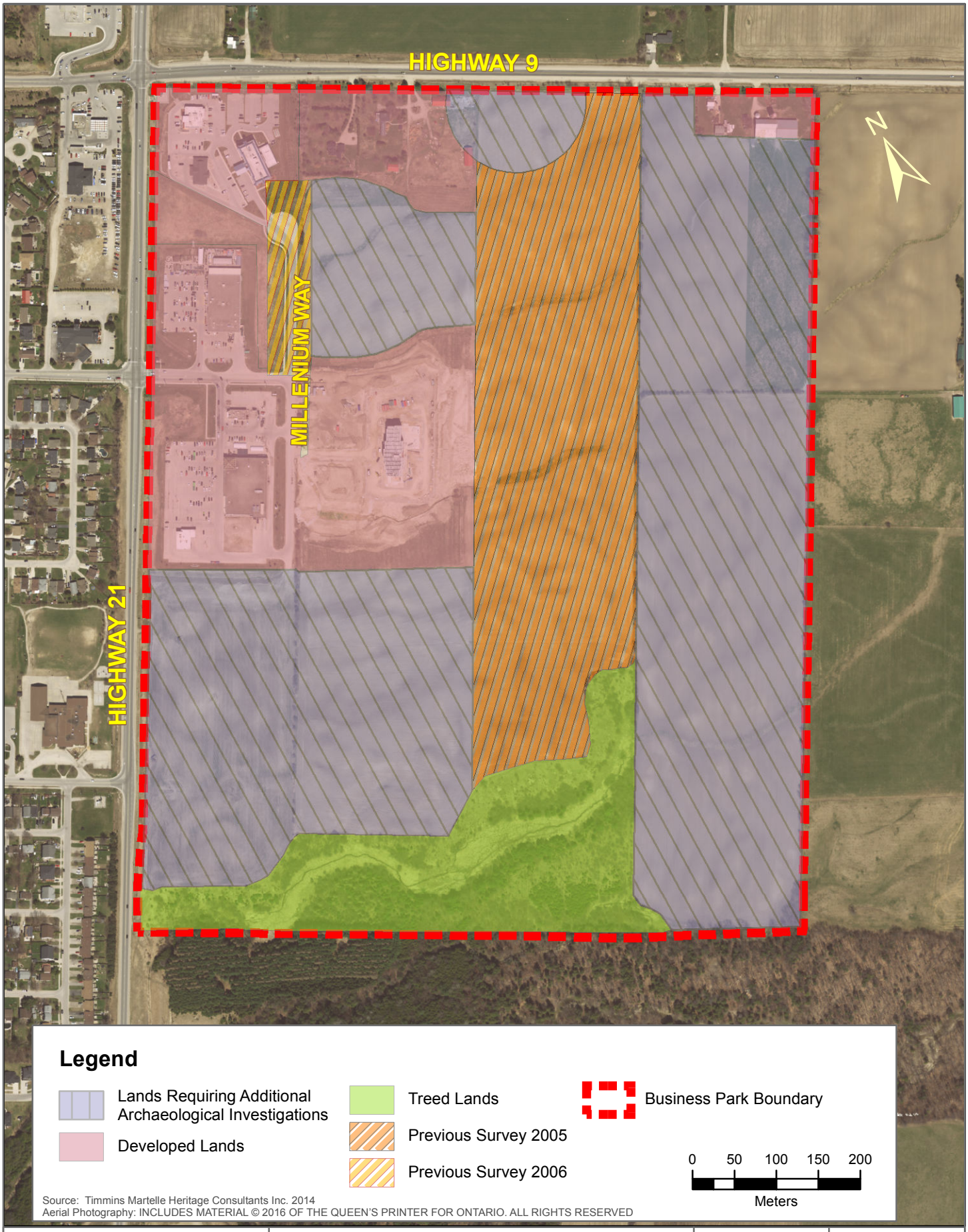
Based on the background research completed for the archaeological assessment, it was identified that there have been at least two previous archaeological assessments within 50 m of the Business Park and one registered archaeological site within 1 km of the study area. A partial Stage 1 and 2 assessment for a residential development comprising of Lots 2 and 3 was completed by AMICK Consultants Ltd (AMICK) in 2005. This assessment identified a historic-era (1840-1860) site, the Clements Site, and an isolated find spot. No further assessment was completed on the Clements Site as part of AMICK assessment. In 2006, THMC completed Stage 1 and 2 archaeological assessments for the extension of Millenium Way. Test pits completed for the assessment did not yield any archaeological resources.

Given the work completed in previous assessments and existing disturbed areas, approximately 49.4 ha of the study area is considered to have potential for intact archaeological resources. The majority of this land are the former and active agricultural lands in the Business Park (38.7 ha), with the remainder being the 10.7 ha of treed or lawn areas.

The recommendations from the Stage 1 Archaeological Assessment are as follows:

- The lands previously assessed as part of the 2006 assessment for Millenium Way do not require any additional assessment;
- A Stage 3 assessment is required for the Clements Site. Until the Stage 3 assessment is undertaken, all lands within 70 m of the Stage 2 limits have archaeological potential and are protected from land alterations (other than typical agricultural cultivation);
- The remaining lands surveyed by AMICK do not require further investigations;
- Former and active agricultural lands that were not surveyed demonstrate potential for archaeological resources, and require ploughing and a pedestrian survey;
- The low-lying, wet and steeply sloped lands associated with the Holtby Drain have low potential, however the limits of these areas require field verification prior to servicing work;
- The limits of previously disturbed areas (i.e., the existing commercial areas and residential lots) require field verification; and
- The treed areas associated with the Holtby Drain and lawn areas within the residential lots have archaeological potential.

The areas requiring additional archaeological investigations are shown in Figure 2.4.



Source: Timmins Martelle Heritage Consultants Inc. 2014

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MUNICIPALITY OF KINCARDINE
SERVICING MASTER PLAN FOR
KINCARDINE BUSINESS PARK
AREAS REQUIRING ADDITIONAL ARCHAEOLOGICAL INVESTIGATIONS

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April 2017	08055
SCALE	FIGURE No.
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2.7 Planning Policies

2.7.1 Provincial Policy Statement

Under the Planning Act (S. 3), the Provincial Policy Statement (PPS) guides the policies in relation to land use and development applications within the Province of Ontario. Decisions surrounding land use and development must be consistent with the policies contained within PPS in order to support the overarching provincial interest. Given the intent of Kincardine Business Park Servicing Master Plan, the following policies of the PPS have been identified to support the consideration of a servicing strategy:

Section 1.6.7: Sewage, Water and Stormwater

- The Servicing Master Plan will address the need to accommodate expected growth and development in the study area;
- The existing municipal services are proposed to be utilized as much as possible and incorporated into project planning in order to provide efficiency in servicing.

Section 1.6.5: Transportation Systems

- Transportation systems within the study area promote the movement of people and goods through the area, while addressing the projected needs of the area;
- Existing infrastructure is to be utilized as the basis for transportation planning in the area, with attention to compatibility with the existing adjacent system.

Section 1.7: Long-term Economic Prosperity

- The project presents the opportunity in the future for economic development and community investment-readiness to occur;
- A focus on long-term availability and use of land is included within the Master Plan.

The Master Plan for the Kincardine Business Park is consistent with the policies outlined within the PPS, given that it addresses the long-term economic potential of the business park; and presents effective and efficient infrastructure and transportation strategies that incorporate the existing infrastructure in planning for future needs.

2.7.2 Official Plan

The Official Plan for the Municipality of Kincardine provides the structural framework for growth and development in the municipality to the year 2026. This includes policies relating to the provision of services and the continued development of the Business Park. Within the Community Improvements section of the Official Plan, the identified goals include the development of the Business Park, as well as the provision of the necessary municipal hard services to broaden the economic base of the Municipality.

It is the intent of the Official Plan that development in the Business Park will create an attractive entrance to Kincardine while minimizing impacts to adjacent properties. Permitted uses in the Business Park, as outlined in the Official Plan, include highway commercial and light industrial uses meant to complement the economic function and vitality of the downtown core. Generally,

highway commercial uses include businesses that require high visibility from vehicle traffic, such as hotels, gas bars and restaurants, among others. Commercial establishments requiring large floor area, parking and outdoor storage or displays that are not consistent with the downtown commercial core shall also be permitted in the Business Park. The permitted uses are limited to: major furniture and appliance sales; warehouse outlets; building supply outlets; fitness centres; restaurants; supermarket/grocery stores; and similar retail uses.

Industrial uses in the Business Park will be limited to light, non-obnoxious industries. The permitted industrial uses include: the manufacture, assembly, process, fabrication, repair, maintenance and indoor storage of goods, materials, commodities and equipment, enclosed warehousing, offices, public utilities, research and development facilities, computer, electronic or data processing establishments, scientific or technological establishments, communication, business and government services and information technology based businesses, services and industries.

As outlined in section D4.2 in the Official Plan, site standards must be addressed by all development proposals within the Business Park. Of particular interest, and described in greater detail in Section 2.6 of this report, the area identified as “Business Park Special” includes lands identified as having the potential for archaeological resources. All development proposals and proposed servicing will incorporate measures to minimize impacts on this area, while compliant to a 30m buffer on the western and southern areas of the property.

The Official Plan also outlines policies and goals for the provision of services within the Municipality. In Settlement Areas (including the Town of Kincardine) municipal sewage and water services are the preferred form of servicing. Furthermore, policy E2.2 of Official Plan further directs that new development in the Kincardine Settlement Area shall only take place on the basis of full municipal services.

2.8 Source Water Protection

The Source Protection Plan for the Saugeen Valley Protection Area came into effect in July of 2016, under the direction of the Clean Water Act (2006). The Source Protection Plan outlines policies developed to protect municipal drinking water sources from threats.

Drinking water for Kincardine is supplied by the Kincardine Drinking Water System, a large municipal residential system, that obtains water from Lake Huron. The drinking water is treated by the water treatment plant located at 155 Durham Street, Kincardine. The surface water intake for the system is located at a depth of 6.8 m below the surface, approximately 765 m offshore from the water treatment building at the west end of Durham Street. This system provides drinking water to approximately 6,000 users (Saugeen, Grey Sauble, Northern Bruce Peninsula Source Protection Region, 2015).

Intake Protection Zone (IPZ) 1 and 2 for the Kincardine Drinking Water System is defined in the Approved Assessment Report Saugeen Source Protection Area, October 15, 2015. IPZs identify areas of vulnerability around a surface water intake, both offshore and onshore. The study area is within the IPZ 2 area and was given a vulnerability score of 4.8, as shown in Figure 2.5. Generally, IPZ 1 is 1,000 m radius around the intake while IPZ 2 includes areas within 2-hour

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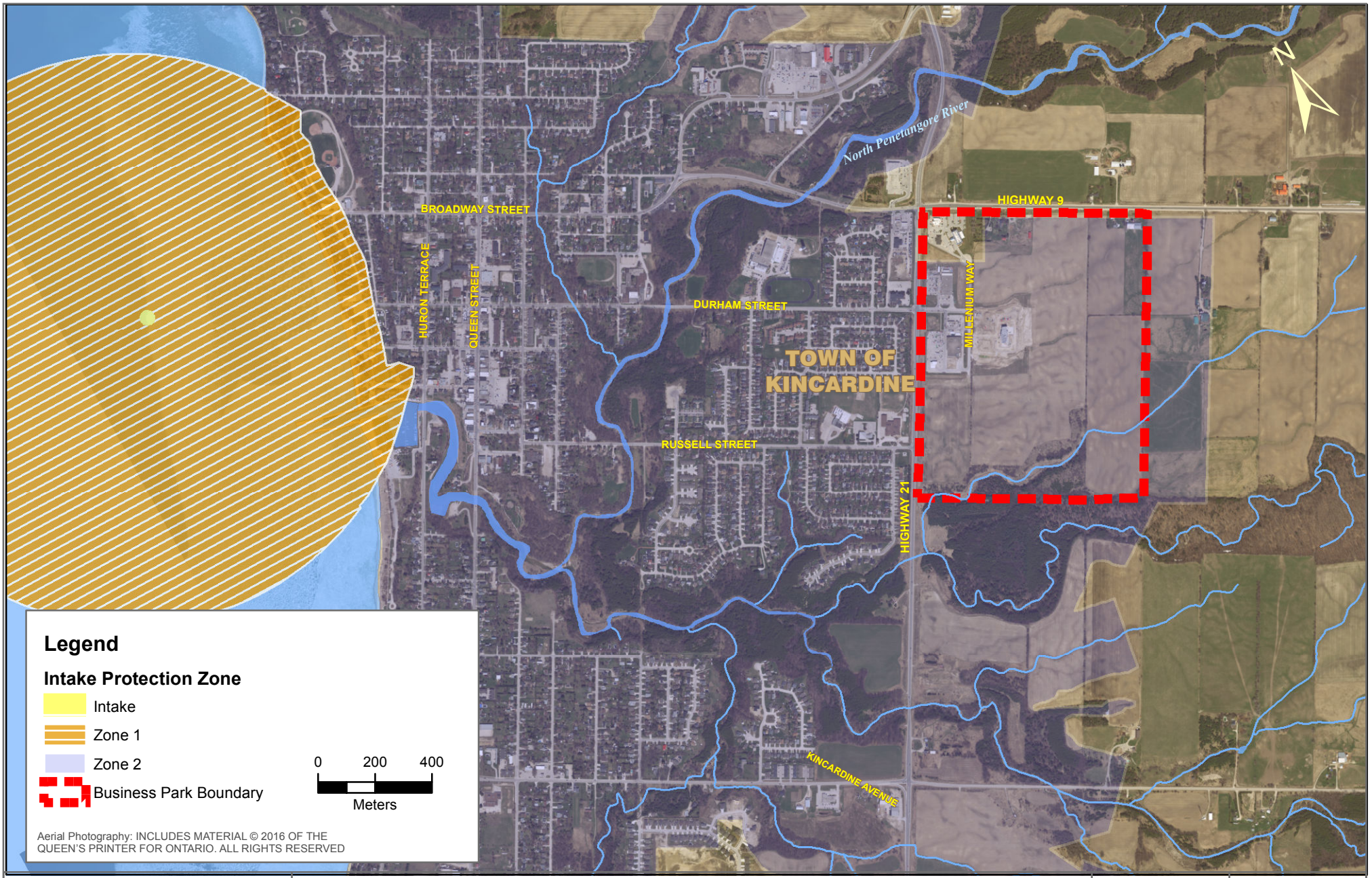

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MUNICIPALITY OF KINCARDINE

SERVICING MASTER PLAN FOR KINCARDINE BUSINESS PARK

(COMMUNITY OF KINCARDINE)

INTAKE PROTECTION ZONES

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1:18,000	2.5

Time of Travel of the intake. Recently, IPZ 3 has been delineated for the Kincardine intake for event-based policies and identifies areas where a contaminant could reach the intake during an extreme event, such as a flood. The Approved Source Protection Plan outlines the policies for protecting drinking water sources in areas where defined threats pose a significant risk. There are no applicable threat-based policies for the study area, given the low vulnerability scores of the IPZs in Kincardine.

In January 2016, the Saugeen, Grey Sauble, Northern Bruce Peninsula Source Protection Region released draft policies for event-based threats for Great Lakes intakes, including Kincardine. These policies address events relating to fuel which may pose a significant threat to drinking water and come into effect based on a minimum quantity of fuel. The study area is included within Event Based Area (EBA) 5000. Within this area, the handling and storage of 5,000 litres of fuel is a significant drinking water threat. It is noted that at the time of writing this report, the event-based policies remain in draft form.

3.0 REVIEW OF DEVELOPMENT STATUS

3.1 General

The Kincardine Business Park Master Plan has been initiated to set out a strategy to provide the undeveloped areas of the Business Park with municipal road, water, sanitary sewage and stormwater infrastructure. The following section of the report summarizes the nature of existing development in the Business Park.

3.2 Development Background

Historically, much of the residential and commercial development in Kincardine has occurred west of Highway 21, within the bounds of the former Town of Kincardine. In 1995, in response to a lack of large, serviced commercial parcels within the Town, the former Town of Kincardine annexed 166 ha of land east of Highway 21 in the former Township of Kincardine. Of the 166 ha, the Town purchased 17 ha in the northwest corner (at the intersection of Highway 9 and 21) and in 1998 and proceeded to service the lands through an extension of Durham Street.

Development in Kincardine is a reflection of the community's role as a commercial node within the Municipality, as well as for the surrounding rural areas. A strong population base and continued employment opportunities, driven primarily by the community's proximity to the Bruce Power site, have brought numerous developments to the Town and the Business Park. Additionally, the Business Park is located at the intersection of two provincial highways (Highways 9 and 21), allowing for high visibility within the community.

Following the creation of the Durham Street extension, Millenium Way, and the provision of municipal water, sanitary and stormwater infrastructure, a number of businesses developed in the northern portion of the Business Park. These commercial developments include: a retail and automotive centre, financial institution, grocery store, restaurants, hotel and professional offices. Recently, another hotel development has been constructed in the Business Park;

however, further development of the area is limited by the absence of municipal servicing infrastructure.

3.3 Review of Development Potential

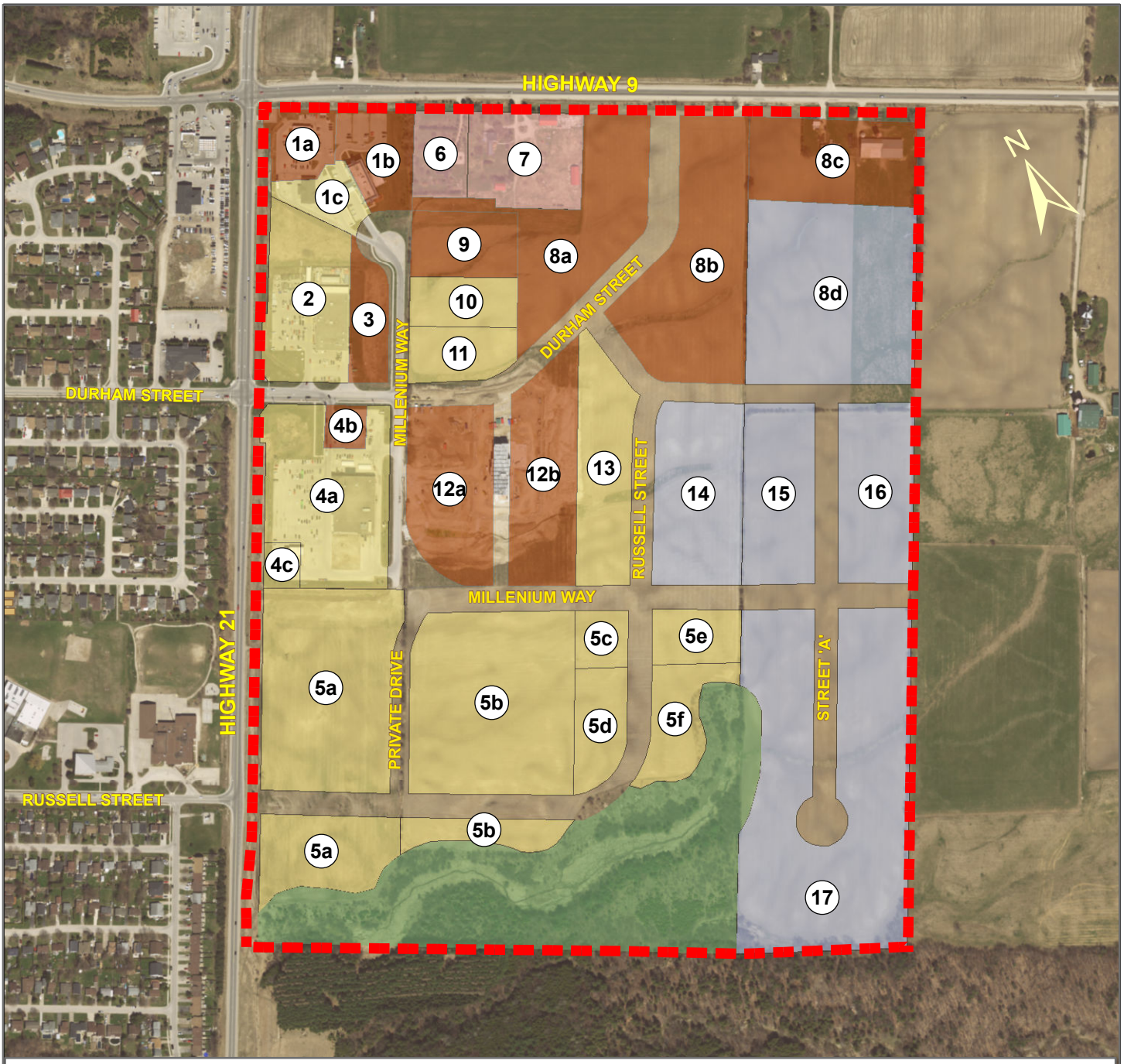
The Kincardine Business Park encompasses approximately 75 ha, of which 52 ha is presently available for future development, with the remainder being already developed or undevelopable. A portion of the Business Park, the land adjacent to the Holtby Drain in the southern extent of the Park, is unsuitable for development and is zoned as 'Environmental Protection'. The remainder of the Park is zoned 'Business Park', which allows for highway commercial and light industrial uses. A road allowance and access to the Business Park from Highway 9 was established in the mid-2000's following an Environmental Assessment for an extension of Durham Street. The Durham Street extension serves as the basis for a conceptual land use plan developed by the Bruce County Planning Department (see Figure 3.1).

The conceptual land use plan shows a combination of highway commercial, large format commercial and light industrial uses within the Business Park. The specific land uses shown in the table represent either existing developments, such as Canadian Tire and Sobeys, or examples of potential, permitted future developments. Permitted uses under the highway commercial land use designation include: motels; motor vehicle service stations and gas bars; automotive and recreational vehicle sales, service and rental establishments; agricultural and industrial equipment sales, and service establishments and contractor yards. Uses classified under large format commercial, also permitted in the Business Park, include: major furniture and appliance sale, warehouse outlet, building supply store, fitness centre, restaurant, supermarket/grocery store, and other similar retailers. The Bruce County conceptual plan also predicts light industrial land uses in the eastern most area of the Business Park, allowing for a significant buffer between any industrial development and any residences. Future industrial uses in the Business Park, as outlined in the Official Plan must be "non-obnoxious light industries involved with the manufacture, assembly, process, fabrication, repair, maintenance and indoor storage of goods, materials, commodities and equipment, enclosed warehousing, offices, public utilities, research and development facilities, computer, electronic or data processing establishments, scientific or technological establishments, communication, business and government services, and information technology based businesses, services and industries."

There is significant potential for development within the Business Park, however it is expected that for continued development, the provision of services to the remainder of the Park is necessary.

3.4 Future Service Areas

Initial investigations into servicing strategies considered the addition of the lands north of the Business Park, between Highway 9 and the Penetangore River, as future service areas. The feasibility of servicing these lands is limited by the existing sewer system and as a result, no future services areas are being considered within the scope of this Master Plan.



Legend

- Highway Service Commercial
- Large Format Commercial
- Light Industrial
- Residential
- Unsuable Land/Natural Area
- Business Park Boundary

0 50 100 150 200
Meters

Source: Bruce County 2011
Aerial Photography: INCLUDES MATERIAL © 2016 OF THE QUEEN'S PRINTER FOR ONTARIO. ALL RIGHTS RESERVED

LOT	AREA	DESCRIPTION	LOT	AREA	DESCRIPTION	LOT	AREA	DESCRIPTION	LOT	AREA	DESCRIPTION
1a	0.65	Boston Pizza	5a	1.44	buildings B, C, D, E, F	6	0.68	single detached dwelling	11	0.81	Building Supply and Sales
1b	0.95	hotel (200 sq m / floor)	5a	3.85	buildings G, H	7	1.52	single detached dwelling, greenhouse	12a	2.08	hotel - 100 room
1c	0.57	retail	5b	4.29	building A, SWM	8a	2.70	retail, Nursery	12b	2.11	3 restaurants, 2 retail stores
2	2.00	Canadian Tire	5b	0.63	building A, SWM	8b	3.51	Marine, Rec and Small Engine Sales	13	1.83	Fitness Centre (950 sq m / floor)
3	0.70	car wash	5c	0.43	building A, SWM	8c	2.03	Auto Sales	14	2.32	2-storey office building (930 sq m / floor)
4a	2.80	Sobeys	5d	0.86	building A, SWM	8d	4.38	Commercial Vehicle Sales / Service	15	1.87	2-storey office building (930 sq m / floor)
4b	0.25	Tim Hortons	5e	0.69	building A, SWM	9	1.01	hotel - 97 room, meeting space (150 sq m / floor)	16	1.94	Research Lab
4c	0.24	Meridian	5f	1.00	building A, SWM	10	0.76	retail	17	7.09	Warehousing, Contractor's Yard

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SERVICING MASTER PLAN FOR
KINCARDINE BUSINESS PARK
CONCEPTUAL LAND USE PLAN

DATE	PROJECT No.
April 2017	08055
SCALE	FIGURE No.
1:7,000	3.1

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4.0 TECHNICAL REVIEW OF EXISTING INFRASTRUCTURE AND FUTURE NEEDS

4.1 Engineering Review of Infrastructure

To determine the impacts of future development in the Business Park on existing infrastructure systems, an engineering review of transportation, water, sanitary sewage and stormwater infrastructure was undertaken. The engineering servicing study is included as Appendix 2 and the findings are summarized in the following subsections.

4.2 Transportation Infrastructure

4.2.1 Existing Road Pattern

The Kincardine Business Park is located at the southwest intersection of Highway 21 and Highway 9. Both Highways are two-lane, provincial highways with posted speed limits of 80 km/hour. West of Highway 21, Highway 9 becomes Broadway Street, a municipal road.

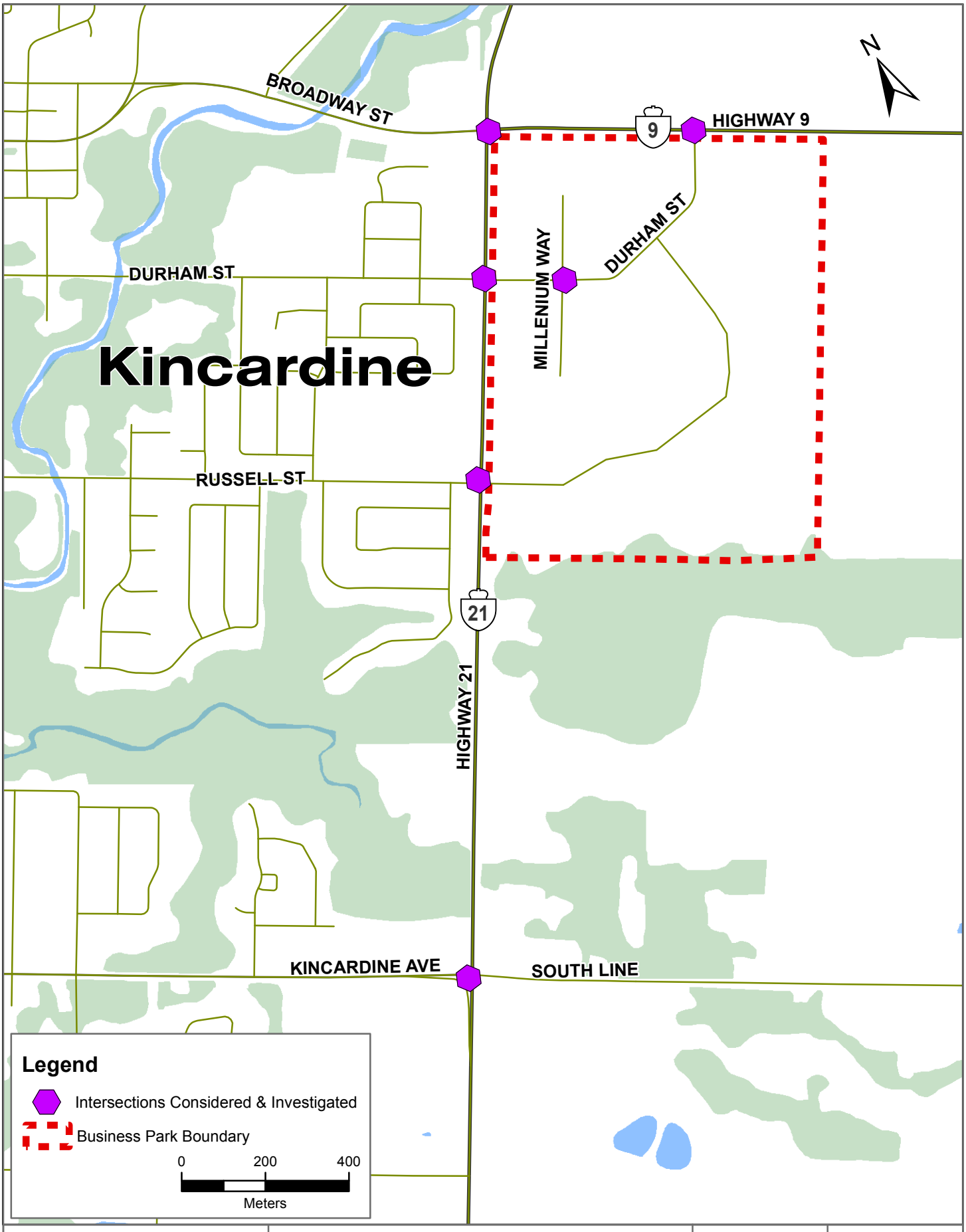
Presently, access to the Business Park is provided via Durham Street, which extends across Highway 21, east into the Park to an intersection with Millenium Way. In 2006, an Environmental Assessment was completed for the northern extension of Millenium Way. The road was extended approximately 250 m north, ending in a cul-de-sac, to provide access to the northwestern corner of the Business Park. Both Durham Street and Millenium Way are municipal roads, with urban cross sections, curb, gutter, and sidewalk on one side. The posted speed limit for both roads is 50 km/hour. The intersection of Highway 21 and Highway 9, and Highway 21 and Durham Street are signalized.

It is anticipated that in the future, access to the Business Park will also be available from an extension of Russell Street, and an extension of Durham Street to Highway 9.

4.2.2 Traffic Impact Study

A traffic impact study for the Business Park was undertaken by Paradigm Transportation Solutions Limited. Initially prepared in June 2011, the study was updated and completed in November 2015 following comments received from the Ministry of Transportation. The traffic impact study was undertaken to evaluation the impact of development within the western half of the Business Park. Given that development plans and the timeline for buildout of the eastern half of the Park are unknown, reasonable traffic forecasts could not be developed for that area of the Park. Impacts, based on background traffic and increased traffic resulting from development within the western half of the Business Park, were examined for the following intersections (as shown in Figure 4.1):

- Highway 21 and Highway 9/Broadway Street;
- Highway 21 and Durham Street;
- Highway 21 and Russell Street;



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SERVICING MASTER PLAN FOR KINCARDINE BUSINESS PARK (COMMUNITY OF KINCARDINE)
INTERSECTIONS INVESTIGATED IN THE TRAFFIC IMPACT STUDY

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April 2017	08055
SCALE	FIGURE No.
1:12,000	4.1

- Highway 21 and Kincardine Avenue/South Line;
- Durham Street and Millenium Way; and
- Highway 9 and the future Durham Street extension.

Impacts and measures to accommodate traffic were examined for 5-year, 10-year, and 15-year forecast periods. Traffic counts for Durham Street, Russell Street, Millenium Way, and Kincardine Avenue are from July 2013. The traffic count for Highway 9 is from October 2012. To estimate peak hour traffic volumes generated by the Business Park, the following land use codes (from the Institute of Transportation Engineers Trip Generation Manual 9th Edition) were used: Hotel, Building Materials and Lumber Store, Shopping Centre and Specialty Retail Centre. It was forecasted that the western portion of the Business Park will generate 424 total new trips in the AM Peak hour and 983 in the PM Peak. Growth in the background traffic volumes was assumed to be 2% over the forecast periods.

4.2.2.1 Forecasted Traffic Conditions

Traffic conditions for 2020, 2025 and 2030 were forecasted at the above-noted intersections. The analyses of traffic conditions included an examination of background traffic operations, volumes, and identification of any deficiencies or remedial actions required. The Level of Service (LOS) for intersections, which is based on delays experienced by vehicles moving through intersections, was used to evaluate traffic operations. The highest rating, LOS A generally represents total delays equal or less than 10 seconds per vehicle. LOS F is the lowest rating and represents delays greater than 50 seconds for unsignalized intersections or 80 seconds for signalized intersections. LOS E is generally used as a guideline for determining the need for improvements, such as dedicated turning lanes.

For the 2020 forecast period, the forecasts identified the following conditions:

- The increase in background traffic is expected to result in a similar LOS (LOS E) as current, existing conditions, with slight increase in delays to left turns from westbound Highway 9 onto Highway 21 during the PM peak hour; and
- With additional traffic resulting from the development of the Business Park, the following deficiencies were identified:
    - Westbound traffic on Highway 9, turning left onto Highway 21 will operate at a LOS of F; and
    - At the intersection of Russell Street and Highway 21, the east and westbound movements are forecasted to operate at LOS F and well above a volume to capacity ratio of 1.0 during the peak PM hour.

For the 2020 forecast period, the forecasts identified the following conditions:

- The increase in background traffic is expected to result in a similar LOS (LOS E) as current, existing conditions, with slight increase in delays to left turns from westbound Highway 9 onto Highway 21 during the PM peak hour; and

- With additional traffic resulting from the development of the Business Park, the following deficiencies were identified:
    - Westbound traffic on Highway 9, turning left onto Highway 21 will operate at a LOS of F; and
    - At the intersection of Russell Street and Highway 21, the east and westbound movements are forecasted to operate at LOS F and well above a volume to capacity ratio of 1.0 during the peak PM hour.

For the 2025 timeframe, the following was identified through the forecasting exercise:

- The increase in background traffic will result in similar conditions as the 2020 background traffic, with the left turn from westbound Highway 9 onto Highway 21 operating at a LOS E; and
- With the addition of traffic to and from the Business Park, the following deficiencies were identified:
    - The left turn movement from westbound Highway 9 onto Highway 21 will be at LOS F during the peak PM hour;
    - At the intersection of Russell Street and Highway 21, the east and westbound movements are forecasted to operate at LOS f and well above a volume to capacity ratio 1.0 during the peak PM hour; and
    - Eastbound movements at Highway 21 and Kincardine Avenue/South Line will operate at LOS F during the peak PM hour, however, the volume to capacity ration is expected to be below 1.0.

By 2030, the following is predicted from the forecasting:

- The increase in background traffic is, again, expected to have similar impacts as the previous time periods; however, the delay for a left turn from westbound Highway 9 onto Highway 21 at the peak PM hour will result in a decline of the LOS from E to F; and
- With additional Business Park traffic, the following deficiencies were identified:
    - The left turn movement from westbound Highway 9 onto Highway 21 will be at LOS F during the peak PM hour;
    - At the intersection of Russell Street and Highway 21, the east and westbound movements are forecasted to operate at LOS F and well above a volume to capacity ratio of 1.0 during the peak PM hour; and
    - Eastbound movements at Highway 21 and Kincardine Avenue/South Line will operate at LOS F during the peak PM hour, however the volume to capacity ratio is expected to be below 1.0.

4.2.2.2 Remedial Measures and Recommended Improvements

From the impacts resulting from forecasted increases in traffic associated with development within the Business Park, a number of remedial measures and recommended improvements

were identified. These improvements include additional signals, turning lanes and signal changes and are summarized below:

Signals

- Traffic signals will be warranted at Russell Street and Highway 21 by 2020; and
- At 2030 traffic levels, a signal is not warranted at Highway 21 and Kincardine Avenue. This is a result of the low volume of traffic on the side streets.

Signal Changes

- At the intersection of Highway 21 and Highway 9, it is recommended that by 2020 an advanced turn signal for left turns from westbound Highway 9 onto Highway 21 be implemented;
- At the intersection of Highway 21 and Durham Street, by 2030 it is recommended that an advanced turn signal for left turns from westbound Durham Street onto Highway 21 be implemented; and
- Associated with the addition of a signal at Highway 21 and Russell Street, it is recommended that the signalization include a left turn signal from westbound Russell Street onto Highway 21 and a southbound left turn from Highway 21 onto Russell Street.

Left Turn Lane Warrants

- A separate westbound left turn lane on Russell Street (from the Business Park) is recommended by 2020;
- On southbound Highway 21 at the intersection of Russell Street, a left turn lane into the Business Park is also recommended by 2020; and
- At the future extension of Durham Street and Highway 9, a left turn lane on Durham Street was not warranted during any of the forecast periods.

Right Turn Lane Warrants

- At 2020 traffic levels, right turn lanes should be considered for Highway 21 at Durham Street and Russell Street.

4.3 Water Infrastructure

The existing water servicing in the Business Park is supplied by the Kincardine Drinking Water System. Existing development is serviced from a 300 mm watermain from Durham Street. There is also an existing 300 mm watermain on Russell Street that could potentially supply the Business Park area.

A preliminary review for the water distribution system was completed and was based on hydrant flow test undertaken at the intersection of Highway 21/Durham Street and Highway 21/Russell Street.

4.3.1 WaterCAD Model

A WaterCAD model was created in order to analyze potential watermain extensions to the development lands. For the purpose of the model, the following assumptions were made:

- Water supply from the existing eastern terminus of Russell Street and from the intersection of Durham Street and Millenium Way are treated as two independent sources. (Note: This is assumed to simplify the model and is assumed to be reasonable because of the relatively high number of connecting watermains upstream of each location.);
- The water supply at each connection location was modelled as a pump, with curve characteristics based on theoretical flow and pressure values calculated from the hydrant flow tests. See below for theoretical flow and pressure values; and
- Available flow and pressure in this area is based on no pumps at the Water Treatment Plant, as this was the case during the hydrant testing.

The Servicing Plan, included as Appendix 2 provides the technical details related to the modelling completed using WaterCAD.

Based on the results of the infrastructure review, the following observations were noted:

- The existing water infrastructure in Kincardine can accommodate the growth of the Business Park lands while maintaining fire flow supply and quantity;
- Pressures within the development area, under most flow demands, typically fall between 250 kPa (36 to 49 PSI). MOECC guidelines would suggest that these pressures should preferably be in the range of 350 kPa to 550 kPa (50 to 80 PSI); and
- A booster pumping station will be required in conjunction with the later phases of construction of the Business Park to ensure that adequate pressures are provided under development densities. The Municipality should establish pressure monitoring to track system operation as development proceeds to better determine the appropriate timing to construct pressure boosting facilities. Given the uncertainty associated with the level of future development, the pressures within the site, and the location for the booster pumping station, a separate EA for the booster pumping station will be required prior to final design of this component.

4.4 Sanitary Sewage Infrastructure

4.4.1 Existing Sewage Collection System

The Kincardine Business Park is located within the drainage area of the Park Street Sewage Pumping Station. There are two potential corridors for sanitary outlets from the Business Park, the existing sanitary sewer connection on Durham Street and a potential connection along

Russell Street. These corridors meet at Scott Street and flow to the Park Street Sewage Pumping Station.

The existing sanitary sewer collection for the Park Street drainage area was constructed in the 1970s to service expanding residential growth. At the time of design and construction, there was no consideration given to an expanded service area beyond Highway 21. Figure 4.2 shows the existing Park Street Sewage Pumping Station drainage area. Presently, the drainage area includes, in addition to residential development:

- Davidson Recreation Centre, two schools, one church;
- Commercial development along the west side of Highway 21;
- The existing Business Park developments, consisting of Canadian Tire, Tim Horton's, Sobeys, a bank, Holiday Inn Express, Boston Pizza, dentist office, and a carwash; and
- The Marriott Suites Hotel in the Business Park; however, the sanitary connection to the Durham Street outlet is considered temporary until such time that additional sanitary sewer extensions may be completed to the Russell Street corridor.

4.4.2 Existing Collection System Flows

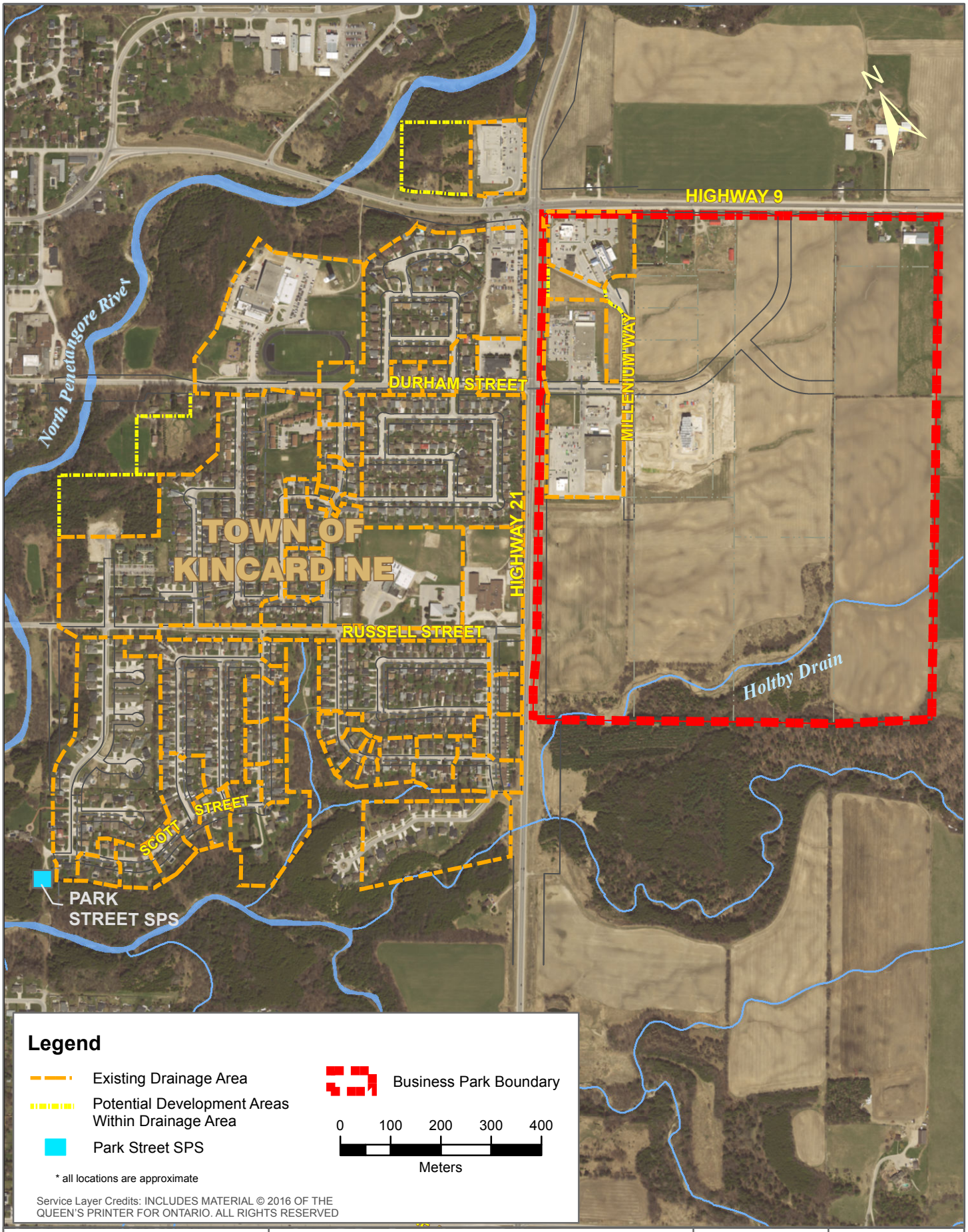
Existing sewer capacities are assessed by comparing the actual carrying capacity of the various sewer sections to the expected peak flow rates that must be conveyed in these sections. For the existing Park Street sewage pumping station drainage area, the total sewage flows are comprised of:

- A domestic sewage flow component (Residential and Commercial); and
- Extraneous sewage flow (infiltration and inflow) component.

For the purpose of this investigation, peaked values for the various sewage flow components have been calculated on an area flow basis in litres per second per hectare (L/s/ha) based on calculations summarized below.

4.4.2.1 Sewage Flow Data

In 2011, a review of the sanitary sewage system was completed based on sewage flow data from the late 2000's. This information is presented below in Table 4.1:



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MUNICIPALITY OF KINCARDINE
SERVICING MASTER PLAN FOR KINCARDINE BUSINESS PARK (COMMUNITY OF KINCARDINE)
EXISTING DRAINAGE AREA OF PARK STREET SEWAGE PUMPING STATION (SPS)

DATE	PROJECT No.
April 2017	08055
SCALE	FIGURE No.
1:10,000	4.2

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Table 4.1 Sewage Flow Data for 2006 to 2009

Year	Pumped Volume m^3	Average Day m^3/day	Max. Day m^3/day
2006	350577	960	3177
2007	299313	820	4536
2008	392465	1075	6454
2009	326686	895	5053
Avg.	**340,000**	**940**	**6454**

For comparison purposes, sanitary sewage data for more recent years was reviewed and summarized below in Table 4.2:

Table 4.2 Sewage Flow Data for 2012 to 2015

Year	Pumped Volume m^3	Average Day m^3/day	Max. Day m^3/day
2012	322,163	880	2294
2013	345,870	949	9012
2014	344,601	943	3121
2015	293,944	806	2234
Total	**325,000**	**895**	**9012**

Based on a review of the above it is evident that the average day flow has not changed significantly from past years of record. A high flow event was recorded however in 2013 that exceeded the event recorded in 2008.

4.4.2.2 Existing Domestic Sewage Flows

A domestic sewage flow component is defined as the total wastewater flow exclusive of any extraneous (infiltration/inflow) component.

Based on the data provided in Table 4.1 and 4.2, a domestic sewage flow component of approximately 900 m^3/day appears to be an appropriate average day flow for the more recent years of record considered.

4.4.2.3 Existing Maximum Extraneous Sewage Flows

Based on the above information, maximum day flow events were observed in 2008 (January thaw/rain event) with a value of 6454 m^3/day (75 L/s) and in 2013 (January thaw/rain event) with a value of 9012 m^3/day (104 L/s). As reported by Kincardine Operations staff, during the 2008 event it was necessary to run 3 pumps to avoid a bypass.

The Operations staff noted that events, such as the one in 2013, have occurred where 3 pumps have not been able to keep up with the peak flow and a "bypass" resulted. During these "bypass" events, the recorded data does not accurately represent the max. daily flow as the wetwell transducer (during the submerged period) will not accurately record the wetwell volume during the bypass period.

Given the above information, the most reliable data available is the January 2008 event where a bypass almost occurred but did not, and an accurate reading from this event was recorded. However, in order to provide a conservative approach to the evaluation of the sewage collection system it is suggested that the data from the 2013 flow event be used to estimate the peak flow for the existing tributary area.

The total drainage area tributary to the Park Street SPS, near the end of 2015, was in the order of 100 Ha.

For the sake of round numbers the following values are suggested:

- Average Domestic Sewage Flow = 900 m^3/day
- Peak Extraneous Flow Value = 9000 m^3/day

As part of the recommendations of this study, the Municipality should complete an investigation to determine (where possible) the source(s) of the extraneous flow and reduce or eliminate the source, where possible.

4.4.2.4 Existing Total Sewage Flows – Calculation of Area Flow Rate Extreme Extraneous Flow Conditions

Using the values stated above, an existing total peak sewage flow value can be calculated for the existing Park Street Sewage Pumping Station drainage area as follows:

$$Q_{peak} = \frac{(Avg.\,Domestic\ Q\ \times 4.0) + (Max.\,Extraneous\ Q)}{\big(Drainage\ Area\ (ha)\big) \times 24 \times 60 \times 60}\ \times \frac{1000}{1}$$

Where:

$Average\ Domestic\ Sewage\ Flow = 900\ m^3$

$Domestic\ Peak\ Factor = 4.0\ \times Avg.$

$Total\ Peak\ Extraneous\ Flow\ Value = 9000\ m^3/day$

$Drainage\ Area = 100\ Ha$

$Max.Extraneous\ Q = Recorded\ high \max day - Avg.Domestic\ day$

$= 9000\ m^3/day - 900\ m^3/day$

$= 8100\ m^3/day$

Therefore:

$$Q_{peak} = \frac{(900\ \times 4.0) + 8100}{100\ \times\ 24\ \times\ 60\ \times\ 60} \times \frac{1000}{1}$$

$$\boldsymbol{Q_{peak} = 1.35\ L/s/ha}\ (based\ on\ existing\ flow\ information)$$

By comparison, standard MOECC Design Guidelines for sewage flow in L/s/ha would be calculated as follows:

$$Q_{peak} = \frac{Avg.Domestic\ Q\ \times 4.0}{1\ ha\ \times\ 24\ \times\ 60\ \times\ 60} \times \frac{1000}{1}$$

Where:

$Avg.Domestic\ Q = 450\ L/capita/day\ \times\ 40\ persons/ha$

$Avg.Domestic\ Q = 18{,}000\ L/day/ha$

$Domestic\ Peak\ Factor = 4.0\ \times Avg.$

$Max.Extraneous\ Q = 0.2\ L/s/ha$

Therefore:

$$Q_{peak}\ L/s = \frac{18{,}000\ \times 4.0}{1 \times 24 \times 60 \times 60} + 0.2$$

$$\boldsymbol{Q_{peak} = 1.03\ L/s/ha}\ (based\ on\ MOECC\ Guidelines)$$

From the above calculation, it can be seen that the recorded domestic and peak extraneous flows are in the area of 30% more than standard MOECC design guidelines. This demonstrates the significance of the high extraneous flow events on the calculation of remaining sewer capacity and the need for the municipality to be vigilant in pursuing the reduction of these extraneous flows.

For the purpose of this report, the unit peak flow rate of 1.35 L/s/ha, based on the calculated existing total peak sewage flow, will be used in capacity considerations and the evaluation of sewer and pipe capacities.

4.4.3 Existing Collection System Analysis

The existing collection system for the Park Street Pumping Station has been analyzed assuming that the tributary area has been built-out. Total peak sewage flows have been applied to the system based on the unit peak flow rate of noted above. The evaluation of the existing system includes the following:

- Existing Tributary Area: 100 Ha
- Area FD1A: 0.6 Ha (Area immediately north of Canadian Tire)
- Area FD1B: 0.6 Ha (Carwash site)
- Area FD2: 1.9 Ha (Residential west of Liquor Store Retail plaza)
- Area FD3: 2.0 Ha (Possible Residential west of MacKendrick Dr.)
- Area FD4: 2.5 Ha (Planned Residential at north end of Campbell St.)

Future development areas, to the east of Millenium Drive, within the Business Park, have not been included in this analysis as the purpose of the review was to determine what areas of the sewer system do or do not presently have available capacity.

Appendix C of the Servicing Report (Appendix 2 of this document) includes the existing sanitary sewer design sheets for the drainage areas noted on Figure 4.3 and identifies the design flows under current peak domestic and the maximum extraneous flow event discussed above.

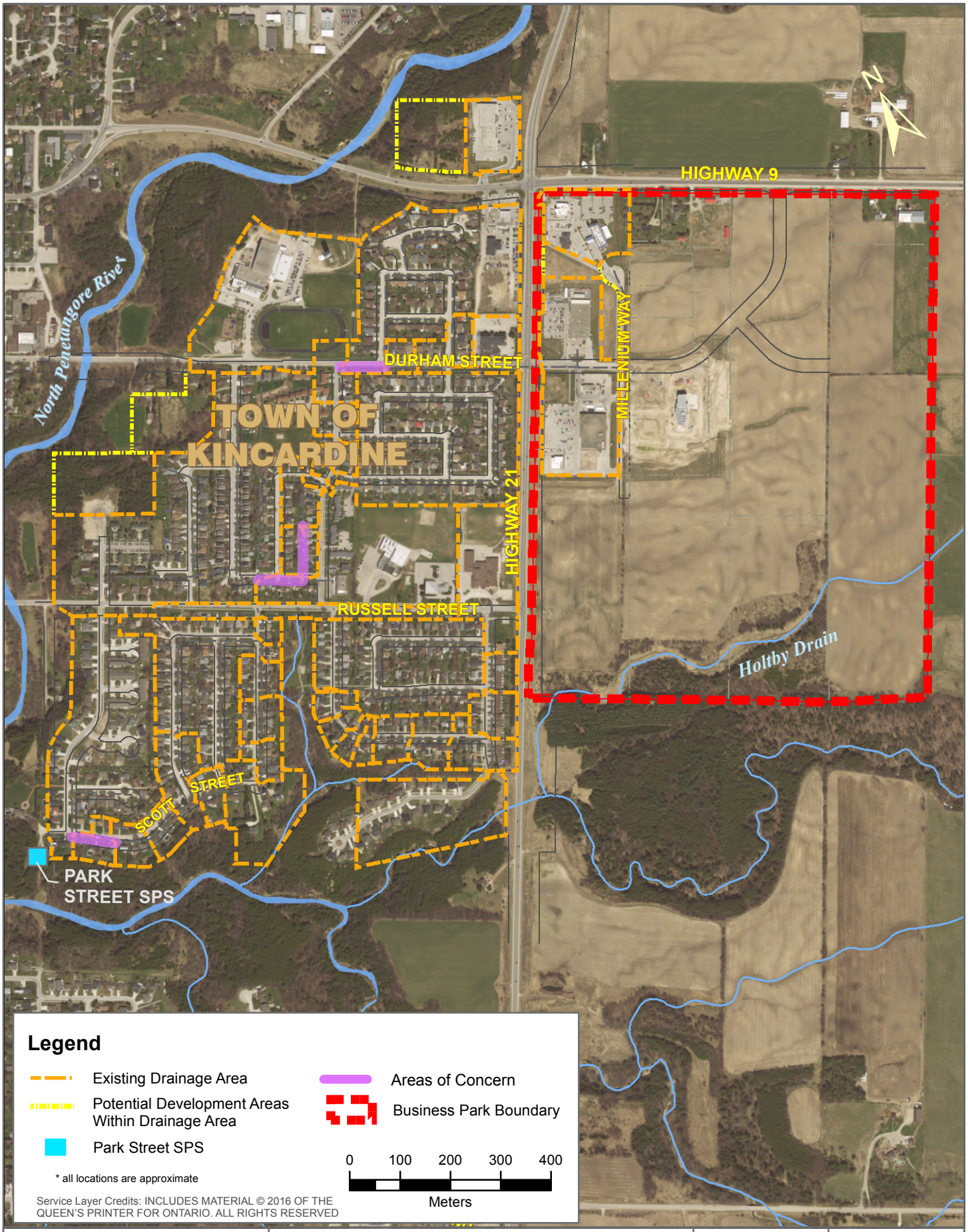
4.4.4 Existing System Analysis and Areas of Concern

Assuming build-out of the current tributary area, and inclusion of areas FD1 to FD4, Figure 4.4 identifies the existing sewers which will theoretically experience surcharging. These areas are identified as follows:

- **Scott Street (21-22)**: This single section of sewer is predicted to have minor surcharging that is less than 100 mm above the top of the pipe. The sewer is at a depth of over 5.0 m in this location and the calculated amount of surcharging should not negatively impact the system;
- **Walsh and MacKendrick (115-117)**: This section of sewer is predicted to have minor surcharging ranging from 200 mm to 300 mm above the top of pipe. As the sewer is at a depth ranging from 3.8 m to 6.0 m the surcharging is not expected to negatively impact development that are connected to the pipe; and
- **Durham Street (107-108)**: This single section of sewer is predicted to have minor surcharging that is less than 200 mm above the top of the pipe. As the sewer is at a depth of over 3.6 m in this location the calculated surcharging should not negatively impact the system.

4.4.5 Existing Sewage System Observations and Opportunities

Based on the analysis and modelling of the existing system, the following observations and opportunities are summarized:



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MUNICIPALITY OF KINCARDINE
SERVICING MASTER PLAN FOR KINCARDINE BUSINESS PARK (COMMUNITY OF KINCARDINE)
PARK STREET SPS AREAS OF CONCERN

DATE	PROJECT No.
April 2017	08055
SCALE	FIGURE No.
1:10,000	4.4

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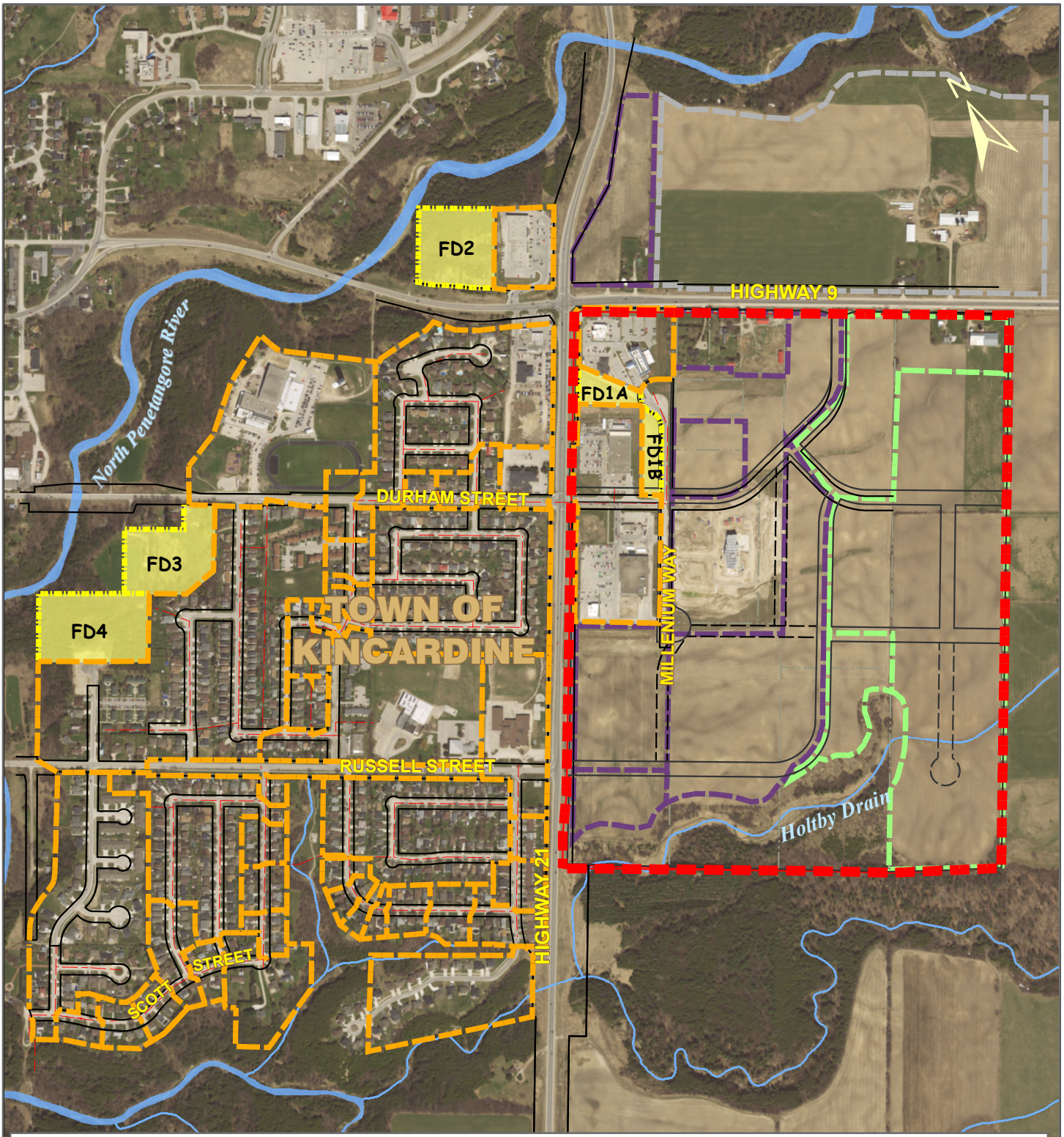

Legend

- Existing Drainage Area
- Stage 1A - Potential Development within Tributary Area (FD1-FD4)
- Stage 1B Development
- Stage 2 Development
- Stage 3 Possible Future Drainage Area
- Potential Development Areas (FD1-FD4)
- Business Park Boundary

* all locations are approximate

0 100 200 300 400
Meters

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SERVICING MASTER PLAN FOR
KINCARDINE BUSINESS PARK
(COMMUNITY OF KINCARDINE)
EXISTING COLLECTION SYSTEM FOR PARK STREET SPS

DATE	PROJECT No.
April 2017	08055
SCALE	FIGURE No.
1:10,000	4.3

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- The Durham Street sewer is not of sufficient depth to provide sanitary outlet for the southerly half of the Business Park lands;
- It is suggested that areas beyond those identified on Figure 4.4 be excluded from the Durham Street sanitary sewer corridor so that the limited capacity available on Walsh and Mackendrick is not reduced further; and
- The existing sewer on Scott Street is at a depth ranging from 3.2 m to 7.5 m and as such some degree of surcharging within this section of sewer (structures 118 to 121 and structures 14 to 24) can be tolerated.

Following a review of the above observations, the most practical means of servicing the Business Park area appears to be through the construction of a new trunk sewer along Russell Street, from Highway 21 to Scott, with outlet to the existing sanitary sewer at the Russell and Scott Street intersection. The Municipality of Kincardine completed the design of this sewer in 2005 and received MOECC approval for the construction from Scott Street to east of Highway 21 at that time. The approval contained a construction window, which limited its validity to 5 years. Given that the sewer has not been constructed, an amendment application in the future will be necessary to allow construction of the Russell Street sewer to proceed.

4.4.6 Business Park Design Flows

Potential design flows for the full development of the Business Park were calculated and assessed. The flows are based on MOECC guidelines; however, it is recognized that the guidelines may be conservative given that the possible uses within the Business Park may ultimately consist of “dry” type industry and big box shopping centres, which typically do not generate significant sewage amounts.

The Business Park is to consist of a mix of various development types, given Official Plan and Zoning policies, including the following:

- Residential (R);
- Highway Service Commercial (HSC);
- Large Format Commercial (LFC); and
- Light Industrial (LI)

Sewage Criteria for each development type is summarized below (Table 4.3):

Residential Population Density = 35 ppHa
Residential Sewage Flow = 450 L/cap/day

Table 4.3 Sewage Criteria for Potential Development Types in the Business Park

Land Use	Average Sewage Flow	Peaking Factor	Infiltration Allowance
R	0.18 L/Ha/s	Harmon	0.2 L/Ha/s
HSC	0.28 L/Ha/s	2.0	0.2 L/Ha/s
LFC	0.28 L/Ha/s	2.0	0.2 L/Ha/s
LI	0.35 L/Ha/s	3.5	0.2 L/Ha/s

Figure 4.5 provides an illustration of the various development types and areas within the Business Park areas as well as the limit of the current tributary area. The stages referred to herein should not be confused with suggested phasing. The development stages have been defined as a way to define the tributary areas considered as part of the collection system analysis.

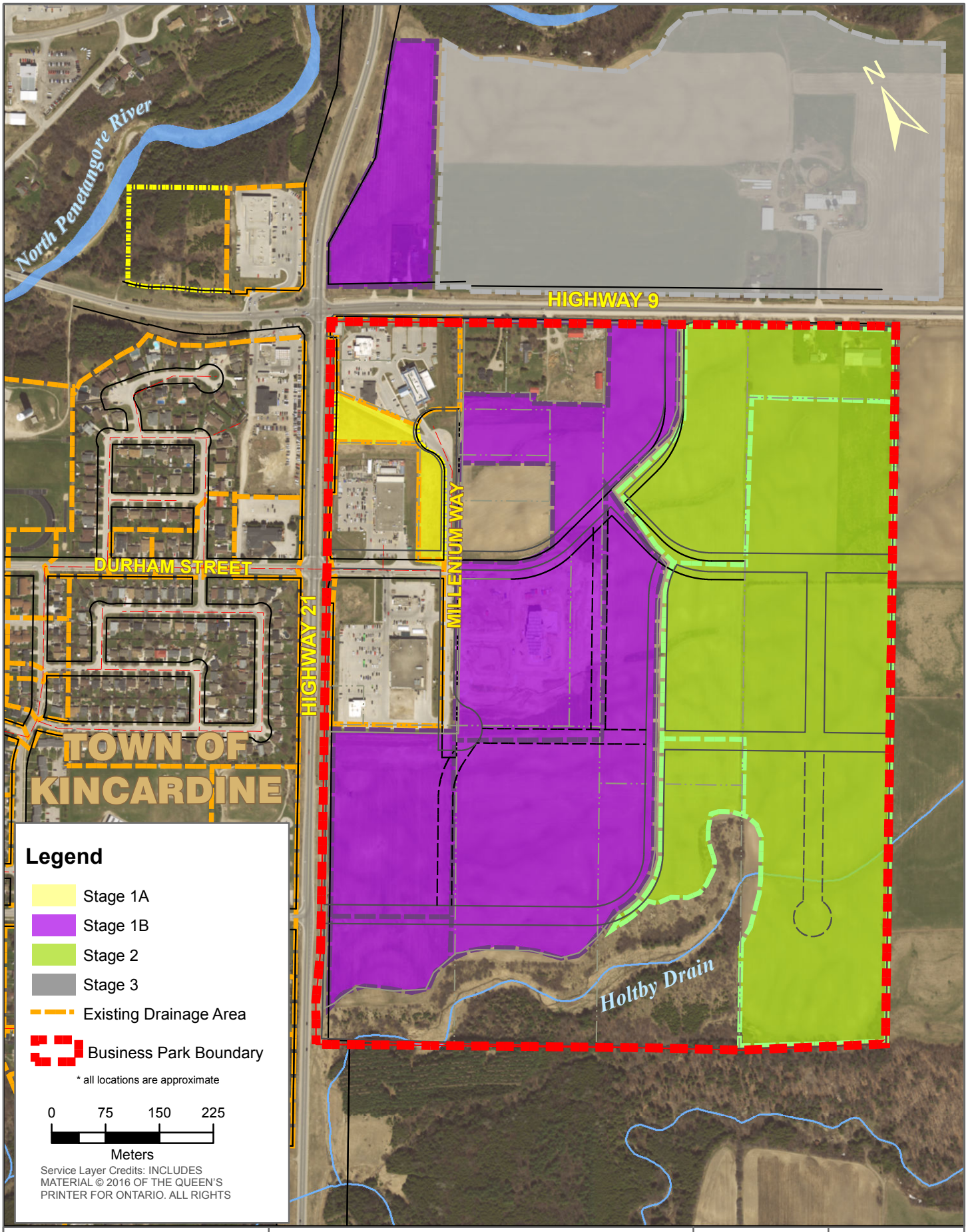
A summary of the possible future development areas (as illustrated in Figure 4.5) are summarized below:

- **Stage 1A**: Represents the remaining potential development areas that are immediately adjacent to, or within, the current tributary drainage area for the Park Street SPS;
- **Stage 1B**: Represents the most westerly half of the Business Park that is not yet developed;
- **Stage 2**: Stage 2 is represented by the easterly half of the Business Park lands; and
- **Stage 3**: Stage 3 represents the area north of Highway 9 which is currently not included in the official plan area of the Municipality. This area was included in the collection system review to determine the feasibility of including it in the tributary area of a new sewer.

A detailed summary of the development types that each stage is comprised of is summarized below in the following table:

Table 4.4 Development Types for Sanitary Sewer Stages

Stage	Development Type (Ha)				Summary (Ha)
	R	HSC	LFC	LI	
1A	6.4	1.2	0.0	0.0	7.6
1B	2.2	15.1	16.3	0.0	33.6
2	0.0	9.7	2.2	20.8	32.7
3	0.0	7.6	7.6	7.6	22.9
Total	**8.6**	**33.6**	**26.1**	**28.4**	**96.8**



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SERVICING MASTER PLAN FOR KINCARDINE BUSINESS PARK (COMMUNITY OF KINCARDINE)
FUTURE STAGES CONSIDERED IN ANALYSIS OF PARK STREET SPS

DATE	PROJECT No.
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SCALE	FIGURE No.
1:7,000	4.5

Given the above areas and the development types, the following peak sewage flows are estimated for each area:

Table 4.5 Peak Sewage Flows for Development Stages

Stage	Total Additional Flow to Park St. SPS	
	Incremental Flows L/s	**Note**
Stage 1A	7.0	Flows to Outlet upstream of Scott St. and Russell St.
Stage 1B	26.0	Flows to Russell St. Sewer
Stage 2	31.0	Flows to Russell St. Sewer
Stage 3	20.0	Flows to Russell St. Sewer

4.4.7 Capacity Analysis

4.4.7.1 Development of Stage 1B

Under this scenario, it is assumed that the existing tributary area is built-out in addition to the first half of the future Business Park lands that are not yet developed. These future flows were assumed to be conveyed within a new sanitary sewer on Russell Street.

The addition of the predicted flows from Stage 1B of the Business Park area will result in most of the Scott Street sewer surcharging beyond what it currently experiences under wet weather flow conditions. Existing sanitary sewers from structure 14 to 22 range in depth from 3.4 to 7.5 m. The surcharge depths correspondingly range from 0.1 m to 0.5 m above the top of the existing pipe. The resultant theoretical surcharge levels are not considered significant given the depth of the sewer system. Given this, it is expected the addition of Stage 1B development can be accommodated in the Scott Street sanitary sewer.

4.4.7.2 Development of Stage 2

Under this scenario, it is assumed that the Stage 1A and Stage 1B lands have been developed in addition to the Stage 2 lands, which make up the remainder of the Business Park. It is assumed that future flows would be conveyed within the new sanitary sewer on Russell Street to its outlet at Scott Street.

Predicted flows from Stage 1A, 1B and Stage 2 of the Business Park will result in all of the Scott Street sewer surcharging beyond what it currently experiences under wet flow conditions. Existing sanitary sewers from structure 118 to 120 and from structure 15 to 24 will have acceptable surcharge depths that in theory do not come with 2.5 m of the finished ground. Existing sanitary sewers from structure 120 to 15 are somewhat shallower, with depths between 3.2 and 4.2 m. This section of sewer may experience surcharging depths that in theory could be within 2.5 m of the finished ground. It is recommended that monitoring of these locations be completed near the end of build-out of Stage 2 and the Business Park.

Stage 1 and Stage 2 of the Business Park area will theoretically contribute a combined sewage flow of about 59 L/s to the Park Street system and will require a 300 mm sanitary sewer on Russell Street installed at a minimum grade of 0.5%.

4.4.7.3 Addition of Stage 3

Under this scenario, an additional 27 ha of developed land area will be added beyond the Stage 1B and Stage 2 development from the north side of Highway 9. Predicted flows from all three stages of development will result in a greater level of surcharging than what would be acceptable. Theoretical depths of surcharging on Scott Street range will come within 0.5 metres of the finished grade in the shallower sections of the sewer.

The possibility of basement flooding within the inclusion of Stage 3 area is very high along several sections of Scott Street, as well as some branch sewer sections. In order to accommodate the future Stage 3 lands, the existing sewers on Scott Street would require upgrading or an alternative relief sewer would need to be installed to remove sewage flow from the Scott Street sewers. It is understood that the soil and water table conditions in the area of Scott Street would significantly complicate construction activities and possible future sewer replacements if the Stage 3 area was to be considered.

Given this, the Municipality may wish to incorporate capacity into the proposed Russell Street Sewer and the internal pipe network of the Business Park with the understanding that Stage 3 could only proceed in the future following long term monitoring of the sewage flows within the Scott Street sewer and/or the upgrade of the Scott Street system at some point in the future.

4.4.8 Summary of Sewage Collection System Analysis

From the analysis of the existing sewage collection system and potential future flows from the Business Park, the following is noted:

- Sewage flows from the remaining undeveloped areas in the northern portion of Lot 1 can be accommodated through the Durham Street sewer outlet;
- Any additional development along Millenium Way should be considered on a case-by-case basis with respect to accommodation of sewage flows through the Durham Street sewer outlet; and
- Construction of the Russell Street trunk sewer will be required for servicing of the Business Park.

4.4.9 Assessment of Park Street Sewage Pumping Station Capacity

The Park Street Sewage Pumping Station was originally designed by BMROSS and constructed in 1976. The station was sized based on population values provided, at the time, by the upstream land developer. The station is a dry pit/wet well configuration with 3 pumps in total (2 pumps in parallel providing the required capacity). The station dry pit/wet well are constructed below the

control building which houses the existing 75 kW generator. All three pumps are Fairbank Morse Series 5443-32, 22.4 kW (30 Hp).

The station pumps directly to the headworks of the Kincardine Sewage Treatment Plant through approximately 1,200 m of 300 mm diameter forcemain. A portion of the existing forcemain is under the Penetangore River.

4.4.9.1 Calculation of Existing Peak Sewage Flow to Station under Extreme Extraneous Flow Conditions

Based on the peak 2013 peak flow event, it is estimated that on occasion, the pumping station sees wet weather peak flow of approximately 115 L/s. It is noted that this value assumes a 10% uncertainty factor. Given the expected peak sewage flow and current pump capacities, it is evident that the inflow rates to the Park Street SPS exceed the station's firm capacity under an extreme extraneous inflow period. On several occasions the operation of all three pumps has been required and was not enough to avert a bypass situation.

4.4.9.2 Calculation of Proposed Peak Sewage Flow to Station with Business Park Areas Included

The anticipated cumulative peak sewage flow to the Park Street SPS is estimated as follows:

- Existing 115.0 L/s
- Stage 1A 122.0 L/s
- Stage 1B 148.0 L/s
- Stage 2 179.0 L/s
- Stage 3 199.0 L/s

4.4.10 Drawdown Testing

Drawdown testing to determine the current pump capacities at the Park Street SPS was conducted on April 14, 2008, which revealed the following pump operating conditions:

- Pump 1 60 L/s
- Pump 2 59 L/s
- Pump 3 55 L/s
- Pump 1 and 2 85 L/s
- Pump 2 and 3 82 L/s
- Pump 1 and 3 82 L/s

Given the results of the drawdown testing and cumulative peak sewage flows expected from development of the Business Park, improvements to increase capacity at the Park Street SPS will be required. The evaluation of alternatives to increase capacity at the Park Street SPS is included within the scope of this Master Plan.

4.5 Stormwater Management

4.5.1 Site Topography and Soils

The site can be described as moderate sloping with underlying soils identified as being a Berrien Sandy Loam (Bes) and Perth clay loam (Pc) as classified under the hydrologic soil group "B-C". Both these soils are further described as imperfectly drained soils.

4.5.2 Pre-Existing Drainage Conditions

Existing drainage for the general watershed area is typically in an east-west direction towards the Highway 21 road corridor. The Business Park is traversed by a series of main catchment groups (including the Holtby Drain) that convey flows to one of two separate outlet locations under Highway No. 21:

- **1500 mm CSP Culvert (A)**: This culvert is located at the upstream end (under Highway 21) of the storm sewer system along the north limit of the school property. The total drainage area tributary to this outlet is about 82 Ha; and
- **5790 x 3650 mm Multi-Plate Arch (B)**: This large multi-plate structure is located on a tributary of the Penetangore River, immediately south of the Business Park. The total drainage area upstream of this outlet is about 1,840 Ha.

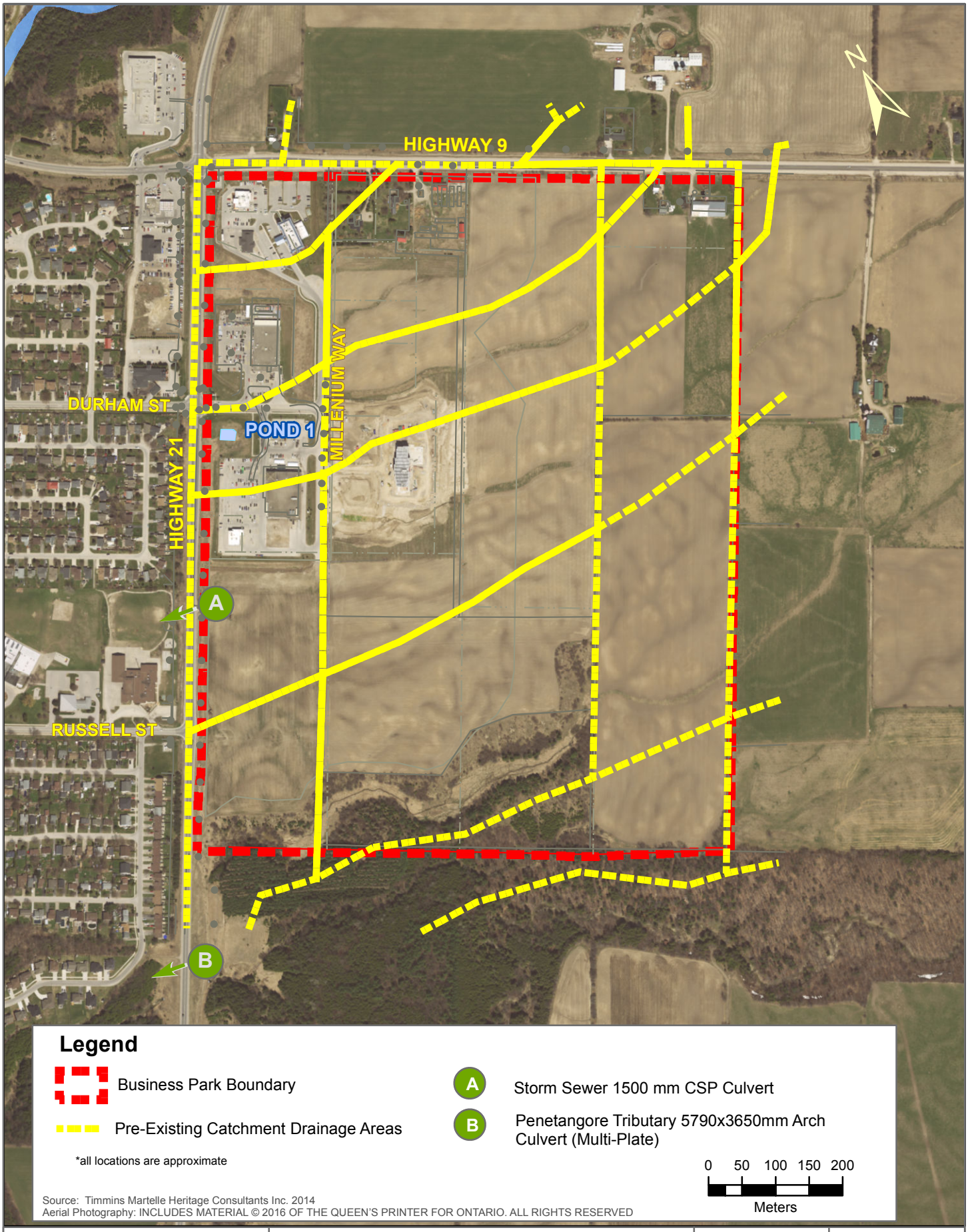
It is recognized that an area of commercial development exists along the Highway 21 corridor from Highway 9, to the south approximately 600 m and along Durham Street and Millenium Way. These developed areas have their own existing runoff control measures that have been designed, approved and constructed through the appropriate planning processes.

In order to adequately compare the original conditions that the two Highway 21 outlets would have been designed for, the pre-development hydraulic modeling has been prepared assuming that the existing commercial area was not developed.

The main catchment groups that traverse the Business Park lands, and their corresponding subcatchment areas, are summarized below:

- **Outlet Location A – 1500 mm CSP Culvert**: This catchment group consists of the following drainage areas: 301, 302, 303, 304, 401, 402, 403, 404, 501, 502, 503, 504, 603 and 605. These drainage areas discharge to the Highway 21 corridor ditch and to outlet location A (1500 mm CSP Culvert).
- **Outlet Location B – 5790 x 3650 mm Multi-Plate** Arch: The catchment group consisting of drainage areas 50, 52, 54, 56, 58, 59, 60, 62, 64, 100, 101, 201, 202, 203, 204 discharge to the Highway 21 Multi-Plate Arch on the tributary of the Penetangore River. Catchments 201 through 204 represent the drainage limits for the Holtby Drain and total approximately 194 Ha.

Figure 4.6 illustrates the pre-existing drainage features for the area.



Legend

- Business Park Boundary
- Pre-Existing Catchment Drainage Areas

*all locations are approximate

- A — Storm Sewer 1500 mm CSP Culvert
- B — Penetangore Tributary 5790x3650mm Arch Culvert (Multi-Plate)

0 50 100 150 200
Meters

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MUNICIPALITY OF KINCARDINE

SERVICING MASTER PLAN FOR
KINCARDINE BUSINESS PARK

PRE-EXISTING STORMWATER DRAINAGE AREAS AND FEATURES

DATE	PROJECT No.
April 2017	08055
SCALE	FIGURE No.
1:7,500	4.6

Filename: Z:\08055-Kincardine-Business_Park_Servicing\Projects\GIS\08055_KincardineBusPark_Fig4.6_PreExistingSWDrainage.mxd 4/11/2017

4.5.3 Stormwater Management Criteria

It is expected that stormwater management criteria for the Business Park area will be similar to that used for previous development proposals, based on discussions with the Saugeen Valley Conservation Authority. The criteria, for both quantity and quality, were developed to minimize potential impacts to the downstream drainage systems and watercourses. The quantity and quality criteria and control measures used for the evaluation of potential stormwater flows are summarized below.

Quantity Control Criteria

The criteria for quantity control involve providing suitable attenuation storage so that peak flows are not exceeded. The following locations will be used for comparisons of quantity control criteria:

- Holtby Drain (immediately prior to its convergence with the Penetangore tributary);
- Highway 21 Outlet A – CSP culvert (school site);
- Highway 21 Outlet B – Multi-plate Arch culvert (Penetangore tributary); and
- Combined flow at both Highway 21 outlet locations.

Quality Control Criteria

The following summarizes the water quality control requirements for each of the two outlet locations:

- 1500 mm CSP culvert – All runoff shall meet MOECC "Enhanced" Level criteria (80% Total Suspended Solids (TSS) removal) prior to discharge to any open watercourse; and
- 5790 x 3650 mm Multi-Plate Arch – All runoff shall meet MOECC 'Enhanced" Level criteria (80% TSS removal) prior to discharge to any open watercourse.

All of the above is to be addressed and designed in accordance with the "Stormwater Management Planning and Design Manual" by the MOE, dated March 2003c (Ontario Ministry of Environment, 2003).

4.5.4 Consideration of External Lands

Any new stormwater management facilities would provide quantity and quality control of stormwater discharge from the proposed development areas within the Business Park lands. It is expected some of the external drainage areas, generally east of the Business Park, will be conveyed through any proposed stormwater management facilities, the external lands have been modeled in their current states (i.e., agricultural usage) and remain unchanged under the future development conditions. Future development of these external lands will require a further review of stormwater management for each specific area.

4.5.5 Methodology for Computing Stormwater Run-off

Pre and post development modelling was prepared using Miduss V2 (Allen A. Smith Inc., 17 Lyndale Drive, Dundas Ontario, L9H 3L4) to simulate the following synthetic design storms and rainfall events:

- Goderich 6 hr, SCS Type II for the 1:2 through 1:100 year return periods

The total rainfall used in the analysis was derived from the Goderich Weather Station. The following key information was used in the development of the Miduss models:

- Miduss Model Schematics for the individual catchments for the existing and potential drainage area conditions; and
- Sub-catchment numbers and drainage boundaries for the existing and potential drainage area conditions.

Additional input parameter and rainfall summary information is provided in Appendix E of the Servicing Plan (Appendix 2). The initial abstraction values used in the Miduss model are based on a calculated value of 0.1 s for all drainage areas. The resulting initial abstraction values range from 5.20 to 8.02 mm for the pervious area, which is consistent with that recommended in the Miduss model and the MOECC Guidelines. The impervious initial abstraction used results in a value of 0.52 mm, which is conservative and will result in similarly conservative flow values.

A summary of the curve number (CN) and manning values used in the model are contained within Appendix E of the Servicing Plan (Appendix 2), along with the model input parameters noted above. The values are consistent with standard practice.

The results of the Miduss modeling for the existing and potential drainage areas are summarized in the following section.

4.5.6 Stormwater Modeling Results

4.5.6.1 Existing Commercial Area

The existing commercial areas identified as catchments 406, 500, 605, 750, and 751 have been constructed with their own stormwater management facilities. Brief details related to the controls provided for each area are summarized as follows:

<u>Areas 406, 500</u>

Runoff from areas 406 and 500 discharge to the existing stormwater management facility (identified as Pond 1). The pond was originally designed and constructed as a dry pond in conjunction with the Canadian Tire development and in recent years was expanded to include the Sobeys grocery store. The pond is located at the south-east corner of the intersection of Highway 21 and Durham Street, and provides basic water quality along with pre to post water quantity control for the noted catchment areas as well as a portion of the currently undeveloped

Business Park area. The pond outlets directly to the ditch located within the Highway 21 road corridor.

Areas 750, 751

These areas have been constructed with roof top control devices to limit the discharge rate to the ditch within the Highway 21 corridor.

Area 605

This area includes a Boston Pizza, Holiday Inn Express, and a dentist office. This catchment area has been designed with on-site quality and quantity control facilities which discharge directly to the ditch along Highway 21.

Area 604

This area is currently developed with a combination of residential and agricultural type buildings and the area has been developed for some time and was never provided with any type of development control. Future development intensification on these lands will need to address potential impacts in relation to runoff characteristics generated from the site.

Area 405

The existing stormwater management facilities (Pond 1) was designed to accommodate runoff from these future development lands. On-site quality controls, however, will be required and it is anticipated that quality control can be provided through the installation of oil-grit separators, or similar type treatment devices on the property. It is anticipated that both major and minor storm runoff events will be conveyed to Pond 1.

Areas 302, 303, 310, 402, 403, 404, 407

These future development areas will require a stormwater management facility, such as a detention pond, with an outlet to Highway 21 ditch.

Areas 304, 311, 312, 313, 314

It is expected that these future development areas will require a stormwater management facility, with an outlet downstream of the Holtby Drain.

4.5.6.2 Summary of Pre-Existing Modeling Results

The following table summarizes the results of the pre-existing stormwater conditions as modelled for the 2-year through to 100-year rainfall events. Flow values at the following locations have been included in the summaries:

- Holtby Drain (immediately prior to its convergence with the Penetangore tributary);
- Highway 21 Outlet A – CSP culvert (school site);
- Highway 21 Outlet B – Multi-Plate Arch culvert (Penetangore tributary); and

- Combined Flow at both Highway 21 outlet locations.

Table 4.6 Pre-Existing Miduss Flows (m^3/s)

Storm Event (year)	Holtby Drain at Confluence with Penetangore Tributary (Confluence 1100)	A 1500mm CSP under Hwy. 21 (Confluence 2000)	B Multi-Plate Arch under Hwy. 21 (Confluence 1000)	A+B Combined at Hwy. 21 (Confluence 3000)
2	3.3	1.9	16.9	17.4
5	7.8	4.5	41.7	43.0
10	11.6	6.6	63.0	65.0
25	17.1	9.4	94.6	97.6
50	21.5	11.6	120.8	124.7
100	26.2	13.6	149.0	153.6

5.0 PROBLEM/OPPORTUNITY IDENTIFICATION

5.1 Overview

The Municipality of Kincardine wishes to determine a practical approach to provide servicing for the remainder of the Kincardine Business Park. Following the designation of the Business Park in the Official Plan, the Municipality purchased the first farm lot east of Provincial Highway 21 and serviced the northern two thirds of that lot. Parcels were then sold for development as serviced land. Following this, there have been numerous proposals for commercial developments within the Business Park, which have required individual reviews and numerous studies. Given this, the Municipality has undertaken the Master Plan process to identify strategies for the provision of municipal infrastructure services to the remainder of the Business Park.

The purpose of this study is to provide a detailed investigation of the existing roads, water supply, stormwater drainage and sanitary sewage collection infrastructure components and identify future needs required to service the remainder of the Business Park. The Master Plan will also assess impacts to existing infrastructure and strategies to coordinate the construction of roads, watermains, sanitary and stormwater facilities with other municipal infrastructure improvement projects, external to the Business Park.

The following sections of this report document the environmental assessment process conducted during the Master Planning process, as well as identification of the preferred outcome for the Master Plan. The key components of the process are summarized below:

- Identification of a problem/opportunity statement;
- Identification of practical alternatives to address the identified problems or opportunities;

- An evaluation of potential impacts associated with the identified alternatives;
- Selection of a preferred alternative;
- Identification of road, water, sanitary, and stormwater servicing strategies;
- Identification of a conceptual implementation plan; and
- Synopsis of issues related to implementation of the servicing strategies.

5.2 Problem/Opportunity Statement

Under Approach 2 of the Master Plan process (as outlined in Section 1.4), the first two phases of the Class EA process must be completed. The first phase of the Class EA process involves the identification of the problems or opportunities that need addressed. The following Opportunity Statement has been identified to provide direction for the study:

Policies within the Town of Kincardine Official Plan direct commercial and industrial growth to the Business Park; however, only the northwest area of the Park is currently serviced by municipal road, water, sanitary sewer, and stormwater infrastructure. At present, there is an opportunity to develop a servicing strategy for the remainder of Business Park that is integrated and coordinated with existing municipal infrastructure and to allow for future development.

6.0 IDENTIFICATION OF PRACTICAL ALTERNATIVES SOLUTIONS

6.1 General

The second phase of the Master Plan/Class EA process involves the identification and evaluation of practical alternative solutions to address to the defined opportunity. The evaluation of alternatives is conducted by examining the technical, economic, and environmental considerations associated with implementing any of the alternatives. Mitigation measures that could lessen environmental impacts are also defined. Following that, a preferred solution or solutions are selected.

The practical alternative solutions for the provision of transportation, water, sanitary sewer and stormwater infrastructure in the Kincardine Business Park are identified in the following subsections. The alternatives included below build upon the findings of the engineering investigations conducted during Master Plan process, with the intent to identify practical and feasible servicing strategies for the Business Park. It is recognized that the road pattern will determine the location of water and wastewater infrastructure and stormwater piping, as these services will be located within the road allowances and the identified easements. Given this, the identification and evaluation of practical alternatives for water, sanitary sewer and stormwater infrastructure does not include routes located outside of the potential road networks.

6.2 Transportation Alternatives

To service the Kincardine Business Park in a manner that promotes orderly movement of traffic, maximizes land available for development, and provides sufficient access within the Park, the following alternative road concepts were identified:

6.2.1 Alternative TR1 - Road Pattern 1

Figure 6.1 shows Road Pattern TR1. This road layout concept is based on the initial road pattern developed and recommended by the County of Bruce Planning Department. In this alternative, additional access to the Business Park is provided from Highway 21 via an extension of Russell Street, and from Highway 9 via an extension of Durham Street. Russell Street will extend approximately 400 m east into the Park before turning north and extending towards Highway 9. Durham Street will extend from the current intersection with Millenium Way, east and then north to intersect with Highway 9. The eastern extension of Russell Street and extension of Durham Street are expected to be 10.5 m wide roads (with 26 m road allowance).

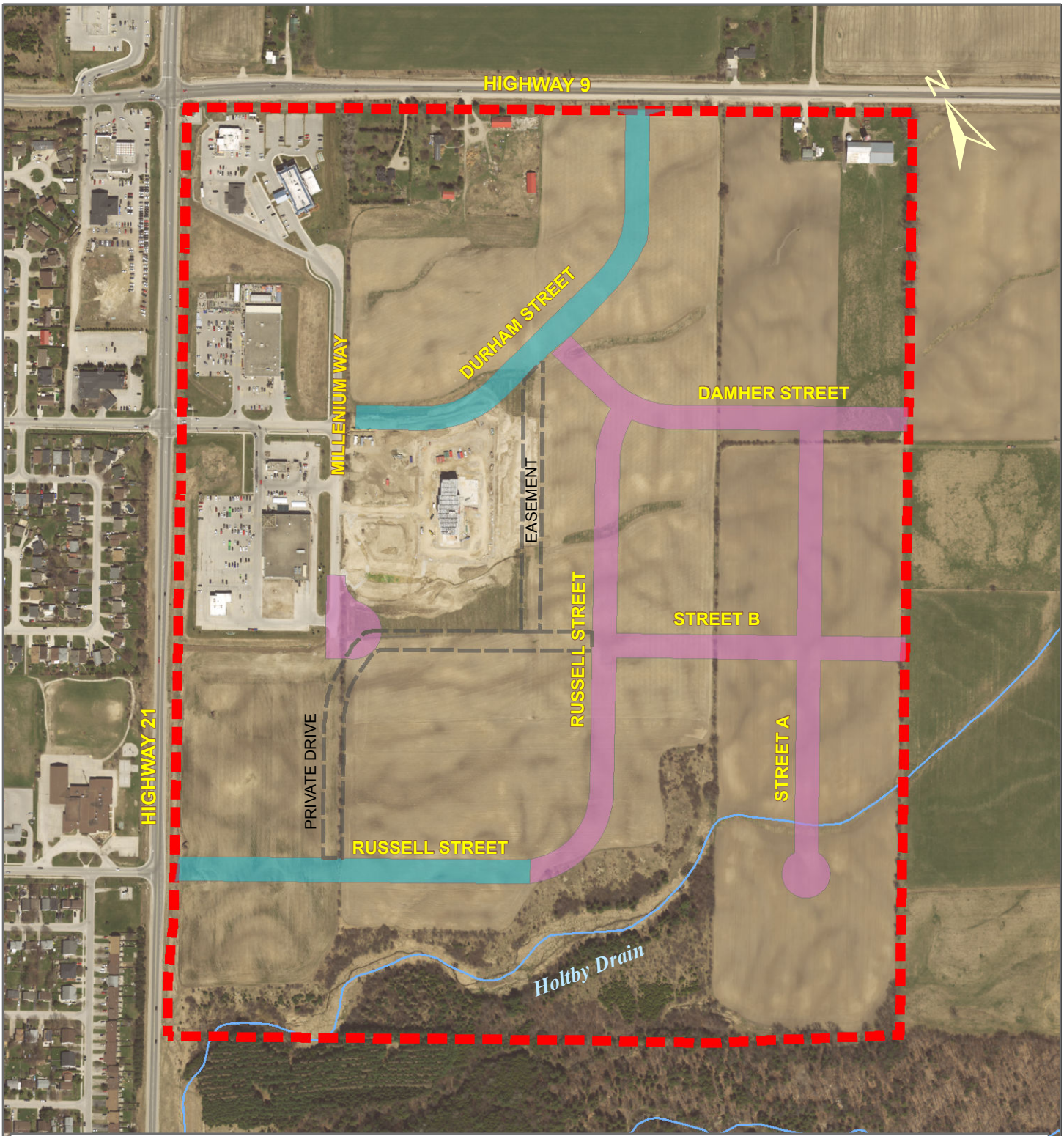
The local roads proposed with this concept are identified in Figure 6.1 as Street A, Street B, and Dahmer Street. Street B and Dahmer Street will extend from Russell Street, east to the eastern limit of the Business Park. Street A will intersect Street B and Dahmer Street, running south from Dahmer Street. The local roads, which include the northern extension of Russell Street, Street A, Street B and Dahmer Street are expected to be 8.5 m wide with 20 m road allowances.

This alternative also includes a 'Private Drive' between Millenium Way and Russell Street, as well as an easement between the end of Millenium Way south to the Russell Street extension. Another easement is identified between the intersection of the Durham Street extension and Dahmer Street, south to the easement between Millenium Way and Russell Street.

All roads in the Business Park will be constructed with a minimum 2% crossfall, adequate sub-grade drainage, curb and gutter, sidewalks on one side of the street (where warranted, given development types), and street lighting.

6.2.2 Alternative TR2 – Road Pattern 2

Road Pattern 2 is shown in Figure 6.2. This road layout was developed based on consultation and comments received from the Ministry of Transportation (MTO) in the review of Road Pattern TR1. The MTO noted possible issues with 'Private Road' between Russell Street and Millenium Way, suggesting that Private Road is located too close to the intersection of Highway 21 and Russell Street. Future left-turn movements from Russell Street onto Private Drive may slow and possibly block traffic flow through the Highway 21 and Russell Street intersection. Given this concern, this road pattern has an alternative alignment of Russell Street, with Russell Street curving north to connect with Millenium Way.



Legend

Proposed Road Layout

- Future 10.5 m Wide Road (26 m min wide road allowance)
- Future 8.5 m Wide Road (20 m min wide road allowance)
- Easement / Private Drive

* locations are approximate

Business Park Boundary

0 50 100 150 200

Meters

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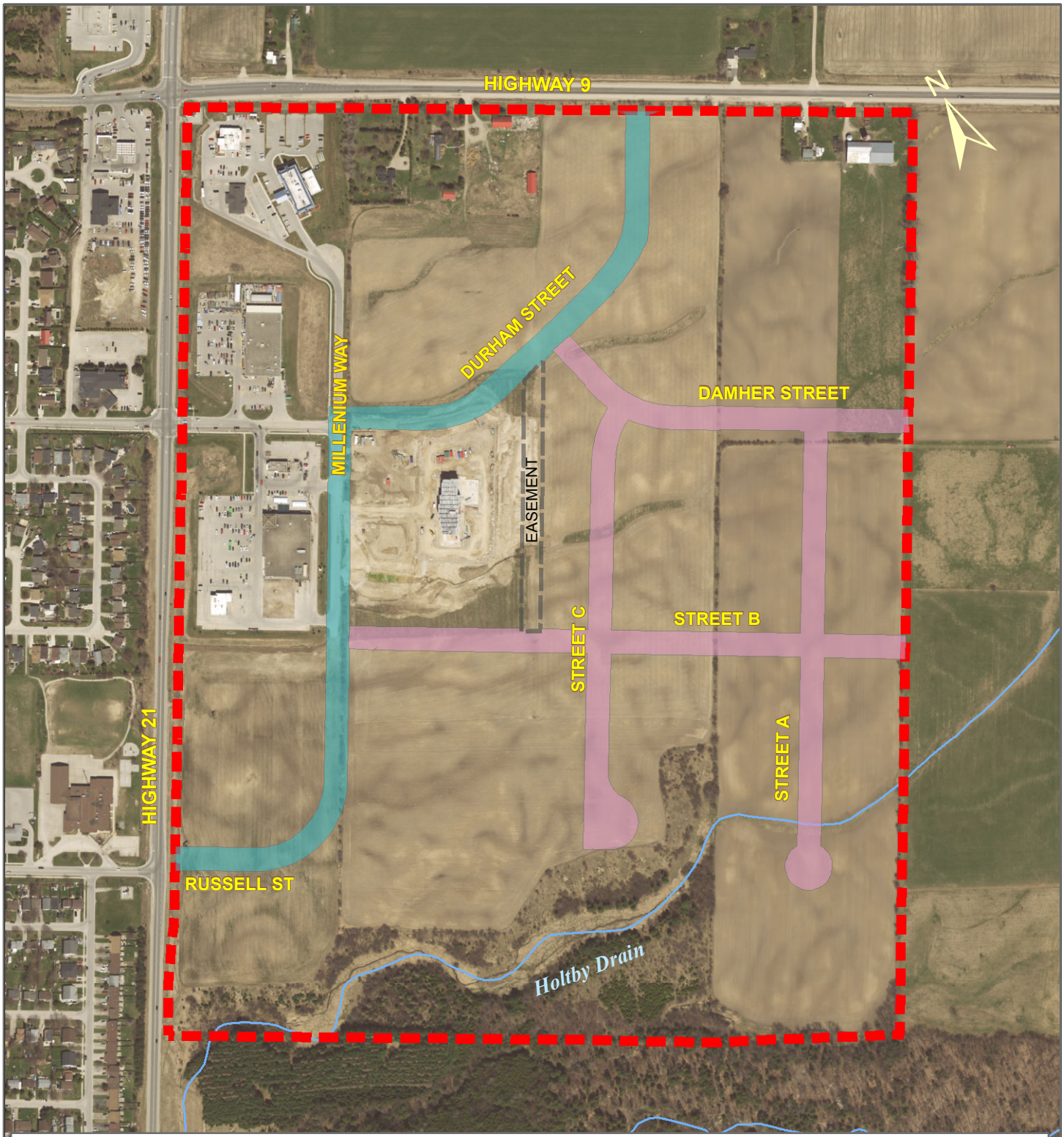
MUNICIPALITY OF KINCARDINE
SERVICING MASTER PLAN FOR
KINCARDINE BUSINESS PARK
(COMMUNITY OF KINCARDINE)
ALTERNATIVE TR1 - ROAD CONCEPT 1

DATE	PROJECT No.
April 2017	08055
SCALE	FIGURE No.
1:6,000	6.1

Filename: Z:\08055-Kincardine-Business_Park_Servicing\Projects\GIS\08055_KincardineBusPark_FigTR1_ProposedRoads.mxd 4/7/2017



Legend

Proposed Road Layout

- Future 10.5 m Wide Road (26 m min wide road allowance)
- Future 8.5 m Wide Road (20 m min wide road allowance)
- Easement / Private Drive

* locations are approximate

Business Park Boundary

0 50 100 150 200

Meters

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ALTERNATIVE TR2 - ROAD CONCEPT 2

DATE	PROJECT No.
April 2017	08055
SCALE	FIGURE No.
1:6,000	6.2

Filename: Z:\08055-Kincardine-Business_Park_Servicing\Projects\GIS\08055_KincardineBusPark_Fig6.2_ProposedRoadsMTO.mxd 8/15/2017

Similar to TR1, additional access to the Business Park will be provided through extensions of Russell Street (at Highway 21) and Durham Street to Highway 9. The Russell Street and Durham Street extensions will be 10.5 m wide roads, with 26 m wide road allowance.

The local streets that make up the interior road pattern, are identified as Street A, B, and C, and Damher Street. Street B will extend from Millenium Way, 200 meters south of Durham Street, to the eastern extent of the Business Park. Dahmer Street will extend from Durham Street, east to the limit of the Business Park. Streets C and A will intersect Street B and Dahmer Street, with Street C located in the third lot and Street A in the fourth lot.

An easement is also included in this road layout between the intersection of Durham and Dahmer Streets, south to Street B.

Similar to the Alternative TR1, the roads will be constructed with a minimum 2% crossfall, adequate subgrade drainage, curb and gutter, sidewalks on one side of the street (where warranted by development type), and street lighting.

6.2.3 Alternative TR3 – Do Nothing

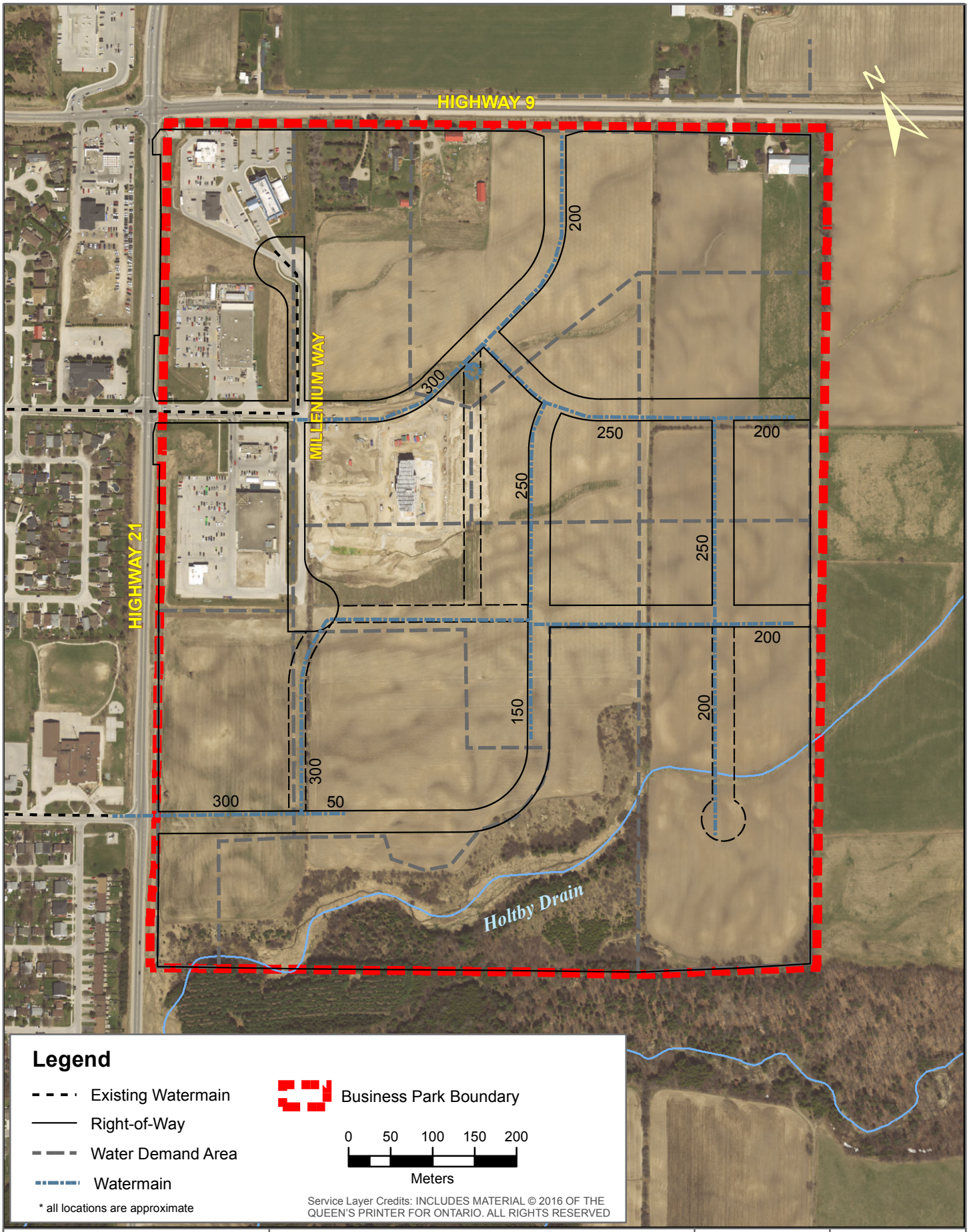
This option proposes that no additions or alterations be made to the existing road network within the Business Park. Under this alternative, access to the Park is limited exclusively to Durham Street. During the Class EA Master Plan design process, the “Do Nothing” alternative may be implemented at any time prior to the commencement of construction. A decision to “Do Nothing” would typically be made when the costs of all other alternatives, both financial and environment, significantly outweigh the benefits.

6.3 Water Servicing Alternatives

6.3.1 Alternative W1 – Extend municipal water services to the remainder of the Business Park

This alternative proposes extending the Kincardine Drinking Water System to service the remainder of the Business Park (see Figure 6.3). The existing water treatment and distribution infrastructure can accommodate growth within the Business Park, while maintaining fire flow supply and quantity, as demonstrated by the engineering review undertaken (see Section 4.3).

The distribution system would be expanded from the existing 300 mm watermains at the intersection of Russell Street and Highway 21, and intersection of Durham Street and Millenium Way. It is proposed that 300 mm watermains would be installed in the road allowances for the Russell Street and Durham Street extensions, with smaller watermains ranging from 150 mm to 250 mm servicing the interior areas of the Park. With this option, it is expected a booster pumping station will be required in conjunction with later phases of development in the Park (requiring a Schedule B Class EA, once the site identified). This is attributable to the higher elevations in the more eastern reaches of the Business Park. A booster pumping station will ensure adequate pressures are provided for the development densities.



Filename: Z:\08055-Kincardine-Business_Park_Servicing\Projects\GIS\08055_KincardineBusPark_Fig6.3_ExWaterInfrastructure.mxd 4/11/2017

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SERVICING MASTER PLAN FOR KINCARDINE BUSINESS PARK (COMMUNITY OF KINCARDINE)

WATER SERVICING ALTERNATIVE W1

EXTEND MUNICIPAL SERVICES

DATE	PROJECT No.
April 2017	08055
SCALE	FIGURE No.
1:6,000	6.3

6.3.2 Alternative W2 – Private or Communal Servicing

Presently, policies in the Town of Kincardine Official Plan require new development or redevelopment within Settlement Areas (including the Business Park) take place on the basis of full municipal services; and permit private services only where a connection to a municipal service is not feasible or is financially prohibitive. Additionally, the provision of private or communal servicing in the Business Park will not allow for the development of a comprehensive servicing strategy, as wells/communal services will be installed for development as it occurs.

Given that there are existing policies restricting private and communal servicing and that it will not address the identified opportunity, this alternative is not considered feasible and will not be evaluated further.

6.3.3 Alternative W3 – Do Nothing

This option proposes no extensions of water services to the unserviced areas of the Business Park. Under this option, water service in the Park would be limited to the existing watermains along Durham Street and Millenium Way. During the Class EA Master Plan design process, the "Do Nothing" alternative may be implemented at any time prior to the commencement of construction. A decision to "Do Nothing" would typically be made when the costs of all other alternatives, both financial and environment, significantly outweigh the benefits.

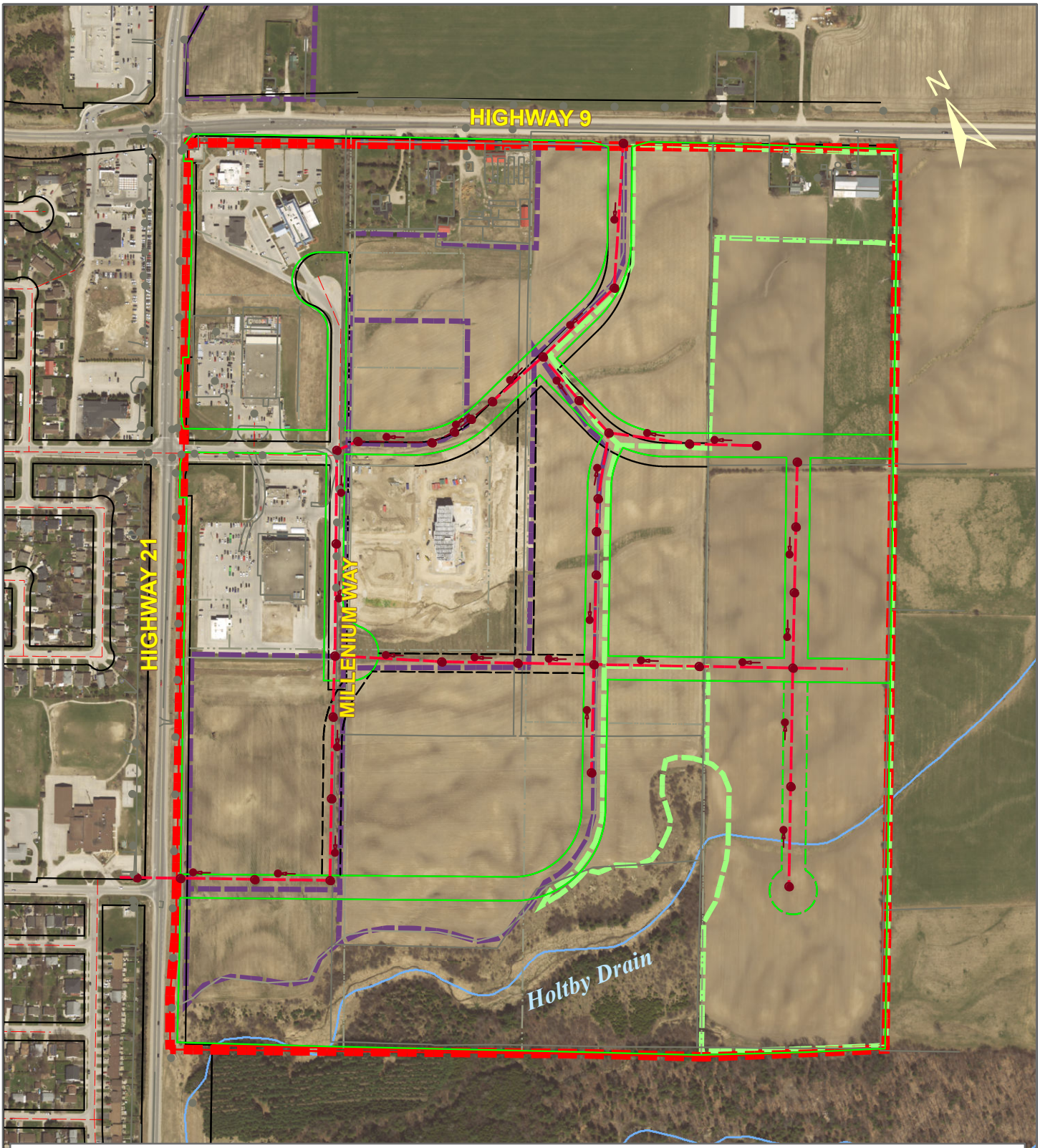
6.4 Sanitary Sewage Servicing Alternatives

6.4.1 Alternative S1 – Extend municipal sanitary sewage services to the remainder of the Business Park

This alternative proposes to extend the Kincardine sanitary sewage collection system to service the remainder of the Business Park. Presently, sanitary sewage services extend into the Business Park along Durham Street and north along Millenium Way. Under this alternative, it is proposed that the collection system will be extended from existing connections at Durham Street/Millenium Way, and Russell Street/Highway 21 (see Figure 6.4). The extension will follow the road layout, with sanitary sewers located within road allowances and easements.

From the engineering investigations (as described in Section 4.4), it was established that the Durham Street sewer is not of a sufficient depth to service additional development within the Business Park. Furthermore, there is limited capacity in the Walsh and Mackendrick Street sewers, which receive flows from the Durham Street sewer. Given this, sewage flows from future development in the Business Park will be conveyed to the Russell Street sewer and Park Street Sewage Pumping Station (SPS).

To accommodate future flows from the Business Park, a new trunk sewer on Russell Street, from Highway 21 to Scott Street, will be required. The Municipality previously completed design for this section of trunk sewer in 2005 and obtained MOECC approval. The approval has since lapsed; however, the Municipality has submitted an Environmental Compliance Approval application to renew the approval.



Legend

- Proposed Sanitary Sewer and Invert
- Stage 1B Development
- Stage 2 Development
- Business Park Boundary

* all locations are approximate

0 100 200
Meters

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SERVICING MASTER PLAN FOR KINCARDINE BUSINESS PARK (COMMUNITY OF KINCARDINE)

SANITARY SEWER SERVICING ALTERNATIVE 1 - EXTEND MUNICIPAL SERVICES

DATE	PROJECT No.
April 2017	08055
SCALE	FIGURE No.
1:6,000	6.4

Filename: Z:\08055-Kincardine-Business_Park_Servicing\Projects\GIS\08055_KincardineBusPark_Fig6.4_ServicingAlt1.mxd 4/10/2017

To accommodate expected peak sewage flows resulting from continued development in the Business Park, it was determined that increased capacity at the Park Street SPS is required. Given the need to increase capacity at the Park Street SPS to accommodate servicing within the Business Park, this alternative includes the consideration of following solutions for the necessary SPS improvements.

Alternative S1.1 – Install larger pumps in the existing dry pit and use the existing forcemain at the Park Street Sewage Pumping Station.

To increase capacity at the Park Street SPS to accommodate peak flows from the Business Park, the existing pumps at the station will be replaced with larger pumps in the existing dry pit. The existing forcemain to the inlet at the treatment plant will be used. The three existing pumps would be replaced with pumps between 63 kW (85 Hp) to 78 kW (105 Hp) in size. Depending on the size of pumps chosen, it is expected that capacity will be increased to 155 up to 190 L/s. A larger standby power unit will be required to operate the pumps as well as modifications to the existing power supply and pump control system.

Alternative S1.2 – Retain the existing pumps and twin the existing forcemain at the Park Street Sewage Pumping Station.

To increase capacity at the Park Street SPS, this alternative proposes using the existing pumps and twinning the forcemain from the station to the inlet at the sewage treatment plant. A second 300 mm forcemain will be installed and will allow two of the three pumps to pump through its own forcemain. This should allow each of the pumps to deliver its full single-pump capacity when operated in parallel. This would give the station a capacity of approximately 115 L/S. This option does not require upgrades to the existing electrical and standby power systems at the station; however, it would require modification to the existing bypass valve chamber and the lagoon inlet chamber. This alternative would also allow future increases in capacity through pump replacement.

Alternative S1.3 – Replace the existing pumps and twin the existing forcemain at the Park Street Sewage Pumping Station.

To increase capacity at the Park Street SPS, the pumps at that the station will be replaced and the existing forcemain to the inlet of the sewage treatment plant will be twinned. A second 300 mm forcemain will allow two of the three pumps to pump through its own forcemain. The three existing pumps at the station will also be replaced with new, higher capacity pumps. This will give the station a firm capacity of 230 L/s, with one pump acting as standby. Similar to Alternative S1.1, this solution will require upgrades to the standby power unit and modifications to the existing power supply and pump control system. Modifications to the existing bypass valve chamber and lagoon inlet chamber as a result of the twinning of the forcemain will also be required.

6.4.2 Alternative S2 – Private or Communal Wastewater Servicing

Presently, policies in the Town of Kincardine Official Plan require new development or redevelopment within Settlement Areas (including the Business Park) take place on the basis of full municipal services; and permit private services only where a connection to a municipal service is not feasible or is financially prohibitive. Additionally, the provision of private or communal servicing in the Business Park will not allow for the development of a comprehensive servicing strategy. The installation of individual systems or a communal system will also significantly reduce the amount of developable land in the Business Park, making this alternative not practical for future development.

Given that there are existing policies restricting private and communal servicing, it will not address the identified opportunity, and will significantly reduce the amount of developable land, this alternative is not considered feasible and will not be evaluated further.

6.4.3 Alternative S3 – Do Nothing

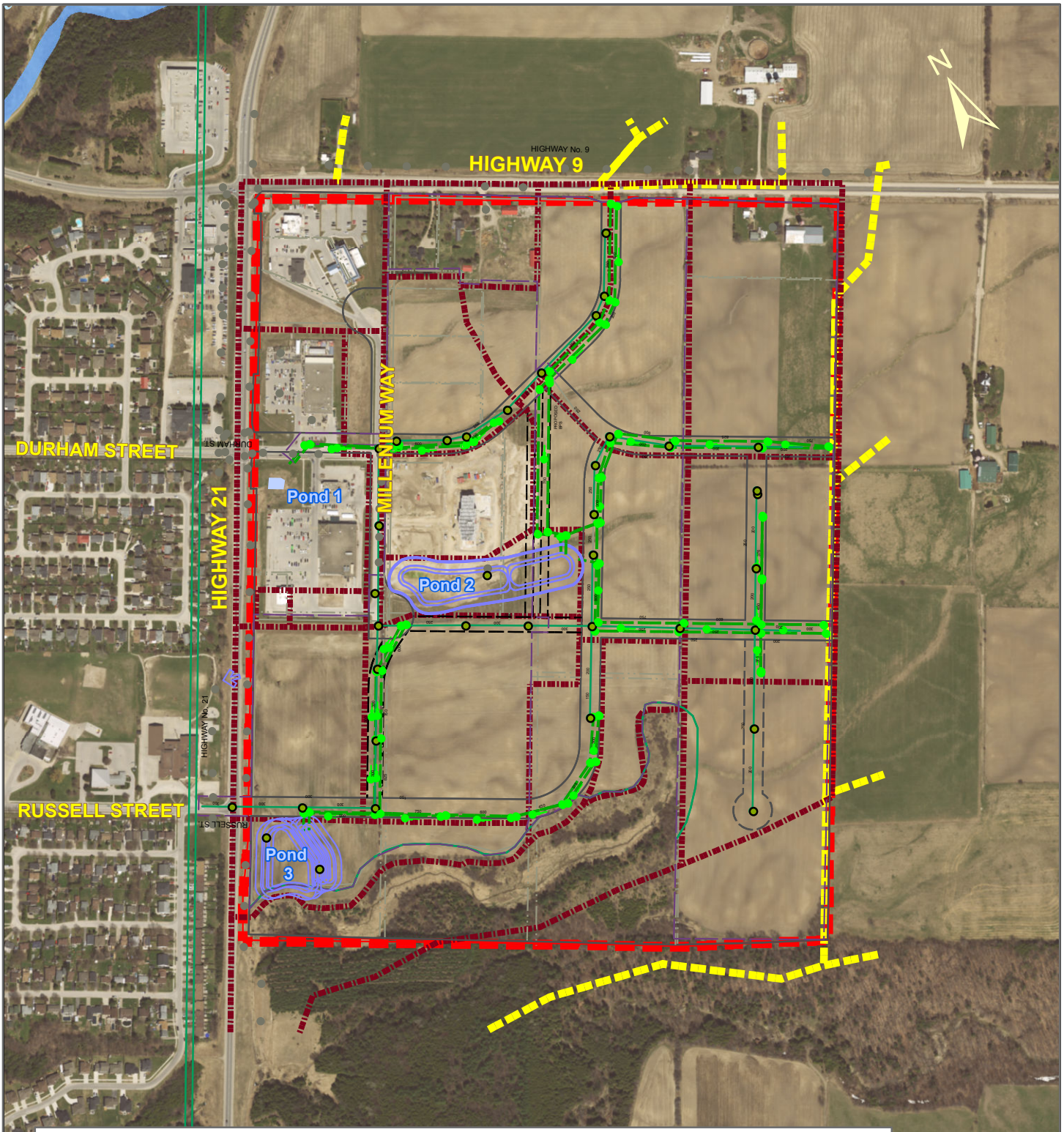
This option proposes no extensions of sanitary sewage collection services to the unserviced areas of the Business Park. Under this option, sanitary sewage collection service in the Park would be limited to the existing connections along Durham Street and Millenium Way. Future development would be significantly limited as a result extremely limited capacity in the downstream Durham Street corridor. During the Class EA Master Plan design process, the "Do Nothing" alternative may be implemented at any time prior to the commencement of construction. A decision to "Do Nothing" would typically be made when the costs of all other alternatives, both financial and environment, significantly outweigh the benefits.

6.5 Stormwater Servicing Alternatives

6.5.1 Alternative SW1 – Extend/add municipal stormwater facilities to service the remainder of the Business Park.

Under this alternative, municipal stormwater facilities will be extended and expanded to service the remainder of the Business Park. Existing stormwater infrastructure in the Business Park is a dry pond at the southeast corner of Highway 21 and Durham Street, which outlets directly to the ditch located within the Highway 21 road corridor. This pond provides basic water quality treatment with pre to post water quantity control for the existing development. It will also serve a portion of future development.

In addition to the existing stormwater detention pond (Pond 1), two additional stormwater ponds and conveyance pipes are proposed to service the remainder of the Business Park (see Figure 6.5). These ponds will minimize impacts to downstream drainage system and water courses through the provision of suitable attenuation storage and meeting the MOECC "Enhanced" level criteria for water quality (i.e., 80% of Total Suspended Solids removed prior to discharge to an open watercourse). The use of one pond was investigated but found not to be a feasible solution for stormwater servicing, due to topographical and property constraints. The



Legend

- Post Development Drainage Catchment Areas
- Proposed Storm Sewer and Pipe Size (mm)
- Pre-Existing Catchment Drainage Areas
- Business Park Boundary

*all locations are approximate

0 50 100 150 200
Meters

Source: Timmins Martelle Heritage Consultants Inc. 2014

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SERVICING MASTER PLAN FOR
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(COMMUNITY OF KINCARDINE)
STORMWATER SERVICING ALTERNATIVE SW1

DATE	PROJECT No.
April 2017	08055
SCALE	FIGURE No.
1:7,500	6.5

Filename: Z:\08055-Kincardine-Business_Park_Servicing\Projects\GIS\08055_KincardineBusPark_Fig6.5_ServicingAltSW1.mxd 4/11/2017

two proposed ponds would provide water quantity and quality control up to the 100-year storm event. Each facility would include a permanent pool area, and outlet structure with control gates to allow pond isolation.

Pond 2 would be an extended detention wet pond facility, located south of the TownePlace Suites and east of Sobeys. The drainage area for this pond would be 56.0 ha, included lands within and external to the Business Park. It would have a permanent pool volume of 5,740 m^3 and an extended detention volume of 2,240 m^3. A 37-hour extended detention time will be provided by means of a 200 mm diameter orifice outlet to the ditch in the Highway 21 corridor.

Pond 3, an extended detention wet pond facility, is proposed for the southwestern corner of the Business Park and will serve an area of 18 ha within the Business Park. It would have a permanent pool volume of 3,223 m^3 and an extended detention volume of 708 m^3. A 22-hour extended detention time will be provided by means of a 200 mm diameter orifice outlet. The outlet for this pond will be immediately downstream of the Holtby Drain.

Minor storm events (up to the 5-year storm event) would be conveyed through storm sewers installed within the road corridors. The storm sewers would outlet to the stormwater ponds. Major storms will also be conveyed to the stormwater facilities; however, it is expected that flows will be conveyed within the finished road surface.

6.5.2 Alternative SW2 – Individual, lot-level stormwater services

This alternative proposes the use of individual, lot-level services to provide stormwater quality and quantity control for future development in the Business Park. This alternative would see the installation of stormwater services for individual properties in the Business Park, installed as development occurs. Individual services may include non-structural control measures to intercept and treat stormwater on site, such as maximizing infiltration into grassed and vegetated areas, rainwater harvesting, and reduction of impervious surfaces. Structural controls that could be utilized include individual stormwater detention ponds or Low Impact Development techniques such as green roofs, rain gardens, infiltration chambers or trenches, vegetated filter trips, and permeable pavement parking lots. Under this alternative, property owners will be responsible for the design, construction and maintenance of stormwater control features located on their property. It is also expected that individual, on-site stormwater facilities will reduce the total amount of developable land within the Business Park.

6.5.3 Alternative SW3 – Do Nothing

This option proposes no extensions or expansions of stormwater collection and treatment services to the remainder of the Business Park. Under this option, stormwater facilities that service in the Park would be limited to the facilities along Durham Street and Millenium Way, including the existing stormwater pond. Future development would be significantly limited given the limited capacity within Pond 1 for additional stormwater flows. During the Class EA Master Plan design process, the “Do Nothing” alternative may be implemented at any time prior to the commencement of construction. A decision to “Do Nothing” would typically be made

when the costs of all other alternatives, both financial and environment, significantly outweigh the benefits.

7.0 EVALUATION OF ALTERNATIVE SOLUTIONS

7.1 Evaluation of Alternatives Methods and Procedures

Following the identification of practical solutions, the alternatives are evaluated as part of Phase 2 of the Master Plan process. The purpose of this stage is to examine the potential environmental impacts associated with the proposed alternatives and to examine potential mitigation for any identified impacts. A preferred solution or solutions is then selected. Several activities were incorporated into this assessment process, including a land use analysis, review of technical opinions and consultation with affected stakeholders, municipal staff and regulatory agencies.

The evaluation of alternatives process was carried out using a comparative assessment methodology designed to predict the nature and magnitude of environmental impacts resulting from each defined option and to assess the relative merits of the alternative solutions. The evaluation method involves these principal tasks:

- Identification of existing environmental conditions (baseline conditions, inventories);
- Assessment of existing land use activities, infrastructure, natural features and socioeconomic characteristics (i.e., environmental scoping);
- Review of proposed alternatives and related works;
- Determination of the level of complexity required to complete the impact assessment;
- Identification of environmental components and sub-components that may be affected by the defined alternatives (i.e., define evaluation criteria);
- Prediction of environmental impacts (positive, negative) resulting from the construction and operation of the defined options;
- Identification and evaluation of measures to mitigate adverse effects;
- Prioritization of evaluation criteria, as required (i.e., weigh environmental components based on preference); and
- Selection of a preferred alternative following a comparative analysis of the relative merits of each option.

Section A.2.1.1 of the Class EA document prescribes that the level of complexity required to assess alternatives is predicated on several factors, including the predicted environmental effects, public and agency input and technical considerations (Municipal Engineers Association, 2000). The level of detail inventoried during the Class EA/Master Plan process should reflect the potential severity of the anticipated impacts. At the outset of this Master Plan, general impact screening criteria were reviewed to predict the potential impacts from each of the alternative servicing solutions. In general, the following conclusions were drawn from the screening process:

- The implementation of the servicing alternatives could potentially impact upon the local environmental setting;

- The works associated with the alternatives are relatively limited in scale and the impacts would be predominately construction-related (i.e., short duration); and
- A low level of environmental assessment is required to evaluate the potential impacts of the alternative solutions. Subject to comments received from review agencies, specialized studies (e.g., biological investigations) will not be conducted to assess the potential impacts of the alternatives.

Given these findings, information inventoried for this Class EA was gathered from the following sources:

- Existing policy guidelines and regulations;
- Comments received through public consultation;
- Input from review agencies and stakeholders; and
- Technical evaluations and expertise.

7.2 Environmental Considerations

Section 6 of this report described the alternative transportation, water servicing, sanitary sewage servicing and stormwater servicing solutions that were identified to address the opportunities within the Kincardine Business Park. It is necessary, as part of the evaluation of the alternative solutions, to determine what effect or impact each alternative will have on the environment and what measures can be taken to mitigate the impact. The two main purposes of this exercise are to:

- Minimize or avoid adverse environmental effects associated with a project; and
- Incorporate environmental factors into the decision-making process.

Under the terms of the EA Act, the environment is divided into five general components:

- Natural environment;
- Social environment;
- Cultural environment;
- Economic environment; and
- Technical environment.

The identified environmental component can be further subdivided into specific elements that have the potential to be affected by the implementation of a solution. Potential impacts are noted in the following section of the report. Table 7.1 provides an overview of the specific environmental components considered relevant to this investigation. These components were identified following the initial round of public and agency input and following a preliminary review of each alternative with respect to technical considerations and the environmental setting of the project.

Table 7.1 Evaluation of Alternatives: Identification of Environmental Components

Environmental Component	Sub-Components	Specific Components
Natural Environment	Terrestrial Habitat	• Significant Natural Features • Species at Risk • Vegetation
	Atmosphere	• Air Quality • Noise
	Surface Water	• Aquatic Habitat • Surface Water Quality • Surface Water Quantity • Source Water Protection • Erosion of Watercourses
	Geology	• Physiographic Features and Soils • Drainage Characteristics
Social Environment	Community	• Disruption During Construction • Visual Impacts and Aesthetics • Adjacent Land Uses • Potential to meet Official Plan policies
Cultural Environment	Heritage	• Heritage/Cultural Resources • Archaeological Features
Economic Environment	Municipal	• Capital Costs • Operating and Maintenance Costs
Technical Environment	Transportation	• Pedestrian/Vehicular Safety • Traffic Patterns/Volumes
	Infrastructure	• Compatibility and integration with existing infrastructure • Need for maintenance • Ability to phase infrastructure development

The environmental effects of each alternative on the specific components are generally determined through an assessment of various impact predictors (i.e., impact criteria). Given the works associated with the alternative solutions, the following key impact criteria were examined during the course of this assessment:

- Nature (direct, indirect or cumulative);
- Magnitude (including the scale, intensity, geographic scope, frequency and duration of potential impacts);
- Technical complexity;

- Mitigation potential (which considers avoidance, compensation and degree of reversibility);
- Public perception;
- Scarcity and uniqueness of affected components; and
- Compliance with applicable regulations and public policy objectives.

Using the above criteria, the potential impacts of each alternative solution were systematically evaluated. The significance of the potential impacts posed by each alternative were evaluated considering the anticipated severity of the following:

- Direct changes occurring at the time of project completion;
- Indirect effects following project completion; and
- Induced changes resulting from a project.

For the purposes of this Master Plan, impact determination criteria developed by Natural Resources Canada have been applied to predict the magnitude of environmental effects resulting from the implementation of the project. Table 7.2 summarizes the impact criteria.

Table 7.2 Criteria for Impact Determination

Level of Effect	General Criteria
High	Implementation of the project could threaten sustainability of feature and should be considered a management concern. Additional remediation, monitoring and research may be required to reduce impact potential.
Moderate	Implementation of the project could result in a resource decline below baseline, but impact levels should stabilize following project completion and into the foreseeable future. Additional management actions may be required for mitigation purposes.
Low	Implementation of the project could have a limited impact upon the resource during the lifespan of the project. Research, monitoring and/or recovery initiatives may be required for mitigation purposes.
Minimal/Nil	Implementation of the project could impact upon the resource during the construction phase of the project but would have negligible impact on the resource during the operation phase.

Given the criteria defined in Table 7.2, the significance of adverse effects is predicated on the following assumptions:

- Impacts from a proposed alternative assessed as having a Moderate or High level of effect on a given feature would be considered significant; and
- Impacts from a proposed alternative assessed as having a Minimal/Nil to Low level of effect on a given feature would not be considered significant.

7.3 Overview of Alternatives

The general works associated with each of the identified project alternatives for transportation, water, sanitary sewage and stormwater servicing are summarized below.

Alternative TR1 – Road Pattern 1

- Construction of a 10.5 m wide extension of Russell Street from intersection with Highway 21;
- Construction of a 10.5 m wide extension of Durham Street from Millenium Way to a new intersection with Highway 9;
- Construction of 8.5 m wide local streets, Street A, B and Dahmer Street;
- Construction of a cul-de-sac at the south end of Millenium Way;
- Establishing the potential private drive between Millenium Way south to Russell Street and from Millenium Way east to the Russell Street extension; and
- Installation of curb, gutter, sidewalks and street lighting.

Alternative TR2 – Road Pattern 2

- Construction of a 10.5 m wide extension of Russell Street from the intersection with Highway 21 east and the north to Millenium Way;
- Construction of a 10.5 m wide extension of Durham Street from Millenium Way to a new intersection with Highway 9;
- Construction of 8.5 m wide local streets, Street A, B, C and Dahmer Street; and
- Installation of curb, gutter, sidewalks and street lighting.

Do Nothing

- No roads or transportation facilities will be extended beyond the existing development in the Business Park.

Alternative W1 – Extend the municipal water distribution system

- Extend the 300 mm watermain from the intersection of Durham Street and Millenium Way in the Durham Street road allowance to the intersection with Dahmer Street;
- Extend the 300 mm watermain from the intersection of Russell Street and Highway 21 within the Russell Street extension and Private Drive road allowances;
- Install 250 mm watermain in Dahmer Street and northern most section of the Russell Street extension;
- Install 150 to 200 mm watermain on Streets A and B, Dahmer Street, and Durham Street (from Dahmer Street to Highway 9); and
- Installation of hydrants.

Do Nothing

- No watermains or associated facilities will be extended beyond the existing development in the Business Park.

Alternative S1 – Extend the municipal sanitary sewage collection system

- Install new trunk sewer on Russell Street between Highway 21 and Scott Street;
- Extend the gravity sanitary sewers in the road allowances of Russell Street, Durham Street, Streets A and B, Dahmer Street and Private Drive; and
- Increase capacity at the Park Street Sewage Pumping Station (SPS) by:
    - Installing larger pumps;
    - Retaining the existing pumps and twinning the existing forcemain; or
    - Installing larger pumps and twinning the existing forcemain.

Do Nothing

- No sanitary sewers or associated facilities will be extended beyond the existing development in the Business Park.

Alternative SW1 – Extend municipal stormwater services

- Install storm sewers in the road allowances of Russell Street, Durham Street, Streets A and B, Dahmer Street and Private Drive;
- Construct an extended detention wet pond (Pond 2), outlet structure, and control gates;
- Construct an extended detention wet pond (Pond 3), outlet structure, and control gates; and
- Install any required on-site controls (e.g., oil-grit separator) where needed.

Alternative SW2 – Individual, lot level stormwater services

- Property owners would be responsible for the design and construction of lot-level stormwater controls. Municipality and local conservation authority would review stormwater control measures through the site plan control process.

Do Nothing

- No stormwater infrastructure will be extended beyond the existing development in the Business Park.

7.4 Environmental Impact Analysis of Alternatives

The following subsections include tables comparing the key considerations for each servicing option with respect to the environmental components described in Table 7.1. The tables outline the potential environmental impacts associated with each of the alternative servicing solutions.

The purpose of this analysis was to determine, in relative terms, the environmental effects of constructing and operating each identified option on the defined environmental components and sub-components (using the impact criteria described in Table 7.2). In this regard, the level of effect for the environmental interactions were rated as High, Moderate, Low and Minimal/ Nil. Potential mitigation measures were also considered as part of this evaluation.

7.4.1 Environmental Impact Analysis of Transportation Alternatives

Table 7.3 summarizes the environmental impacts of the three transportation servicing alternatives.

7.4.2 Environmental Impact Analysis of Water Servicing Alternatives

Table 7.4 summarizes the environmental impacts of the two water servicing alternatives.

7.4.3 Environmental Impact Analysis of Sanitary Sewage Servicing Alternatives

Table 7.5 summarizes the environmental impacts of the two sanitary servicing alternatives. Associated with Alternative S1 – Extend municipal sanitary sewage services to the remainder of the Business Park is the need for increased capacity at the Park Street Sewage Pumping Station. The preliminary engineering investigation identified three potential alternatives for increasing capacity at the Park Street SPS. The three alternatives are evaluated for their environmental impacts in Table 7.6.

7.4.4 Environmental Impact Analysis of Stormwater Servicing Alternatives

Table 7.7 summarizes the environmental impacts of the three stormwater servicing alternatives.

Table 7.3 Environmental Impacts Analysis – Transportation Alternatives

Criteria	TR 1 – Road Pattern 1		TR 2 – Road Pattern 2		TR 3 – Do Nothing	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Natural Environment						
Significant Natural Features	Low	• Russell Street extension is adjacent to Holtby Drain and wooded area • Construction and operation of other roads not expected to have any impacts	Nil/ Minimal	• Russell Street extension turns north away from Holtby Drain and wooded area – lesser impact compared to TR1 • Construction and operation of other roads not expected to have any impacts	Nil/ Minimal	• No impacts anticipated
Species at Risk	Nil/ Minimal	• Limited habitat opportunity in study area given agricultural operations and crop rotation • No impacts anticipated	Nil/ Minimal	• Limited habitat opportunity in study area given agricultural operations and crop rotation • No impacts anticipated	Nil/ Minimal	• No impacts anticipated
Vegetation	Low	• Limited vegetation removal will be required for construction of proposed roads • Study area is presently used for agricultural purposes	Low	• Limited vegetation removal will be required for construction of proposed roads • Study area is presently used for agricultural purposes	Nil/ Minimal	• No impacts anticipated
Air Quality	Moderate	• Potential for construction-related impacts to air quality, locally • Standard construction mitigation measures will	Moderate	• Potential for construction-related impacts to air quality, locally. • Standard construction mitigation measures will	Nil/ Minimal	• No impacts anticipated

Table 7.3 Environmental Impacts Analysis – Transportation Alternatives

Criteria	TR 1 – Road Pattern 1		TR 2 – Road Pattern 2		TR 3 – Do Nothing	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Air Quality		minimize construction-related impacts • Operation of the road network will have local air quality impacts from vehicles		minimize construction-related impacts • Operation of the road network will have local air quality impacts from vehicles		
Noise	Low	• Potential for construction-related noise impacts locally • Operation of the road network will have local noise impacts as a result of vehicle traffic, however impacts are expected to be minimal and within reason for a commercial area	Low	• Potential for construction-related noise impacts locally • Operation of the road network will have local noise impacts as a result of vehicle traffic, however impacts are expected to be minimal and within reason for a commercial area	Nil/ Minimal	• No impacts anticipated
Aquatic Habitat	Low	• Potential for impacts during construction of the Russell Street extension, which is adjacent to the Holtby Drain • Standard construction mitigation measures (erosion fencing etc.,) will minimize potential for impacts	Nil/ Minimal	• Minimal potential for impacts during construction with alternative configuration of Russell Street • No aquatic habitat in the remainder of the Business Park	Nil/ Minimal	• No impacts anticipated

Table 7.3 Environmental Impacts Analysis – Transportation Alternatives

Criteria	TR 1 – Road Pattern 1		TR 2 – Road Pattern 2		TR 3 – Do Nothing	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Aquatic Habitat		• No aquatic habitat in the remainder of the Business Park.				
Surface Water Quality	Nil/ Minimal	• Potential for impacts to water quality during construction; however standard construction mitigation measures will minimize impacts	Nil/ Minimal	• Potential for impacts to water quality during construction; however standard construction mitigation measures will minimize impacts	Nil/ Minimal	• No impacts anticipated
Surface Water Quantity	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated
Source Water Protection	Nil/ Minimal	• Construction and operation of road network is not a significant drinking water threat • Activities associated with the road network (application of salt and snow storage) are not significant threats given the low vulnerability score of the area (4.8)	Nil/ Minimal	• Construction and operation of road network is not a significant drinking water threat • Activities associated with the road network (application of salt and snow storage) are not significant threats given the low vulnerability score of the area (4.8)	Nil/ Minimal	• No impacts anticipated
Erosion	Low	• Russell Street extension is adjacent to area identified as an erosion hazard • Standard construction	Nil/ Minimal	• Minimal potential for impacts during construction with alternative configuration of	Nil/ Minimal	• No impacts anticipated

Table 7.3 Environmental Impacts Analysis – Transportation Alternatives

Criteria	TR 1 – Road Pattern 1		TR 2 – Road Pattern 2		TR 3 – Do Nothing	
	Level of Effect	Potential Impacts	Level of Effect	Potential Impacts	Level of Effect	Potential Impacts
Erosion		mitigation measures will minimize impacts		Russell Street		
Physiographic Features and Soils	Low	• Native soils will be disturbed during construction • Road layout avoids gully around Holtby Drain and wooded area south of the Business Park lands	Low	• Native soils will be disturbed during construction • Road layout avoids gully around Holtby Drain and wooded area south of the Business Park lands	Nil/ Minimal	• No impacts anticipated
Drainage	Low	• Construction of roads will increase impermeable surface area in Business Park	Low	• Construction of roads will increase impermeable surface area in Business Park	Nil/ Minimal	• No impacts anticipated
Social Environment						
Disruption During Construction	Moderate	• Construction at intersections of Russell Street and Highway 21 and Durham Street and Highway 9 will disrupt traffic movements and may result in short delays • Standard construction mitigation measures will be implemented to minimize impacts • Construction within the	Moderate	• Construction at intersections of Russell Street and Highway 21 and Durham Street and Highway 9 will disrupt traffic movements and may result in short delays • Standard construction mitigation measures will be implemented to minimize impacts • Construction within the	Nil/ Minimal	• No impacts anticipated

Table 7.3 Environmental Impacts Analysis – Transportation Alternatives

Criteria	TR 1 – Road Pattern 1		TR 2 – Road Pattern 2		TR 3 – Do Nothing	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Disruption During Construction		undeveloped area of Business Park is not expected to cause any disruptions		undeveloped area of Business Park is not expected to cause any disruptions		
Visual Impacts and Aesthetics	Low	• Visual impacts will be limited to the construction phase • Road network will be paved, with curb, gutter, sidewalk and street lights to match current standards within Kincardine	Low	• Visual impacts will be limited to the construction phase • Road network will be paved, with curb, gutter, sidewalk and street lights to match current standards within Kincardine	Nil/ Minimal	• No impacts anticipated
Adjacent Land Uses	Low	• Adjacent land uses include residential, commercial, and agricultural uses. Given existing development in Business Park, impacts of extending the road network are expected to be minimal	Low	• Adjacent land uses include residential, commercial, and agricultural uses. Given existing development in Business Park, impacts of extending the road network are expected to be minimal	Nil/ Minimal	• No impacts anticipated
Meet Official Plan Policies	Nil/ Minimal	• Meets the policies and goals of the Official Plan regarding the Business Park through the provision of services and allowing future development	Nil/ Minimal	• Meets the policies and goals of the Official Plan regarding the Business Park through the provision of services and allowing future development	High	• Does not meet the policies and goals for servicing and future development in the Business Park

Table 7.3 Environmental Impacts Analysis – Transportation Alternatives

Criteria	TR 1 – Road Pattern 1		TR 2 – Road Pattern 2		TR 3 – Do Nothing	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Cultural Environment						
Heritage/Cultural Resources	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated
Archaeological Resources	Moderate	• Stage 1 archaeological assessment identified potential for archaeological resources within the Business Park. Stage 2 archaeological assessment required	Moderate	• Stage 1 archaeological assessment identified potential for archaeological resources. Stage 2 archaeological assessment required	Nil/ Minimal	• No impacts anticipated
Economic Environment						
Capital Costs	Low	• Similar cost to other alternative • Impacts of capital cost to municipality may be offset through development charges or special area charges	Low	• Similar cost to other alternative • Impacts of capital cost to municipality may be offset through development charges or special area charges	Nil/ Minimal	• No impacts anticipated
Operating and Maintenance Costs	Low	• Will require annual maintenance (sweeping, snow removal), adding costs to the municipal public works budget • Adds assets that require eventual replacement in the long-term	Low	• Will require annual maintenance (sweeping, snow removal), adding costs to the municipal public works budget • Adds assets that require eventual replacement in the long-term	Nil/ Minimal	• No impacts anticipated

Table 7.3 Environmental Impacts Analysis – Transportation Alternatives

Criteria	TR 1 – Road Pattern 1		TR 2 – Road Pattern 2		TR 3 – Do Nothing	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Technical Environment						
Pedestrian/Vehicular Safety	Low	• Includes provision of sidewalks, curbs and street lighting for pedestrian safety • Includes provision of turning lanes, new signal and signal changes at existing intersections, as recommended in the Traffic Analysis Study (see Section 4.2.2)	Low	• Includes provision of sidewalks, curbs and street lighting for pedestrian safety • Includes provision of turning lanes, new signal and signal changes at existing intersections, as recommended in the Traffic Analysis Study (see Section 4.2.2)	Nil/ Minimal	• No impacts anticipated
Traffic Patterns/Volumes	Moderate	• Expected to result in increase in local traffic volumes • Turning lanes, new signals and signal changes at existing Highway intersections expected to mitigate impacts from increased vehicle volumes	Moderate	• Expected to result in increase in local traffic volumes • Turning lanes, new signals and signal changes at existing Highway intersections expected to mitigate impacts from increased vehicle volumes	Nil/ Minimal	• No impacts anticipated
Compatibility and Integration with Existing Infrastructure	Low	• MTO expressed preference for this alternative because it allows for future traffic mitigation measures (on the	Low	• Less opportunity on the Russell Street extension for implementing future traffic mitigation measures	Nil/ Minimal	• No impact anticipated

Table 7.3 Environmental Impacts Analysis – Transportation Alternatives

Criteria	TR 1 – Road Pattern 1		TR 2 – Road Pattern 2		TR 3 – Do Nothing	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Compatibility and Integration with Existing Infrastructure		Russell Street extension) and to "protect the highway intersection for additional future traffic mitigation measures (turning lanes/storage etc.,) …" • Compatible with existing municipal infrastructure		(turning lanes/storage etc.,). • Compatible with existing municipal infrastructure		
Need for Maintenance	Low	• Will require annual maintenance similar to other municipal roads in the Business Park	Low	• Will require annual maintenance similar to other municipal roads in the Business Park	Nil/ Minimal	• No maintenance required
Ability to Phase Implementation	Nil/ Minimal	• Construction of road network can be phased as development occurs	Nil/ Minimal	• Construction of road network can be phased as development occurs	Nil/ Minimal	• Not applicable

Table 7.4 Environmental Impacts Analysis – Water Servicing Alternatives

Criteria	W1 – Extend Municipal Water Service		W3 – Do Nothing	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Natural Environment				
Significant Natural Features	Nil/ Minimal	• Water for the Kincardine Drinking Water System is sourced from Lake Huron. Not expected to impact Lake Huron as the system has sufficient capacity to accommodate growth in the Business Park. • Construction of watermains will be road allowances with no stream crossings	Nil/ Minimal	• No impacts anticipated
Species at Risk	Nil/ Minimal	• Limited habitat opportunity in study area given agricultural operations and crop rotation • Construction within road allowance minimizes disturbances • No impacts anticipated	Nil/ Minimal	• No impacts anticipated
Vegetation	Nil/ Minimal	• Construction within road allowance minimizes disturbances • Study area is presently used for agricultural purposes	Nil/ Minimal	• No impacts anticipated
Air Quality	Nil/ Minimal	• Potential for construction-related impacts to air quality, locally • Standard construction mitigation measures will minimize construction-related impacts	Nil/ Minimal	• No impacts anticipated
Noise	Low	• Potential for construction-related noise impacts locally	Nil/ Minimal	• No impacts anticipated
Aquatic Habitat	Low	• Potential for impacts minimized as construction is within road allowances • Standard construction mitigation measures	Nil/ Minimal	• No impacts anticipated

Table 7.4 Environmental Impacts Analysis – Water Servicing Alternatives

Criteria	W1 – Extend Municipal Water Service		W3 – Do Nothing	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Aquatic Habitat		(erosion fencing etc.,) will further minimize potential for impacts • No aquatic habitat in the remainder of the Business Park		
Surface Water Quality	Low	• Potential for impacts to water quality during construction; however standard construction mitigation measures will minimize impacts	Nil/ Minimal	• No impacts anticipated
Surface Water Quantity	Nil/ Minimal	• Kincardine Drinking Water System obtains water from Lake Huron. There is sufficient capacity within the system and water source to accommodate growth within the Business Park	Nil/ Minimal	• No impacts anticipated
Source Water Protection	Nil/ Minimal	• Business Park located within IPZ-2, with a vulnerability score of 4.8 and activities associated with construction of a watermain (handling and storage of fuel) are not considered a significant threat	Nil/ Minimal	• No impacts anticipated
Erosion	Low	• Potential for impacts minimized as construction is within road allowances • Standard construction mitigation measures will minimize impacts	Nil/ Minimal	• No impacts anticipated
Physiographic Features and Soils	Low	• Native soils will be disturbed during construction	Nil/ Minimal	• No impacts anticipated
Drainage	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated

Table 7.4 Environmental Impacts Analysis – Water Servicing Alternatives

Criteria	W1 – Extend Municipal Water Service		W3 – Do Nothing	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Social Environment				
Disruption During Construction	Moderate	• Construction of watermain crossing at intersection of Russell Street and Highway 21 may disrupt traffic and may result in short delays. Construction of connection to existing system at Durham Street and Millenium Way may also result in local traffic disruptions • Standard construction mitigation measures will be implemented to minimize impacts • Construction within the undeveloped area of Business Park is not expected to cause any disruptions	Nil/ Minimal	• No impacts anticipated
Visual Impacts and Aesthetics	Low	• Visual impacts will be limited to the construction phase	Nil/ Minimal	• No impacts anticipated
Adjacent Land Uses	Low	• Adjacent land uses include residential, commercial, and agricultural uses. Given existing development in Business Park, impacts of extending the water network are expected to be minimal	Nil/ Minimal	• No impacts anticipated
Meet Official Plan Policies	Nil/ Minimal	• Meets the policies and goals of the Official Plan regarding the Business Park through the provision of services and allowing future development.	High	• Does not meet the policies and goals for servicing and future development in the Business Park
Cultural Environment				
Heritage/Cultural Resources	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated

Table 7.4 Environmental Impacts Analysis – Water Servicing Alternatives

Criteria	W1 – Extend Municipal Water Service		W3 – Do Nothing	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Archaeological Resources	Moderate	• Stage 1 archaeological assessment identified potential for archaeological resources within the Business Park. Stage 2 archaeological assessment required.	Nil/ Minimal	• No impacts anticipated
Economic Environment				
Capital Costs	Low	• Impacts of capital cost to municipality may be offset through development charges, special area charges, and/or connection fees	Nil/ Minimal	• No impacts anticipated
Operating and Maintenance Costs	Low	• Annual maintenance (watermain flushing) will be incorporated into annual system maintenance program and budget • Adds assets that will require eventual replacement in the long-term	Nil/ Minimal	• No impacts anticipated
Technical Environment				
Pedestrian/Vehicular Safety	Low	• May impact pedestrian and vehicular safety during construction of watermain crossing at Highway 21 and Russell Street. Standard construction mitigation measures (signage, flag-people) will mitigate potential for impacts	Nil/ Minimal	• No impacts anticipated
Traffic Patterns/Volumes	Moderate	• Provision of services will allow development and increase traffic within the Business Park	Nil/ Minimal	• No impacts anticipated
Compatibility and Integration with Existing Infrastructure	Low	• Sufficient capacity within the Kincardine Drinking Water System to supply the Business Park while maintaining fire flow supply and quantity • Two potential connections at intersections of	Nil/ Minimal	• No impact anticipated

Table 7.4 Environmental Impacts Analysis – Water Servicing Alternatives

Criteria	W1 – Extend Municipal Water Service		W3 – Do Nothing	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Compatibility and Integration with Existing Infrastructure		Russell Street and Highway 21, and Durham Street and Millenium Way • Compatible with existing municipal infrastructure		
Need for Maintenance	Low	• Will require annual maintenance similar to other watermain that is part of the Drinking Water System	Nil/ Minimal	• No maintenance required
Ability to Phase Implementation	Nil/ Minimal	• Construction of watermains can be phased as development occurs • A booster pumping station will be required to service the northeastern area of the Business Park	Nil/ Minimal	• Not applicable

Table 7.5 Environmental Impacts Analysis – Sanitary Sewage Servicing Alternatives

Criteria	S1 – Extend Municipal Sanitary Sewage Service		S3 – Do Nothing	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Natural Environment				
Significant Natural Features	Nil/ Minimal	• Construction of sanitary sewers will be road allowances with no stream crossings	Nil/ Minimal	• No impacts anticipated
Species at Risk	Nil/ Minimal	• Limited habitat opportunity in study area given agricultural operations and crop rotation • Construction within road allowance minimizes disturbances • No impacts anticipated	Nil/ Minimal	• No impacts anticipated
Vegetation	Nil/ Minimal	• Construction within road allowance minimizes disturbances • Study area presently used for agricultural	Nil/ Minimal	• No impacts anticipated
Air Quality	Nil/ Minimal	• Potential for construction-related impacts to air quality, locally • Standard construction mitigation measures will minimize construction-related impacts • Operation of sanitary sewers not expected to have any impacts on air quality	Nil/ Minimal	• No impacts anticipated
Noise	Low	• Potential for construction-related noise impacts locally	Nil/ Minimal	• No impacts anticipated
Aquatic Habitat	Low	• Potential for impacts minimized as construction is within road allowances • Standard construction mitigation measures (erosion fencing etc.,) will further minimize potential for impacts • No aquatic habitat in the remainder of the Business Park	Nil/ Minimal	• No impacts anticipated

Table 7.5 Environmental Impacts Analysis – Sanitary Sewage Servicing Alternatives

Criteria	S1 – Extend Municipal Sanitary Sewage Service		S3 – Do Nothing	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Surface Water Quality	Low	• Potential for impacts to water quality during construction; however standard construction mitigation measures will minimize impacts • Potential for impacts to water quality from leakages and breaks, however use of PVC sewers will minimize risk	Nil/ Minimal	• No impacts anticipated
Surface Water Quantity	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated
Source Water Protection	Nil/ Minimal	• Business Park located within IPZ-2, with a vulnerability score of 4.8 and threats associated with construction and operation of a sewer system (system that collects, transmits sewage, and handling and storage of fuel) are not considered significant threats	Nil/ Minimal	• No impacts anticipated
Erosion	Low	• Potential for impacts minimized as construction is within road allowances • Standard construction mitigation measures will minimize impacts	Nil/ Minimal	• No impacts anticipated
Physiographic Features and Soils	Low	• Native soils will be disturbed during construction	Nil/ Minimal	• No impacts anticipated
Drainage	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated
Social Environment				
Disruption During Construction	Moderate	• Construction of sewer crossing at intersection of Russell Street and Highway 21 may disrupt traffic and may result in short delays.	Nil/ Minimal	• No impacts anticipated

Table 7.5 Environmental Impacts Analysis – Sanitary Sewage Servicing Alternatives

Criteria	S1 – Extend Municipal Sanitary Sewage Service		S3 – Do Nothing	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Disruption During Construction		Construction at the connection to the sanitary sewer at Durham Street and Millenium Way may disrupt traffic locally • Standard construction mitigation measures will be implemented to minimize impacts • Construction within the undeveloped area of Business Park is not expected to cause any disruptions		
Visual Impacts and Aesthetics	Low	• Visual impacts will be limited to the construction phase	Nil/ Minimal	• No impacts anticipated
Adjacent Land Uses	Low	• Adjacent land uses include residential, commercial, and agricultural uses. Given existing development in Business Park, impacts of extending the sanitary sewer network are expected to be minimal	Nil/ Minimal	• No impacts anticipated
Meet Official Plan Policies	Nil/ Minimal	• Meets the policies and goals of the Official Plan regarding the Business Park through the provision of services and allowing future development	High	• Does not meet the policies and goals for servicing and future development in the Business Park
Cultural Environment				
Heritage/Cultural Resources	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated
Archaeological Resources	Moderate	• Stage 1 archaeological assessment identified potential for archaeological resources within the Business Park. Stage 2 archaeological assessment required	Nil/ Minimal	• No impacts anticipated

Table 7.5 Environmental Impacts Analysis – Sanitary Sewage Servicing Alternatives

Criteria	S1 – Extend Municipal Sanitary Sewage Service		S3 – Do Nothing	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Economic Environment				
Capital Costs	Low	• Impacts of capital cost to municipality may be offset through development charges, special area charges, and/or connection fees	Nil/ Minimal	• No impacts anticipated
Operating and Maintenance Costs	Low	• Annual maintenance will be incorporated into annual system maintenance program and budget • Adds assets that will require eventual replacement in the long-term	Nil/ Minimal	• No impacts anticipated
Technical Environment				
Pedestrian/Vehicular Safety	Low	• May impact pedestrian and vehicular safety during construction of sanitary sewer crossing at Highway 21 and Russell Street. Standard construction mitigation measures (signage, flag-people) will mitigate potential for impacts	Nil/ Minimal	• No impacts anticipated
Traffic Patterns/Volumes	Moderate	• Provision of services will allow development and increase traffic within the Business Park	Nil/ Minimal	• No impacts anticipated
Compatibility and Integration with Existing Infrastructure	Low	• Requires construction of trunk sewer between Russell Street and Scott street to accommodate flows from the Business Park • Requires increased capacity at the Park Street Sewage Pumping Station • Sufficient treatment capacity at the Kincardine Wastewater Treatment Plant	Nil/ Minimal	• No impact anticipated

Table 7.5 Environmental Impacts Analysis – Sanitary Sewage Servicing Alternatives

Criteria	**S1 – Extend Municipal Sanitary Sewage Service**		**S3 – Do Nothing**	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Need for Maintenance	Low	• Will require annual maintenance similar to other sanitary sewers within the existing system.	Nil/ Minimal	• No maintenance required
Ability to Phase Implementation	Nil/ Minimal	• Construction of sanitary sewers can be phased as development occurs	Nil/ Minimal	• Not applicable

Table 7.6 Environmental Impacts Analysis – Alternatives to increase capacity at the Park Street SPS

Criteria	S1. 1 – Install larger pumps and keep existing forcemain		S1.2 – Keep existing pumps and twin the forcemain		S1.3 – Install larger pumps and twin the forcemain	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Natural Environment						
Significant Natural Features	Nil/ Minimal	• New, larger pumps would be installed in existing dry pit within the station.	Moderate	• Forcemain will cross South Penetangore River	Moderate	• New, larger pumps would be installed in existing dry pit within the station • Forcemain will cross South Penetangore River
Species at Risk	Nil/ Minimal	• No impacts anticipated as work will be contained to within the station	Moderate	• Potential to impact any species at risk in the South Penetangore River	Moderate	• Potential to impact any species at risk in the South Penetangore River
Vegetation	Nil/ Minimal	• No impacts anticipated as work will be contained to within the station	Low	• Vegetation removal may be required during installation of forcemain in corridor from the Station south to Park Street	Low	• Vegetation removal may be required during installation of forcemain in corridor from the Station south to Park Street
Air Quality	Nil/ Minimal	• No impacts anticipated as work will be contained to within the station • Operation of the station with larger pumps is not expected result in odour issues	Low	• Potential for construction-related impacts to air quality, locally • Standard construction mitigation measures will minimize construction-related impacts • Operation of the twinned forcemain is not expected to result in odours	Low	• Potential for construction-related impacts to air quality, locally • Standard construction mitigation measures will minimize construction-related impacts • Operation of twinned forcemain and larger pumps not expected to result in odours

Table 7.6 Environmental Impacts Analysis – Alternatives to increase capacity at the Park Street SPS

Criteria	S1. 1 – Install larger pumps and keep existing forcemain		S1.2 – Keep existing pumps and twin the forcemain		S1.3 – Install larger pumps and twin the forcemain	
	Level of Effect	Potential Impacts	Level of Effect	Potential Impacts	Level of Effect	Potential Impacts
Noise	Low	• Potential for construction-related noise impacts locally • Requires installation of a larger standby generator which may increase noise levels locally when in use	Low	• Potential for construction-related noise impacts locally	Low	• Potential for construction-related noise impacts locally • Requires installation of a larger standby generator which may increase noise levels locally when in use
Aquatic Habitat	Nil/ Minimal	• No impacts anticipated as work will be contained to within the station	Moderate	• Potential to impact aquatic habitat in South Penetangore River	Moderate	• Potential to impact aquatic habitat in South Penetangore River
Surface Water Quality	Nil/ Minimal	• No impacts anticipated as work will be contained to within the station	Moderate	• Potential for impacts to water quality during construction of forcemain	Moderate	• Potential for impacts to water quality during construction of forcemain
Surface Water Quantity	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated
Source Water Protection	Nil/ Minimal	• SPS located within IPZ-2, with vulnerability score of 4.8 and threats associated with construction and operation of a sewer system (system that collects, transmits sewage, and handling and storage of fuel) are not considered significant threats	Nil/ Minimal	• SPS located within IPZ-2, with vulnerability score of 4.8 and threats associated with construction and operation of a sewer system (system that collects, transmits sewage, and handling and storage of fuel) are not considered significant threats	Nil/ Minimal	• SPS located within IPZ-2, with vulnerability score of 4.8 and threats associated with construction and operation of a sewer system (system that collects, transmits sewage, and handling and storage of fuel) are not considered significant threats

Table 7.6 Environmental Impacts Analysis – Alternatives to increase capacity at the Park Street SPS

Criteria	S1. 1 – Install larger pumps and keep existing forcemain		S1.2 – Keep existing pumps and twin the forcemain		S1.3 – Install larger pumps and twin the forcemain	
	Level of Effect	Potential Impacts	Level of Effect	Potential Impacts	Level of Effect	Potential Impacts
Erosion	Nil/ Minimal	• No impacts anticipated as work will be contained to within the station	Low	• Potential for impacts during construction of forcemain	Low	• Potential for impacts during construction of forcemain
Physiographic Features and Soils	Nil/ Minimal	• No impacts anticipated	Low	• Native soils will be disturbed during construction	Low	• Native soils will be disturbed during construction
Drainage	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated
Social Environment						
Disruption During Construction	Low	• Installation of pumps may result in temporary service interruption for local users	Nil/ Minimal	• Service is not expected to be interrupted during construction of the additional forcemain	Nil/ Minimal	• Installation of pumps may result in temporary service interruption for local users
Visual Impacts and Aesthetics	Nil/ Minimal	• No impacts anticipated as work will be contained to within the station	Low	• Visual impacts will be limited to the construction phase	Low	• Visual impacts will be limited to the construction phase
Adjacent Land Uses	Nil/ Minimal	• The SPS is located at the end of a residential street and entrance to the Penetangore River trail system • No impacts anticipated	Low	• The SPS is located at the end of a residential street and entrance to the Penetangore River trail system • Access to the trail system entrance at McGraw and Scott Street may be	Low	• The SPS is located at the end of a residential street and entrance to the Penetangore River trail system • Access to the trail system entrance at McGraw and Scott Street may be

Table 7.6 Environmental Impacts Analysis – Alternatives to increase capacity at the Park Street SPS

Criteria	S1. 1 – Install larger pumps and keep existing forcemain		S1.2 – Keep existing pumps and twin the forcemain		S1.3 – Install larger pumps and twin the forcemain	
	Level of Effect	Potential Impacts	Level of Effect	Potential Impacts	Level of Effect	Potential Impacts
Adjacent Land Uses				temporarily closed during construction • Adjacent residences may be impacted by noise during construction of the forcemain		temporarily closed during construction • Adjacent residences may be impacted by noise during construction of the forcemain
Meet Official Plan Policies	Nil/ Minimal	• Meets the policies and goals of the Official Plan regarding the Business Park through the provision of services and allowing future development	Moderate	• Meets the policies and goals of the Official Plan regarding the Business Park through the provision of services • Does not provide sufficient capacity for future development	Nil/ Minimal	• Meets the policies and goals of the Official Plan regarding the Business Park through the provision of services and allowing future development
Cultural Environment						
Heritage/Cultural Resources	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated
Archaeological Resources	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated given the area has previously been disturbed during construction of the existing forcemain	Nil/ Minimal	• No impacts anticipated given the area has previously been disturbed during construction of the existing forcemain
Economic Environment						
Capital Costs	Moderate	• Cost estimated between $840,000 and $960,000	Moderate	• Cost estimated at $960,000	Moderate	• Cost estimated at $1,920,000

Table 7.6 Environmental Impacts Analysis – Alternatives to increase capacity at the Park Street SPS

Criteria	S1. 1 – Install larger pumps and keep existing forcemain		S1.2 – Keep existing pumps and twin the forcemain		S1.3 – Install larger pumps and twin the forcemain	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
		• Least expensive option				
Operating and Maintenance Costs	Low	• Replaces aged assets • Will not add significant operating and maintenance costs	Low	• Adds an asset that will require eventual replacement in the long-term	Low	• Replaces aged assets • Adds an asset that will require eventual replacement in the long-term
Technical Environment						
Pedestrian/Vehicular Safety	Nil/ Minimal	• No impacts anticipated	Low	• Construction of forcemain may temporarily close access to the Kincardine trail system from McGraw and Scott Street	Low	• Construction of forcemain may temporarily close access to the Kincardine trail system from McGraw and Scott Street
Traffic Patterns/Volumes	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated
Compatibility and Integration with Existing Infrastructure	Moderate	• Larger pumps require greater power costs, including need for a larger standby power system • Larger pumps will increase the risk of forcemain failure • Modifications to power supply and pump control system are likely required	Low	• No electrical or standby power upgrades required • Will require modifications to the existing bypass valve chamber and lagoon inlet chamber to accommodate the second forcemain	Moderate	• Larger pumps require greater power costs, including need for a larger standby power system • Larger pumps will increase the risk of forcemain failure • Modifications to power supply and pump control system are likely required • Will require modifications to the existing bypass valve

Table 7.6 Environmental Impacts Analysis – Alternatives to increase capacity at the Park Street SPS

Criteria	S1. 1 – Install larger pumps and keep existing forcemain		S1.2 – Keep existing pumps and twin the forcemain		S1.3 – Install larger pumps and twin the forcemain	
	Level of Effect	Potential Impacts	Level of Effect	Potential Impacts	Level of Effect	Potential Impacts
Compatibility and Integration with Existing Infrastructure						chamber and lagoon inlet chamber to accommodate the second forcemain
Need for Maintenance	Nil/ Minimal	• Maintenance requirements are similar to those of the existing pumps	Nil/ Minimal	• Maintenance requirements will be similar to those of the existing forcemain	Nil/ Minimal	• Maintenance requirements will be similar to those of the existing pumps and forcemain
Ability to Phase Implementation	Moderate	• Cannot be phased	Low	• Additional capacity could be achieved with pump replacements	Moderate	• Cannot be phased

Table 7.7 Environmental Impacts Analysis – Stormwater Servicing Alternatives

Criteria	SW1 – Extend/add municipal stormwater services		SW2 – Individual, lot-level stormwater services		SW3 – Do Nothing	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Natural Environment						
Significant Natural Features	Nil/ Minimal	• Construction of ponds and installation of storm sewers is not anticipated to have impacts on any significant natural features.	Moderate	• Siting of lot level controls may impact developable land near the erosion area, south of the Russell Street extension, adjacent to the Holtby Drain.	Nil/ Minimal	• No impacts anticipated
Species at Risk	Nil/ Minimal	• Limited habitat opportunity in study area given agricultural operations and crop rotation • Construction within road allowance minimizes disturbances • No impacts anticipated	Low	• Limited habitat opportunity in study area given agricultural operations and crop rotation	Nil/ Minimal	• No impacts anticipated
Vegetation	Low	• Vegetation will be removed for construction of detention ponds • Construction within road allowance minimizes disturbances • Study area is presently used for agricultural purposes	Low	• Type of lot-level control will determine impacts to vegetation	Nil/ Minimal	• No impacts anticipated.

Table 7.7 Environmental Impacts Analysis – Stormwater Servicing Alternatives

Criteria	SW1 – Extend/add municipal stormwater services		SW2 – Individual, lot-level stormwater services		SW3 – Do Nothing	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Air Quality	Low	• Potential for construction-related impacts to air quality, locally. • Standard construction mitigation measures will minimize construction-related impacts • Operation of detention pond and storm sewers not expected to have impacts on air quality	Low	• Potential for construction-related impacts to air quality, locally.	Nil/ Minimal	• No impacts anticipated
Noise	Low	• Potential for construction-related noise impacts locally.	Low	• Potential for construction-related noise impacts locally.	Nil/ Minimal	• No impacts anticipated
Aquatic Habitat	Low	• Potential for impacts minimized as construction is within road allowances and ponds are sited away from aquatic habitat (Holtby Drain) • Standard construction mitigation measures (erosion fencing etc.,) will further minimize potential for impacts	Moderate	• Lot level controls may impact aquatic habitat depending on siting specifically if, adjacent to the Holtby Drain.	Nil/ Minimal	• No impacts anticipated

Table 7.7 Environmental Impacts Analysis – Stormwater Servicing Alternatives

Criteria	SW1 – Extend/add municipal stormwater services		SW2 – Individual, lot-level stormwater services		SW3 – Do Nothing	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Aquatic Habitat		• No aquatic habitat in the remainder of the Business Park • Ponds will provide quality and quantity controls to minimize potential impacts downstream of outlets				
Surface Water Quality	Low	• Wet ponds include quality control areas designed to minimize potential impacts	Moderate	• Level of treatment of water quality treatment will depend on the types of lot-level stormwater control measures implemented	Nil/ Minimal	• No impacts anticipated
Surface Water Quantity	Low	• Ponds designed with extended detention volume component for up to 1:100 storm event	Moderate	• Water quantity controls will depend on the types of lot level stormwater control measures implemented	Nil/ Minimal	• No impacts anticipated
Source Water Protection	Nil/ Minimal	• The Business Park located within IPZ-2, with a vulnerability score of 4.8 and the threat associated with construction of a stormwater system (storage of fuel) is not considered a significant threat	Nil/ Minimal	• The Business Park located within IPZ-2, with a vulnerability score of 4.8 and the threat associated with construction of a stormwater system (storage of fuel) is not considered a significant threat	Nil/ Minimal	• No impacts anticipated

Table 7.7 Environmental Impacts Analysis – Stormwater Servicing Alternatives

Criteria	SW1 – Extend/add municipal stormwater services		SW2 – Individual, lot-level stormwater services		SW3 – Do Nothing	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Erosion	Nil/ Minimal	• Standard construction mitigation measures will be implemented to minimize impacts during construction of ponds • Construction of storm sewers is within road allowances, minimizing impacts	Low	• Potential for impacts will vary with types of lot-level stormwater services installed and methods of construction.	Nil/ Minimal	• No impacts anticipated
Physiographic Features and Soils	Low	• Native soils will be disturbed during construction	Low	• Native soils will be disturbed during construction	Nil/ Minimal	• No impacts anticipated
Drainage	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated
Social Environment						
Disruption During Construction	Low	• May be local disruptions resulting from increased truck traffic during construction	Low	• Expected that lot-level controls will be installed as properties are developed	Nil/ Minimal	• No impacts anticipated
Visual Impacts and Aesthetics	Low	• Ponds will be landscaped to increase aesthetic appeal	Low	• Property owners will be responsible for maintaining lot-level controls and their appearance	Nil/ Minimal	• No impacts anticipated

Table 7.7 Environmental Impacts Analysis – Stormwater Servicing Alternatives

Criteria	SW1 – Extend/add municipal stormwater services		SW2 – Individual, lot-level stormwater services		SW3 – Do Nothing	
	Level of Effect	**Potential Impacts**	**Level of Effect**	**Potential Impacts**	**Level of Effect**	**Potential Impacts**
Adjacent Land Uses	Nil/ Minimal	• Will provide stormwater control for some areas external to the Business Park		• Impacts will depend on the type of lot-level controls installed	Nil/ Minimal	• No impacts anticipated
Meet Official Plan Policies	Nil/ Minimal	• Meets the policies and goals of the Official Plan regarding the Business Park through the provision of services and allowing future development	Moderate	• Does not meets the policies and goals of the Official Plan regarding the Business Park through the provision of municipal services where services are available	High	• Does not meet the policies and goals of the Official Plan regarding the Business Park through the provision of services and allowing future development
Cultural Environment						
Heritage/Cultural Resources	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated
Archaeological Resources	Moderate	• Stage 1 archaeological assessment identified potential for archaeological resources within the Business Park. Stage 2 archaeological assessment required	Moderate	• Stage 1 archaeological assessment identified potential for archaeological resources within the Business Park. Stage 2 archaeological assessment required	Nil/ Minimal	• No impacts anticipated
Economic Environment						
Capital Costs	Moderate	• Total cost for ponds and storm sewers for remainder of the Business Park is $2,630,000	Nil/ Minimal	• Cost borne by property owners	Nil/ Minimal	• No impacts anticipated

Table 7.7 Environmental Impacts Analysis – Stormwater Servicing Alternatives

Criteria	SW1 – Extend/add municipal stormwater services		SW2 – Individual, lot-level stormwater services		SW3 – Do Nothing	
	Level of Effect	Potential Impacts	Level of Effect	Potential Impacts	Level of Effect	Potential Impacts
Operating and Maintenance Costs	Low	• Maintenance includes cleaning debris from outlet structures and forebays, landscaping, and annual cleaning of catch basins	Nil/ Minimal	• Property owners will be responsible for maintenance	Nil/ Minimal	• Replaces aged assets • Adds an asset that will require eventual replacement in the long-term
Technical Environment						
Pedestrian/Vehicular Safety	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated
Traffic Patterns/Volumes	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated	Nil/ Minimal	• No impacts anticipated
Compatibility and Integration with Existing Infrastructure	Nil/ Minimal	• Portion of the storm sewers will outlet to the existing stormwater pond in the Business Park	Moderate	• Potential for wide range of stormwater controls	Nil/ Minimal	• No impacts anticipated
Need for Maintenance	Low	• Maintenance includes cleaning debris from outlet structures and forebays, landscaping, and annual cleaning of catch basins	Low	• Maintenance will be responsibility of property owners	Nil/ Minimal	• No impacts anticipated
Ability to Phase Implementation	Nil/ Minimal	• Storm sewers and ponds can be phased as development occurs		• Lot level services will be installed as development occurs	Nil/ Minimal	• Not applicable

7.5 Comparative Analysis

Tables 7.8 to 7.12 provides a summary of the key considerations for each of the servicing alternatives. The table outlines benefits and impacts that were identified as significant during the initial evaluation of alternatives. Potential mitigation measures for the identified impacts are also presented.

Table 7.8 Comparative Analysis of Benefits and Impacts of Transportation Alternatives

Alternative Solution	Anticipated Benefits	Potential Impacts	Potential Mitigation
TR1 – Road Pattern 1	• Provides two additional points of access to the Business Park from Highway 21 (at Russell St.) and Highway 9 (at Durham St. extension) • Will allow future development in the remainder of the Business Park • Meets policy goals of the Official Plan • Construction can be phased • Is the configuration preferred by the MTO	• Air Quality	• Standard construction mitigation measures will minimize construction related impacts
		• Construction of new intersections with Highway 21 and 9 may result in short-term disruptions to traffic flow	• Implement standard construction mitigation measures to control traffic flow
		• Archaeological Resources	• Undertake a Stage 2 Archaeological Assessment
		• Increased traffic volumes	• Addition of turning lanes, signal changes, new signals as traffic levels warrant
TR1 – Road Pattern 2	• Provides two additional points of access to the Business Park from Highway 21 (at Russell St.) and Highway 9 (at Durham St. extension) • Will allow future development in the remainder of the Business Park	• Air Quality	• Standard construction mitigation measures will minimize construction related impacts
		• Construction of new intersections with Highway 21 and 9 may result in short-term disruptions to traffic flow	• Implement standard construction mitigation measures to control traffic flow

Table 7.8 Comparative Analysis of Benefits and Impacts of Transportation Alternatives

Alternative Solution	Anticipated Benefits	Potential Impacts	Potential Mitigation
TR1 – Road Pattern 2	• Meets policy goals of the Official Plan • Construction can be phased • Is the configuration less preferred by the MTO	• Archaeological Resources	• Undertake a Stage 2 Archaeological Assessment
		• Increased traffic volumes	• Addition of turning lanes, signal changes, new signals as traffic levels warrant
TR3 – Do Nothing	• Least costly option • Fewest environmental impacts	• Will not allow future development in the remainder of the Business Park	• Unable to mitigate against loss of development potential
		• Does not meet the goals and objectives of the Official Plan	• Unable to mitigate

Table 7.9 Comparative Analysis of Benefits and Impacts of Water Servicing Alternatives

Alternative Solution	Anticipated Benefits	Potential Impacts	Potential Mitigation
W1 – Extend municipal water services	• Sufficient supply capacity • Construction will be within road allowances, minimizing environmental impacts • Will allow future development within the Business Park • Meets the objectives and goals of the Official Plan • Will allow a loop between Russell Street and Durham Street • Can be phased	• Construction of watermain crossing at Highway 21 and Russell Street may result in short-term traffic disruptions	• Implement standard construction mitigation measures to control traffic flow
		• Archaeological Resources	• Undertake a Stage 2 Archaeological Assessment
W3 – Do Nothing	• Least costly option • Fewest environmental impacts	• Will not allow future development in the remainder of the	• Unable to mitigate against loss of development potential

Table 7.9 Comparative Analysis of Benefits and Impacts of Water Servicing Alternatives

Alternative Solution	Anticipated Benefits	Potential Impacts	Potential Mitigation
W3 – Do Nothing		Business Park	
		• Does not meet the goals and objectives of the Official Plan	• Unable to mitigate

Table 7.10 Comparative Analysis of Benefits and Impacts of Sanitary Sewage Servicing Alternatives

Alternative Solution	Anticipated Benefits	Potential Impacts	Potential Mitigation
S1 – Extend municipal sanitary sewage services	• Sufficient treatment capacity • Construction will be within road allowances, minimizing environmental impacts • Will allow future development within the Business Park • Meets the objectives and goals of the Official Plan • Can be phased	• Construction of sanitary sewer crossing at Highway 21 and Russell Street may result in short-term traffic disruptions	• Implement standard construction mitigation measures to control traffic flow
		• Archaeological Resources	• Undertake a Stage 2 Archaeological Assessment
		• Will require new trunk sewer on Russell Street	• New asset, with construction in an established road allowance
		• Requires upgrades at Park Street SPS to increase capacity	• Impacts and mitigation will depend on upgrade alternative chosen (see Table 7.11)
S3 – Do Nothing	• Least costly option • Fewest environmental impacts	• Will not allow future development in the remainder of the Business Park	• Unable to mitigate against loss of development potential
		• Does not meet the goals and objectives of the Official Plan	• Unable to mitigate

Table 7.11 Comparative Analysis of Benefits and Impacts of Alternatives for Increasing Capacity at the Park Street SPS

Alternative Solution	Anticipated Benefits	Potential Impacts	Potential Mitigation
S1.1 – Install larger pumps	• Will provide sufficient capacity to service Business Park • Construction will occur within the existing station, limiting the potential for environmental impacts • Least expensive option • Replaces aged assets	• Requires electrical and control upgrades in the station	• Unable to mitigate
		• Increased risk of forcemain failure with use of larger pumps	• Unable to mitigate
		• Cannot be phased	• Unable to mitigate
S1.2 – Twin the forcemain	• Provides some increase in capacity	• Does not provide enough capacity to service entire Business Park	• Unable to mitigate against loss of development potential
		• Must cross Penetangore River, increasing potential for environmental impacts	• Implement standard construction mitigation measures • Install via trenchless technologies
S1.3 – Install larger pumps and twin the forcemain	• Will provide sufficient capacity to service Business Park	• Most expensive option	• Unable to mitigate
		• Must cross Penetangore River, increasing potential for environmental impacts	• Implement standard construction mitigation measures • Install via trenchless technologies

Table 7.12 Comparative Analysis of Benefits and Impacts of Stormwater Servicing Alternatives

Alternative Solution	Anticipated Benefits	Potential Impacts	Potential Mitigation
SW1– Extend/add municipal stormwater services	• Ponds will provide water quality and quantity controls up to the 1:100 year storm • Services the Business Park and some external lands • Consistent with existing stormwater servicing in the Business Park • Can be phased • Meets objectives and goals of the Official Plan	• Cost for two ponds and storm sewers estimated at approximately 2.6 million	• Collect for through development charges
		• Archaeological resources	• Undertake Stage 2 Archaeological Assessment
SW2 – Individual, Lot-level controls	• Least costly • Property owners responsible for construction and maintenance of stormwater infrastructure on their property	• Environmental impacts will vary with types of stormwater controls constructed	• Mitigation will vary with construction methodologies
		• Lot level controls may not be sufficient for the larger storm events	• Provision of additional facilities to accommodate large storm events
		• May reduce amount of developable land	• Unable to mitigate
SW3 – Do Nothing	• Least expensive option	• Does not provide sufficient stormwater control for future development	• Unable to mitigate
		• Does not meet the goals and objectives of the Official Plan	• Unable to mitigate

7.6 Identification of Preferred Servicing Strategies

The outcome of the evaluation of the identified alternatives is the selection of the preferred strategies for transportation, water, sanitary sewage and stormwater servicing for the remainder of the Kincardine Business Park. Given the environmental impacts as outlined in Tables 7.3 to 7.7 and potential benefits and impacts summarized in Tables 7.8 to 7.12, the preferred servicing strategies are:

- TR1 – Road Pattern 1;
- W1 - Extending municipal water services to the remainder of the Business Park;
- S1 – Extending municipal sanitary sewage services to the remainder of the Business Park;
    - S1.1 – Constructing a new trunk sanitary sewer on Russell Street and installing larger pumps to increase capacity at the Park Street SPS; and
- SW1 – Extending and adding municipal stormwater services for the remainder of the Business Park

The following are the key attributes associated with identifying these strategies as the preferred options:

- The preferred servicing strategies address the opportunity to provide services in a manner that is integrated and coordinated with the existing infrastructure in the Business Park;
- Will allow future development, as envisioned in the Official Plan, in the remainder of the Business Park;
- Most of the services will be located within road allowances to maximize the amount of developable land available; and
- With respect to the Park Street SPS, the installation of larger pumps is the most economical option that provides additional capacity. It also has the least potential for environmental impacts.

8.0 CONSULTATION

Public consultation represents an integral part of the Master Planning process. During this study, a consultation program was implemented to obtain input on key study issues from the general public, government review agencies, and key stakeholders. Information gathered through this process was incorporated into the analysis of future servicing needs and the evaluation of alternatives. The following subsections summarize the consultation program.

8.1 Public Consultation

Comments were solicited from local residents by way of public notice and a public information meeting. The notice summarized the purpose and intent of the Master Plan study and requested comments from interested persons. The notice was issued in the January 25, 2011 and February 1, 2011 editions of the Kincardine News and Kincardine Independent. A public meeting was held March 27, 2013 at the Municipal Administration Building from 7 p.m to 9 p.m. Notices for the meeting were published in the two local newspapers, two consecutive weeks prior to the meeting date. Copies of both the initial and public meeting notices, and the presentation slides from the public meeting are included in Appendix 3 of this report.

The general purpose of the public meeting was to provide audience members with the following:

- A summary of the Master Plan process;
- A review of background information relating to Kincardine Business Park;
- Review of potential transportation, water, sanitary sewage, and stormwater servicing strategies;
- Review of preliminary costs;
- An overview of the next steps in the EA process; and
- An opportunity to ask questions or bring forward comments relating to the Master Plan.

Approximately 16 residents and stakeholders were in attendance for the public meeting. The following table (Table 8.1) summarizes the comments and questions raised during the public meeting.

Table 8.1 Summary of Comments and Questions from the Public Meeting

Question/Comment	**Study Team Response**
Is electrical servicing included in the cost estimates?	Street lighting is included, but the cost of servicing properties is not
Is it possible to attract a gas station to the Business Park and associate it with a tourist booth	Both are permitted uses within the Business Park
Should lobby Canadian Tire to put in a Marks Work Warehouse	Beyond the scope of the Servicing Master Plan
What is the timing for construction?	Timing is complicated by different ownership of parcels within the Business Park. Will depend on development interest
When will the Master Plan be completed	Once consultation with review agencies regarding the servicing options is completed
Could the Municipality offer incentives to developers?	The Municipality could offer incentives but it is up to Council to decide that
How much commercial land is available in Goderich, as a matter of comparison. If a developer has to pay $80,000 to develop, why would they develop in Kincardine?	The cost of infrastructure reflects sizing requirements. Similar infrastructure would cost a similar amount in a different municipality

8.2 Review Agency Consultation

Input into the study process was solicited from 12 review agencies by way of direct mail correspondence. Agencies were sent a general project summary, which provided background information on the study, outlined the Master Plan process and the scope of the investigations. The information was circulated on January 26, 2011 and agencies were requested to forward comments on the project by March 23, 2011. A copy of the letter and a list of the agencies circulated is included in Appendix 3.

The comments received in response to the project are summarized below in Table 8.2 and included in Appendix 3.

Table 8.2 Summary of Comments Received from Review Agencies

Review Agency	Comments/Concerns	Response
Ministry of the Environment (MOE) February 4, 2011 (via fax)	• Interest in understanding how the proposed development may impact the watercourse which flows through the southerly portion of the property (in the context of mainly stormwater management) • Notes that present flows to the municipal sewage treatment facility are approaching 80% of its approved capacity and therefore the implications of the development of the business park upon near term available capacity and potentially the need for expansion in the near-term.	• Servicing study will include stormwater component
Ministry of Municipal Affairs and Housing (MMAH) February 24, 2011 (letter)	• Recommend consideration of Provincial Policy Statement policies in their entirety in developing the proposed Master Plan. • Water supply, stormwater drainage and sanitary sewage collection systems should be provided in a manner that are of an appropriate size and type to accommodate present and future requirements 2) can be sustained by the water resources upon which these services rely 3)are located and designed in accordance with provincial standards; 4) are financially viable and comply with all other regulatory requirements; 5) promote water conservation and water use efficiency; 6) protects human health and the natural environment. • Ensure municipal and County policies regarding water supply, stormwater drainage and sanitary sewage collection are integrated into the Master Plan process • Should ensure transportation systems are: 1) safe, energy efficient and facilitate the movement of people and goods; 2) appropriate to address projected needs; 3) use existing and planned infrastructure efficiently; 4) integrate transportation and land-use considerations at all stages of	• Noted. Policies from the Provincial Policy Statement, municipal and Official Plans will be reviewed as part of the Master Plan process (see Section 2.7)

Table 8.2 Summary of Comments Received from Review Agencies

Review Agency	Comments/Concerns	Response
Ministry of Municipal Affairs and Housing (MMAH) February 24, 2011 (letter)	the planning process; 5) connectivity within and among transportation systems and modes is maintained. • Ensure municipal and County policies regarding transportation are integrated into the Master Plan process.	
Grey Bruce Public Health Unit (GBPHU) March 21, 2011 (via email and letter)	• Please review the following considerations for the development of the Kincardine Business Park • Environment – ensure the proposed development is compatible with neighbouring uses from a community health perspective including industrial and commercial emissions, nuisance noise and odour impacts • Ensure the proposed development is designed to improve rather than diminish air and water quality for the community through the preservation of green space. • Promote sustainable green building and development approaches (e.g., LEED standards), to reduce reliance on traditional energy systems, conserve energy and protect air quality. • Ensure the transportation network prioritizes active modes of transportation (e.g., walking, cycling) to decrease use of single occupancy motor vehicles and reduce motor vehicle trips. • Design the transportation network in a way that ensures access for all modes of transportation, with specific attention to active transportation and pedestrian needs. • Ensure the provision of active transportation infrastructure that is safe, accessible, barrier-free and aesthetically pleasing, and that is connected to the street system with direct and convenient links to adjacent uses, residential, commercial and recreational spaces. • Provide green spaces for people to meet and congregate.	• Land uses are governed by the Official Plan and Zoning By-law policies and are not proposed as part of this Master Plan. • Provision of sidewalks included in transportation alternatives
Saugeen Valley Conservation Authority (SVCA) March 23, 2011 (mail and fax)	• Subject area includes Environmental Protection (EP) lands. Located in the EP is Holtby Drain, which would flood under a regulatory event. Mapping is available • Portions of the area are subject to SVCA's Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation (Ontario Regulation 169/06). Mapping of these areas is available • Written permission of SVCA required prior to the commencement of site alteration related to proposal within SVCA's regulated area.	• Noted

Table 8.2 Summary of Comments Received from Review Agencies

Review Agency	Comments/Concerns	Response
Saugeen Valley Conservation Authority (SVCA) March 23, 2011 (mail and fax)	• As construction plans become available they should be forwarded to SVCA for review. • With respect to the proposed extension of Russell Street, subject area appears to be adjacent to a natural slope for the Holtby Drain. Design and location of the road should ensure that the road is not affected by the hazard or does it create or aggravate an existing hazard • Street A appears to bisect a portion of the Holtby Drain floodplain. No negative effect upstream or downstream on the Holtby Drain should be created from the placement and installation of roads. • Mapping of the extended floodplain is available from the SVCA. • Should an outlet to the Holtby Drain be required a permit from the SVCA will be required. • Any future stormwater management facilities should maintain an appropriate setback from the top of the slope to ensure slope stability is not affected. Water quality and quantity should be reviewed and addressed as part of future studies and reports. • At this time, SVCA does not foresee any concerns over the proposed routing of sanitary service. SVCA does not foresee any concerns should water services follow the approximate location of the sanitary services.	• Concerns to be addresses during design and approval
Ministry of Transportation (MTO) April 23, 2013 (email)	• Reviewed draft Servicing Plan • Suggest use of 2% growth rate for purpose of study • An analysis for each major phase of development and 5,10 year horizons beyond full build-out of the site are required per MTO Guidelines for the Preparation of Traffic Impact Studies • The distance between Highway 21 and Millenium Way is approximately 150 m and contains 3 access points. The site traffic assignment along this road may cause traffic operation problems for intersections and site access. The consultant is to identify other viable options to reduce site traffic through this link. • The Highway 21 distance between Highway 9 and Durham Street is approximately 325 m long. The distance is not adequate for single back-to-back left turns lanes to service projected left-turning traffic volumes. The consultant is to identify any required geometric improvements or other	• 2015 update of Traffic Impact Study addressed concerns related to projections • Additional concerns to be addressed through the design and approval process.

Table 8.2 Summary of Comments Received from Review Agencies

Review Agency	Comments/Concerns	Response
Ministry of Transportation (MTO) April 23, 2013 (email)	viable options to accommodate future left-turning traffic volume. • The private drive access point with Russell Street is in close proximity to Highway 21 and may cause traffic operational problems for the intersection of Highway 21 and Russell Street. We recommend consideration of relocating the access point. • The report assessed the requirement for traffic signal installation as a result of development at the intersection of Highway 21 and Russell Street. The consultant is required to include any required geometric improvements in the revised report. • Should access geometric improvements requirements for existing signalized intersections and calculate required storage lanes. • Provisions must be in place to protect highway ditches during construction • Requires analysis for the storm events for both the pre-development and post-development conditions showing no increase in flow towards either Highway 21 or 9 drainage systems after post-development. • Must demonstrate there is no negative impacts upstream or downstream to Highway 21 and Highway 9 drainage systems (up to and including the 100-year storm event) because of this development or failure of the proposed drainage works • Does not recognize any benefit from the attenuation of stormwater runoff using parking lot or rooftop storage where control is achieved by orifice devices • Report indicates that Business Park development may be done in phases but no indication of the stormwater control during the development and if not all phases developed at the same time is there efficient stormwater management in place. • MTO permits are required for all grading/construction located within 800 m of the Highway 21 and 9 property limits. MTO will require all new commercial building and structures, including stormwater management ponds/facilities be setback a minimum of 14 m from Highway 21 and 9 property limits.	• To be finalized in conjunction with final design. • MTO Class EAs to address specific details related to work in the MTO road allowance.

Table 8.2 Summary of Comments Received from Review Agencies

Review Agency	Comments/Concerns	Response
Ministry of Transportation (MTO) April 23, 2013 (email)	• MTO permits are required to fall visible signs proposed to be located within 400 m of the Highway 21 and 9 property limits. • MTO permits are required for all access points to Highway 21 and 9 • MTO permits are required for all encroachments proposed to be located, both above and below ground within the Highway 21 and 9 property limits.	
Saugeen Valley Conservation Authority (SVCA) October 28, 2016 (email)	• SVCA has reviewed the proposed servicing plan. • It appears the proposed stormwater pond in the southwest corner of the property may be located with SVCA's Regulated Area and within the valley slope setback of the Holtby Municipal Drain. Th extension east of Russell Street may also intersect this area and Street 'A' may be in the floodplain of the Holtby Drain. These proposals would require permission from the SVCA permit to Alter a Regulated Area or Watercourse. • Note alternations to the valley of watercourse may not be acceptable to SVCA staff; alterations to the floodplain of watercourse may not be acceptable to SVCA staff; alterations within the slope setback of a steep slope may not be acceptable to SVCA staff; and please confirm access for maintenance purposes to the Holtby Drain is available within the proposed southwest pond design and roadways. • A new stormwater pond was constructed with the new hotel. Has this pond been considered in the report? • The drainage characteristics of the land that the pond will be installed upon are being altered as part of this proposal and need to be accounted for by the report (permeability, runoff, etc.,) • Have field tile outlets been factored into the stormwater plan, pre and post development. Phasing of development may impacts these tiles if present. • Please clarify the allowable proposed impervious area of the proposed development areas. The SVCA is not clear how impervious roadway surfaces, ponds, boulevards have been factored into the allowable impermeable calculations for the developable lands • A portion of the southwest stormwater management pond is not within Phase 1 servicing lands.	• Comments noted. • Clarification and modifications as required by the SVCA will be provided through future stages of the design and approval process.

Table 8.2 Summary of Comments Received from Review Agencies

Review Agency	Comments/Concerns	Response
Saugeen Valley Conservation Authority (SVCA) October 28, 2016 (email)	• The central proposed pond is shared between two phases of the proposed development. The pond would need to be part of one phase or another. • The SVCA is aware there has been local interest to provide habitat in stormwater ponds. Could habitat enhancement components be added to the proposed ponds? • Additional details are needed with regards to lot grading and sediment control as the process proceeds for SVCA review. • Proposed roadways are indicating development lands will extent to the east in the future. No development potential has been taken into consideration upstream of lot 4. Perhaps a drainage route, or capacity for that future development can be included in the proposed. • There are proposed watermains to cross the valley and watercourse to the south (Holtby Drain). While not necessarily unacceptable, permission will be required from the SVCA and these features would need to be designed to not impact the watercourse and be done in the appropriate time of the year. • Generally, this proposal is acceptable to SVCA provided the above comments are addressed. SVCA will be involved with the EA review process and will provide additional review comments when more details plans are provided for review.	
Ministry of Transportation (MTO) January 23, 2017 (email)	• Reviewed the revised Servicing Plan • Turning movements counts were conducted in 2012-2013 and may not have the new traffic from developments after that period. Suggest the consultant use more current volumes to reflect current conditions. This update can be done by addendum of the Traffic Impact Study. • Rational method should be use for areas under 100 ha • Ministry does not allow the use of orifice plates as a means of control. A section of reducer pipe with an inside diameter equivalent to the inside diameter of the orifice design is acceptable. • Indication is that the ponds are going to outlet into the Highway 21 ditch and Holtby Drain. How is this being accomplished when pond 2 is located in the middle of the industrial park?	• Agreed that upon application for new development, the traffic study will be updated to reflect current count information • Other items are noted and will be addressed in conjunction with future design and approvals.

Table 8.2 Summary of Comments Received from Review Agencies

Review Agency	Comments/Concerns	Response
Ministry of Transportation (MTO) January 23, 2017 (email)	• MTO wants to ensure there is adequate setback for entrances and municipal road intersections. The configuration shown should consider adequate spacing for future warranted turning lanes and other traffic impact mitigation measures for any entrance or intersection that is expected to intensify. • In review of configurations TR1 and TR2, MTO's preference would be for TR1 because this configuration would allow for more future traffic mitigation measures when the developments intensify and to protect the highway intersection for additional future traffic mitigation measures. • Previous MTO comments recommended the reconsideration of this access point. MTO would like to reiterate this comment as any access point that is in close proximity to the intersection will limit future traffic mitigation measures. • MTO will require further details of the proposed utility extensions crossing Highway 21, including construction method, geotechnical details, depth and location of crossing, casing detail and impacts to highway traffic. MTO may require the municipality to enter into a legal agreement to address items such as relocation responsibilities and indemnification. • Prior to final approval, the MTO will require a review of all access points in the Business Park to ensure visibility triangles are designed to meet the minimum dimensions.	

8.3 First Nation and Métis Consultation

To identify First Nations and Métis communities that may have an interest in the Servicing Master Plan, federal and provincial agencies were consulted. The following communities were sent a letter outlining the project (included in Appendix 3) The letter was mailed January 26, 2011 to the following communities:

- Chippewas of Nawash Unceded First Nation;
- Chippewas of Saugeen First nation;
- Grey-Bruce Peninsula Métis Council;
- Historic Saugeen Métis; and
- Métis Nation of Ontario.

The letter included information regarding the proposed Servicing Master Plan and key map. A log of correspondence with First Nation and Métis communities is provided in Table 8.3. Copies of all correspondence sent is included within Appendix 3.

Table 8.3 First Nation and Métis Community Correspondence Log

First Nation or Métis Contact	Date	Type of Contact	Details/Response
Historic Saugeen Metis	January 26, 2011	Letter sent by BMROSS	Project initiation letter • Received fax on February 4, 2011 from Audrey Erin Holden, Lands and Resources Consultation Coordinator. Requested any copies of all archaeological studies relating to the Kincardine Business Park.
Chippewas of Nawash Unceeded First Nation	January 26, 2011	Letter sent by BMROSS	Project initiation letter • No response received
Chippewas of Saugeen First Nation	January 26, 2011	Letter sent by BMROSS	Project initiation letter • No response received
Grey-Bruce Peninsula Métis Council	January 26, 2011	Letter sent by BMROSS	Project initiation letter • No response received
Métis Nation of Ontario	January 26, 2011	Letter sent by BMROSS	Project initiation letter • No response received
Ministry of Aboriginal Affairs	January 26, 2011	Letter sent by BMROSS	Project initiation letter • No response received
Indian and Northern Affairs of Canada	January 26, 2011	Letter sent by BMROSS	Project initiation letter and request for information • Email response received February 4, 2011. Provided additional information on identifying First Nation and Métis communities that may have an interest in the project.
Chippewas of Nawash Unceeded First Nation	March 12, 2013	Letter sent by BMROSS	Notice of Public Information Centre sent • No response received

Table 8.3 First Nation and Métis Community Correspondence Log

First Nation or Métis Contact	Date	Type of Contact	Details/Response
Chippewas of Saugeen First Nation	March 12, 2013	Letter sent by BMROSS	Notice of Public Information Centre sent • No response received
Métis Nation of Ontario	March 12, 2013	Letter sent by BMROSS	Notice of Public Information Centre sent • No response received
Historic Saugeen Métis	March 12, 2013	Letter sent by BMROSS	Notice of Public Information Centre sent • No response received
Grey-Bruce Peninsula Métis Council	March 12, 2013	Letter sent by BMROSS	Notice of Public Information Centre sent • No response received
Historic Saugeen Métis	April 23, 2014	Report sent by BMROSS	Copy of the Stage 1 Archaeological Assessment for the Kincardine Business Park mailed

Upon finalization of the Master Plan document, the First Nation and Métis communities will be mailed a copy of the Notice of Completion.

8.4 Stakeholders

The study team met with local property owners, developers and other stakeholders on October 22, 2010 at the Davidson Centre in Kincardine. The meeting provided an opportunity for the study team to discuss the Master Plan process and associated works, the history of development in the Business Park, as well as solicit input on potential future developments. The questions and comments raised during the stakeholder meeting are summarized in Table 8.4.

Table 8.4 Summary of Input from Oct 22, 2010 Stakeholder Meeting

Question/Comment	Study Team Response
Is the distance that is required from the intersection of Highway 9 and Highway 21 to the future intersection of Highway 9 and the Durham Street extension based on speed? If the speed limit is lowered, would that reduce the distance requirements?	The distance between the Highway 9/21 intersection and Highway 9/Durham Street extension intersection is the minimum distanced previously negotiated with the MTO, based on MTO guidelines.
Has the replacement of the Russell Street trunk sewer been included in the capital budget?	Russell Street trunk sewer is not in the capital budget, but the project does have agency approval.
Is the traffic on Highway 21 going to be evaluated? Would highway upgrades be done all at once?	A traffic study will be completed as part of the Master Plan. It is unlikely all highway upgrades would be done at the same time as a result of costs.
Will any more entrances be allowed on Highway 9? Noted issues with people trying to find the entrance to Boston Pizza.	Unlikely the MTO would allow current agricultural accesses be converted to road access. The MTO mandate does not include providing access for commercial activities.
What is the development process from an agricultural perspective?	Farmers can continue to farm their land, but if they decided to service their lands there are two commonly used methods municipalities use to charge for servicing land. The first method is Development Charges, which collects monies for services once a building permit is issued. The second method is implementing a by-law under the Municipal Act. A key part of the Master Plan will be determining how and when payment for services is collected.
Suggested the Business Park would make a good site for a new secondary school.	Would be up to the school board to decide, but is important to know for the traffic study.

8.5 Consultation Summary

The consultation program developed for this study was directed towards stakeholders, adjacent property owners and provincial review agencies. Comments received during the public meeting and meeting with stakeholders reflected a positive attitude towards the provision of municipal services in the Business Park.

9.0 PHASING OF DEVELOPMENT

9.1 Potential Phasing

It is anticipated by the Municipality that the completion of the development of the business park will take a number of years and will therefore need to follow a phased-in infrastructure plan. Further discussions need to be undertaken with the various property owners to ascertain what areas of the Business Park may need to proceed in advance of others.

The information included in this report provides the basis for discussion for the sharing of costs for the development of the balance of the business park. The municipality and the developers will need to reach some consensus as to how the services on the balance of the Business Park will be funded.

Following these discussions, a development scenario can be created including associated interim costs and possible funding options.

9.2 Summary of Servicing and Associated Works

The following table (Table 9.1) summarizes the recommended servicing improvements, their EA schedule and the additional work that may be required prior to their implementation.

Table 9.1 Summary of Proposed Servicing Strategy Projects and Associated Works

Project	Timing	Schedule	Work required prior to implementation
Transportation Servicing Projects			
Russell Street Extension	Phase 1	MCEA B	• Stage 2 archaeological review • Subject to approval, project may proceed to detail design. • Will require permit from MTO
Durham Street Extension	Phase 1	MCEA B	• Stage 2 and 3 archaeological review • Subject to approval, project may proceed to detail design • Will require permit from MTO
Street A	Phase 3	MCEA B MCEA A - if local road constructed as condition of site plan/plan of subdivision	• Timing dependent on the development of lands within Lot 4 • Stage 2 archaeological review

Table 9.1 Summary of Proposed Servicing Strategy Projects and Associated Works

Project	Timing	Schedule	Work required prior to implementation
Street B	Phase 2/3	MCEA B MCEA A - if local road constructed as condition of site plan/plan of subdivision	• Timing dependent on the development of lands within Lot 3 and 4 • Stage 2 archaeological review
Dahmer Street	Phase 2/3	MCEA B MCEA A - if local road constructed as condition of site plan/plan of subdivision	• Timing dependent on the development of lands within Lot 3 and 4 • Stage 2 archaeological review
Signal at Hwy 21 and Russell	By 2020/ Phase 2	May be subject to MTO Class EA	• Further discussion with MTO required to confirm EA and approval process
Left turn lane (from Russell extension, south onto Hwy 21)	By 2020	MCEA A+	• Subject to approval, project may proceed to detail design • Will require permit from MTO
Right turn lane (on Hwy 21 onto Russell)	By 2020/ Phase 2	May be subject to MTO Class EA	• Further discussion with MTO required to confirm EA and approval process
Right turn lane (on Hwy 21 onto Durham)	By 2020/ Phase 2	May be subject to MTO Class EA	• Further discussion with MTO required to confirm EA and approval process
Signal change – advanced left from Hwy 21 to Hwy 9	By 2020/ Phase 2	May be subject to MTO Class EA	• Further discussion with MTO required to confirm EA and approval process
Signal change – advanced left from Highway 21 to Durham St	By 2030/ Phase 2	May be subject to MTO Class EA	• Further discussion with MTO required to confirm EA and approval process
Signal change – advanced left from Russell onto Highway 21	By 2020/ Phase 2	May be subject to MTO Class EA	• Further discussion with MTO required to confirm EA and approval process

Table 9.1 Summary of Proposed Servicing Strategy Projects and Associated Works

Project	Timing	Schedule	Work required prior to implementation
Left turn lane (from Hwy 21, west onto Russell)	By 2020/ Phase 2	May be subject to MTO Class EA	• Further discussion with MTO required to confirm EA and approval process
Water Servicing Projects			
Extend Water Distribution System	Phase 1, 2, 3	MCEA B	• Subject to approval, the project may proceed to detail design • Will require MTO approval for crossing at Russell Street
Booster Pumping Station	Phase 2	MCEA B	• Establish a pressure monitoring program to determine need and timing for booster pumping station. • Separate Schedule B Class EA process.
Sanitary Sewer Servicing Projects			
Extend Sanitary Sewage Collection System	Phase 1, 2, 3	MCEA B	• Subject to approvals, the project may proceed to detail design • Will require MTO approval for crossing at Russell Street
New trunk sewer on Russell Street	Phase 1	MCEA A+	• Subject to approvals, the project may proceed to detail design • New Environmental Compliance Approval required
Park Street SPS Upgrades	Phase 1	Alt 1 - replace pumps – MCEA A+	• Subject to approvals, the project may proceed to detail design
Stormwater Servicing Projects			
Pond 2	Phase 1	MCEA B	• Subject to approvals, the project may proceed to detail design
Pond 3	Phase 2	MCEA B	• Subject to approvals, the project may proceed to detail design • Will require MTO permit due to proximity to highway corridor

Table 9.1 Summary of Proposed Servicing Strategy Projects and Associated Works

Project	Timing	Schedule	Work required prior to implementation
Storm sewers	Phase 1,2,3	MCEA A+	• Subject to approvals, the project may proceed to detail design

10.0 COSTS AND FINANCING

10.1 Probable Costs

Preliminary estimated costs to provide full servicing and road construction for the Business Park have been prepared and are presented based upon recent tenders for similar works. All costs include allowances for local sanitary collection, external sanitary collection and pumping upgrades, water distribution and pressure boosting facilities, storm sewer collection, storm water management, road construction, engineering, and contingencies. HST has not been included in the costs presented. The presented costs also do not include costs associated with the provision of electricity services or street lighting.

Table 10.1 summarizes the anticipated total costs. Appendix I of the Servicing Plan (included as Appendix 2 of this report) provides further breakdown and additional details of the costs shown.

Table 10.1 Estimated Probable Costs

Servicing Component	Cost			
	Phase 1	**Phase 2**	**Phase 3**	**Total**
Internal Servicing				
Road System	$1,082,000	$1,744,000	$1,176,000	$4,002,000
Storm Collection System	$710,000	$880,000	$354,000	$1,944,000
Stormwater Management Facilities	$384,000	$302,000	$0	$686,000
Sanitary Collection System	$389,000	$315,000	$257,000	$961,000
Water Distribution System	$501,000	$348,000	$237,000	$1,086,000
Subtotal - Internal Servicing	**$3,066,000**	**$3,589,000**	**$2,024,000**	**$8,679,000**
External / Other Servicing				
Russell Street Sanitary Sewer	$627,000	$0	$0	$627,000
Park Street Pumping Station Upgrades	$950,000	$0	$0	$950,000
Hwy. 21 Improvements	$0	$617,000	$0	$617,000
Water Booster Station	$0	$799,000	$0	$799,000
Subtotal - External / Other Servicing	**$1,577,000**	**$1,416,000**	**$0**	**$2,993,000**

Servicing Component	Cost			
	Phase 1	Phase 2	Phase 3	Total
TOTAL - Internal / External / Other Servicing	**$4,643,000**	**$5,005,000**	**$2,024,000**	**$11,672,000**

10.2 Financial Implications of Servicing the Business Park

10.2.1 General

As set out in Table 10.2, the estimated probable cost of servicing the Business Park is approximately $12 million dollars. Although this is a considerable amount, it is not anticipated that it will all be required at one time. Rather, the development of the Business Park will likely be constructed in phases, as individual land owners decide to participate or sell their properties to interested parties. This is one of the main issues in trying to develop the Park – a number of different property owners across the area with varying degrees of interest in developing. This Master Plan is somewhat of an illustration of how and in what order the Business Park will develop.

All cost estimates are predicated on the proposed road pattern being developed in a somewhat orderly fashion from west to east over 3 phases.

The overarching principle for servicing the Business Park is that development pays for servicing. This was expressed by the Municipality as far back as 2008, when there were early discussions with developers and landowners. Earlier cost sharing approaches were developed on this basis (BMROSS, November 07, 2008). The exception to this was the need to upgrade the Park Street Sewage Pumping Station, which was considered as a municipal-funded project. It is anticipated that the Municipality will direct the development of external servicing projects and collect monies from the properties in the Business Park.

The implementation of other internal servicing projects can be either carried out by the municipality or by the individual developers under agreement. The municipality would probably charge out the costs on a fixed basis and provide credits as appropriate for work done under development agreements.

10.2.2 Financing Alternatives

10.2.2.1 Future Growth

To collect the growth-related share of costs for projects that provide capacity for future development, municipalities rely on the Development Charges Act (1997). This Act allows municipalities to levy new growth with its costs for providing services that benefit growth. The Municipality of Kincardine has a Development Charge Bylaw in place and in 2016, underwent a mandatory five-year review of the charges. Presently, the municipality imposes development

charges for roads, water and wastewater services. At this time, none of the component projects for the development of the Business Park have been included in the current Development Charge calculation. However, future development charge schedules could include projects from this Master Plan. The municipality would want to consider the Business Park as a separate service area under the Development Charges Act, if it chooses to use development charges for cost recovery.

10.2.2.2 Municipal Act

Part XII of the Municipal Act provides municipalities with broad powers to impose fees and charges via passage of a by-law. The powers, as presented in S. 391(1) of the Municipal Act authorize a municipality to impose fees or charges for:

- Services or activities provided or done by or on behalf of it;
- Costs payable by it for services or activities provided or done by or on behalf of any other municipality or local boards; and
- The use of its property, including property under its control.

Municipalities use the authority of the Municipal Act to collect capital charges from water and sewage projects. Under the Act, municipalities can charge an immediate benefit to those properties who will receive a benefit at a future time. Under the Act, municipalities are permitted to pass a by-law requiring mandatory connections to the system and mandatory pay by-laws.

There are many methods available to assess and calculate a capital cost recovery rate for a project, including:

- By metres of frontage of the property;
- A hectarage rate;
- A fixed charge for each parcel (flat rate); or
- Any other method Council considers fair.

In assessing charges over a large, undeveloped land base, a hectarage rate is often used for the calculations.

10.2.3 Cost-Sharing Calculations

Appendix 4 of the Master Plan contains copies of two cost sharing exercises completed by BMROSS in 2008. They were completed using the development configuration current for that time and the associated cost estimates. This Master Plan contains a final recommended configuration of roads, sewers, water and stormwater management needs and an up-to-date cost estimate. For the purposes of illustration, we have built on the 2008 methodologies to present a current cost sharing scenario. The exact cost sharing formula will only be known once decisions are made on servicing and development agreements are finalized.

The main assumptions used in the calculations are:

- There are a number of development parcels of varying sizes throughout the Business Park. Given this, it is assumed that all the servicing, no matter where it occurs, is of equal benefit to all of the properties. Costs will be assessed based on a hectarage rate;
- As development will take place over an unknown time frame, the rate will be increased by inflation throughout the implementation time frame;
- For the purposes of this calculation, it is assumed that all external and internal servicing is developed by the Municipality who collects the charges as properties are developed;
- The Municipality may assume the cost of any external projects, if so, the costs of the assumed external projects can be removed from the calculations; and
- The undeveloped area of the Business Park is 52.3 ha in size.

Internal Servicing

Total Cost = $8,679,000

Cost per ha = $ 165,946

External Servicing

Total Cost = $2,993,000

Cost per ha = $ 57,228

Total Internal and External Servicing

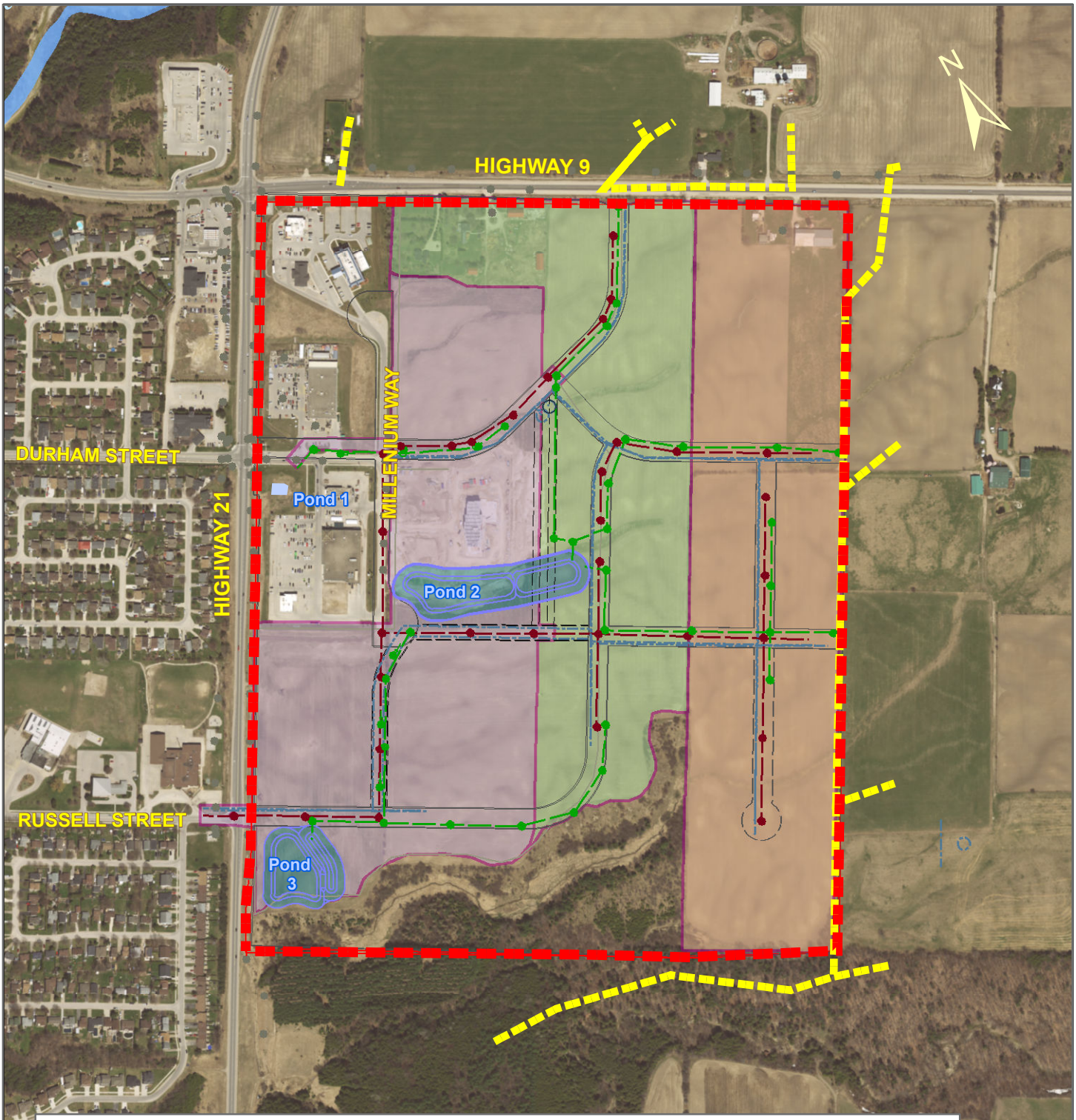
Cost per ha = $223,174 per ha

11.0 EVALUATION OF PREFERRED SERVICING STRATEGIES

11.1 Framework of Analysis

Following the selection of the preferred servicing strategies (see Section 7.6), a study framework was developed to further evaluate the potential impacts of implementing this Master Plan. For reference, Figure 11.1 shows the preferred servicing strategies. The purpose of this review is to assess the environmental interactions resulting from the construction the proposed servicing infrastructure, and to determine if the identified interactions would generate potential environmental impacts. The assessment of the preferred servicing strategies incorporated these activities:

- Assessment of the construction and operational requirements of the proposed works;
- Consultation with the public, stakeholder groups and government agencies;
- Review of engineering methodologies associated with the proposed works;
- Prediction of the environmental interactions between the proposed works and the identified environmental components;
- Identification of specific environmental features that may be impacted, in a significant adverse manner by the proposed works; and



Legend

Servicing Phases

- Phase 1
- Phase 2
- Phase 3
- Proposed SWM Ponds

- Proposed Storm Sewer
- Proposed Sanitary Sewer
- Watermain
- Pre-Existing Catchment Drainage Areas

Business Park Boundary

0 50 100 150 200
Meters

*all locations are approximate

Source: Timmins Martelle Heritage Consultants Inc. 2014

BMROSS engineering better communities

MUNICIPALITY OF KINCARDINE

SERVICING MASTER PLAN FOR
KINCARDINE BUSINESS PARK
(COMMUNITY OF KINCARDINE)
SERVICING PLAN - COMPLETED PHASES

DATE	PROJECT No.
April 2017	08055
SCALE	FIGURE No.
1:7,500	11.1

Filename: Z:\08055-Kincardine-Business_Park_Servicing\Projects\GIS\08055_KincardineBusPark_Fig11.1_ServicingPlan.mxd 4/11/2017

- Evaluation of the potential impacts of the project on the environmental features, including residual effects following mitigation.

The following section of the report summarizes the findings of the evaluation process.

11.2 Evaluation of Stormwater Impacts

Two new stormwater facilities are proposed as part of the servicing strategy for the Business Park. The possibility of limiting the facilities to a single pond was initially reviewed as part of the technical investigation of alternatives; however, due to topographical and property constraints a single facility was not considered feasible.

In addition to the two proposed ponds, the existing dry pond located at the corner of Durham Street and Highway 21 referred to as Pond 1, will be used to control a portion of the development area.

11.2.1 Water Quality Control

The MOECC Guidelines for design of stormwater management facilities note that the preferred facility type for drainage areas over 10 ha is an extended detention wet pond facility. The evaluation of alternatives identified the provision of extended detention wet pond facilities as the most practical strategy for providing stormwater management within the Business Park. Each facility will be designed to include the following:

- Permanent pool area;
- Wet pond quality and quantity control for extended detention;
- Outlet structure with control gates for possible pond isolation;
- Maintenance access to the forebay and outlet structure; and
- Landscaping

Details and characteristics of the proposed new ponds are summarized below:

<u>Pond 2</u>

The design parameters for the facility have been based on the following:

- The impervious levels of the drainage area within the proposed Business Park (31.5 ha) are to be based on an average value of 64%. It is noted, however that the impervious level for the various catchments varies from between 50% to 75%. The detailed Miduss input parameter sheets (refer to Appendix E of the Servicing Plan) should be referred to for the specific impervious value of each catchment area. The external tributary lands (24.5 ha) have been modeled based on their current impervious level of 0%;
- Proposed Business Park Area: 31.5 ha;
- Average Impervious Level: 64%;

- External Drainage Area: 24.5 ha;
- Average Impervious Level: 0%;
- Total Drainage Area: 56.0 ha;
- Net Impervious Level: 36%;
- Level 1 receiving stream and 35% impervious level;
- End of pipe, extended detention, wet pond configuration; and
- An interpolated storage volume of 143 m^3/ha results (40 m^3/ha extended detention and 103 m^3/ha of permanent pool volume).

Based on these parameters, the minimum storage requirements for Pond 2 include a permanent pool volume of 5,740 m^3 and an extended detention volume of 2,240 m^3. A 37-hour extended detention time will be provided by means of a 200 mm diameter orifice outlet.

Pond 3

Design parameters for this facility have been based on the following:

- The impervious level for the drainage area of this pond (18.0 ha) is to be based on an average value of 73%. The majority of the areas have been designed with an impervious level of 75%, however, there is one catchment with an impervious level of 50%. The detailed Miduss input parameter sheets (see Appendix E of the Servicing Plan) should be referred to for the specific impervious value of each catchment area. There are no external lands that are tributary to this facility;
- Proposed Business Park Area: 17.7 ha;
- Average Impervious Level: 69%;
- Level 1 receiving stream and 69% impervious level;
- End-of-pipe, extended detention, wet pond configuration; and
- An interpolated storage volume of 223 m^3/ha (40 m^3/ha extended detention and 183 m^3/ha of permanent pool).

Based on these parameters, the minimum storage requirements for Pond 3 include a permanent pool volume of 3,233 m^3 and an extended detention volume of 708 m^3. A 22-hour extended detention time will be provided by means of 200 mm diameter orifice outlet. Confirmation of the pond storage requirements, actual pond volumes, forebay sizing, cleanout frequency and drawdown timing is provided in Appendix G of the Servicing Master Plan.

11.2.2 Water Quantity Control

Both of the proposed facilities have been designed with an extended detention volume component for pre to post development control of the 1:2 through to the 1:100 storm events. Pre and post hydrologic models were developed as follows:

- Pre-development flows were assessed consideration the entire watershed area for each of the two outlets under Highway 21. The assessment included the existing tributary of the Penetangore. This approach ensures that a full review of the flows downstream of the Business Park was completed.
- Post-development flows were assessed considering development within the proposed Business Park and all external drainage areas for the two outlets under Highway 21 as completed for the pre-development area. It is noted that a significant portion of the external lands are conveyed within the tributary of the Penetangore and are not within the development boundaries of the Business Park.

Minor Drainage System

Minor system surface flow will be directed into pond from all sub-catchment areas within the Business Park. Typically, the minor system will be conveyed within a new storm sewer system designed to accommodate the 1:5 year storm event. Storm sewers are proposed to outlet to the end-of-pipe wet pond stormwater facilities.

Major Storm System

Major system surface flow will be directed into each pond from all sub-catchment areas within the Business Park. Typically, the major system will be conveyed within the finished road surface.

Modelling Results

The following tables summarize the results for both the pre-existing condition and the proposed development state. For comparative purposes, flow values at the following locations have been included in the summaries;

- Holtby Drain (immediately prior to its convergence with the Penetangore tributary);
- Highway 21 Outlet A – CSP culvert (school site);
- Highway 21 Outlet B – Multi-plate Arch culvert (Penetangore tributary); and
- Combined flow at Highway 21 outlet locations.

Table 11.1 presents the pre-existing site flows for the 2 year through 100-year rainfall events. Table 11.2 presents the post development site flows for the 2 year through 100-year rainfall events. Table 11.3 presents the comparison between Table 11.1 and Table 11.2 as a percentage increase or decrease.

Table 11.1 Pre-Existing Miduss Flows (m^3/s)

Storm Event (year)	Holtby Drain at Confluence with Penetangore Tributary (Confluence 1100)	A 1500mm CSP under Hwy. 21 (Confluence 2000)	B Multi-Plate Arch under Hwy. 21 (Confluence 1000)	A+B Combined at Hwy. 21 (Confluence 3000)
2	3.3	1.9	16.9	17.4
5	7.8	4.5	41.7	43.0
10	11.6	6.6	63.0	65.0
25	17.1	9.4	94.6	97.6
50	21.5	11.6	120.8	124.7
100	26.2	13.6	149.0	153.6

Table 11.2 Post-Development Miduss Flows (m^3/s)

Storm Event (year)	Holtby Drain at Confluence with Penetangore Tributary (Confluence 1100)	A 1500mm CSP under Hwy. 21 (Confluence 2000)	B Multi-Plate Arch under Hwy. 21 (Confluence 1000)	A+B Combined at Hwy. 21 (Confluence 3000)
2	3.1	0.6	16.8	17.1
5	7.4	1.3	41.5	42.3
10	11.1	2.0	62.7	64.4
25	16.3	3.6	94.1	97.2
50	20.5	4.8	120.2	124.5
100	25.5	6.1	148.4	153.7

Table 11.3 Comparison Miduss Flows (% Change)

Storm Event (year)	Holtby Drain at Confluence with Penetangore Tributary (Confluence 1100)	A 1500mm CSP under Hwy. 21 (Confluence 2000)	B Multi-Plate Arch under Hwy. 21 (Confluence 1000)	A+B Combined at Hwy. 21 (Confluence 3000)
2	-4.9	-69.1	-0.3	-2.0
5	-5.3	-71.2	-0.4	-1.7
10	-4.6	-69.7	-0.5	-1.0
25	-4.9	-61.6	-0.5	-0.4
50	-4.8	-58.5	-0.5	-0.2
100	-2.7	-55.3	-0.4	0.1

Discussion related to the above results is summarized below for each location considered:

- Holtby Drain: under all storm flow events (i.e., 2 through 100 year storms), there appears to be a nominal decrease in the peak flow events experienced under the developed state of the Business Park;
- 1500 mm CSP Culvert under Highway 21: the proposed plan will significantly reduce flows to this outlet under Highway 21 as compared to the pre-existing condition (i.e., no commercial development). This is typically due to the fact that some of the predevelopment drainage areas of being redirected to the new stormwater ponds proposed for the Business Park;
- Multi-Plate Arch: the proposed plan will result in essentially no change to the peak flows experienced under 2 through 100-year flow events and the developed state; and
- Combined Total at Highway 21: the proposed plan will not result in an increase, under al flow events, for the combined drainage area upstream of Highway 21.

11.2.3 Construction Sediment and Erosion Control

Before the commencement of stripping operations on the site, erosion and sediment controls are to be installed. Monthly Erosion and Sediment Control Inspection Reports (Report Sheet included as Appendix H of the Serving Plan) are to be completed and made available to interested parties. These reports are to be based on bi-weekly inspections and after significant storm events (>13 mm). These reports are to be submitted when the site has been stabilized.

11.2.4 Monitoring and Maintenance Program

The facility has been designed to reduce maintenance requirements. General maintenance and monitoring for the facility should be in compliance with the "Stormwater Management Planning and Design Manual" by the MOE, March 2003, and would include the following:

- Inspection of the facility initially and after each significant rainfall event for the first two years following construction. It is proposed that inspections then be carried out after the first two years on an annual basis;
- Cleaning of debris from the outlet structure;
- Replacement of any plantings that have died; and
- Removal of accumulated sediments from the forebay. It is expected that the cleaning of the forebay will be required approximately every 12 years and 6.5 years for Pond 2 and Pond 3, respectively.

11.2.5 Summary of Stormwater Management Impacts

From the results of pre and post stormwater modeling the following is concluded:

- Two new end-of-pipe extended detention wet pond facilities will provide a suitable strategy for providing stormwater management for the area. In addition, the existing dry pond at the intersection of Durham Street and Highway 21 will be utilized for a portion of the development lands;
- The proposed facilities have been designed in compliance with the criteria established in the MOE "Stormwater Management Planning and Design Manual", dated March 2003;
- The stormwater management facilities will provide:
    - Quality and quantity control of the developed Business Park lands and any existing external lands at their current impervious level; and
- Modeling results demonstrate that peak flow rates from the developed lands will generally not change significantly from that of the pre-existing condition for the area.

11.3 Servicing Scope

The works summarized for the provision of municipal services, illustrated conceptually in Figure 11.1, represent the scope of construction for the servicing of the Business Park. The construction plan for the installation of the preferred servicing strategies includes the following general tasks:

- Mobilization to the site;
- Complete layout and locates;
- Advise emergency services of anticipated road works;
- Implement traffic controls;
- Install erosion and sediment controls;
- Excavate as needed;
- Place new water, sanitary sewer and stormwater piping, including bedding (native or granular backfill);
- Construct stormwater ponds, including outlet structure and control gates;
- Install granular base, curb, sidewalk, street lights and asphalt for new roads;
- Restore boulevards within road allowance;
- Site restoration and landscaping around stormwater ponds;
- Remove traffic controls, as appropriate; and
- Complete all required documentation and reporting on the works.

Servicing within the Business Park is expected to follow a phased approach, and as development occurs there are additional works required to provide the needed services. These works include replacement of the Russell Street trunk sewer, replacement of pumps at the Park Street Sewage Pumping Station, a water booster station, and improvements to intersections and signals along the Highway 21 and 9 corridors. The requirements for evaluation of these additional works is summarized in Section 9.2.

11.4 Impact Assessment and Mitigation

11.4.1 Environmental Interactions

An assessment was conducted to identify and evaluate the environmental interactions which could arise from implementation of the preferred servicing strategies. The assessment examined the potential impacts of constructing and operating the proposed works on the defined environmental sub-components. Table 11.4 summarizes the findings of the interactions assessment.

Table 11.4 Assessment of Construction and Operation Impacts

	Components/ Subcomponents / Project Activities	Natural				Social	Cultural	Economic	Technical	
		Terrestrial	Surface Water	Atmosphere	Geology	Community	Heritage	Municipal	Transportation	Infrastructure
1	**Construction Phase**									
	Mobilization to the site	○	○	○	○	●	○	○	●	●
	Complete layout and locates	○	○	○	○	○	○	○	○	○
	Advise emergency services of anticipated road closures	○	○	○	○	○	○	○	○	○
	Implement traffic controls	○	○	○	○	●	○	○	○	○
	Install erosion and sediment controls	○	○	○	○	○	○	○	○	○
	Excavate	○	○	○	○	●	●	○	○	○
	Install new water, sanitary sewer, stormwater piping	○	○	○	○	●	○	○	●	○
	Construct stormwater ponds	○	○	○	○	●	○	○	●	○
	Install granular base, curb, sidewalk, street lights and asphalt	○	○	○	○	●	○	○	●	○
	Restore boulevards within road allowance	○	○	○	○	○	○	○	●	○
	Site restoration and landscaping	○	○	○	○	○	○	○	○	○
2	**Operations Phase**									
	Clean out and maintenance (as required)	○	○	○	○	○	○	○	○	○

• Potential for environmental effect ○ No environmental effect anticipated

11.5 Assessment of Impacts

Based upon the finding of the general impacts assessment (Tables 7.3 to 7.7), the environmental interactions analysis (Table 11.4), and the input received through the public and agency consultation program, the project has the potential to impact upon several environmental features. The potential impacts are associated with the following project issues and components:

- Social environment
    - Community-level impacts
- Cultural environment
    - Archaeological features
- Economic environment
    - Project Cost
- Technical environment
    - Transportation impacts
- Construction impacts

This section of the report summarizes the above-noted matters and outlines the measures proposed to mitigate potential environmental effects. The selection of mitigation measures incorporated an evaluation of alternative forms of mitigation and a consideration of three broad approaches to mitigation: avoidance, minimization of adverse effects, and compensation.

11.6 Discussion of Potential Impacts and Mitigation Measures

11.6.1 Community-level Impacts

The preferred servicing strategies for the remainder of the Business Park will require some construction at locations that may inconvenience local residents. These locations include the intersection of Durham Street and Millenium Way, Highway 21 and Russell Street, and Highway 9 and Durham Street. At these locations, construction may result in traffic delays with temporary lane reductions and traffic control measures as services are installed.

Properties located in the immediate vicinity of the Business Park may experience minor impacts related to noise, dust and traffic levels as construction occurs. All construction related activities are to be confined to typical daytime work hours. Weekend and evening work will be avoided, if at all practical.

11.6.2 Archaeological Features

A significant portion of the Business Park was identified as having potential for archaeological resources from the Stage 1 Archaeological Assessment (see Section 2.6). Prior to the start of any construction within 70 m of the Clements Site, a Stage 3 Assessment must be completed. For the remaining area of the Business Park (not including the area assessed by AMICK in 2005), as

previously identified in Section 2.6 and Figure 2.4, a Stage 2 archaeological assessment is required prior to any construction activities.

11.6.3 Transportation Impacts

The proposed servicing strategy includes: construction of new intersections with existing roads at Russell Street and Highway 21, Highway 9 and Durham Street, and Millenium Way and Durham Street; and the extension of water and sanitary sewer services from Russell Street across Highway 21 to the Business Park. These works are expected to impact local transportation for the duration of construction. Roads around the Business Park (Highway 21, Highway 9, Durham and Russell Street) are expected to remain open, however there will be temporary lane closures while the work proceeds. This may result in minor traffic delays. The Contractor completing the work will be responsible for submitting a Traffic Plan for review.

Additionally, the provision of servicing in the Business Park is expected to result in development. Future development is expected to result in increases in traffic levels, as described in the Traffic Impact Study (see Section 4.2). To accommodate increased traffic, a number of improvements via additional turning lanes, signals and signal improvements have been recommended. Traffic counts and development will be monitored to determine when these improvements are warranted. A summary of the recommended traffic improvements is included in Section 9.2.

11.6.4 Construction Impacts

Construction-related activities associated with implementation of the preferred servicing strategy have the potential to impact upon existing environmental features, the general public, and construction works. The Contractor completing any work associated with the preferred servicing strategy is responsible for carrying out construction activities in accordance with industry safety standards and all applicable legislation. Mitigation measures will also be incorporated into the construction specifications to ensure that operations are conducted in a manner that limits detrimental effects to the environment.

Table 11.5 outlines a series of mitigation measures that are typically incorporated into construction specifications. For this project, contract specifications may need to be modified depending on the nature of the construction activity and any additional requirements of the regulatory agencies.

Table 11.5 Typical Mitigation for Construction-Related Activities

Construction Activity	Typical Mitigation Measure
Refuelling and Maintenance	- Identify locations for designated refuelling and maintenance areas. - Restrict refuelling or maintaining equipment near watercourses. Non-spill equipment is required within 30 m of any watercourse. Fuelled equipment shall be stored overnight not less than 30 m from the edge of water. - Avoid cleaning equipment in watercourses and in locations where debris can gain access to sewers or watercourses. - Prepare to intercept, clean up, and dispose of any spillage that may occur (whether on land or water).
Traffic Control	- The Contractor shall prepare and submit a traffic plan to the Project Engineer for review and acceptance. - Traffic flow should be maintained at all times during construction for private access. The Contractor will provide adequate signage and barricades.
Disposal	- Dispose of all construction debris in approved locations. - Avoid emptying fuel or lubricants into sewers or watercourses.
Pesticides	- Co-ordinate the use of pesticides and herbicides with affected landowners and the local pesticide control officer.
Silt Control	- Silt fences shall be installed and maintained down slope from any stockpile locations or disturbed areas.
Dust Control	- Cover or wet down dry materials and rubbish to prevent blowing dust and debris. - Avoid the use of chemical dust control products adjacent to wetlands and watercourses.
Site Clearing	- Protective measures shall be taken to safeguard trees from construction operations. - Equipment or vehicles shall not be parked, repaired or refuelled near the dripline area of any tree not designated for removal. Construction and earth materials shall also not be stockpiled within the defined dripline areas. - Restrict tree removal to areas designated by the Contract Administrator. - Minimize stripping of topsoil and vegetation.
Sedimentation/ Erosion Control	- Erect sediment fencing to control excess sediment loss during construction period. - Minimize the removal of vegetation from sloped approaches to watercourses. - Protect watercourses, wetlands, catch basins and pipe ends from sediment intrusion. - Complete restoration works following construction. - Install straw bale check dams in ditch lines following rough grading of ditches.
Noise Control	- Site procedures should be established to minimize noise levels in accordance with local by-laws. - Provide and use devices that will minimize noise levels in the construction area. - Night time or Sunday work shall not be permitted, except in emergency situations.

11.7 Operations Phase

Upon completion of the proposed servicing strategy, the Municipality will maintain road, water, sanitary sewer and stormwater infrastructure in accordance with regular municipal practices. In this regard, the infrastructure will be subject to routine maintenance activities and will be added to the works department maintenance schedule and budget allocation, as determined by the Municipality. Standard response procedures will also be employed to resolve problems with the constructed works, as well as emergencies.

12.0 IMPLEMENTATION

12.1 Additional Studies Required

Prior to the implementation of the preferred servicing strategy, a Stage 2 Archaeological Assessment must be completed for the areas identified through the Stage 1 Assessment. Additionally, no construction work is permitted within 70 m of the Clements Site until a Stage 3 Assessment is completed for that site.

The technical investigation of water servicing in the Business Park identified the potential need for a booster pumping system for later phases of development. It is anticipated a booster pumping station will be sited in the vicinity of Millenium Way and Durham Street. Prior to constructing a booster pumping station, it is recommended the Municipality establish a pressure monitoring system to track system operation as development proceeds to better determine the appropriate timing for construction of the pressure boosting facilities. Given that the timing of the construction of the booster pumping station is dependent on development and a specific site has not been identified, it is suggested that a separate Schedule B Municipal Class EA be completed.

In conjunction with future development proposals, it will be necessary to update the Traffic Study to reflect up to date traffic counts and anticipated volumes.

12.2 Approvals

Implementation of the preferred servicing strategy and associated works will be subject to the receipt of all necessary approvals. Following a review of existing legislation, it was determined that a number of formal approvals will be required to permit construction of the proposed works.

12.2.1 Conservation Authorities Act

Implementation of some components of the preferred servicing strategy may involve construction on lands regulated by the Saugeen Valley Conservation Authority (SVCA). In accordance with the Conservation Authorities Act, applications will be submitted to SVCA for approval prior to construction. The application will define measures to protect sensitive lands during construction in order to minimize the negative impacts of the project on the natural

features of the area. Site restoration and post-construction enhancements to disturbed areas will also be presented.

12.2.2 Ontario Water Resources Act

Construction of water, sanitary sewer, and stormwater management facilities, which are a components of preferred servicing strategy associated with future development lands, will be subject to the Ontario Water Resources Act. Consequently, the project cannot proceed until the Municipality has obtained the necessary Environmental Compliance Approvals from the MOECC.

12.2.3 Ministry of Transportation

The proposed servicing strategy includes utility extensions that will cross Highway 21. Under the Public Transportation and Highway Improvement Act, permits from the MTO are required for all encroachments proposed to be located above and below ground within the provincial highway property limits. Additionally, permits will be required for all new accesses from Highway 21 and Highway 9 and any construction within 800 m of the highway property limits.

13.0 CLASS EA REQUIREMENTS

13.1 Master Plan Approval

The Kincardine Business Park Servicing Master Plan was developed following an approved Maser Plan process, as set out in the Class EA document. For this study, the Master Plan process incorporated the completion of Phases 1 and 2 of the Class EA process. The Master Plan will be approved for implementation subject to the adoption by the Council of the Municipality of Kincardine.

13.2 Additional Class EA Investigations

As an outcome of this assessment, a series of projects have been identified to implement the master Plan. These projects are classified as Schedule ‘A’, ‘A+’, or ‘B’ activities under the terms of the Class EA document. The majority of schedule ‘A’, ‘A+’ and ‘B’ activities have been assessed in conjunction with the current Master Plan process and do not require additional Class EA review prior to implementation. One Schedule B project has not been assessed as part of this Master Plan – the construction of a water booster pumping station. Given that the need for the booster pumping station is dependent on timing of development and a specific site cannot be identified at this time, it is recommended that a Schedule B Class EA be completed for this project when the station is required and a potential site is identified. Table 9.1 summarizes the proposed activities and Class EA schedules associated with implementation of specific projects identified in this Master Plan.

13.3 Requirements for Master Plan Completion

The following activities are required in order to complete the formal Class EA process:

- Issue a Notice of Study Completion for the Master Plan;
- Make Master Plan Report available for public review in conjunction with the Notice of Study Completion;
- Obtain feedback from public, stakeholders and agencies;
- Make the revised Master Plan report available for public/agency review;
- Address outstanding issues resulting from the Notice of Completion;
- Advise the Municipality and Ministry of Environment and Climate Change (MOECC) when the process is complete.

13.4 Final Public Consultation

A Notice of Master Plan Completion will be circulated to local property owners, stakeholders, and government review agencies. The notice will identify the preferred servicing strategy and indicated the approval process needed to move forward with implementation.

The notice will be issued upon finalization of the Master Plan document and will be placed in the two local newspapers (Kincardine Independent and Kincardine News) for a two week notification period.

13.5 Master Plan Recommendations

The following represents the key study recommendations developed following the evaluation of alternatives as part of the Master Plan process:

- That Road Concept 1 be adopted as the preferred transportation strategy to provide service for future development within the Business Park;
- That extending the Kincardine Drinking Water System and Kincardine Sanitary Sewage Collection System be adopted as the preferred strategy for water and sanitary servicing within the Business Park;
- That construction of two additional extended detention wet pond facilities and storm sewer conveyance system be adopted as the preferred stormwater management strategy within the Business Park;
- Implementation of the Master Plan will require further archaeological assessment to evaluate the potential for archaeological resources in the Business Park;
- Schedule ‘A’, ‘A+’ and ‘B’ projects, as identified in Table 11.1 have undergone sufficient investigation and evaluation to complete Phases 1 and 2 of the Class EA process and therefore are approved through the Master Plan process;
- Implementation of the Master Plan should be conducted with reference to the project phasing strategy detailed in Section 9.1 of this report;

- Impact mitigation measures discussed in Section 11 of this report should be incorporated into the detailed construction plans for each proposed activity, as appropriate;
- Recommended components of the preferred servicing strategy should be considered for incorporation into the next Official Plan update for the Municipality of Kincardine;
- The Master Plan should be reviewed on a regular basis to evaluate the accuracy of key assumptions (e.g., condition of existing infrastructure/availability of funding) and to confirm the suitability of the implementation sequence. The Master plan should be modified, as required to address changes to the environmental setting and local conditions.

14.0 SUMMARY

The Municipality of Kincardine initiated a Master Plan study to identify the infrastructure needs associated with the continued development of the Kincardine Business Park. The Business Park as designated by the Official Plan, includes the first four farm lots east of Highway 21 and south of Highway 9. The northern two-thirds of the western-most lot has been serviced and developed. In the past, proposals for development in the Business Park have been reviewed on an individual basis, requiring the completion of numerous studies as a result. To identify strategies for a coordinated approach for development and servicing in the remainder of the Business Park, the Municipality retained B. M. Ross and Associates to conduct a Servicing Master Plan study.

The first phase of the Master Plan process involved the identification of the problems or opportunities that need addressed. The following Opportunity Statement was identified to provide direction for the study:

Policies within the Town of Kincardine Official Plan direct commercial and industrial growth to the Business Park; however, only the northwest area of the Park is currently serviced by municipal road, water, sanitary sewer, and stormwater infrastructure. At present, there is an opportunity to develop a servicing strategy for the remainder of Business Park that is integrated and coordinated with existing municipal infrastructure and to allow for future development.

The outcome of the evaluation of the identified alternatives is the selection of the preferred strategies for transportation, water, sanitary sewage and stormwater servicing for the remainder of the Kincardine Business Park. The preferred servicing strategies are:

- TR1 – Road Pattern 1;
- W1 - Extending municipal water services to the remainder of the Business Park;
- S1 – Extending municipal sanitary sewage services to the remainder of the Business Park;
    - S1.1 – Construct a new trunk sewer on Russell Street and install larger pumps to increase capacity at the Park Street SPS; and
- SW1 – Extending and adding municipal stormwater services for the remainder of the Business Park

The following are the key attributes associated with identifying these strategies as the preferred options:

- The preferred servicing strategies address the opportunity to provide services in a manner that is integrated and coordinated with the existing infrastructure in the Business Park;
- Will allow future development, as envisioned in the Official Plan, in the remainder of the Business Park;
- Most of the services will be located within road allowances to maximize the amount of developable land available; and

With respect to the Park Street SPS, the installation of larger pumps is the most economical option that provides additional capacity. It also has the least potential for environmental impacts.

The consultation program developed for this study was directed towards stakeholders, adjacent property owners and provincial review agencies. Comments received during the public meeting and meeting with stakeholders reflected a positive attitude towards the provision of municipal services in the Business Park.

As an outcome of this assessment, a series of projects have been identified to implement the master Plan. These projects are classified as Schedule 'A', 'A+', or 'B' activities under the terms of the Class EA document. The majority of schedule 'A', 'A+' and 'B' activities have been assessed in conjunction with the current Master Plan process and do not require additional Class EA review prior to implementation.

It is anticipated by the Municipality that the completion of the development of the Business Park will take a number of years and will therefore need to follow a phased-in infrastructure plan. Further discussions need to be undertaken with the various property owners to ascertain what areas of the Business Park may need to proceed in advance of others.

Prior to the implementation of the preferred servicing strategy, a Stage 2 Archaeological Assessment must be completed for the areas identified through the Stage 1 Assessment. Additionally, no construction work is permitted within 70 m of the Clements Site until a Stage 3 Assessment is completed for that site.

The technical investigation of water servicing in the Business Park identified the potential need for a booster pumping system for later phases of development. It is anticipated a booster pumping station will be sited in the vicinity of Millenium Way and Durham Street. Prior to constructing a booster pumping station, it is recommended the Municipality establish a pressure monitoring system to track system operation as development proceeds to better determine the appropriate timing for construction of the pressure boosting facilities. Given that the timing of the construction of the booster pumping station is dependent on development and the site should be reviewed further, it is suggested that a separate Schedule B Municipal Class EA be completed for this component.

The Kincardine Business Park Servicing Master Plan has been completed in accordance with the planning and design process of the Municipal Class Environmental Assessment (Class EA). For this study, the Master Plan process incorporated the completion of Phases 1 and 2 of the Class EA process. The Master Plan will be approved for implementation subject to the adoption by the Council of the Municipality of Kincardine.

All of which is respectfully submitted.

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