



December 12, 2013

David Schaeffer Engineering Limited
600 Alden Road #500
Markham, Ontario
L3R 0E7

Attention: Mr. Mike Baldesarra, P. Eng.
Manager of Design Administration

RE: Merton Tertiary Planning Area Odour Study

Dear Mr. Baldesarra,

1.0 Introduction

We provide herein the results of the Merton Tertiary Planning Area Odour Study which provides an understanding of the potential impacts of the Mid-Halton Wastewater Treatment Plant on the Merton Tertiary Planning Area (see attached Study Area Drawing) and the proposed separation distances from the Mid-Halton Wastewater Treatment Plant to sensitive land uses.

2.0 Mid-Halton Wastewater Treatment Plant (WWTP)

The Mid-Halton WWTP, which was originally commissioned in 1991, is located in the Town of Oakville, north of the North Service Road between Third Line and Bronte Road. The treatment plant services portions of the Town of Oakville, Town of Milton, Halton Hills and City of Burlington. Halton Region has indicated that the:

Mid-Halton WWTP operated with an Annual Average Day flow of 49.0 MLD in 2012, under a Rated Capacity of 75.0 MLD. Ministry approval for expansion to a 125 MLD capacity was received in August 2012. Our current planning horizon of 2031 (Sustainable Halton) is projected to require a capacity of approximately 175 MLD. Significant growth between 2031 - 2041 has been identified by the Province however planning and servicing impacts have not yet been assessed by Halton beyond 2031.

The Phase IV and V expansion of the WWTP will add 50 ML/d to increase the plant rated capacity from 75 MLD to 125 MLD.

Specific details of the Mid-Halton WWTP are provided in Section 4.1 of this report which discusses the relevant aspects of the Phase IV & V Expansion Class Environmental Assessment Environmental Study Report with regards to odour.

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3.0 Applicable Guidelines

3.1 MOE Guideline D2

The MOE GUIDELINE D-2 (formerly 07-05) Compatibility between Sewage Treatment and Sensitive Land Use, August 1996, cites the following separation distances for sewage treatment plants relative to sensitive land uses:

3.4.3 Capacity Greater than 25,000 m³/d

These plants will be dealt with on an individual basis. A separation distance of greater than 150 metres may be required.

The determination of the required distance will depend on the type of noise sources (for example generators, blowers, etc...) and the type of noise / odour control measures being applied.

The Guideline further indicates that alternatives to buffer area acquisition include effective odour mitigation to provide an optimum level of protection between the sewage treatment facility and adjacent sensitive land uses.

The Guideline indicates that when measuring separation distances, the separation distances will be measured from the periphery of the noise/odour-producing source-structure, to the property/lot line of the sensitive land use.

3.2 Halton Region Draft Land Use Compatibility Guidelines

The Draft Land Use Compatibility Guidelines, December 2012, provides the Potential Area of Influence of a source based on the nature of the odour emissions generated by the source. The Potential Area of Influence is based on the Class of Industrial Facility as follows:

Source	Odour	Potential Area of Influence
Class I Industrial Facility	Infrequent and not intense	70 metres
Class II Industrial Facility	Frequent and occasionally intense	300 metres
Class III Industrial Facility	Persistent and/or intense	1000 metres

The Guideline indicates that the potential area of influence are a good beginning point to determine appropriate separation distances, however, in cases of current planning, assessments evaluating odour quality can be conducted to determine actual areas of influence and indicate appropriate separation distances for particular activities and sources.

In the Guideline a sensitive land use is defined as:

Sensitive land uses means building, amenity areas or outdoor spaces where routine or normal activities occurring at reasonably expected times would experience one or more adverse effects from contaminant discharges, fumes, odours, vibrations, sound waves of radiation generated by a nearby industrial, transportation or utility source. Sensitive land uses may be part of the natural or built environment. Examples may include, but are not limited to: residential uses, seniors housing, community centres, recreation areas, day care centres, nursing homes, hospitals, and schools.

4.0 Reports and Information Provided By Halton Region

We have conducted a review of reports and correspondence provided by Halton Region related the Mid-Halton Wastewater Treatment Plant and provide the following summaries relating to odour.

4.1 Mid Halton Wastewater (Sewage) Treatment Plant Phase IV & V Expansion Class Environmental Assessment Environmental Study Report, April 2010, Hatch Mott MacDonald Group

The report indicates that the plant was currently in the completion stage of construction for the Phase III expansion which was expected to be commissioned during Spring 2010. The Phase III expansion will bring the capacity of the Mid-Halton WWTP to 75 ML/d average day capacity. The proposed expansion for Phases IV and V will bring the plant capacity to 125 ML/d.

With regards to odour control, the report indicates that Mid-Halton WWTP was currently equipped with two odour control units, one installed in the headworks building, and one installed in the biosolids building. The headworks odour control unit is a 6,000 cfm carbon adsorption unit. The biosolids odour control unit is a 6,000 cfm biological odour control system which contains a biofilter.

The report indicates that although there is no record of public odour complaints specifically linked to emissions or activities at the Mid Halton WWTP, some key areas which could potentially produce odour, would be provided with emission control equipment as preventative measure during the Phase IV and V expansion. It is planned to provide odour control equipment at the North Pumping Station, and expand odour control in the Headworks Building if deemed necessary. Odour control technology in the biosolids building will not be expanded, as the building itself will not require expansion.

The report also indicates that the structural design of the proposed primary clarifiers and detritor tanks is such that future covering of these tanks could be implemented in future, if deemed necessary for odour control.

The report included the Figure 10.1 below which depicts a perspective view of the plant site with the proposed facility expansions.

Figure 10.1 Perspective View of Plant Site Showing Existing and Proposed Facilities



With regards to Buffer Distance from Community, the report stated the following:

As a result of a letter from Halton Region to MOE providing a copy of the Notice of Commencement for this project, the Ministry of the Environment provided a response on February 6, 2009 which included MOE Technical Support Section's comments on the proposed undertaking.

The MOE letter recommended referring to MOE "D-Series" Guidelines – Land Use Compatibility to ensure that all applicable Ministry procedures are followed while planning for any infrastructure or facilities relating to wastewater, pipelines, landfills or industrial uses. Guidelines D-2 of the D-Series Guidelines deals with compatibility between sewage treatment and sensitive land use. The requirements of this guideline are also incorporated into the MOE Design Guideline for sewage works 2008. In Section 4.5 of this MOE guideline, the minimum separation distance between sewage works and sensitive land use is discussed. Section 4.5.3 of this guideline suggests a separation distance of greater than 150 m for plants with rated capacities equal to or

greater than 25 ML/d. Following the Phase IV & V Expansion of the Mid-Halton plant, the capacity will be 125 ML/d. The following is extracted from the MOE Guideline

4.5.3 STPs with Rated Capacity Equal to or Greater than 25,000 m³/d (6.6 mUSgd). The recommended separation distance should be greater than 150 m (490 ft) and determined on a case-by-case basis. The determination of the required distance will depend on factors such as the type of treatment process, type of noise or odour control measures being applied, existing municipal zoning and availability of land.

The Mid-Halton WWTP currently has the largest buffer distance between off-site sensitive land uses and plant facilities with the potential to generate odours of any of the Region of Halton's sewage treatment plants.

The existing North Pumping Station is currently the plant facility that is closest to residential development.

That facility is approximately 280 m from the residential development to the north-east of the plant site. This pumping station is planned to be expanded as part of the Phase IV and V WWTP Expansion by constructing a physical expansion of that facility to the west. It is also planned to incorporate odour control measures as part of that pumping station expansion. This planned pumping station expansion will therefore not decrease the existing separation distance and the odour control measures proposed will lessen the potential off-site odour impacts of this facility.

The next closest proposed treatment facilities as part of the Phase IV and V WWTP expansion are the additional primary clarifiers. These primary clarifiers will be approximately 300 m from the existing residential development to the north-east of the plant site. A new grit detritor tank is also proposed but this tank will be > 300 m from the existing residential development to the north-east of the plant site. Although no odour control measures are proposed for the primary clarifiers and detritor tank for this proposed expansion, it is recommended that the structural design of the tankage for these facilities should be such that covers could be provided in future if ever deemed necessary for odour control.

Even following this planned Phase 4 and 5 WWTP Expansion phases, the separation distances from the pumping station and plant processes with the potential to emit odours will therefore be well in excess of the MOE recommended minimum separation distance of 150 m.

4.2 Annual Odour Monitoring at the Mid-Halton Wastewater Treatment Plant (WWTP), 2011, November 10, 2011, ORTECH Environmental

Odour emission testing was carried out at 26 sources in the plant to determine odour concentrations and emission rates for these sources. Results for these sources were used to estimate odour emission rates for a further 28 sources in the plant to give a total of 54 sources.

The report indicates that the odour emission rates for the sources which were tested ranked as follows:

- 50000 to 60000 ou/s - Biosolids Truck Loading Vent – loading
- 1000 to 2000 ou/s - Inlet Building Exhaust Vent
 - Detritor No. 2 Exit Channel
 - Primary Clarifiers Exit Channel
 - Aeration Tank No. 9 Anoxic Zone
 - Biofilter Stacks (2 stacks)
- 500 to 1000 ou/s - Third Line Pumping Station building Vent
 - Detritor No. 1
 - Detritor No. 1 Exit Channel
 - Biosolids Truck Loading Vent – no loading
- 100 to 500 ou/s - North Pumping Station Exhaust Stack No. 2
 - Carbon Adsorber Exhaust Vent
 - Detritor No. 1 Turbulent Channel
 - Detritor No. 2
 - Primary Clarifier Inlet End
 - Aeration Tank No. 5
 - Aeration Tank No. 9 Aeration Zone
- 0 to 100 ou/s - Primary Clarifier No. 3 Scum End
 - Aeration Tanks (5 tanks)
 - Mixed Liquor Channel
 - Secondary Clarifier No. 1 Outlet End
 - Secondary Clarifier No. 1 Scum End

The report indicates that for the past seven years the reported plant total odour emission rates have been:

- 2005.....19077 ou/s
- 2006.....28524 ou/s
- 2007.....66850 ou/s
- 2008.....20726 ou/s
- 2009.....46834 ou/s

- 201072629 ou/s
- 201116841 ou/s

4.3 Region-Wide Odour Management Strategy (OMS) for Halton Wastewater Treatment Plants, March 19, 2012, ZORIX Consultants Inc.

Wastewater treatment plant odour sources were identified and quantified in terms of their odour emission rates in 2007. The odour emission rates were modelled using AERMOD to determine theoretical impacts on surrounding neighborhoods and to develop control solutions for priority sources.

The report indicates that odour complaints received by Halton for the five year period of 2003 – 2007 were analyzed and summarized and that very few odour complaints had been received relative to the Mid-Halton WWTP and the complaints that were received were not believed to have resulted from odour originating from the WWTP based on analysis of the complaint details and the recorded wind directions. The report indicated that odour complaints in 2003/2004/2005 may have been due to Petro-Canada.

The report indicates that the odour threshold where complaints begin to occur as a result of odours from WWTP's varies based on published scientific studies, with values between 4.2 OU/m³ and 20 OU/m³ reported.

The report indicates that given the complexity of establishing appropriate odour criteria, quantitative target criteria for odour are not proposed for Halton WWTPs. Rather, prediction of ambient OU (Odour Unit) level and frequency of occurrence was recommended as a means to assess the relative degree of the potential odour impact with a WWTP and odour source, and to gauge the relative benefit of potential odour control improvements and to assist in decision making.

The report indicates that relative to the expansion of the Mid-Halton WWTP, it is recommended that odour controls (covers and treatment) be considered and evaluated for any new primary clarifiers and grit tanks.

The results of the AERMOD odour dispersion modelling indicated the following:

- Modelling the 2007 odour data, almost all of the odours are contained to inside the plant property line with an expected off property maximum impact of about 5.5 OU at a point of impingement located approximately 160 m northeast of the plant property line.
- Modelling the future odour emissions following the WWTP expansion, with inclusion of recommended odour remedial controls (i.e. odour control for biosolids facility and pumping wet well), the expected off property maximum impact is 5.6 OU at a point of impingement located approximately 160 m northeast of the plant property line.

The report indicates that no additional costs will be need to reduce odours generated at the Mid-Halton WWTP as odour controls are being constructed with the expansion of the facility.

4.4 E-mail correspondence with Mr. Steve English, PM Regulatory Compliance, Halton Region

The Region-Wide Odour Management Strategy (OMS) for Halton Wastewater Treatment Plants, March 19, 2012, ZORIX Consultants Inc. Report provides AERMOD odour dispersion modelling of the future odour emissions following the WWTP expansion, with inclusion of recommended odour remedial controls (i.e. odour control for biosolids facility and pumping wet well).

Pollutech contacted Mr. Steve English, PM Regulatory Compliance, Halton Region to confirm what odour control for the biosolids facility had been implemented. Mr. English responded that:

“The current biosolids building went into operation in late 2009 with full production of both Rotary Drum Thickeners and Centrifuge in 2010. The biofilter treats containment for the process equipment, conveyor system, storage hoppers and tanks. The truck loading is tied to separate ventilation (high-rate) during loading only. In 2011 modifications were made to the discharge plenums and curtains were installed to better contain releases during the cake transfer (storage hopper to truck). The discharge for the truck loading exhaust fans are not controlled, the system is designed to mitigate in-building emissions during the loading process.”

Mr. English indicated that Annual Odour Monitoring at the Mid-Halton Wastewater Treatment Plant (WWTP) for the 2012 operating year has been conducted, however, the report I marked confidential, and it he was not sure how long it would take to get clearance for release. Nevertheless, for comparative purposes Mr. English provided the following summary of the emission rates:

Source	Emission Rate (ou/s)
Biosolids Truck Loading Exhaust	43,757
Biofilter #1	9,274
Biofilter #2	8,665
North Pumping Station (Ex 1 / WW1)	4,386
North Pumping Station (Ex 2 / WW2)	1,402 (pro-rated)
Inlet Building Carbon Exhaust	332
Inlet Building Exhaust Stack	427
Primary Clarifier #3 Exit Channel	134
Primary Clarifier #3	159
Grit Tank #1 Exit Channel	78
Grit Tank #1	122
Aeration Tank #3	1,663

Source	Emission Rate (ou/s)
Aeration Tank #9 - Anoxic	3,330
Circular Aeration Tank #8	1,750

Mr. English indicated that AERMOD dispersion modelling of the facility odour emissions with a scenario including the high odour emissions from the Biosolids Truck Loading exhaust has not been conducted, or is planned, and agreed that the high fugitive emission rate associated with Biosolids Truck Loading operations would certainly be germane to any future 'worst case' odour modelling scenario.

5.0 Discussion and Conclusions

In terms of the separation distance between the Mid-Halton Wastewater Treatment Plant and sensitive land uses, we provide the following:

The MOE Guideline D2 indicates a separation distance of greater than 150 metres may be required and the Halton Region Draft Land Use Compatibility Guidelines indicate a potential area of influence of 300 metres for a Class II Industrial Facility (Frequent and occasionally intense odour). However, these guidelines recognize that effective odour mitigation and/or assessments evaluating odour quality can be conducted to determine actual areas of influence and indicate appropriate separation distances for particular activities and sources.

As part of the Mid-Halton Wastewater Treatment Plant Phase IV and V expansion, some key areas which could potentially produce odour are to be provided with emission control equipment as preventative measure to control odours. Furthermore, the design of the proposed primary clarifiers and detritor tanks is such that future covering of these tanks could be implemented in future, if deemed necessary for odour control.

The Region-Wide Odour Management Strategy (OMS) for Halton Wastewater Treatment Plants Report provides an evaluation of odour quality based on real odour data collected from the Mid-Halton Wastewater Treatment Plant (WWTP) and dispersion modelling of future odour emissions following the WWTP expansion, with inclusion of recommended odour remedial controls. The dispersion modelling predicts an expected off property maximum impact at a point of impingement located approximately 160 m northeast of the plant property line. However, the dispersion modelling conducted does not include the short term impacts from the Biosolids Truck Loading operations and this emission source represents a significant odour emission source at the facility.

It would be prudent to conduct dispersion modelling of the the short term impacts from the Biosolids Truck Loading operations to assess maximum impact and any potential requirements for operational or process mitigation, and also any impact on current or future separation distance allocation.

In the absence of such definitive information we would recommend for planning purposes that the minimum separation distance of 300 m referenced in the Halton Region Draft Land Use Compatibility Guidelines be applied to any future development to minimize potential adverse effects due to odour.

When measuring separation distances, the separation distance should be measured from the periphery of the odour-producing source-structure at the Mid-Halton Wastewater Treatment Plant, to the property/lot line of the sensitive land use. The attached Tertiary Plans for Options A, B, and C depict a 300 metre separation distance from the periphery of the odour-producing source-structures at the Mid-Halton Wastewater Treatment Plant and we note that none of the new proposed land use options are deemed sensitive land uses within the proposed 300 metre separation distance.

6.0 Closure

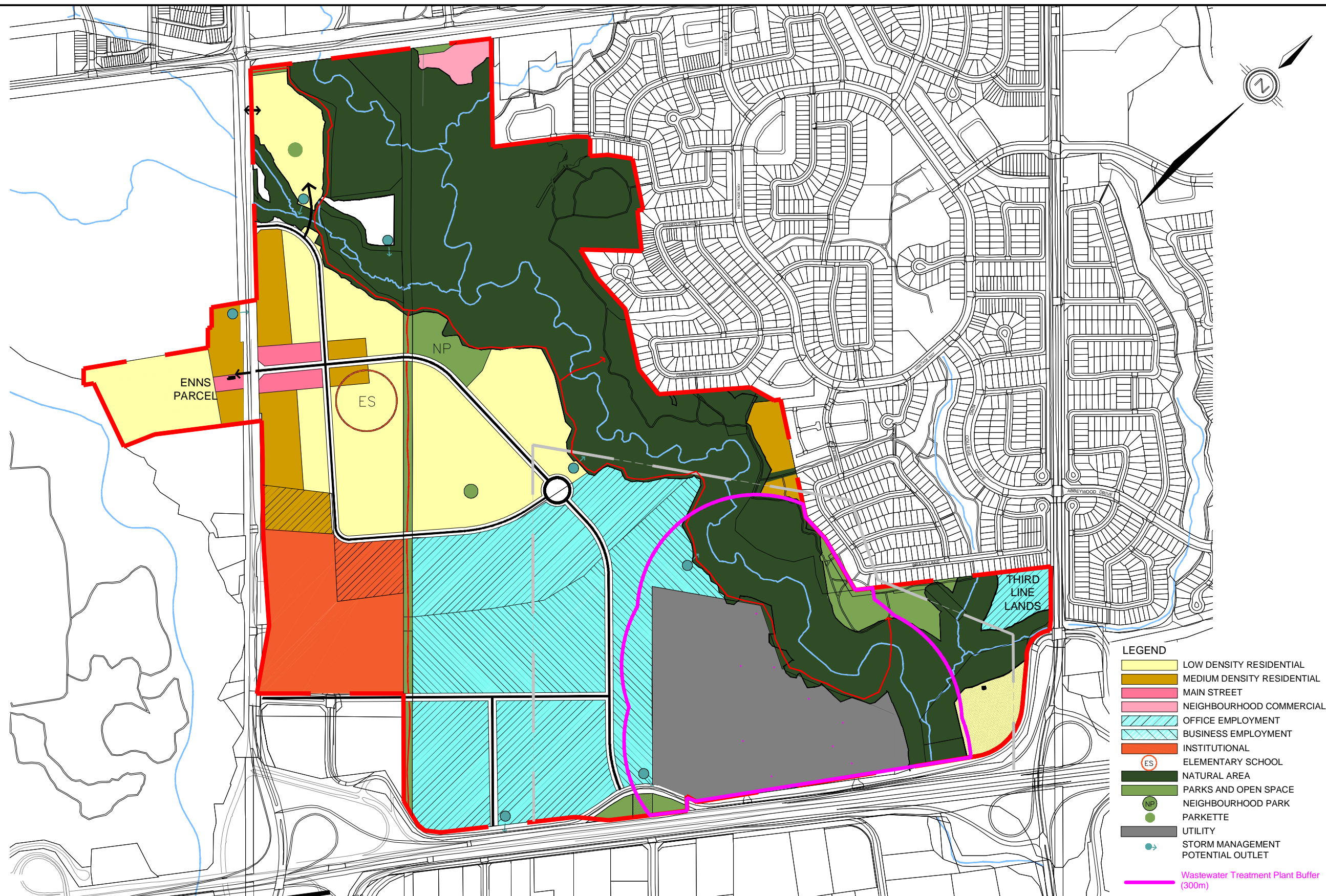
We trust that the results of the Bronte Green Odour Study have been presented in a straightforward manner, however, if any additional clarification is required feel free to contact us.

Yours very truly,

POLLUTECH ENVIRONMENTAL LIMITED



Gregory M. Brown, P.Eng., M.A.Sc., MBA, GHG-IQ
President

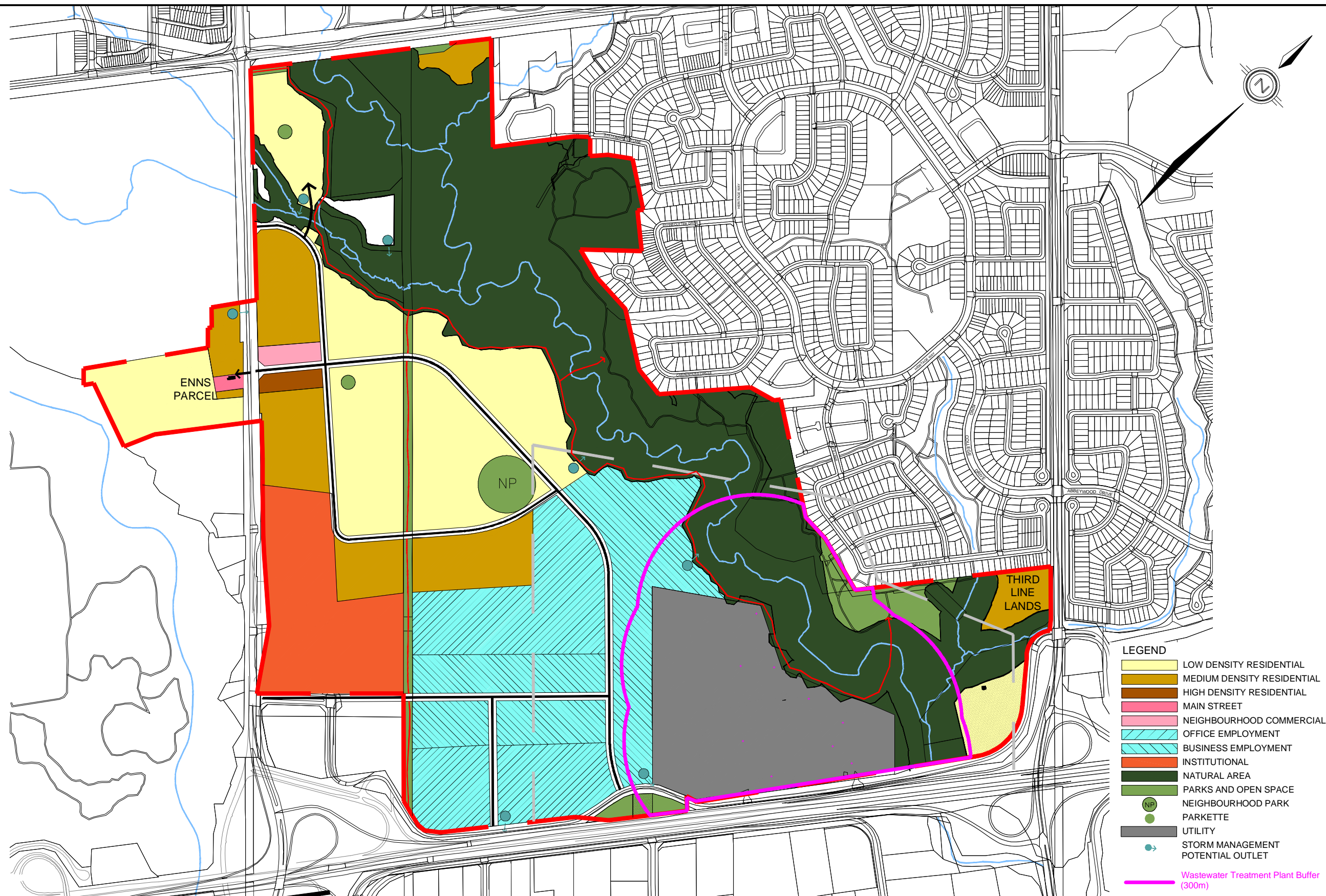


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MERTON (QEW / BRONTE ROAD) TERTIARY PLANNING STUDY

TERTIARY PLAN - OPTION A

DATE:	NOVEMBER 2013
SCALE:	1:10000
PROJECT No.:	12-601
FIGURE	2

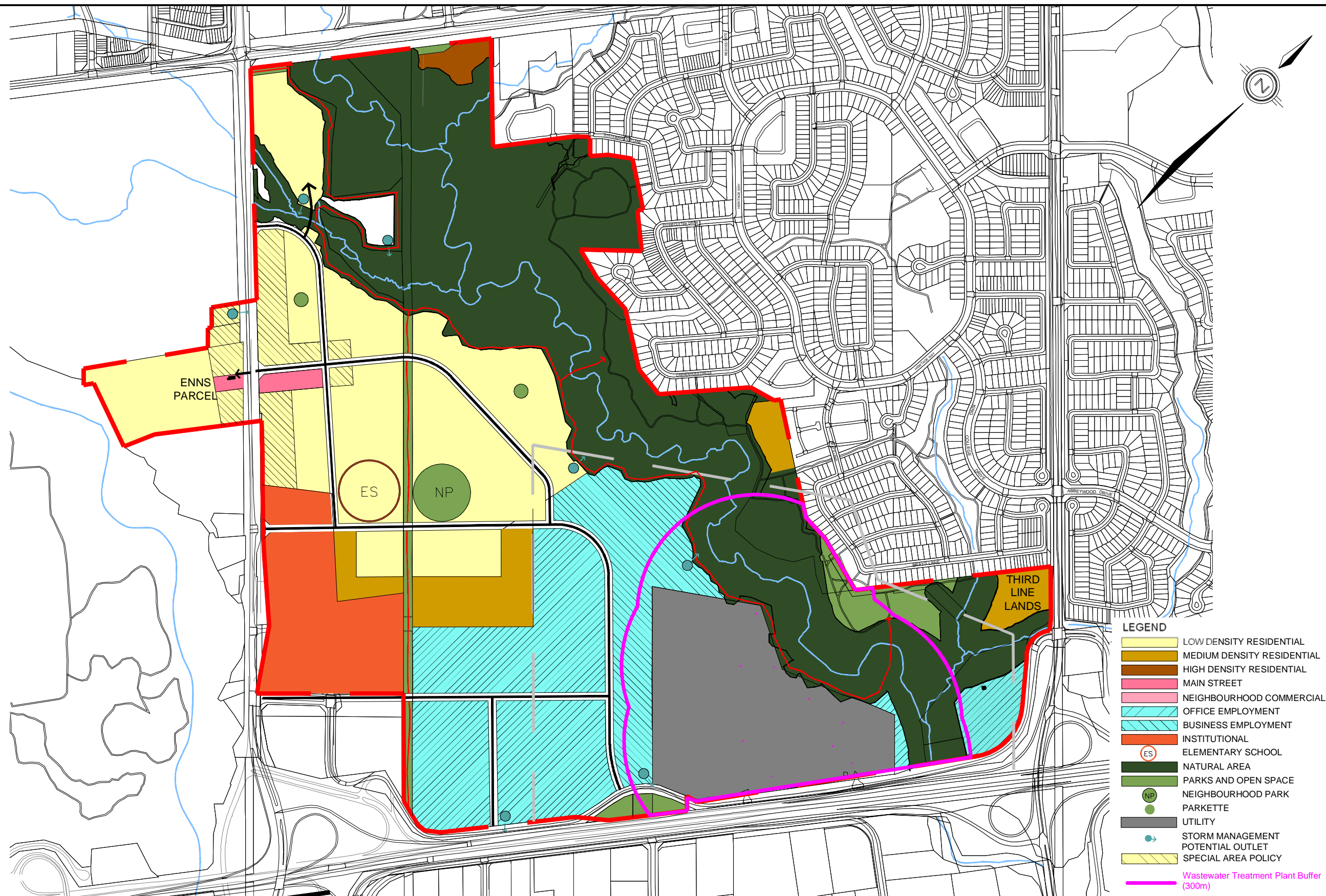


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MERTON (QEW / BRONTE ROAD) TERTIARY PLANNING STUDY

TERTIARY PLAN - OPTION B

DATE:	NOVEMBER 2013
SCALE:	1:10000
PROJECT No.:	12-601
FIGURE	3



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MERTON (QEW / BRONTE ROAD) TERTIARY PLANNING STUDY

TERTIARY PLAN - OPTION C

DATE: NOVEMBER 2013

SCALE: 1:10000

PROJECT No.: 12-601

FIGURE 4