

COMMITTEE OF THE WHOLE – JUNE 19, 2012

KLEINBURG–NASHVILLE SERVICING STRATEGY CLASS ENVIRONMENTAL ASSESSMENT STUDY NOTICE OF STUDY COMPLETION WARD 1 – VICINITY NORTH OF RUTHERFORD ROAD BETWEEN HUNTINGTON & KIPLING

Recommendation

The Commissioner of Engineering and Public Works, in consultation with the Commissioner of Finance / City Treasurer, recommends that Council approve the Draft Kleinburg–Nashville Servicing Strategy in principle, and direct staff to issue a notice of study completion following finalization of the study report.

Contribution to Sustainability

In considering the objectives of the City's Community Sustainability and Environmental Master Plan (Green Directions Vaughan), the Kleinburg-Nashville Servicing Strategy will assist in:

- Minimizing greenhouse gas emissions and the movement towards carbon neutrality for City facilities and infrastructure
- Ensuring efficient and appropriate use of potable water
- Achieving sustainable growth and development
- Creating a City with sustainable built form
- Sharing sustainable best practices and ideas between and among municipal staff and the community

Implementing the recommended infrastructure will advance water conservation and efficiency initiatives and the reduction of inflow and infiltration within the wastewater collection system.

Economic Impact

The Kleinburg-Nashville Servicing Strategy recommends a network of new watermains and sanitary sewers required to service planned growth and the existing residential neighborhoods (currently on private services) within the limits of the Community Plan. The total cost of these improvements is valued at approximately \$62 million as detailed in this report.

The growth-related component is valued at approximately \$37 million. The majority of this proposed infrastructure, approximately \$22 million, will be designed, constructed and paid for by local developers in conjunction with the servicing of development. The remainder of the growth related works, approximately \$15 million, will be included in the City's Draft Development Charges Background Study currently being prepared by Hemson Consulting.

The Strategy further identifies what infrastructure would be required to service existing residential neighborhoods currently on private services. These works would not be considered growth related. The non-growth related component of the Strategy is valued at approximately \$25 million. Funding and implementation of the non-growth component would be user-driven. As the existing residential neighborhoods are currently adequately serviced by private septic systems and / or wells, there is no expectation the property owners will be petitioning the City to extend services into their neighborhoods in the foreseeable future. Accordingly, there is currently no financial impact to existing residential property owners / residents. At some point in the future, should existing residential property owners wish to connect to the municipal systems, the City may impose a special fees by-law applicable to all existing benefitting areas in accordance with the provisions of the "*Municipal Act*" to fund the works. Any costs attributable to the City would be subject to future capital budget deliberations.

Once implemented, the water and wastewater servicing improvements will incur normal expense associated with annual operating, maintenance and life cycle costs. The life cycle costs will be detailed further in conjunction with capital funding requests for individual components of the Strategy.

Communications Plan

A comprehensive public consultation program to obtain input from all affected stakeholders was completed as part of the study. The main components undertaken include:

- Notice of Study Commencement
- Two Public Information Forums
- Various individual stakeholder meetings with local landowners
- Notice of Study Completion (to be released fall of 2012)

All notification related to the study was directly mailed to affected stakeholders on the project mailing list, advertised in local newspapers and posted on the City website.

A final Notice of Study Completion will be issued in the fall of 2012. Upon issuance of this notice, the final study report will be placed on public record for a 30-day review period in accordance with the requirements of the Municipal Class Environmental Assessment process.

Purpose

The purpose of this report is to highlight the conclusions and recommendations of the Kleinburg-Nashville Servicing Strategy for Council's approval in principle so the Notice of Study Completion can be issued in accordance with the Municipal Class Environmental Assessment process.

Background - Analysis and Options

Kleinburg-Nashville Community Plan to accommodate population of 32,000

The Kleinburg-Nashville Community Plan area is bounded by Rutherford Road to the south, Kirby Road to the north, Huntington Road to the west and Kipling Avenue to the east as shown on Attachment No. 1. Main branches of the Humber River traverse the community providing significant valleyland corridors and generous topographic relief.

In 2007 Council approved Official Plan Amendment (OPA) 601 for the Kleinburg-Nashville Community, which provided for an ultimate residential community population of approximately 7,500 people. Accordingly, servicing strategies to accommodate the proposed growth were undertaken by the City and York Region.

As part of the recent City-wide Official Plan review process, a number of focus areas within the existing community limits were considered for growth. With the conclusions of this work in 2010, and the concurrent approval of residential development within Block 61, an ultimate residential population of approximately 32,000 people is now planned for the community.

A Servicing Strategy ensures infrastructure is comprehensively planned and delivered in a timely manner

AECOM Canada was retained by the City to undertake a local servicing strategy study in accordance with the Municipal Class Environmental Assessment process. The draft Servicing Strategy was completed in July of 2011. It builds upon previous Regional and local infrastructure studies and recommends the required water and wastewater system improvements to facilitate

development planned for the community as envisioned by the City's new Official Plan 2010. The Servicing Strategy is key to ensuring infrastructure is comprehensively planned and delivered in a timely manner and will facilitate the development review and approvals process. A detailed overview (Executive Summary) of the study is provided in Attachment No. 2. The key findings and recommendations of the study are outlined below.

Lake-based water supply required to service community

York Region's water supply to the existing Kleinburg-Nashville Community is currently well-based. It relies on a groundwater (aquifer) supply source which draws water from three communal wells to provide potable water to residents and businesses. The City then distributes this water to local residents and businesses via the local water distribution network. The available supply of water from the wells is limited. As growth continues, the wells will no longer be able to adequately supply the peak daily volume of water required to service the community. Accordingly, a water supply system conversion to York Region's lake-based water supply system will be implemented.

The Regional water supply conversion will occur in phases and is expected to be fully complete by summer of 2014. Upon completion of the system conversion, the existing wells will remain on standby as a secondary emergency supply if required. The timing for the permanent decommissioning of the existing wells is currently unknown.

A number of Regional water supply system improvements will be constructed to facilitate the ultimate conversion. These include the following:

- Huntington Rd Watermain - 750 millimetre diameter (Rutherford Rd to Nashville Rd)
- Islington Ave Watermain - 400 millimetre diameter (Sunset Ridge to Bindertwine / Sevilla Blvd)
- Booster Station 1 (at existing elevated water storage tank site)
- Nashville Rd / Whisper Lane / Highway 27 Watermain - 600 millimetre diameter
- Booster Station 2 (at the existing well-house on Whisper Lane)

Attachment No. 3 graphically identifies the proposed Regional watermain network improvements.

The recommendations of the City's Servicing Strategy consider and build upon the planned Regional infrastructure. A series of distribution watermains will be required to facilitate growth and provide municipal water to existing residential neighborhoods currently serviced by private wells. Attachment No. 3 graphically identifies the proposed network of new City watermains recommended by the study. These include:

- Major Mackenzie Dr Watermain (Huntington Rd to Islington Ave)
- Highway 27 Watermain (Existing elevated tank to Kirby Rd)
- Kirby Road Watermain (Highway 27 east to Kipling Ave)
- Kipling Ave (Kirby Rd south to Stegman's Mill Rd)
- Huntington Rd Watermain (north of Nashville Rd)

Sanitary sewer system improvements will connect Kleinburg-Nashville to the York-Durham Sewage System via Woodbridge and Maple service areas

The current wastewater collection system is comprised of local City-owned sanitary sewers and privately owned sewage septic systems. The outlet for the local sewers is the Regional Kleinburg Water Pollution Control Plant (KWPCP) which discharges directly to the Humber River within the community.

An expansion to the existing KWPCP has recently been completed and commissioned by York Region which essentially doubles the sewage treatment capacity for the community to a maximum serviced population of 7,500 people. Although its capacity has significantly increased, it can not support the ultimate anticipated growth (approximately 32,000 people) within the community.

The City's Study has concluded that sanitary sewage flows beyond the expanded capacity of the water pollution control plant will be directed to the York-Durham Sewage Servicing system via the existing Maple and Woodbridge service areas. Given the topographic constraints within the community, a number of local sewage pump stations and forcemains are proposed to work concurrently with the proposed gravity sewer system. An expansion to the City's existing sewage pumping station at Highway 27 and Nashville Road will also be required.

Attachments No. 4 and 5 graphically identify the proposed network of new sanitary sewers, pump stations and forcemains recommended by the study. Attachment No. 4 identifies all growth related system improvements and Attachment No. 5 identifies all non-growth related system improvements required to allow for existing residential areas currently serviced by private septic systems to connect with the municipal system in the future, if necessary. The key infrastructure improvements are listed below:

- Nashville Rd Sewer (Huntington Rd to Highway 27)
- Major Mackenzie Dr Sewer (Huntington Rd to Highway 27)
- Huntington Rd / Block 61 West Sewer (Major Mackenzie Dr north towards Kirby Rd)
- Highway 27 Sewer (Major Mackenzie Dr to Kirby Rd)
- Kirby Rd Sewer (Highway 27 to Kipling Ave)
- Kipling Ave Sewer / Teston Rd Forcemain

The Block 61 Developers' Group has advanced the construction of a 750 millimetre diameter sanitary sewer along Huntington Road (from Trade Valley Drive to Major Mackenzie Drive) to collect wastewater flows from proposed development in the area. This sewer will ultimately outlet to the Woodbridge Collector and the York-Durham Sewage System. Refer to Attachment No. 4.

Sanitary sewage flows generated by the proposed development along the west side of Kipling Avenue will be directed east to the proposed Pine Valley North Pumping Station in Block 40. These flows will ultimately outlet to the Maple Collector and the York-Durham Sewage System. Refer to Attachment No. 4.

Implementation of growth related infrastructure will be development driven

Given the wide range of capital projects comprising the recommended solution, implementation of various elements of the Strategy will be development driven. The majority of the elements in the Strategy are considered growth-related and will be constructed through development or funded through Development Charges.

Staff will ensure infrastructure requirements are financially secured and constructed as part of the development review and approvals process.

The Strategy provides for the servicing of the existing suburban residential areas if required in the long term

The main objective of the Strategy was to consider the ultimate servicing needs of the entire community. As a result, the recommendations of the Strategy identify how all existing residential neighborhoods could be serviced by municipal water and sewer systems in the future if needed. These neighborhoods comprise of rural residential pockets currently serviced by private septic

systems and wells, and suburban areas currently serviced with municipal water, but on private septic systems.

As these existing residential neighborhoods are currently adequately serviced by private septic systems and / or wells, there is no expectation that the property owners will be petitioning the City to extend services into their neighborhoods in the foreseeable future. If in the future the property owners in an unserved neighborhood petition the City to extend services, then the City could impose a special fees by-law applicable to all existing benefitting areas in accordance with the provisions of the "Municipal Act" to fund the works. Any costs attributable to the City would be subject to future capital budget deliberations.

Preliminary estimates value total capital costs for all City infrastructure improvements at approximately \$62 Million

A summary of the preliminary estimated capital costs associated with the recommended infrastructure improvements for all City growth related and non-growth related works is provided below.

**GROWTH RELATED
INFRASTRUCTURE IMPROVEMENT COSTS**

ITEM	DESCRIPTION	COST (Millions)
1	Sanitary Sewers (Gravity)	\$ 6
2	Sanitary Forcemains	\$ 3
3	Sanitary Pump Stations	\$13
4	Watermains	\$ 15
TOTAL		\$ 37

The majority of the above growth related infrastructure will be designed, constructed and paid for by local developers in conjunction with the servicing of new development. The remainder will be included in the next Development Charges Background Study and constructed when needed.

**NON-GROWTH RELATED
INFRASTRUCTURE IMPROVEMENT COSTS**

ITEM	DESCRIPTION	COST (Millions)
1	Sanitary Sewers (Gravity)	\$ 7
2	Sanitary Forcemains	\$ 2
3	Sanitary Pump Stations	\$ 15
4	Watermains	\$ 1
TOTAL		\$ 25

Relationship to Vaughan Vision 2020 / Strategic Plan

In consideration of the strategic priorities related to Vaughan Vision 2020, the recommendation of this report will assist in:

- The pursuit of excellence in service delivery
- Leadership initiatives and promotion of environmental sustainability
- Effective governance
- Planning and managing growth, and economic vitality

The recommendations of this report will assist in advancing the City's Strategic Plan initiative to establish "city-wide master phasing and servicing allocation plans".

This report is therefore consistent with the priorities previously set by Council.

Regional Implications

Regional staff has been involved throughout the duration of the study and are supportive of the study findings and recommendations. Regional comments have been received on the draft document and will be addressed prior to finalizing the study report.

In addition, the finalization of the study report will inform the on-going Regional West Vaughan Sanitary Sewer Class Environmental Assessment Study. This study will identify a sustainable and cost effective solution for the long-term sewage servicing needs of the West Vaughan area.

Conclusion

The draft Kleinburg-Nashville Servicing Strategy Study has been completed. It recommends a network of new watermains and sanitary sewers required to service planned growth and existing residential areas within the limits of the community. Preliminary estimates value the recommended improvements at approximately \$62 million. Capital funding for the majority of these improvements will be funded by local developers and remainder through Development Charges. Funding and implementation of the non-growth elements would be user-driven if needed in the future.

The approval in principle of the draft Kleinburg-Nashville Servicing Strategy will ensure infrastructure is comprehensively planned and delivered in a timely manner to support the planned development within the area and will enable staff to take the next steps towards implementing the Strategy.

Attachments

1. Kleinburg-Nashville Community Plan Area
2. Executive Summary – AECOM Canada
3. Proposed Watermains
4. Proposed Sanitary Sewer System (Growth Related)
5. Potential Sanitary Sewer System (Non-Growth Related)

Report prepared by:

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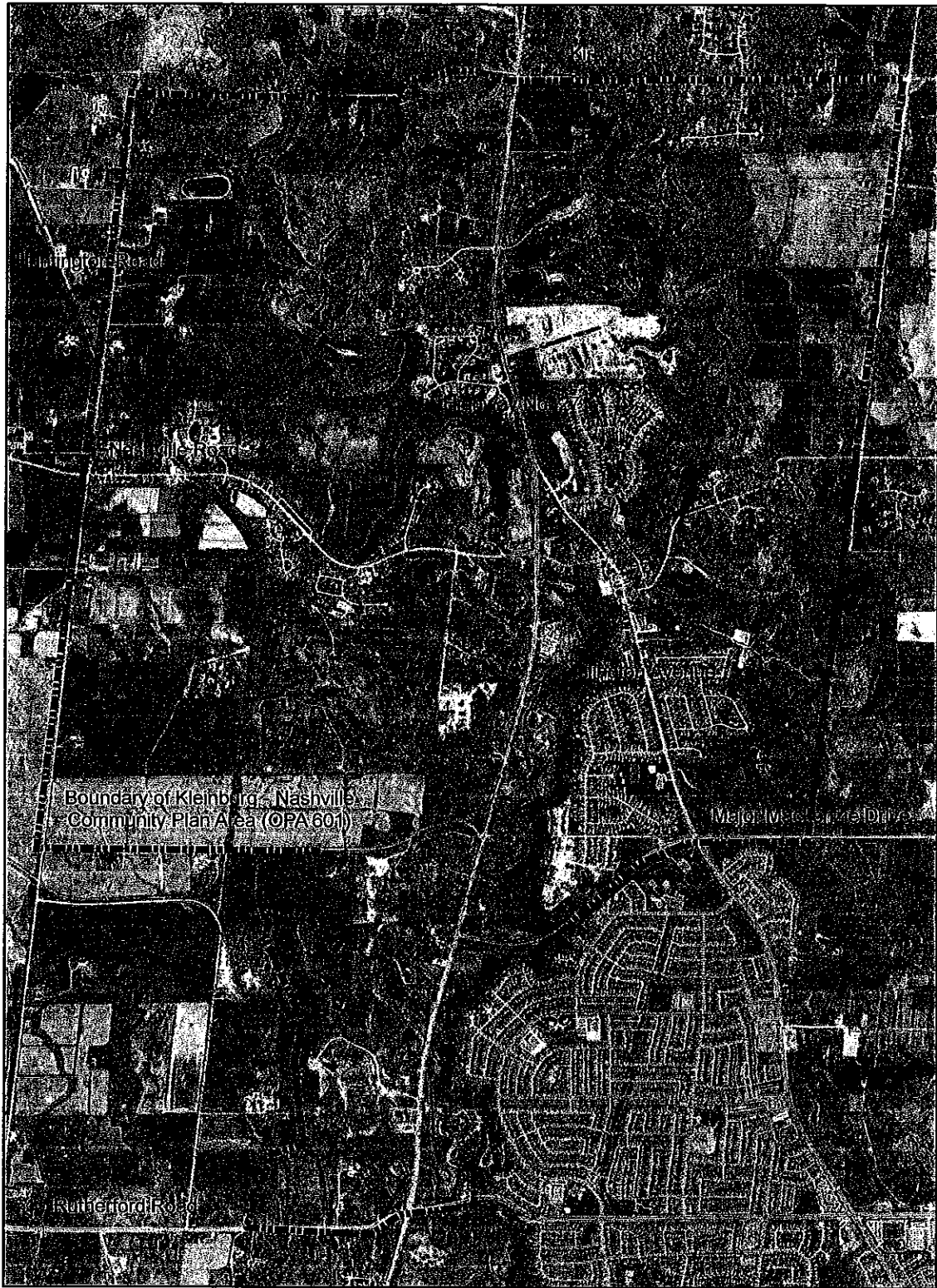
Michael Frieri, Manager of Engineering Planning & Studies, Ext. 8729

Respectfully submitted,

Paul Jankowski, P. Eng.
Commissioner of Engineering
And Public Works

Andrew Pearce, C.E.T.
Director of Development/
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ATTACHMENT NO. 1



BOUNDARY OF KLEINBURG-NASHVILLE
COMMUNITY PLAN AREA (OPA 601)

Executive Summary

ES-1 Introduction

ES-1.1 Background

The Kleinburg-Nashville community is located in the City of Vaughan and nestled between and intertwined with the Main and East Humber River Valleys. It currently has a population of approximately 4,500 people and there are several development areas within the Community Plan limits. In addition, the City of Vaughan has identified further potential growth areas through its focus area studies related to the Official Plan Update. To accommodate potential development, the City will expand its services to meet increased water demands and wastewater flows.

ES-1.2 Master Plan Goals and Objectives

The Master Plan objectives and workplan were defined as follows:

- Review and update all planning data and inputs to the servicing analysis based on best planning estimates provided at the outset of the project
- Undertake a comprehensive review and analysis for both water and wastewater servicing requirements
- Utilize the hydraulic water and wastewater models for the analysis of servicing alternatives.

Key work tasks included:

- Study area profile
- Identification of servicing constraints and opportunities
- Evaluation of alternatives and selection of the preferred alternative for both water and wastewater servicing
- Implementation plan.

The Water and Wastewater Master Plan Update Class EA Report, including all Appendices, is the documentation placed on public record for the Class EA review period. This report contains and describes all required phases of the planning process and incorporates the procedure considered essential for compliance with the Environmental Assessment Act.

ES-2 Master Planning Process

The Municipal Class Environmental Assessment (EA) process clearly defines approaches for completion of Master Plans within the Class EA context. The City of Vaughan has prepared this Master Plan based generally on Approach 2, which involves preparing a Master Plan document at the conclusion of Class EA Phases 1 and 2 in order to fulfill the requirements for Schedule B projects. Any Schedule C projects identified would require a separate detailed study to fulfill Phases 3 and 4 of the Class EA process.

Municipalities recognize the benefits of comprehensive, long-range planning exercises that examine problems and solutions for an overall system of municipal services. The Municipal Class EA for Water and Wastewater Projects recognizes the importance of master plans as the basis for sound environmental planning.

According to the Class EA document, a master plan must at least satisfy the requirements of Phases 1 and 2 of the Class EA process and incorporate the five key principles of environmental planning, as identified in Section 2.1. The

master plan must document public and agency consultation at each phase of the process and a reasonable range of alternative solutions must be identified and systematically evaluated.

This Master Plan is following Section A.2.7 Master Plans of the Municipal Engineers Association Municipal Environmental Assessment (October 2000, as amended 2007) and is intended to satisfy Phases 1 and 2 of the Class EA Planning and Design Process.

ES-3 Problem and Opportunity Statement

The purpose of the Problem and Opportunity Statement is to define the principal starting point in the undertaking of the Master Plan Class EA and assist in defining the scope of the project.

As such, the Problem and Opportunity Statement has been defined as:

Identify a plan for future water and wastewater servicing for the community of Kleinburg-Nashville that accommodates future growth and is consistent with the City of Vaughan Official Plan, as well as the Water and Wastewater Master Plan for the Regional Municipality of York, reflecting the following factors:

- Current land use and projected growth based on the Kleinburg-Nashville Official Plan and Focused Area Study
- Current facility capacity
- Current construction climate and costs
- Individual project requirements

Satisfy Phases 1 and 2 of the Class EA process as per Section A.2.7 Master Plans, as defined in the Municipal Class Environmental Assessment document (October 2000, as amended in 2007).

ES-4 Master Plan Methodologies

A number of tasks and evaluations were undertaken as part of this Master Plan that are not standard in other Master Plans.

ES-4.1 Land Use and Development

In order to develop water and wastewater infrastructure requirements, it is essential to understand water demand and wastewater flows for each geographical area. Water demands and wastewater flow characteristics are specific to the population and land use type (e.g. residential, industrial etc.). Therefore an important component of the study was confirming the planning projections and land uses for the study area.

Land uses were designated for residential, non residential, parks and other uses for the existing and the ultimate build-out scenario. Land use assumptions were based on the Kleinburg-Nashville Official Plan (1982, modified in 2000).

ES-4.2 Water and Wastewater System Models

Water and wastewater system hydraulic models were identified as important tools to complete the Master Plan. These tools were used to facilitate the detailed hydraulic evaluation of alternative servicing scenarios.

The City of Vaughan had existing water and wastewater models that were updated as part of this Master Plan study.

ES-5 Existing Conditions

There are several aspects of the community that define the existing current conditions of the study area, including significant environmental features and important community areas. This section summarizes the important considerations with respect to the natural and social environments that make up the Kleinburg-Nashville community.

ES-5.1 Natural Environment

Kleinburg-Nashville is surrounded by significant environmental features, some of which are protected by law. It is situated within the Humber River system and it is also located within the Greenbelt.

The following natural features are discussed in detail in the Master Plan report:

- Physiography, Geography and Soils
- Terrestrial Ecology
- Significant Natural Areas
- Wildlife
- Water Resources

ES-5.2 Socio-Economic Environment

The socio-economic environment of the Kleinburg community is also very distinctive and was considered an important aspect during the master planning process. The following socio-economic factors were considered and are discussed in greater detail within the report:

- Land Use and Zoning
- Historical Context
- Recreation
- Conservation Areas

ES-6 Existing Servicing

ES-6.1 Existing Water Distribution System

Existing serviced residents are located in developments between the two Humber River branches. Water supply is provided through groundwater sources using two production wells. Disinfection is provided at the pump houses. The disinfection process also provides iron sequestering. After treatment, water is pumped to the elevated water storage tank where it is distributed to residents. Currently there is only one storage facility servicing the community.

Most of the community is at an elevation between 195 and 230 m. Residents north of the elevated storage tank are at elevations higher than 230 m.

As discussed above, the existing system consists of two wells and an elevated storage tank; however construction is underway to replace the groundwater supply with a lake based water supply being implemented by the Regional Municipality of York. Since construction is already underway and filing of this Master Plan will occur once the lake based system is in place, the lake based system will be considered as the existing water supply system.

The existing water supply system therefore consists of the following components:

- The Kleinburg-Nashville elevated tank, owned and operated by The Regional Municipality of York, is located on Highway 27 north of the intersections of Highway 27 and Nashville Road, providing 1,819 m³ of water storage.
- A 750 mm watermain is currently being constructed along Huntington Road from the York-Peel Feedermain to the existing 300 mm regional watermain along Nashville Road. The York-Peel feedermain is operating at much higher pressures than PD-6 and therefore a pressure reducing valve (PRV) is also being installed.
- A connection is currently being constructed from the new PD-KN system (the existing elevated tank) back to the PD-6 system with a valve (pressure reducing) to allow water to flow back to the PD-6 system should pressures drop in the PD-6 system (in an emergency).
- For reliability of supply, a 400 mm watermain connection is also being constructed from the 400 mm watermain in the Woodbridge Expansion Area at Islington Avenue and Sunset Ridge north along Islington Avenue to an existing 300 mm watermain at Bindertwine Boulevard. This watermain will provide a closed loop PD-6 system.

ES-6.2 Existing Wastewater Collection System

Existing serviced residents are located in developments in between the two Humber River branches. Wastewater collection is provided by gravity sewers and forcemains that flow to the Kleinburg Water Pollution Control Plant (WPCP).

The Kleinburg WPCP was commissioned in 1991 to service residents in the immediate vicinity of Kleinburg-Nashville, with a rated capacity of 1,205 m³/d. This plant provided adequate capacity for 16 years until it was determined that the plant needed to be expanded. Following this, the Regional Municipality of York undertook a Class EA to determine the preferred method to provide additional capacity to the residents of Kleinburg-Nashville. It was determined that the best course of action would be to upgrade and expand the plant. The plant is undergoing expansion to provide a rated treatment capacity of 2,874 m³/d. It is expected that construction will be completed in late 2011.

ES-7 Design Criteria

ES-7.1 Water Design Criteria

Water design criteria were developed and applied for the evaluation of water servicing alternatives.

ES-7.1.1 Per Capita Water Demand

The Master Plan was carried out using a per capita use of 347 L/cap/d, with a maximum day factor of 2.5 and a peak hourly demand factor of 4, consistent with York Region's water use projections for the Kleinburg community (York Region Water and Wastewater Master Plan, 2009). The City of Vaughan design standards for water distribution stipulate a per capita use of 450 L/cap/d, with a maximum day factor of 2 and a peak hourly demand factor of 4. Although the standards are slightly different, an analysis of the proposed watermain sizes revealed that the difference in per capita demand does not change the recommendations. The slightly higher per capita use and slightly lower maximum day factor result in approximately the same maximum day demand and the slight increase in peak day demand averaged throughout the community does not impact recommended pipe sizes.

ES-7.2 Wastewater Design Criteria

The wastewater Master Plan model addressed present and future wastewater generation in the community of Kleinburg-Nashville.

ES-7.2.1 Per Capita Wastewater Generation

The community of Kleinburg-Nashville typically has a high water demand and wastewater generation, as compared to other communities of similar size. For this reason, it was important to ensure that the wastewater generation rates used were reflective of the community. The York Region Water and Wastewater Master Plan, completed in 2009, provided wastewater unit generation rates for the small communities within the Region. The future Kleinburg wastewater generation rate of 417 L/cap/d was proposed by the Region's Master Plan. The City of Vaughan wastewater design standard for sewer capacity purposes is 450 L/cap/d, with a peak factor of 4, and an allowance for inflow and infiltration of 0.23 L/s/ha of area serviced by the sewer. Although the City's criteria specifies the use of the Harmon formula for peaking factor calculation, based on the relatively small populations for each service area, the maximum peak factor used for each area was 4, the maximum recommended by the Ministry of the Environment. Future wastewater generation was based on the City's criteria of 450 L/cap/d and population projections as discussed in Section 3.2.

ES-7.3 Unit Costs

For the purposes of comparative evaluation and selecting the preferred servicing alternative, capital costs have been developed. Costs were developed for budgetary purposes as well as to allow financial comparison of alternatives. The same unit costs were used for projects, to ensure a consistent and valid comparison of alternatives.

Base construction costs were developed using a unit cost approach. These unit costs have been updated from the previous studies and reflect current 2010 conditions, including trends in materials, labour, other market conditions and recent tendered projects.

Due to the limited development in Kleinburg-Nashville, it was necessary to develop two unit cost estimates; one for rural areas with limited development and one for urban areas where existing infrastructure would be encountered. These designations were intended to improve the accuracy of project estimates.

ES-8 Evaluation Methodology

The Class EA process states that the evaluation process should be systematic and reproducible. The evaluation process generally consisted of two steps: screening and detailed evaluation. The screening process eliminates alternatives that do not achieve 'must-meet' criteria. Must-meet criteria are essential to the project's success and therefore an alternative which does not meet this requirement should not be considered further. Any alternatives that pass these requirements will be considered further in the detailed evaluation process.

The detailed evaluation process identified a preferred alternative based on several criteria dealing with environmental, social, financial, and legal/jurisdictional considerations.

The following list identifies must-meet criteria that was considered during the screening phase of the evaluation process:

- Meets government and agency regulations

- Accommodates present capacity and allows for future growth: strategy is acceptable for servicing of existing residents and planned developments within the 2031 timeframe.

The detailed evaluation process will compare the impacts and benefits of each alternative with respect to:

- Natural Environmental factors
- Socio-Cultural factors
- Legal-Jurisdictional factors
- Technical factors
- Economic factors.

The alternative with the most net benefit and the least negative impacts will be selected as the preferred alternative. The preferred alternative will be further investigated to develop an implementation plan and more detailed cost estimates. The implementation plan will identify the requirements to implement the recommendations in the Master Plan.

ES-9 Development and Evaluation of Water Servicing Alternatives

Water servicing alternatives were developed based on existing conditions, future planning projections and constraints and limitations. This section identifies the alternatives and provides a description of each water servicing system alternative. The alternatives will then undergo the screening and detailed evaluation process to determine the preferred alternative.

It is important to note that the layout of infrastructure projects identified for new growth areas is conceptual at this master planning level, based on the best available planning information and area topography. Infrastructure projects may require modifications at the time of implementation, to reflect detailed information of the area to be developed.

Two (2) alternatives were identified for the water servicing alternatives, including the “Do Nothing” alternative. Descriptions and impact analyses of each are provided in the report.

ES-10 Development and Evaluation of Wastewater Servicing Alternatives

This section identifies the alternatives and provides a description of each wastewater servicing alternative. The alternatives will then undergo the screening and detailed evaluation process to determine the preferred alternative.

It is important to note that the layout of infrastructure projects identified for new growth areas is conceptual at this master planning level, based on the best available information on development plans and area topography. Infrastructure projects may require modifications at the time of implementation, to reflect detailed information of the area to be developed.

All alignments and sites for new infrastructure are conceptual and based on the best available planning information at the time of analysis. As projects move forward to detailed design stage, additional studies will be undertaken to ensure that all proposed infrastructure meets the needs of the City and the residents to be serviced. The City will consider minor modifications to the proposed plans, provided that the proposals are based on sound engineering principles and studies have been completed to justify the proposed alternatives.

It should be noted that the Kleinburg Water Pollution Control Plant (WPCP) is a Regional facility and expansion to the WPCP was already planned and is currently under construction. Therefore, the cost implications from this WPCP upgrade project are not considered in any of the alternatives since the impacts/benefits will apply to all of the alternatives.

Seven (7) alternatives were identified for the wastewater servicing alternatives, including the “Do Nothing” alternative. Descriptions and impact analyses of each are provided in the report.

ES-11 Preferred Alternatives

ES-11.1 Preferred Water Servicing Alternative

Based on the screening process and detailed evaluation, the preferred water servicing alternative is Alternative 1. This alternative meets all the requirements for servicing present and future Kleinburg-Nashville populations and is consistent with the requirements of the Regional Municipality of York Master Plan.

Alternative 1 proposes to have two pressure districts, PD-6 and PD-KN. This was recommended in the Kleinburg-Nashville Water Servicing Class EA. New developments or residences connecting to the system in the north-eastern part of Kleinburg-Nashville will be serviced by PD-KN. The rest of Kleinburg-Nashville will be serviced by PD-6. Most servicing will be provided along Major Mackenzie Drive, Huntington Road, Nashville Road, Highway 27, Kirby Road and Kipling Avenue.

The pressure district boundaries are proposed to be modified slightly from those proposed in the Kleinburg-Nashville Water Servicing Class EA to ensure security of supply through looping of watermains and multiple potential supply mains to each area. The delineation of pressure districts proposed in this Master Plan provides security to both the PD-6 and PD-KN systems within the community of Kleinburg-Nashville.

The preferred solution and project tables identify City watermains to be constructed along road right-of-ways. Some internal watermains (within development areas) are shown on the preferred solution map to illustrate the internal looping of watermains, however the alignment and size of these mains will be based on the development plans for those development areas.

The total projected water capital costs are \$16.1 M in 2010 dollars.

There are potential impacts that will need to be minimized and mitigated to ensure successful completion of the projects. The most significant potential impact relates to the natural environment. Depending on the environmental concern for each individual project, studies will be required during detailed design to determine the optimal approach to minimizing impacts. To minimize social impacts due to construction in urban areas, projects will be implemented in co-ordination with planned road work in order to take advantage of construction synergies and minimize the duration and extent of impacts to the community.

Should alternate water servicing options be presented in support of individual development applications, which do not conform to the Master Plan requirements, the need and extent of the required watermain upgrade may be revisited based on the City's site specific review. Any alternate servicing options must consider the overall intent of the preferred servicing strategy identified in this Master Plan and shall be subject to the satisfaction of the City.

ES-11.2 Preferred Wastewater Servicing Alternative

Based on the screening process and detailed evaluation, the preferred wastewater servicing alternative is Alternative 8. This alternative meets all the requirements for servicing present and future Kleinburg-Nashville populations and is consistent with all the requirements of the Regional Municipality of York Master Plan.

For Alternative 8, wastewater from residents in the northeast end of the community would be directed east to the block 40/47 sewer on Pine Valley Drive. Capacity at the Kleinburg WPCP would be used for new developments in the Highway 27 corridor and ultimate phase flow (existing residences that will connect in the future) will require a gravity sewer down Highway 27 to connect to the York Durham Sewage System (YDSS). No upgrading of existing gravity sewers is required, however the existing Nashville Pumping Station (PS) and forcemain would require upgrades. Furthermore, the sewers downstream of the Nashville PS to the Kleinburg WPCP require ongoing monitoring to ensure that flows are maintained within their capacity and to plan upgrades of these sewers accordingly as flows increase and the risk of surcharging becomes evident.

New developments to the west would be serviced by conveying wastewater through gravity sewers on Major Mackenzie Drive and Huntington Road. There will be a YDSS sewer extension along Huntington Road to provide wastewater conveyance. The sewers on Major Mackenzie Drive would be sized to accept flows from residences currently on private systems that decide to connect to the City system. The Major Mackenzie sewer would also accept flows in excess of the Kleinburg-Nashville WPCP rated capacity.

Wastewater from residents to the north at Highway 27 would be directed south along Highway 27. Wastewater from the proposed development area to the northeast will be directed further east to the block 40/47 sewer on Pine Valley Drive via a new pumping station and forcemain, as well as gravity sewers.

Residents to the south on private systems would require a pumping station and forcemain to the existing Woodbridge Expansion Area community trunk sewers.

The total projected wastewater capital costs are \$45.6 M in 2010 dollars.

Similar to water servicing projects, there will be environmental impacts that will require mitigation through investigations for each individual project during detailed design. Additionally, there will be some impact to residents for construction of sewers through residential areas. Additionally, the City will have to procure land for several pumping stations throughout Kleinburg-Nashville for existing residents to connect to the collection system.

Should alternate wastewater servicing options be presented in support of individual development applications, which do not conform to the Master Plan requirements and do not require connection to the existing Nashville Pumping Station, the need and extent of the required pumping station or sewer upgrade may be revisited based on the City's site specific review. Any alternate servicing options must consider the overall intent of the preferred servicing strategy identified in this Master Plan and shall be subject to the satisfaction of the City.

ES-12 Implementation

The preferred servicing strategies will support the short and long term servicing needs of the approved growth areas as well as provide flexibility for servicing potential growth areas in the future.

As previously outlined, this Master Plan has been completed following Approach 2 under the MEA Class EA approach for Master Plans. As such, this document provides supporting information for any future investigations and studies for the preferred projects identified within the Master Plan.

The preferred servicing solutions section outlines the complete servicing strategy implementation program. Table ES-1 and ES-2 show the proposed water and wastewater projects, respectively, for Kleinburg-Nashville, including the Class EA schedule for each project. The timing and scope for each of the water and wastewater projects contained within this Master Plan is subject to change without amendment to this Master Plan in order to allow for developments to occur in a timely fashion while meeting the objectives of the overall Servicing Strategy Master Plan. Minor modifications to the water and wastewater projects identified within this Master Plan may be required as the detailed design and implementation stages occur. Such modifications will not require amendment to this Master Plan provided that the intent of the Master Plan is maintained.

Upon completion of the Master Plan or Phase 2 of the Class EA process, the Schedule A, A+ and B projects are pre-approved and may proceed to design and construction, subject to finalization of the 30-day review period and assuming no Part II Orders (bump ups) are received. It is anticipated that through the design process, studies will be undertaken as required to confirm and refine infrastructure alignments, locations and construction methods as necessary within the context of the project as presented in this document. These additional studies will include consultation with stakeholders and approval agencies such as, the Toronto Region Conservation Authority (TRCA) as well as the Ministry of Natural Resources (MNR) to ensure that all impacts to natural environment features and species of concern are mitigated to the greatest possible extent and to the satisfaction of all parties.

Any Schedule C projects identified through a Master Plan must complete Phases 3 and 4 of the Class EA process prior to proceeding to implementation since by definition, these Schedule C projects are anticipated to have more significant mitigative requirements that will need to be addressed in further detailed studies. As noted in Table ES-1 and Table ES-2, no Schedule C projects have been identified for the preferred Kleinburg-Nashville water and wastewater servicing strategies.

It should be noted that several of the proposed wastewater pumping stations will be required for development and therefore the land requirements for the proposed pumping stations will be secured via the development approvals process for the draft plans of subdivision, as they are completed. Construction will be advanced by the developers groups in the respective areas and ownership will be transferred to the City upon completion of construction and commissioning.

The Notice of Completion for this Master Plan is issued based on identification of the projects and Class EA Schedules presented in Table ES-1 and Table ES-2.

ES-12.1 Follow on Implementation Requirements

The Master Plan has identified key projects from the preferred servicing strategies that will require additional coordination during detailed design of the projects to finalize the preferred design concept. Integral to this Master Plan Class Environmental Assessment, a preliminary review was undertaken to identify key environmental, socio/economic and cultural factors within the study areas to be reviewed and considered as part of the follow on implementation requirements. These factors are detailed in the Master Plan report.

Table ES-1 Water Projects and Class EA Schedule

ID	Project Description	Project Phase ¹	Class EA Schedule
W-02	Huntington Rd. Servicing EE1	Phase 1	A+
W-04	Huntington Rd. Servicing EE1	Phase 1	A+
W-05	Major Mackenzie from West of Stevenson Rd. To McGillivray Rd.	Phase 1	A+
W-06	Major Mackenzie from McGillivray Rd. To Huntington Rd.	Phase 1	A+
W-07	Hwy 27 from Water Tower to Kirby Rd.	Phase 1	A+
W-08	Kirby Rd. Servicing X	Ultimate	A+
W-09	Kirby Rd. From Hwy 27 to Kipling Ave.	Phase 1	A+
W-10	Briarose Ave. Servicing AA and Y	Ultimate	A+
W-11	Kipling Ave from Kirby Rd. Servicing EE3	Phase 1	A+
W-12	Teston Rd. To Kipling Ave.	Phase 1	A+
W-13	Hwy 27 to Broda Dr.	Phase 1	A+
W-14	Hwy 27 from Broda Dr. To Major MacKenzie	Phase 1	A+
W-15	Kipling Ave from Teston Rd. Servicing EE3	Ultimate	A+
W-16	From Pressure Release Valve to Hwy 27	Phase 1	A+
W-17	From Huntington Road to Water Tower	Phase 1	A+

Notes:

1. The timing and scope for each of the water projects contained within this Master Plan is subject to change without amendment to this Master Plan in order to allow for developments to occur in an orderly fashion and to meet the objectives and timing of the overall Servicing Strategy Master Plan. Minor modifications to the water and wastewater projects identified within this Master Plan may be required as the detailed design and implementation stages occur. Such modifications will not require amendment to this Master Plan provided that the intent of the Master Plan is maintained.

Table ES-2 Wastewater Projects and Class EA Schedule

ID	Project Description	Project Phase ¹	Class EA Schedule
WW-01	Huntington Rd. Gravity Sewer to service EE1	Phase 1	A+
WW-02	Huntington Rd. Gravity Sewer to Nashville Rd. Servicing EE1 and T	Phase 1	A+
WW-03	Huntington Rd. Gravity Sewer from Nashville Rd. to service EE2	Phase 1	A+
WW-04	Huntington Rd. Gravity Sewer to Major Mackenzie Servicing EE2	Phase 1	A+
WW-05	Major Mackenzie from West of Stevenson Rd. to McGillivray Rd.	Phase 1	A+
WW-06	Major Mackenzie from McGillivray Rd. to Huntington Rd.	Phase 1	A+
WW-07	Gravity Sewer on Nashville Rd to service C	Ultimate	A+
WW-08	Gravity Sewer on Nashville Rd from Klein's Cr. To Stevenson Rd.	Ultimate	A+
WW-09	Hwy 27 from Hedgerow Lane to Islington Ave.	Phase 1	A+
WW-10	Kipling Ave from EE3 to Teston Rd.	Phase 1	A+
WW-11	Gravity Sewer to service Z	Ultimate	A+
WW-12	Hwy 27 from Islington Rd. to Nashville Rd.	Phase 1	A+
WW-13	Hwy 27 from Nashville Rd. to sewer close to WWTP	Ultimate	A+

WW-14	Hwy 27 from WPCP to Humber Valley Trail	Ultimate	A+
WW-17	Forcemain from SPS-01 to Hedgerow Lane	Phase 1	A+
WW-18	Forcemain from SPS-02 to sewer on Hwy 27	Phase 1	A+
WW-19	Forcemain from SPS-06 to sewer on Major Mackenzie	Phase 1	A+
WW-20	Gravity Main from Humber Trail to Broda Drive	Phase 1	A+
WW-21	Forcemain from SPS-03 servicing Z	Ultimate	A+
WW-24	Gravity sewer on Kirby Rd. to service AA	Ultimate	A+
WW-25	Gravity sewer from Hwy 27 to SPS-09 (deep sewer)	Ultimate	A+
WW-26	Kirby Rd. to service X to Hwy 27	Ultimate	A+
WW-28	Forcemain from SPS-11 to existing sewer	Ultimate	A+
WW-29	Gravity sewer to service GG	Ultimate	A+
WW-30	Gravity sewer from AA to Briarose Ave. (Belsite Ct)	Ultimate	A+
WW-34	Gravity Main from Broda Dr. to SPS-06	Phase 1	A+
WW-35	Gravity sewer to service BB	Phase 1	A+
WW-37	Forcemain from SPS-09 to SPS-01	Ultimate	A+
WW-40	Stevenson Rd. to service K and L	Phase 1	A+
WW-45	Forcemain from SPS-12 to gravity sewer WW-34 to service J	Ultimate	A+
WW-46	Forcemain from SPS-10 to gravity sewer WW-09 to service W	Ultimate	A+
WW-48	Forcemain from SPS-15 servicing EE3	Phase 1	A+
WW-Upgr	Forcemain Upgrade	Phase 1	A+
SPS-01	Highway 27 South of Kirby Rd.	Phase 1	B
SPS-02	Cedar Valley and Stevenson Rd.	Phase 1	B
SPS-03	Valley Rd. to service Z	Ultimate	B
SPS-06	Highway 27 South of Old Major Mackenzie (CC4)	Phase 1	B
SPS-08	Kirby Rd. to service X	Ultimate	B
SPS-09	Kirby Rd. to service AA, and Y	Ultimate	B
SPS-10	End of Hedgerow Lane to service W	Ultimate	B
SPS-11	Highway 27 to service GG	Ultimate	B
SPS-12	End of Broda Drive to service J	Ultimate	B
SPS-15	Teston Rd at Kipling	Phase 1	B
SPS-Upgr	Nashville Pumping Station Upgrade	Phase 1	B

Notes:





1. The timing and scope for each of the wastewater projects contained within this Master Plan is subject to change without amendment to this Master Plan in order to allow for developments to occur in an orderly fashion and to meet the objectives and timing of the overall Servicing Strategy Master Plan. Minor modifications to the water and wastewater projects identified within this Master Plan may be required as the detailed design and implementation stages occur. Such modifications will not require amendment to this Master Plan provided that the intent of the Master Plan is maintained.

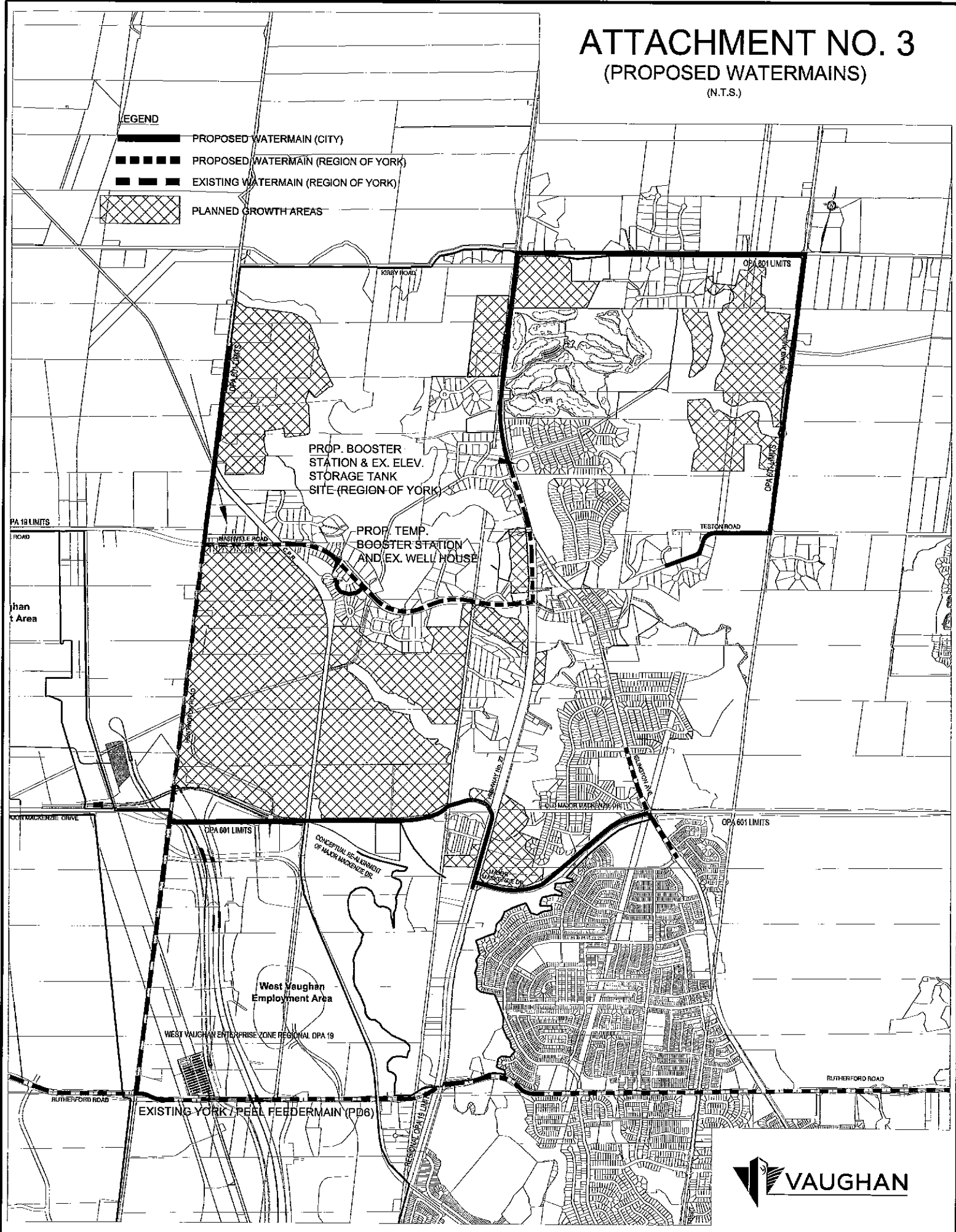
ATTACHMENT NO. 3

(PROPOSED WATERMAINS)

(N.T.S.)

LEGEND







-  PROPOSED WATERMAIN (CITY)
-  PROPOSED WATERMAIN (REGION OF YORK)
-  EXISTING WATERMAIN (REGION OF YORK)
-  PLANNED GROWTH AREAS

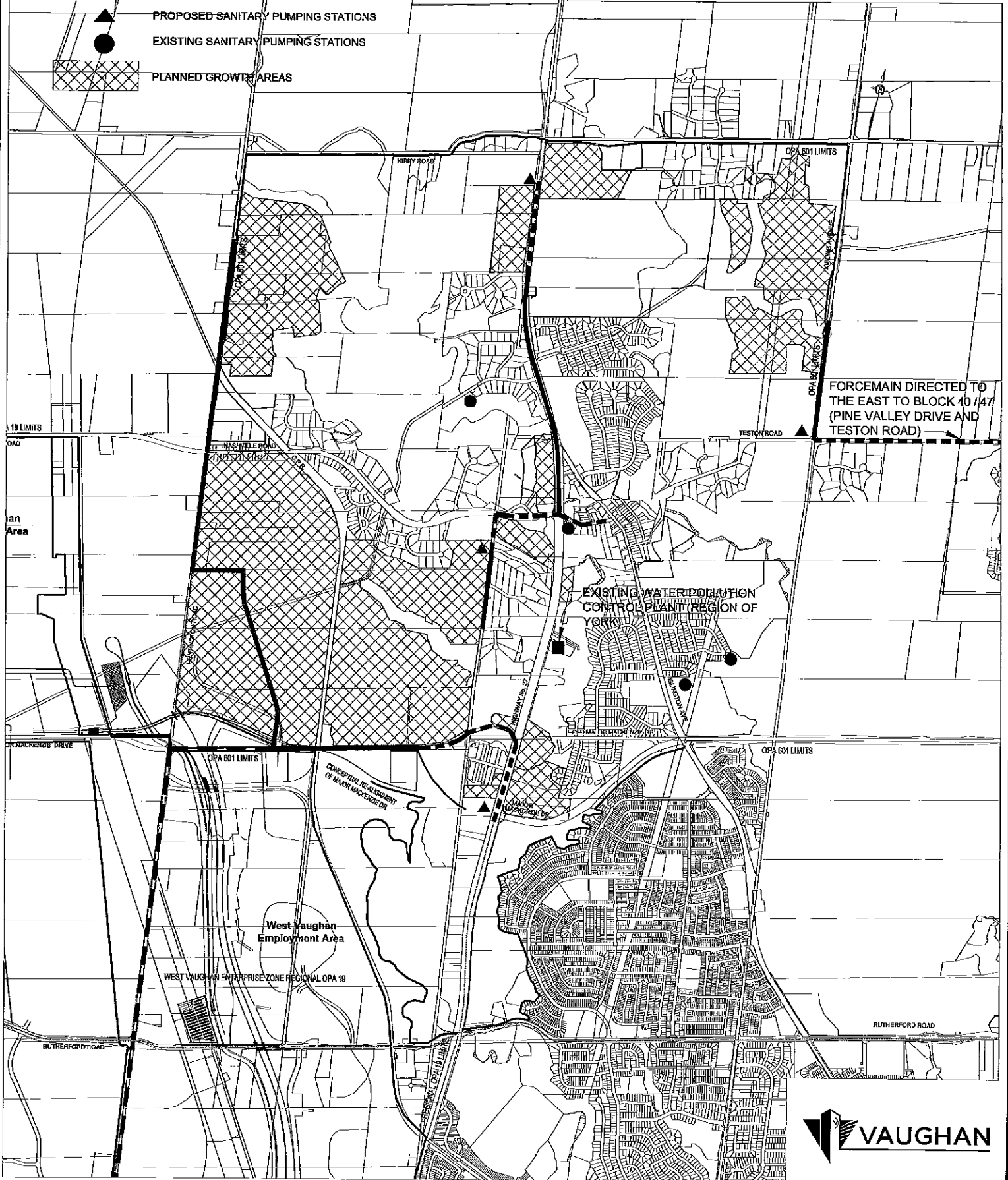


ATTACHMENT NO. 4 (PROPOSED SANITARY SEWER SYSTEM) (GROWTH RELATED)

(N.T.S.)

LEGEND





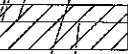
-  TRUNK SEWER CONSTRUCTED BY BLOCK 61
-  PROPOSED SANITARY SEWERS
-  PROPOSED SANITARY FORCEMAINS
-  PROPOSED SANITARY PUMPING STATIONS
-  EXISTING SANITARY PUMPING STATIONS
-  PLANNED GROWTH AREAS



ATTACHMENT NO. 5 (POTENTIAL SANITARY SEWER SYSTEM) (NON-GROWTH RELATED)

(N.T.S.)

LEGEND

-  PROPOSED SANITARY SEWERS
-  PROPOSED SANITARY FORCEMAINS
-  PROPOSED SANITARY PUMPING STATIONS
-  EXISTING SANITARY PUMPING STATIONS
-  EXISTING RURAL AND SUBURBAN AREAS

