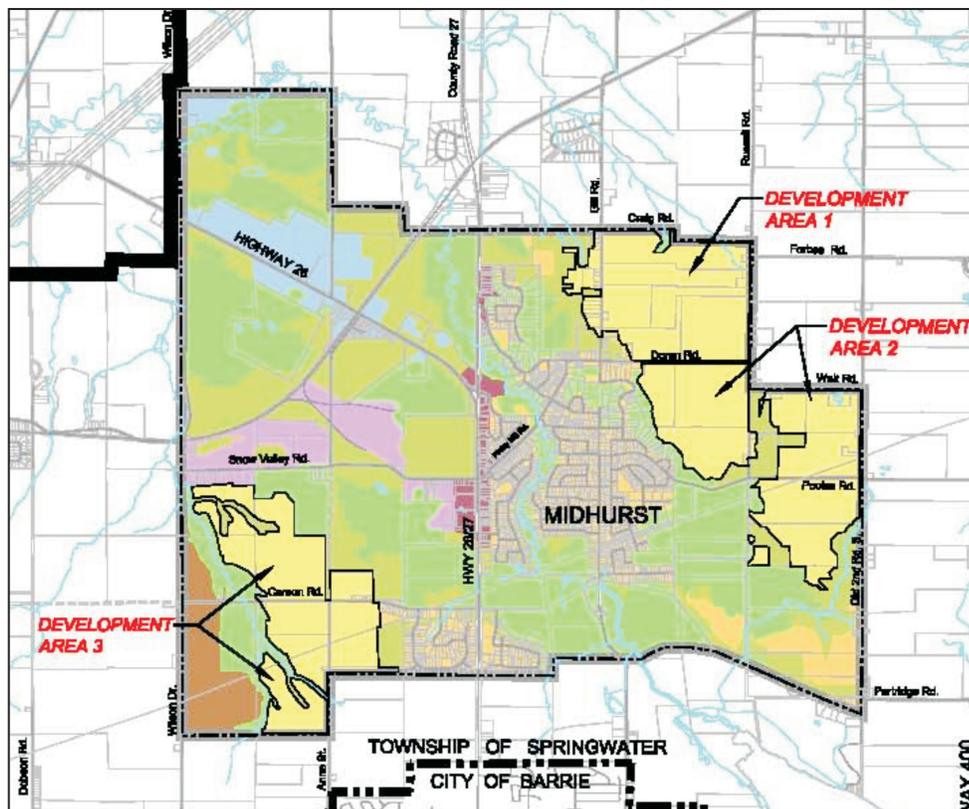


Township of Springwater
**Class Environmental Assessment Study
for the Midhurst Water,
Wastewater and Transportation
Master Plan
Phase 1 and 2 Report**



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**TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT STUDY FOR THE
MIDHURST WATER, WASTEWATER AND TRANSPORTATION
MASTER PLAN**

PHASE 1 AND 2 REPORT

Executive Summary

Purpose

The Township of Springwater has finalized its Secondary Plan (OPA# 38) for the Midhurst area and that Plan is currently under review by the County of Simcoe. In order to provide a complete planning process, the Township has also completed a Master Plan for the provision of water, wastewater and transportation upgrades to service future growth in the Midhurst area. The purpose of the Master Plan is to plan and provide preliminary design for the water, wastewater and transportation projects to service the population growth based on the outcome of the Township's Secondary Plan.

Future Growth

The future growth, as determined by the Township's "Growth Options" report, and using a development yield of 40 persons per hectare (3 persons per unit), is as follows:

Development Area 1 – 2,379 units x 3 ppu	= 7,137 persons
Development Area 2 – 2,920 units x 3 ppu	= 8,760 persons
Development Area 3 – 2,559 units x 3 ppu	= 7,677 persons
Future Employment equivalent (estimate) 350 units	= 1,050 persons
Total Projected Growth Population	= 24,624 persons
Existing population (serviced and unserviced)	= 4,014 persons
Total Future Equivalent Population Projection	= 28,638 persons

It should be noted that the total equivalent population could be revised in the future, pending the County's review of the Secondary Plan.

Water Demands

The projected water demands for the servicing of the three Development Areas are as follows:

Average Day Demand	= 9,357 m ³ /d
Maximum Day Demand	= 16,843 m ³ /d
Storage volume	= 8,855 m ³

Wastewater Flows

The projected wastewater flows for the servicing of the three Development Areas are as follows:

Average Daily Flow rate	= 10,600 m ³ /d
Peak Day Flow rate	= 28,081 m ³ /d

The projected wastewater flows to service both existing development and future development are as follows:

Average Daily Flow rate	= 12,314 m ³ /d
Peak Day Flow rate	= 32,075 m ³ /d

Preferred Infrastructure Works

Specific infrastructure works have been identified as being required to allow growth to occur in the Midhurst Secondary Plan area. Descriptions of the Works are provided as follows:

TRANSPORTATION

The following road network improvements constitute the Preferred Solution (Alternative 6):

- 2-lane re-construction of Pooles Road from Highway 400 to Silverwood Crescent towards St. Vincent Street with the addition of auxiliary turning lanes
- 2-lane new construction of Forbes Road from Old Second Road to Russell Road with the addition of auxiliary turning Lanes and construction of traffic control devices
- 2-lane new construction of Craig Road from Russell Road to County Road 27 with the addition of auxiliary turning lanes and construction of traffic control devices
- 2-lane re-construction of Walt Road from Old Second Road to Russell Road
- 2-lane re-construction of Russell Road from Forbes Road to Pooles Road with the addition of auxiliary turning lanes and construction of traffic control devices.
- 2-lane re-construction of Doran Road from Russell Road to Gill Road with the addition of auxiliary turning lanes and construction of traffic control devices
- 2-lane re-construction of Finlay Mill Road with the addition of auxiliary turning lanes and construction of traffic control devices

- 2-lane re-construction of Gill Road from Craig Road to Doran Road with the addition of auxiliary turning lanes and construction of traffic control devices
- 2-lane new construction of Gill Road from Doran Road to Wattie Road with the addition of auxiliary turning lanes and construction of traffic control devices
- 2-lane re-construction of St. Vincent Street from Wattie Road to the Barrie City limits with the addition of auxiliary turning lanes and construction of traffic control devices
- 2-lane re-construction of Carson Road from Highway 27 to Wilson Drive with the addition of auxiliary turning lanes and construction of traffic control devices
- 2-lane re-construction of Anne Street from Carson Road to the Barrie City limits
- 2-lane re-construction of Snow Valley Road from Wilson Drive to County Road 27
- 4-lane new construction of Wilson Drive from Snow Valley Road to the Barrie City Limits with the addition of auxiliary turning lanes and construction of traffic control devices
- 4-lane new construction of County Road 27, from existing 4 lanes to new Craig Road extension with the addition of auxiliary turning lanes and construction of traffic control devices
- 2-lane re-construction of Old Second Road from Pooles Road to Walt Road
- New interchange at Pooles Road with Highway 400

The following intersection improvements are recommended:

- A traffic signal at the intersection of Doran Road with Gill Road
- A traffic signal at the intersection of Doran Road with Russell Road
- A traffic signal at the intersection of Russell Road with Forbes Road
- A traffic signal at the intersection of County Road 27 with Craig Road
- A traffic signal at the intersection of County Road 26 with County Road 27
- A traffic signal at the intersection of County Road 27 with Finlay Mill Road
- A traffic signal at the intersection of St. Vincent Street with Pooles Road
- A traffic signal at the intersection of Carson Road with Wilson Drive
- A traffic signal at the intersection of Carson Road with Highway 26/27

The following intersection/interchange improvements are recommended:

- Gill Road with Craig Road
- Pooles Road with Russell Road
- Carson Road with Anne Street
- Partial interchange with Highway 400 at Pooles Road

The estimated capital cost for the proposed works is \$78,600,000.

WASTEWATER

The following wastewater collection and treatment facilities constitute the Preferred Solution (Option G):

1. Design and construct wastewater treatment plant with an approximate ADF capacity of 10,600 m³/d (peak flow rate of 28,081 m³/d) with tertiary treatment and effluent limits as follows:
 - Nitrate Nitrogen less than 9.8 mg/L monthly average of weekly samples
 - Total Phosphorus (TP) less than 0.03 mg/L monthly average of weekly samples
 - Total ammonia concentration should be less than 1 mg/L
 - CBOD₅ less than 10 mg/L annual average
 - Total Suspended Solids (TSS) less than 15 mg/L annual average
 - pH maintained between 6.0 and 9.5 at all times
2. The plant can be constructed in stages but must be expandable in the future to accommodate the servicing of existing Midhurst (future total ADF of approximately 12,314 m³/d)
3. Effluent discharge pipe from the plant to Willow Creek, north of Highway 26, sized to service the entire Secondary Plan area including existing Midhurst.
4. Design and construct wastewater collection system complete with pump stations and manifolded forcemain system as required, to service proposed development layout and, in the future, existing Midhurst. A manifolded forcemain is suggested in order to reduce the number of forcemains that will eventually need to be constructed. It is anticipated that a number of pumps stations can use the same forcemain.

The estimated capital cost for the proposed works is \$68,100,000.

WATER

The following water supply, treatment, distribution and storage facilities constitute the Preferred Solution (Option F):

Develop and equip a combination of wells within both the Doran Road North (Alliance Development) and the Doran Road South (Geranium Development) areas and along Russell Road to provide an approximate MDD of 200 L/s to service 8,208 equivalent residential units (estimated equivalent population of 24,624 persons). It is suggested that additional capacity be provided for a backup supply of approximately 40 L/s (one additional well to be developed and equipped). Exact locations of wells to be determined in Phase 3 of a future Class EA planning process;

Design and construct water treatment facility (chlorination and iron sequestration or filtration) complete with in-ground water storage (approximate useable volume of 5,300 m³ based on a fire flow rate of 133 L/s for 3 hours), high lift pumping capabilities and standby power source at a location within future development lands and easily accessible to existing roads. Final location to be determined based on further engineering assessment to be undertaken as part of a future Phase 3 Class EA planning process;

1. Design and construct raw water transmission watermains from all wells to the treatment/storage/high lift pumping facility, along existing road allowances or within future development road allowances. Size and alignment to be determined;
2. Design and construct treated water transmission mains from the treatment facility to the various Development areas as required including a high pressure transmission main across existing Midhurst with connections to the existing water distribution system through pressure reducing valves and with consideration for a future duplicate high pressure transmission main to provide system redundancy;
3. Design and construct internal water distribution system to service proposed development layout, and;
4. Design and construct in-ground water storage facility (approximate useable volume of 3600 m³ based on a fire flow rate of 133 L/s for 3 hours), complete with high lift pumping capabilities and standby power source for water supply to the Carson Road Development and to the future employment lands.

The estimated capital cost for the proposed works is \$25,800,000.

Future improvements to the existing Midhurst water supply, storage and distribution system may be necessary to allow for infilling within the Secondary Plan Area.

Future Class EA Requirements

The following infrastructure works require additional planning under the Class Environmental Assessment process:

- All of the identified Water works
- All of the identified Wastewater works
- New interchange at Pooles Road with Highway 400
- 2-lane new construction of Craig Road from Russell Road to County Road 27
- 4-lane new construction of Wilson Drive from Snow Valley Road to Barrie City Limits

The above-mentioned water and wastewater works will require the completion of a number of assessments, which are listed in Section 23.0 of the Master Plan. Those Assessments are summarized as follows:

- either protect or conduct additional investigation with respect to area H-1 as identified in the Stage 1-2 Archaeological Report for 154 Doran Rd. dated December 2007 by Archeoworks
- complete Stage 2 Archaeological Assessment for both Development Areas 2 and 3 and all proposed well sites including a Stage 3 test excavation of the Coutts property
- complete EIAs for development Areas 2 and 3

- construct, develop and test production wells along Russell Rd. and to identify the sites of those wells and to undertake background reviews as listed in Section 23.0
- complete background reviews as listed in Section 23.0, for all future sewage pump station sites
- assessment of the best suitable wastewater treatment technology and to determine the preferred treatment option
- finalize the assimilation study for the proposed effluent discharge to Willow Creek

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- A – Terms of Reference and Authorization
- B – Minutes of Meetings
- C – Select Background Reports (URS Transportation Report, J.E. Coulter Noise Impact Assessment, Golder Hydrogeological Study and Wilson Well Evaluation for Production Well 1)
- D – Notice of Study Commencement and Associated Correspondence
- E – Communication Plan
- F – PIC No. 1 Notice, Material and Associated Correspondence
- G – Cost Estimates
- H – Effluent Discharge Correspondence
- I – Evaluation of Options
- J – Notice of Completion and Associated Correspondence

1.0 Introduction

1.1 Terms of Reference and Authorization

Ainley & Associates Limited (AAL) was retained in late April 2008 by the Township of Springwater (Township) to undertake a Master Servicing Plan following the MEA Class EA process, to identify and evaluate servicing options for the Midhurst Secondary Plan area. A copy of the April 10, 2008 Terms of Reference for the Master Plan is included in *Appendix A* along with the Townships authorization to proceed with the Master Plan.

1.2 Advisory Committee and Review Agency Meetings

An Advisory Committee was formed to administer the Master Plan. Members of the Advisory Committee included representatives from the Township staff, Council, the Developer Groups and AAL as follows:

Kim Anderson	Councillor, Township of Springwater
Brad Sokach	Township Director of Public Works
Andrew Fyfe, Brent Spagnol and Nancy Tuckett	Township Directors of Planning
Rick Hunter	Planscape
Greg Gemmell	Gemmell Project and Construction Management
Nancy Mather	Stonybrook Consulting Inc.
Joe Mullan, Mike Neumann and Reid Mitchell	Ainley & Associates Limited

Copies of the minutes of the Advisory Committee meetings and other meetings are included in *Appendix B*. Also included is a copy of a letter dated June 5, 2008 from AAL to the Township requesting confirmation of the “interim density” of 40 pph.

Review Agency Meetings were held as follows:

- October 8, 2008 – Transportation Master Plan presentation to County of Simcoe
- January 23, 2009 – Technical meeting re: large subsurface wastewater effluent disposal systems
- April 28, 2009 – Presentation to NVCA re: surface water effluent disposal (complete with email comments from MOE)
- May 25, 2009 – PowerPoint Presentation to Township of Springwater Planning Committee

1.3 Purpose of Master Plan

The Ontario Environmental Assessment Act includes provision for municipal road projects and municipal water and wastewater projects to be planned as “Class Environmental Assessments”. The Municipal Engineers Association (MEA), on behalf of Ontario Municipalities, completed Class EA

Document in 1987, which has recently been updated (October 2000, as amended in 2007). The MEA Document classifies municipal projects in terms of Schedules. Descriptions of the four types of Class EA Schedules are as follows:

- Schedule A - generally includes normal or emergency operational and maintenance activities – pre-approved
- Schedule A⁺ - added in 2007, these projects are pre-approved, however the public is to be advised prior to project implementation.
- Schedule B - generally includes improvements and minor expansions to existing facilities
 - potential for some adverse environmental impacts and therefore the proponent is required to proceed through a screening process (Phases 1 and 2 of the Class EA planning process)
- Schedule C - generally includes the construction of new facilities and major expansions to existing facilities
 - potential for adverse environmental impacts and therefore the proponent is required to proceed through a more intense screening process (phases 1, 2, 3, 4 and 5 of the Class EA planning process)

In addition, the MEA Class EA Document identifies the planning process to be undertaken for the completion of Master Plans which encompass a group of related projects (roads, water supply and wastewater treatment). Quoting the MEA Class EA Document, “Master Plans are long range plans which integrate infrastructure requirements for existing and future land use with environmental assessment planning principles.” In order to complete a Master Plan, the proponent must, at a minimum, complete Phases 1 and 2 of the Class EA planning process as described in Clause A2.7 of the MEA Class EA Document. It is important to note that public and agency consultation must take place during each of Phases 1 and 2 of the Master Plan. As noted in the MEA Class EA Document, “The Master Plan would be used in support of further work carried out for specific Schedule B projects and further work in Phases 3 and 4 for specific Schedule C projects.” And “Requests for an order to comply with Part II of the EA Act, however, would be possible only for the specific projects identified in the Master Plan and not the Master Plan itself.”

The purpose of the Township of Springwater’s Master Plan is to identify and evaluate options for the provision of municipal water supply and wastewater treatment infrastructure along with transportation upgrades to service future growth within the Midhurst Secondary Plan area. It is the intention of the Township to undertake the servicing Master Plan in conjunction with the Secondary Plan to confirm the servicing feasibility of future growth projections. The Master Plan will follow the planning process as outlined in the MEA Class EA Document (Phases 1 and 2). It is anticipated that additional Class EA planning will be necessary to complete Phases 3 and 4 for specific projects.

1.4 Secondary Plan Amendment and Development Areas

The Township has finalized its Secondary Plan for the Midhurst area. An Open House was held on August 28, 2008 for the purpose of presenting the Draft Secondary Plan to the public. The Secondary Plan was adopted by Council on September 22, 2008 and a Notice of Adoption was published on November 11, 2008. At the Present time (June 2009) the Secondary Plan is under review by the County.

The Secondary Plan originally identified future development areas within the Midhurst Secondary Plan area. The “Growth Options” report dated April 14, 2008, as prepared by the Township’s Planning Consultant, identifies the “Potential Development Yields” for each of three “Growth Option Areas”. A copy of both the “Growth Option Areas” plan and the “Potential Development Yields” Table is included overleaf. For the purposes of servicing analyses, the Advisory Committee agreed that a population density of 40 persons per hectare (pph) would be used to determine the future population that will need to be serviced. Therefore, for the purposes of the Master Plan, the design units are as per the “Potential Development Yields” Table for 40 pph as follows:

Area 1 = 2,379 units

Area 2 = 2,920 units

Area 3 = 2,559 units

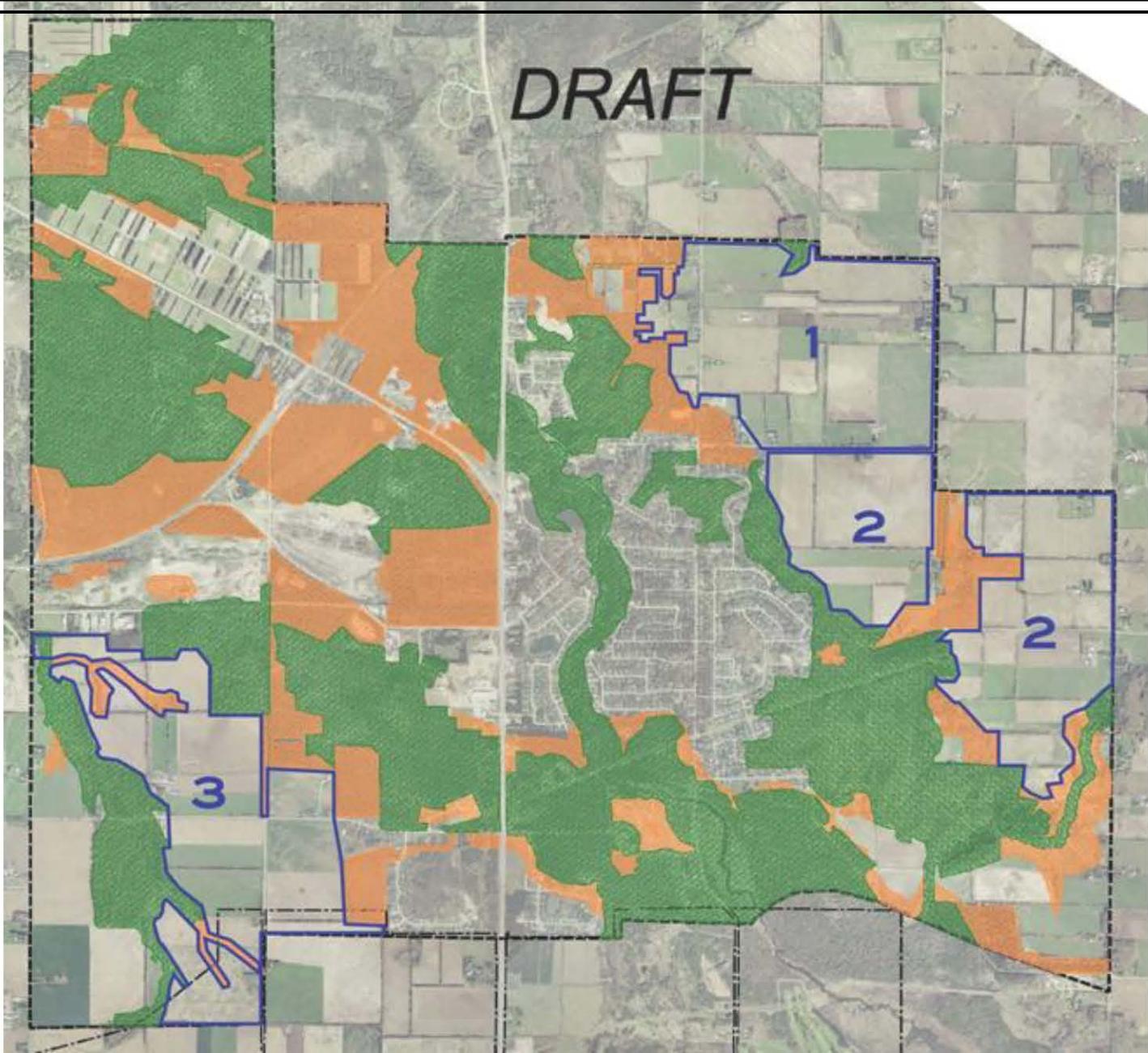
It is noted that subsequent to the completion of the Midhurst Secondary Plan, revisions were made to the descriptions of the originally defined “Growth Option Areas”. The revised Areas are as shown on the enclosed (overleaf) copy of Schedule B as reprinted from the Midhurst Secondary Plan. In summary, the following revisions were made to the descriptions of the “Growth Option Areas”:

- Original Area 1 is now referred to as Neighbourhood 2 – north of Doran Road
- Original Area 2 is now referred to as the south portion of Neighbourhood 2 (south of Doran Road) and Neighbourhood 3
- Original Area 3 is now referred to as Neighbourhood 1

Despite these revisions, this Master Plan is based on the original “Growth Option Areas”. ***The reader is urged to refer to the map of the “Growth Option Areas” included overleaf when reading this Master Plan.***

It is noted that during future planning phases, the design population may need to be revised but for the purposes of this Master Plan, the design population is as presented in Clause 3 hereinafter.

Growth Option Areas



Potential Development Yields

Development yields for each Growth Option are as follows:

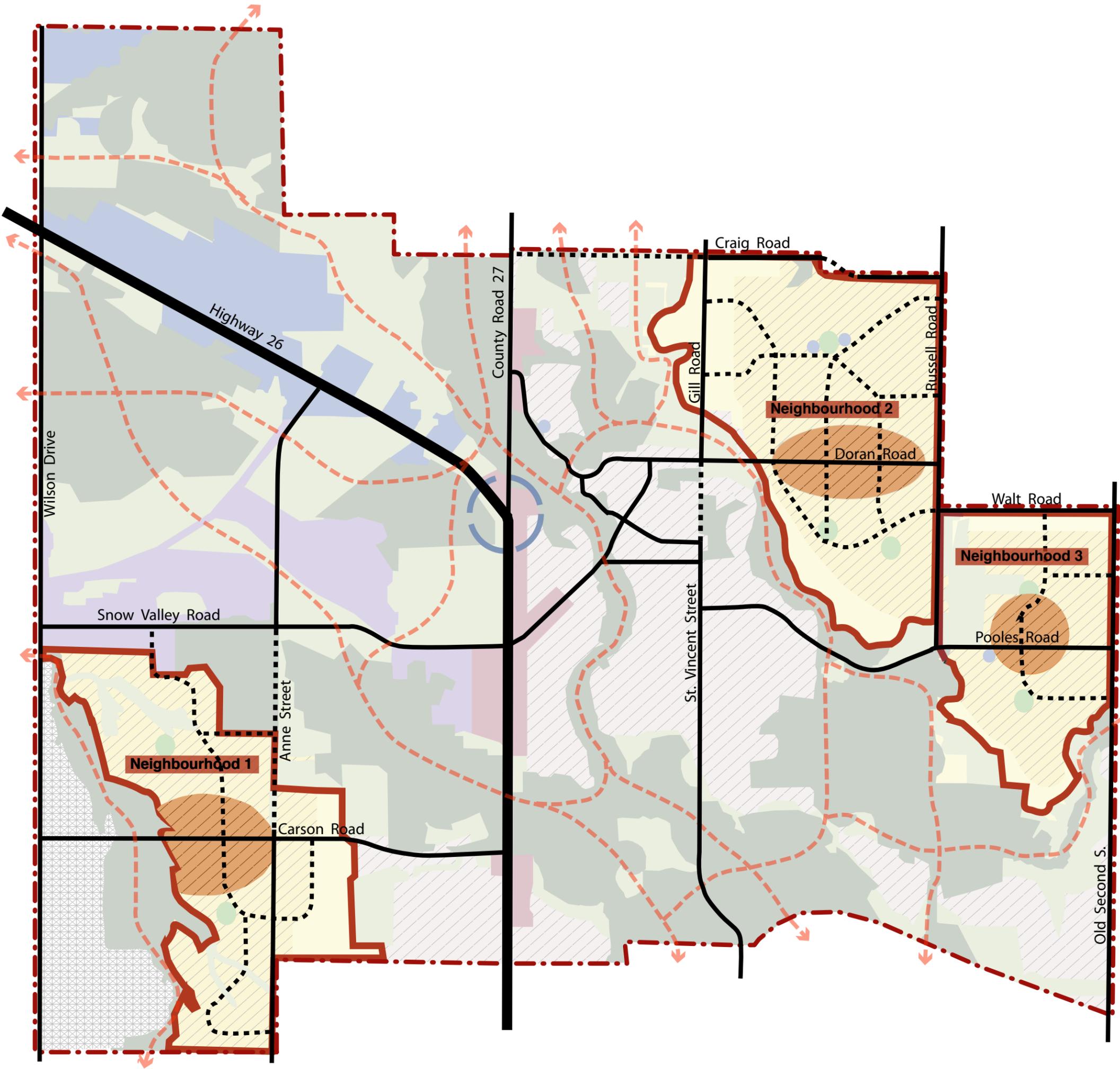
	50 pph (16.67 uph)	40pph (13.33 uph)	30pph (10 uph)
Area 2	3650	2920	2190
Area 3	3201	2559	1920
Area 1	2976	2379	1785
Total Units	9827	7858	5896

MIDHURST SETTLEMENT AREA SECONDARY PLAN

TOWNSHIP OF SPRINGWATER
October 29, 2008

Schedule 'B' - Neighbourhood Structure & Road Network/Trails

- Neighbourhood Boundaries
- Neighbourhood Centres
- Provincial Highway
- Primary Road
- Potential Primary Road
- Settlement Area Boundary
- Environmental Connections / Potential Trails
- Future Intersection Improvements



2.0 Existing Conditions

2.1 General

As noted in the “Background Summary” of the “Midhurst Secondary Plan”, the Midhurst Secondary Plan area consists of approximately 3500 ha. with a current population of about 3,500 people. A majority of the existing population is serviced by a municipal water supply system. The remainder of the population within the Study Area is serviced by private wells. All of the developed properties are currently serviced by private, on-site septic systems. At present there is a good system of roads throughout the developed area.

2.2 Summary of Background Reports

2.2.1 General

The Developer Group undertook to complete numerous Background Reports in support of their proposed individual developments in the Midhurst Secondary Plan area. Copies of those Reports were made available to AAL for information purposes with respect to the Master Plan. Summaries of those Background Reports are presented in the Sections following.

2.2.2 Development Area 1 – Midhurst Heights, Midhurst Rose Alliance Inc. (MRAI)

The Midhurst Rose Alliance Inc. group provided two binders of reports, coupled with numerous letters and other Reports. The following Table outlines the titles of the Reports, provides summaries of the contents and comments on the relevance of the Reports and letters with respect to the servicing Master Plan. The Reports and letters are presented in Chronological order.

Alliance Reports and Letters

Report Title (Abbreviated)	Summary of Contents	Relevance to Master Plan
Assessment of Environmental Features – Cook, Property 3 – March 2006 Azimuth Environmental Consulting Inc.	<ul style="list-style-type: none"> - surface water does not flow from one field to another – no watercourses - hedgerows have limited value to wildlife - no tree species of conservation concern - property is extensively farmed and provides no environmental features or functions that would require protection 	- will be used as background report for ESR

(Abbreviated)	Relevance to Master Plan	
Assessment of Environmental Features – Gill, Property 2 – March 2006 Azimuth Environmental Consulting Inc.	<ul style="list-style-type: none"> - no natural heritage features or functions - no tree species of conservation concern - hedgerows have limited value to wildlife - no significant environmental features or functions 	<ul style="list-style-type: none"> - will be used as background report for ESR
Assessment of Environmental Features – Beer, Property 1 – March 2006 Azimuth Environmental Consulting Inc.	<ul style="list-style-type: none"> - Surface water does not flow from one field to another – no watercourses - no valuable woodlots - hedgerows have limited value to wildlife - no tree species of conservation concern - no significant environmental features or functions 	<ul style="list-style-type: none"> - will be used as background report for ESR
Soils Suitability – Maple Lane Estates, December 2006 Wilson Associates	<ul style="list-style-type: none"> - in-ground sewage disposal systems are viable over much of the site except for a small area in the western portion which should be avoided - sewage treatment is required to reduce nitrate concentration of the effluent to 7.7 mg/L or lower for the proposed 345 units 	<ul style="list-style-type: none"> - information will be used to assess feasibility of tile fields (vertical injection wells)
Soils Suitability – Meadows of Midhurst, December 2006 Wilson Associates	<ul style="list-style-type: none"> - in-ground sewage disposal systems are viable over much of the site except for a small area in the northwestern corner which should be avoided - sewage treatment is required to reduce nitrate concentration of the effluent to 8.98 mg/L or lower for the proposed 125 units 	<ul style="list-style-type: none"> - information will be used to assess feasibility of tile fields (vertical injection wells)
Soils Suitability – Johns Property, December 2006 Ian D. Wilson Associates Limited	<ul style="list-style-type: none"> - in-ground sewage disposal systems are viable over much of the site except for the western portion which should be avoided - sewage treatment is required to reduce nitrate concentration of the effluent to 7.8 mg/L or lower for the proposed 215 units 	<ul style="list-style-type: none"> - information will be used to assess feasibility of tile fields (vertical injection wells)

(Abbreviated)	Relevance to Master Plan	
<p>Land Use Planning Report Meadows of Midhurst - January 2007 Rudy & Associates Ltd.</p>	<ul style="list-style-type: none"> - provides summaries of supporting technical reports - suggests two options for water supply - suggests SBR wastewater treatment process with subsurface effluent disposal (pressurized beds) - leaching beds are viable except in northwest corner - reduce nitrate in effluent to 7.8 mg/L or less - no direct fish habitat - no woodlot of value - no conservation concern - no wetland habitat - no environmental features - no archaeological resources - suggests main points of access as Gill Road and Russell Road - 125 residential units 	<ul style="list-style-type: none"> - will be used to define existing site conditions for potential wastewater treatment plant and potential well locations
<p>Land Use Planning Report Maple Lane Estates – January 2007 Rudy & Associates Ltd.</p>	<ul style="list-style-type: none"> - similar to Meadows of Midhurst but proposes 345 residential units 	<ul style="list-style-type: none"> - will be used to define existing site conditions for potential wastewater treatment plant and potential well locations
<p>Land Use Planning Report Johns Property – January 2007 Rudy & Associates Ltd.</p>	<ul style="list-style-type: none"> - similar to Meadows of Midhurst but proposes 215 residential units 	<ul style="list-style-type: none"> - will be used to define existing site conditions for potential wastewater treatment plant and potential well locations
<p>Stage 1-2 Archaeological Assessment – Maple Lane Estates, January 2007 Archaeological Assessments Ltd.</p>	<ul style="list-style-type: none"> - no archaeological resources present 	<ul style="list-style-type: none"> - will be used as background report for ESR
<p>Stage 1-2 Archaeological Assessment – Meadows of Midhurst, January 2007 Archaeological Assessments Ltd.</p>	<ul style="list-style-type: none"> - no archaeological resources present 	<ul style="list-style-type: none"> - will be used as background report for ESR

(Abbreviated)	Relevance to Master Plan	
Stage 1-2 Archaeological Assessment – Johns Subdivision, January 2007 Archaeological Assessments Ltd.	<ul style="list-style-type: none"> - no archaeological resources present 	<ul style="list-style-type: none"> - will be used as background report for ESR
Phase 1 ESA – Beer and Gill Properties, July 2007 Azimuth Environmental Consulting Inc.	<ul style="list-style-type: none"> - host geological environment is not overly conducive to significant chemical movement - few concerns with this type of land - no further investigation is warranted 	<ul style="list-style-type: none"> - not applicable to water and wastewater servicing
Phase 1 ESA – 2290 Russell Road West, July 2007 Azimuth Environmental Consulting Inc.	<ul style="list-style-type: none"> - host geological environment is not overly conducive to significant chemical movement - few concerns with this type of land - no further investigation is warranted 	<ul style="list-style-type: none"> - not applicable to water and wastewater servicing
Stage 1-2 Archaeological Assessment – 154 Doran Road, December 2007 Archeoworks Inc.	<ul style="list-style-type: none"> - area H1 should be protected from disturbance or some additional investigation should be carried out - all other areas should be cleared from further archaeological concern 	<ul style="list-style-type: none"> - will be used as background report for ESR
Phase 1 ESA – Johns Property, May 2008 Azimuth Environmental Consulting Inc.	<ul style="list-style-type: none"> - host geological environment is not overly conducive to significant chemical movement - few concerns with this type of land - no further investigation is warranted 	<ul style="list-style-type: none"> - not applicable to water and wastewater servicing

(Abbreviated)	Relevance to Master Plan	
<p>Consolidated Hydrogeologic Evaluation – Midhurst Rose Alliance, June 2008</p> <p>Ian D. Wilson Associates Limited</p>	<ul style="list-style-type: none"> - nitrate content of groundwater entering the site is between <0.1 to 0.4 mg/L - in-ground effluent disposal beds are viable over the site except for two small areas of land - recommends that some tile beds can surround the STP while others can be located throughout the development (along paths, trails – 6 m width) - effluent application rate should not exceed 50 L/m²/day - tertiary sewage treatment is required to reduce nitrate concentration to 3.21 mg/L or lower for design flow of 2,376 m³/d - a well is being developed to provide 48 L/s and the aquifer could yield up to 100 L/s - provides geotechnical information 	<ul style="list-style-type: none"> - information will be used to assess feasibility of tile fields (vertical injection wells) - well rate will be used to assess water supply options
<p>Draft Plan of Subdivision - July 8, 2008</p> <p>Weston Consulting Group</p>	<ul style="list-style-type: none"> - provides proposed layout 	<ul style="list-style-type: none"> - shows proposed road layout and location of environmental area for WWTP
<p>Planning Justification Report - July 8, 2008</p> <p>Weston Consulting Group</p>	<ul style="list-style-type: none"> - provides site description and development proposal for 1,471 units - notes full on-site municipal water and wastewater servicing (no specific details) - provides suggested phasing - provides summary of other reports (see below) 	<ul style="list-style-type: none"> - this is a planning document
<p>Midhurst Heights Vision – July 11, 2008</p> <p>STLA & John G. Williams Ltd</p>	<ul style="list-style-type: none"> - provides architectural and landscape “vision” - shows proposed STP site 	<ul style="list-style-type: none"> - none

(Abbreviated)	Relevance to Master Plan	
<p>Master Servicing Report – revised July 2008 Richardson Foster Ltd. & TSH</p>	<ul style="list-style-type: none"> - addresses servicing options for Midhurst Rose Alliance Inc, Midhurst Rose Alliance Johns Inc, Midhurst Rose Alliance Cooney Inc, Midhurst Rose Alliance O’Brien Inc, External properties A to C, Frankcom property D, Borean property E and existing institutional lands - properties A, B C and D may be developed in the future - Midhurst Rose lands will be developed in four phases - Provides water servicing design criteria - Suggests two water servicing options – recommends new water system - Provides wastewater flow criteria - Suggests effluent criteria and treatment process - Proposes subsurface effluent disposal 	<ul style="list-style-type: none"> - will be used to assess options
<p>Environmental Impact Study Requirement – O’Brien Property – July 2008 Azimuth Environmental Consulting Inc.</p>	<ul style="list-style-type: none"> - no watercourses evaluated wetlands, ANSIs, County Greenlands, NVCA regulated lands or rare species on record - no wildlife movement - no unevaluated forests - no environmental features or functions 	<ul style="list-style-type: none"> - will be used as background report for ESR

(Abbreviated)	Relevance to Master Plan	
<p>North East Quadrant Internal Traffic Study, July 2008 C. C. Tatham & Associates Ltd.</p>	<ul style="list-style-type: none"> - addresses Traffic signal improvements at various intersections in the Midhurst settlement area. - outlines existing conditions such as road network, traffic volumes, intersection operations. - discusses future background traffic volumes with respect to planning horizons, identified road improvements, existing background traffic volumes. - discussed site locations, proposed land use and phasing, site access, site generated trips and internal road system. - identifies 2018 and 2028 future total conditions such as traffic volumes, external roads, external road improvements warrants, internal roads and recommended road network for Alliance neighbourhood. - does not include traffic impact for the entire Midhurst area 	<ul style="list-style-type: none"> - will be used as background information for Transportation Master Plan of Midhurst area
<p>Comments report on Class Environmental Assessment and Secondary Plan Richardson Foster Ltd.</p>	<ul style="list-style-type: none"> - request to consider the EA in Master Plan study - considerations of the overlap in proposed roadway improvements amongst the various funding mechanisms and others. - discusses wastewater treatment for the entire Doran Road North Area - discusses topography and wastewater treat facilities - discusses effluent disposal - phasing of the east land and water supply - discusses the transportation and overlap in transportation improvements - existing funding mechanisms and planning. - phasing of transportation improvements 	
<p>Status of Well Construction and Testing – Wilson letter dated August 19, 2008</p>	<ul style="list-style-type: none"> - describes well construction and results of 2 hour test. - 72 hour test is required 	<ul style="list-style-type: none"> - appears to be a viable water supply source

(Abbreviated)	Relevance to Master Plan	
Preliminary Analysis of Production Well 1 – Wilson letter dated Oct 20, 2008	<ul style="list-style-type: none"> - aquifer could yield 6,300 L/min (105 L/sec.) - at least one additional production well is required - additional analysis of the ability of the existing wells to sustain interference potential is needed before significant aquifer development beyond about 60 to 90 L/sec. Is contemplated that a yield of 100 L/sec will be likely 	<ul style="list-style-type: none"> - sufficient for Master Plan purposes
Richardson Foster Ltd. letter dated October 24, 2008 Re: various topics	<ul style="list-style-type: none"> - asks for consideration for two WWTPs - asks for updating of the water servicing solutions for Doran Road north - asks for consideration of funding for roads and phasing of new road construction and overlapping of funding mechanisms and planning documents - asks that the Secondary Plan consider phasing of all services 	<ul style="list-style-type: none"> - See March 12, 2009 letter by G. Gemmell Re: WWTP - water servicing resolved - will be considered - not an issue for Master Plan
AECOM (TSH) letter to G. Gemmell dated December 5, 2008 Re: Sewage Treatment Plant Location Cost Analysis	<ul style="list-style-type: none"> - identifies cost estimates for four WWTP options - favours two WWTPs 	<ul style="list-style-type: none"> - see Black & Veatch submission of March 2009

(Abbreviated)	Relevance to Master Plan	
<p>Well Evaluation Production Well 1 Midhurst Rose Alliance Inc. December 19, 2008 Wilson Associates</p>	<ul style="list-style-type: none"> - well 1 is capable of “easily yielding the maximum screen transmitting capacity of 45 L/s - additional well field development is warranted - maximum lower aquifer yield potential is theoretically in excess of 100 L/s - bacteriological quality is acceptable - chemical quality is acceptable - elevated iron and manganese can be treated - lower aquifer is “considered a groundwater source secure from the influence of surface water” - at a combined capacity of 100 L/s, there will be no interference with existing municipal and domestic wells - operation of wells in aquifer A2 will not be influenced by withdrawals from the lower aquifer A3 	<ul style="list-style-type: none"> - see Jagger Hims letter dated January 30, 2009 “significantly more technical work is needed to meet the objectives of this Class EA” - considered to be suitable for Master Plan purposes but more assessment is necessary in Phases 3 and 4 of the Class EA process
<p>G. Gemmell letter dated January 12, 2009 Re: Sanitary Servicing Evaluation – Eastern Lands</p>	<ul style="list-style-type: none"> - promotes single WWTP within Doran Road North Development 	<ul style="list-style-type: none"> - see subsequent letter dated March 12, 2009
<p>Weston Consulting Group Inc. letter dated January 19, 2009 Re: location of WWTP</p>	<ul style="list-style-type: none"> - responds to SCS letter dated December 16, 2008 - promotes WWTP location within Doran Road north area 	<ul style="list-style-type: none"> - see Gemmell letter dated March 12, 2009
<p>G. Gemmell letter dated January 22, 2009 Re: water storage and fire protection – includes Genivar letter dated October 22, 2008</p>	<ul style="list-style-type: none"> - offers 3 options for establishing fire flows and resulting water storage volumes - Options 2 and 3 are based on “mining” the well supply during a fire event to reduce fire storage volume 	<ul style="list-style-type: none"> - Option 1 is acceptable to the Township, fire flows to be determined - “mining” of well supply is not acceptable
<p>G. Gemmell letter dated January 26, 2009 Re: Response to SCS letter of Dec 8, 2008</p>	<ul style="list-style-type: none"> - promotes single WWTP located within the Doran Road north Development area 	<ul style="list-style-type: none"> - see subsequent letter dated March 12, 2009

(Abbreviated)	Relevance to Master Plan	
<p>Midhurst Wastewater Treatment Plant, Process Selection for Final Effluent Criteria March 3, 2009 AECOM (TSH)</p>	<ul style="list-style-type: none"> - suggests anticipated surface water effluent quality limits and objectives for C. of A. - suggests anticipated subsurface effluent quality limits and objectives for C. of A. - discusses “ultra low” P removal technology options - states that nitrogen levels of 1.0 mg/L are “readily achievable” which meets the requirements for this project - states that P levels approaching 0.03 mg/L are “achievable” which meets the requirements for this project. 	<ul style="list-style-type: none"> - will be considered in determining method of effluent disposal
<p>G. Gemmell letter dated March 12, 2009 re: AECOM (Gartner Lee) Report and SCS Reports of Feb 13, 2009</p>	<ul style="list-style-type: none"> - supports “servicing scheme” (one sewage plant to be located in the west) but stipulates “minor differences of opinion”. - must permit all development in the Secondary Plan to proceed in a timely manner - should include the servicing of the existing Midhurst community in order to lessen impact on Willow Creek and to provide for servicing of the eastern side of the Secondary Plan area - location of WWTP in the Carson Road Neighbourhood is premature and must be confirmed through Master Plan. Exact location of WWTP should be determined in Phases 3 and 4 of the Class EA - disagrees with several servicing assumptions made by SCS - backup calculations should be provided to substantiate magnitude of cost savings re: single WWTP - final process selection (as suggested by Black & Veatch) is premature and must be determined through Phases 3 and 4 of a Class EA. - selection of SBR treatment may be premature re: phase considerations 	<ul style="list-style-type: none"> - taken to be agreement in principle with the single sewage plant servicing scheme with concerns noted. - it is noted that the servicing of the existing Midhurst area is not feasible with respect to funding

(Abbreviated)	Relevance to Master Plan	
<p>G. Gemmell letter dated May 1, 2009 re: Comprehensive Area Servicing Strategy (wastewater)</p>	<ul style="list-style-type: none"> - agrees with one WWTP with effluent discharge to Willow Creek - disagrees with proposed servicing scheme proposed by SCS in a letter dated February 13, 2009 and is concerned about phasing - feels that existing Midhurst must be serviced initially to reduce septic loading within the existing community - provides conceptual options for sewage servicing 	<ul style="list-style-type: none"> - phasing of development and related servicing will be determined by the Township as part of its planning process - the servicing of existing Midhurst in the initial stages of future development is considered to be unwarranted since there is no immediate problem in the area - servicing Options were considered in developing the final Preferred "conceptual" layout.
<p>Facility Fit Evaluation Block 1142 – Environmental Centre AECOM – June 2009</p>	<ul style="list-style-type: none"> - describes water supply facility for Development Areas 1 and 2 - peak hour demand = 192 L/s - MDD plus fire = 261 L/s - storage volume = 7500 m³ - proposes three phase construction - proposed three site locations within Development Area 1 - recommends site # 1 – central site 	<ul style="list-style-type: none"> - provides preliminary details of proposed water treatment facility

2.2.3 Development Areas 2 and 3 – Geranium Lands – Doran Road and Carson Road

The Geranium Corporation provided numerous reports and letters associated with the lands south of Doran Road (Midhurst Development Doran Road Inc. – MDDRI) and along Carson Road (Carson Road Development Inc. – CRDI). The Table below outlines the titles of the Reports, provides summaries of the contents and comments on the relevance of the Reports and letters with respect to the servicing Master Plan. The summaries are presented in Chronological order.

Geranium Reports and Letters

Report Title (Abbreviated)	Summary of Contents	Relevance to Master Plan
Stage 1 Archaeological – Carson Neighbourhood – May 2008 Amick Consultants Limited	<ul style="list-style-type: none"> - “high archaeological potential” - Stage 2 Assessment is recommended 	- none
Stage 1 Archaeological – Doran Neighbourhood – May 2008 Amick Consultants Limited	<ul style="list-style-type: none"> - “high archaeological potential” - Stage 2 Assessment is recommended - Stage 3 test excavations will be required on the Coutts Site 	- none
Preliminary Hydrogeological Study – Carson Neighbourhood – May 2008 Golder Associates	<ul style="list-style-type: none"> - Municipal wells in the area produce between 6 and 19 L/s - several news wells would be needed to provide max day demand - tertiary treatment is required to remove nitrate to concentration of 6 mg/L which is lower than the concentration in aquifers A1 and A2 - soils will accommodate leaching beds capable of receiving treated effluent at a rate of 3,225 m³/day - water supply is expected to be found north of Midhurst 	<ul style="list-style-type: none"> - information will be used to assess feasibility of tile fields (vertical injection wells) and for sewage treatment options - more information needed re: water supply (See Golder Report Dec. 2008)
Preliminary Hydrogeological Study – Doran Neighbourhood – May 2008 Golder Associates	<ul style="list-style-type: none"> - tertiary treatment is required to remove nitrate to concentration of 3.6 mg/L based on background nitrate concentration of 1.2 mg/L - soils will accommodate leaching beds capable of receiving treated effluent at a rate of 3,130 m³/day - Reasonable Use Guideline indicates max nitrate concentration on Coutts site 	<ul style="list-style-type: none"> - information will be used to assess feasibility of tile fields (vertical injection wells) and for sewage treatment options - more information needed re: water supply (see Golder Report Dec. 2008)

(Abbreviated)	Relevance to Master Plan	
	<ul style="list-style-type: none"> is 5.65 mg/L based on background concentration of 4.2 mg/L - water supply is expected to be found north of Midhurst 	
<p>Agricultural Assessment – May 2008 AgPlan Limited</p>	<ul style="list-style-type: none"> - secondary Plan Area lands are poorer, agriculturally - relatively poor soils require higher input of cost and labour - no specialty crop production - Secondary Plan Area can be designated for urban development 	<ul style="list-style-type: none"> - None
<p>Commercial Needs Analysis – May 2008 Urban Metrics Inc.</p>	<ul style="list-style-type: none"> - see Report 	<ul style="list-style-type: none"> - none, will use equivalent population of 1,000 persons for water and wastewater assessments
<p>Surface Receiving Water Assessment for Carson Road Development – May 2008 Gartner Lee</p>	<ul style="list-style-type: none"> - Black Creek is known to contain both cool and cold water fish habitat and supports brook trout – ecologically sensitive - recommends field program to assess creek conditions - separation distance between tile beds and surface water should be maximized - Phosphorus and nitrate removal will be required in wastewater treatment process such that TP and nitrate levels are less than 0.03 mg/L or 2.93 mg/L with respect to nitrate-N - recommends impact study on phosphorus budget for pre and post-development site - recommends study to determine assimilation estimates for discharge of wastewater effluent and stormwater - recommends further reviews pending a better understanding of ground and surface water interactions 	<ul style="list-style-type: none"> - need additional studies (See AECOM Report June 2009)
<p>Surface Receiving Water Assessment for Doran Neighbourhood Development – May 2008 Gartner Lee</p>	<ul style="list-style-type: none"> - Willow Creek is known to have areas of both cool and cold water fisheries and may also contain such sensitive fish habitat - need additional study on water quality, flow and the nature of aquatic life over the entire length of the tributary – field 	<ul style="list-style-type: none"> - need additional studies (See AECOM Report June 2009)

(Abbreviated)	Relevance to Master Plan	
	<p>program is underway as of Spring 2008</p> <ul style="list-style-type: none"> - separation distance between tile beds and surface water should be maximized - Phosphorus and nitrate removal will be required in wastewater treatment process such that TP and nitrate levels are less than 0.03 mg/L or 2.93 mg/L with respect to nitrate-N - recommends impact study on phosphorus budget for pre and post-development site - recommends study to determine assimilation estimates for discharge of wastewater effluent and stormwater - recommends further reviews pending a better understanding of ground and surface water interactions 	
<p>Doran Neighbourhood Natural Environment Support Document – May 2008 Beacon Environmental</p>	<ul style="list-style-type: none"> - most of the area is currently agricultural and is suitable for development - EIA is needed in the future in support of future draft plans of subdivision 	<ul style="list-style-type: none"> - defines development area
<p>Carson Neighbourhood Natural Environment Support Document – May 2008 Beacon Environmental</p>	<ul style="list-style-type: none"> - most of the area is currently agricultural and is suitable for development - EIA is needed in the future in support of future draft plans of subdivision 	<ul style="list-style-type: none"> - defines development area
<p>Carson Road Servicing Concept – May 2008 SCS Consulting Group Ltd.</p>	<ul style="list-style-type: none"> - proposes local sanitary collection system and new WWTP with subsurface discharge to local tile fields - proposes an extension of watermains from Highway 26, new wells, treatment plant and storage facility for potable water supply 	<ul style="list-style-type: none"> - provides general information re: water supply and wastewater collection and treatment
<p>Doran Road Servicing Concept – May 2008 SCS Consulting Group Ltd.</p>	<ul style="list-style-type: none"> - proposes local sanitary collection system and new WWTP with subsurface discharge to local tile fields - proposes an extension of watermains from Highway 26, new wells, treatment plant and storage facility for potable water supply 	<ul style="list-style-type: none"> - provides general information re: water supply and wastewater collection and treatment

(Abbreviated)	Relevance to Master Plan	
Carson Neighbourhood Planning Rational Report – May 2008 Gatzio Planning & Development Consultants Inc.	<ul style="list-style-type: none"> - general statements only with respect to water and wastewater servicing 	<ul style="list-style-type: none"> - none
Doran Neighbourhood Planning Rational Report – May 2008 Gatzios Planning & Development Consultants Inc	<ul style="list-style-type: none"> - general statements only with respect to water and wastewater servicing 	<ul style="list-style-type: none"> - none
Carson Road OPA Report TRAFFIC IMPACT STUDY Prepared for: MIDHURST DEVELOPMENT CARSON ROAD INC. (MDCRI) May, 2008 BA Group Transportation Consultants	<ul style="list-style-type: none"> - addresses the area context of Carson Neighbourhood. - discussed transportation context with respect to Midhurst secondary plan, study area, existing road network, and future road network assumptions. - addresses proposed neighbourhood plan and internal road network system. - Provides traffic forecasts such as Existing Traffic volumes, horizon year, background traffic growth, trip generation, site traffic assessment and future total traffic volumes. - analyzed Traffic Impacts such as signalized intersections, unsignalized intersections. - recommended Midhurst development Carson Neighbourhood INC. future road network. - does not include overall transport system and traffic impacts for the whole Midhurst settlement area. 	<ul style="list-style-type: none"> - will be used as background report for Transportation Master Plan
Doran Road OPA Report TRAFFIC IMPACT STUDY Prepared for: MIDHURST DEVELOPMENT DORAN ROAD INC. (MDCRI)	<ul style="list-style-type: none"> - addresses the area context of Doran Neighbourhood. - discussed transportation context with respect to Midhurst secondary plan, study area, existing road network, and future road network assumptions. - addresses proposed neighbourhood plan and internal road network system. - provides traffic forecasts such as Existing 	<ul style="list-style-type: none"> - will be used as background report for Transportation Master Plan

(Abbreviated)	Relevance to Master Plan	
<p>May, 2008</p> <p>BA Group Transportation Consultants</p>	<p>Traffic volumes, horizon year, background traffic growth, trip generation, site traffic assessment and future total traffic volumes.</p> <ul style="list-style-type: none"> - analyzed Traffic Impacts such as signalized intersections, unsignalized intersections. - recommended Midhurst development Doran Neighbourhood INC. future road network. - does not include overall transport system and traffic impacts for the whole Midhurst settlement area. 	
<p>Report on New Environmental Technology Evaluation Program Injection Well Technology for Treated Effluent Disposal – July 2008</p> <p>Golder Associates</p>	<ul style="list-style-type: none"> - “The use of injection well or recharge beds applies the same evaluation method and there is no difference in the environmental impact between the two methods of discharge” - outlines special environmental conditions for the use of injection wells - treated effluent to be disinfected prior to disposal - precipitation of calcium and iron does not appear to pose a severe limitation to the development of injection wells 	<ul style="list-style-type: none"> - Developer to continue to assess this option and to provide MOE with design rational (this option was subsequently abandoned from further assessment – surface water discharge is now recommended)
<p>Golder letter dated July 14, 2008 re: Water Supply Well Drilling Program Progress Update</p>	<ul style="list-style-type: none"> - progress report only, outlines further work to be done 	<ul style="list-style-type: none"> - identifies location of TW 7/08 as being the most feasible site for a new municipal well
<p>Draft Preliminary Hydrogeological Study – Midhurst Water Supply Exploration – August 2008</p> <p>Golder Associates</p>	<ul style="list-style-type: none"> - Regional aquifer A3 is considered to be the primary target for a new municipal well - water quality is similar to that in existing municipal wells – meets OWDS - wells along Russell Road could yield 25 to 50 L/sec - wells at County rd 22 and County rd 27 could yield 16 to 22 L/sec - wells north of Anten Mills could yield 50 L/sec and more - wells on Carson Rd lands could yield 12 to 16 L/sec 	<ul style="list-style-type: none"> - potential well sites will be considered based on future water demands

(Abbreviated)	Relevance to Master Plan	
<p>Draft Preliminary Hydrogeological Study Injection Well Option for Treated effluent Disposal – August 2008 Golder Associates</p>	<ul style="list-style-type: none"> - considers Carson Rd lands only – not Doran Rd - tertiary treatment is needed to remove nitrate – consider additional treatment including UV disinfection of effluent - “Treatment of sewage effluent to obtain a nitrate concentration of 3.7 mg/L would result in treated effluent having a nitrate concentration lower than the existing water in aquifers A1 or A2 and a theoretical consent rate of 2.5 mg/L at the property boundary” - injection rates of 500 m³/day – resulting in the need for 7 injection wells to handle flow rate of 3,225 m³/day - additional wells would be required to provide firm capacity 	<ul style="list-style-type: none"> - developer to continue to assess this option and to provide MOE with design rational (this option was subsequently abandoned from further assessment – surface water discharge is now recommended)
<p>Secondary Plan Servicing Support – August 2008 SCS Consulting Group Ltd.</p>	<ul style="list-style-type: none"> - proposes three separate wastewater treatment plants – one for each of the three Development areas - outlines sewer collection systems for each of the three current development areas, the employment lands, the Admin/Gov lands, future estate residential lands, future development lands and the existing Midhurst area - proposes design criteria for wastewater - suggests SBRs for wastewater treatment - suggests sub-surface effluent disposal using injection wells for all three development areas - integrate new well(s) with existing water supply - increase water storage as needed based on hydraulic model analysis - proposes design criteria for water supply 	<ul style="list-style-type: none"> - will consider servicing options as part of Class EA
<p>Secondary Plan Servicing Support – September 2008 SCS Consulting Group Ltd.</p>	<ul style="list-style-type: none"> - similar to August 2008 version 	<ul style="list-style-type: none"> - none

(Abbreviated)	Relevance to Master Plan	
Water Supply Well Drilling Program Russell Road Progress Updates – Sept 18 and 23, 2008 Golder Associates	<ul style="list-style-type: none"> - advises status of test well - determines water quality, elevated manganese (0.075 mg/L) and sodium (45.2 mg/L) - no information on capacity 	<ul style="list-style-type: none"> - need capacity (see Dec 2008 Report)
Golder letter dated September 29, 2008 Re: soils conditions at proposed wells sites at Anten Mills and on Russell Road	<ul style="list-style-type: none"> - preliminary only, no site specific investigations were performed - Anten Mills – surficial clay and clayey till extending to about 10 to 12 m below grade, underlain by sands and gravels with water level at about 8 m - Russell Road – surficial sand and gravel extending to about 5 to 7 m below grade, underlain by clayey till to about 16 to 17 m below grade with water level at about 6 m - both sites are suitable for the construction of well pumphouses. 	<ul style="list-style-type: none"> - suitable for preliminary purposes.
Golder letter Oct 3, 2008 re: Water Supply Update	<ul style="list-style-type: none"> - Russell Road site testing needs to be completed but it looks like yield of 35 to 45 L/sec is feasible - 3 to 4 wells could be developed along Russell Road to provide 133 L/sec. - wells on the south end of Russell Road could produce 30 to 50 L/sec - a 65 hour test was completed at the Anten Mills site and yields of 40 to 50 L/sec are anticipated. - no interference with existing municipal wells in Anten Mills 	<ul style="list-style-type: none"> - need confirmed testing results from Russell Road site and from Anten Mills site but both sites seem to be suitable for Master Plan purposes (see Dec. 2008 Report)
Beacon Environmental Ecological Investigation of Anten Mills well site and of Russell Road well site – Oct 4, 2008	<ul style="list-style-type: none"> - adequate space for a well pumphouse on the Anten Mills site without removal of trees and shrubs - no trees would need to be removed for the construction of a well pumphouse in the Russell Road well location 	<ul style="list-style-type: none"> - adequate for Master Plan purposes
Archaeological Report on Anten Mills well site – 1053 Coughlin Road Oct 2008 Amick Consultants Limited	<ul style="list-style-type: none"> - high potential for archaeological resources of First Nations origin - stage 2 assessment is recommended 	<ul style="list-style-type: none"> - needs Stage 2 Assessment

(Abbreviated)	Relevance to Master Plan	
Archaeological Report on Russell Road well site – Road Allowance Concessions 2 and 3 – Oct 2008 Amick Consultants Limited	<ul style="list-style-type: none"> - high potential for archaeological resources of First Nations origin - stage 2 assessment is recommended 	<ul style="list-style-type: none"> - needs Stage 2 Assessment
SCS letter dated October 16, 2008 Re: WWTP Block Location	<ul style="list-style-type: none"> - advises of proposed WWTP location 	<ul style="list-style-type: none"> - See subsequent Black & Veatch submission
David S. White letter dated December 5, 2008 – Legal opinion re: determining WWTP location	<ul style="list-style-type: none"> - states that location of WWTP must be determined as part of the Master Plan process 	<ul style="list-style-type: none"> - noted, see subsequent submission by Black & Veatch
Hydrogeological Study Midhurst Water Supply Exploration Program Supporting Document – December 2008 Golder Associates	<ul style="list-style-type: none"> - compilation of all previous Hydrogeological Reports, including test results - water quality in Aquifer A3 has been found to be similar to that for water obtained at existing municipal wells in Midhurst. Water quality from TW17/08 meets the ODWS for all parameters tested. - TW17/08 at the intersection of Storrie Road and Russell Road has potential to provide a yield of 50 L/s - The Alliance well (PW1) was tested at 45 L/s for 72 hours - TW18/08 at the south end of Russell Road north of Pooles Rd has similar yield potential as TW 17/08 and PW 1 - Aquifer A3 has adequate groundwater flow to support a maximum day taking of 213 L/s and an average day taking of 133 L/s. Both the Doran Road and Carson Road developments can be supplied water from this source. - wells along Russell Road should be spread out to maximize capture and to minimize interference. Interference with the operation of private wells is not anticipated 	<ul style="list-style-type: none"> - will be used to determine Preferred water supply solution - A group of wells in one general location is considered to be more cost effective, operationally. - This well site is too far from the development locations

(Abbreviated)	Relevance to Master Plan	
	<ul style="list-style-type: none"> - OW6/08 at the intersection of County Road 27 and Horseshoe Valley Road indicates potential to construct well with a yield of 16 to 22 L/s - water quality from TW12/08 and TW14/08 on Coughlin Road in Anten Mills meets the ODWS for all parameters tested - the Coughlin Road site has a potential yield of 80 L/s with manageable impacts to adjacent private water supplies - Unit yields of 12 to 16 L/s could be expected from wells developed within the Carson Road lands. The development of one municipal well on that site is possible. 	<ul style="list-style-type: none"> - This well site is too far from the development locations and may impact adjacent private water supplies - Insufficient supply to service all of the Carson Road development
SCS letter Dec 8	<ul style="list-style-type: none"> - Outlines preferred location of wastewater treatment plant (WWTP) within Area 2 to service Areas 1 and 2 	<ul style="list-style-type: none"> - It was subsequently determined that one WWTP should be provided to service Development Areas 1, 2 and 3 and that the preferred location would be within the northwest corner of Area 3. That location may be revised in the future (to the north side of Snow Valley Road within the existing gravel pit) subject to evaluation in Phase 3 of the Class EA process. The plant will be expandable to service existing Midhurst in the future if deemed necessary.
SCS letter dated December 16, 2008 Re: Sanitary Servicing Evaluation – Doran Road Communities	<ul style="list-style-type: none"> - promotes southern location for WWTP 	<ul style="list-style-type: none"> - see March 2009 submission by Black & Veatch
SCS letter dated December 18, 2008 Re: WWTP location – Doran Road Community	<ul style="list-style-type: none"> - promotes single WWTP within Doran Road south area 	<ul style="list-style-type: none"> - see Black & Veatch submission – March 2009
SCS letter dated January 20, 2009 Re: Sanitary conveyance Details – Doran Road South	<ul style="list-style-type: none"> - promotes single WWTP located within the southwest corner of Geranium lands – Doran Road south 	<ul style="list-style-type: none"> - see subsequent SCS letter dated February 13, 2009

(Abbreviated)	Relevance to Master Plan	
<p>Preliminary Assessment of the effects of Sewage Effluent Discharge Scenarios from the proposed Midhurst Development Projects to Alternative Ground and Surface Receiving Waters</p> <p>AECOM (Gartner Lee)– March 2009</p>	<ul style="list-style-type: none"> - Draft Assimilation Analysis - proposed low effluent limits will not result in degraded water quality in the receivers - four alternative receivers were assessed - higher flows present at Willow Creek at Highway 26 and presence of Minessing Swamp downstream suggest that discharge at this location is preferred 	<ul style="list-style-type: none"> - consideration can be given to surface water discharge
<p>Final Surface Water Receiving Assessment for Doran Neighbourhood Development</p> <p>AECOM (Gartner Lee) - February 2009</p>	<ul style="list-style-type: none"> - Willow Creek through Doran Road Neighbourhood Development is receiving surface water of interest - Willow Creek is a coolwater stream that supports excellent water quality. As a receiving water, is primarily limited by flow which is intermittent - suggests effluent disposal by vertical well injection to aquifer A2 - proposes effluent limits of 2.5 mg/L Nitrate and 0.5 mg/L of Total Phosphorus - conducted field assessment including Benthic invertebrate sampling, a fisheries assessment and monthly field visits to three sites involving collection of water chemistry, flow and temperature measurements 	<ul style="list-style-type: none"> - consider effluent disposal by vertical well injection
<p>Final Surface Water Receiving Assessment for Carson Neighbourhood Development</p> <p>AECOM (Gartner Lee) - February 2009</p>	<ul style="list-style-type: none"> - Black Creek through Carson Neighbourhood Development is sensitive cold water stream and should be protected - suggests effluent disposal by vertical well injection to aquifer A2 - Proposes effluent limits of 2.5 mg/L Nitrate and 0.5 mg/L of Total Phosphorus - conducted field assessment including Benthic invertebrate sampling, a fisheries assessment and monthly field visits to three sites involving collection of water chemistry, flow and temperature measurements 	<ul style="list-style-type: none"> - consider effluent disposal by vertical well injection

(Abbreviated)	Relevance to Master Plan	
Golder Associates letter dated February 4, 2009 Re: Nitrate and Phosphorous Attenuation	<ul style="list-style-type: none"> - evaluates subsurface environmental impacts of disposal of treated effluent with respect to Nitrate and Phosphorus. - provides impacts for four scenarios including one WWTP and combinations of WWTPs. 	<ul style="list-style-type: none"> - applicable if subsurface disposal is considered further
SCS Consulting Group Ltd, letter dated February 13, 2009 Re: Wastewater Treatment Plant Evaluation	<ul style="list-style-type: none"> - best strategy is a single WWTP ideally located in the Carson Road Neighbourhood - one WWTP provides cost savings - includes drawing of potential sanitary drainage plan and sanitary flow calculations 	<ul style="list-style-type: none"> - provides potential sanitary sewer layouts and catchment areas for Carson Road WWTP
Black & Veatch Technical Memorandum dated February 13, 2009 Re: Liquid-Stream Treatment Process Selection	<ul style="list-style-type: none"> - investigates possibility of proposed WWTP by looking at potential treatment processes - assumes the following effluent criteria; Nitrate-nitrogen = 3.0 mg/L and TP = 0.03 mg/L monthly average of weekly samples - recommend using treatment process that would include a biological nutrient removal (BNR) process followed by a tertiary physical/chemical treatment step followed by an effective solids/liquid separation process - provides overview of different processes with above treatment steps. - summarizes that it is possible to meet proposed effluent criteria but further investigation is needed to determine most suitable technology 	<ul style="list-style-type: none"> - provides potential treatment processes for proposed WWTP (one plant at Carson Road site)
Black & Veatch Executive Summary of Submissions for Input into the Midhurst Wastewater Servicing Concept March 2009	<ul style="list-style-type: none"> - Doran Neighbourhood will include approx. 5,400 residential units housing 16,200 people and contains a tributary of Willow Creek - Carson Neighbourhood will include approx. 3,200 residential units housing 9,600 people and contains Black Creek (a tributary of Willow Creek) - propose WWTP located in NW corner of Carson Neighbourhood discharging to Willow Creek - estimated total ADF = 14,853 m³/d and 	<ul style="list-style-type: none"> - proposes one treatment plant and discusses considerations associated with a single plant

(Abbreviated)	Relevance to Master Plan	
	<p>PF = 35,944 m³/d</p> <ul style="list-style-type: none"> - proposed disposal to Willow Creek at Highway 26 (increased stream flow after joining with Matheson Creek resulting in greater assimilative capacity, immediately upstream from Minesing Swamp for flow buffer and effluent polishing) - effluent criteria being considered for planning purposes; TP – 0.03 mg/L and Nitrate-nitrogen – 3.0 mg/L (monthly average of weekly samples) - currently preparing report discussing treatment processes and technologies - provides overview of proposed collection system - next steps include; meeting with MOE and NVCA; report discussing wastewater treatment technologies; detailed assimilative and biological studies 	
<p>Gatzios Planning + Development – Memorandum re: Population and Employment Projections – April 8, 2009</p>	<ul style="list-style-type: none"> - requests consideration to increase serviced population equivalent to 32,750 persons from 28,638 	<ul style="list-style-type: none"> - Subsequently determined to complete MP based on a population equivalent of 28,638 persons with future consideration for an increase
<p>Geranium email April 21, 2009 – Potential Growth Options (DRAFT)</p>	<ul style="list-style-type: none"> - Provides employment population equivalent options for future consideration 	<ul style="list-style-type: none"> - Will be considered in the future by the Township
<p>Geranium letter dated May 27, 2009, email June 1, 2009, Ainley letter dated June 2, 2009, Geranium email June 2, 2009, Gemmell letter June 3, 2009, Geranium email June 4, 2009</p>	<ul style="list-style-type: none"> - Proposes new location (within Area 2) for water treatment facility 	<ul style="list-style-type: none"> - Subsequently agreed by the Township to consider this site in future Class EA planning (Phase 3) along with other sites within Area 1
<p>Interim Assimilation Analysis: Discharge of Treated Sewage Effluent from the Proposed Midhurst WWTP to Willow Creek AECOM (Gartner Lee) –</p>	<ul style="list-style-type: none"> - Nitrate and phosphorus concentrations in Willow Creek will be maintained below guideline values of 0.03 mg/L total phosphorus and 4.7 mg/L of nitrate at effluent concentrations of 0.030 mg/L total phosphorus and 9.8 mg/L of nitrate nitrogen. 	<ul style="list-style-type: none"> - provides sufficient information for Master Plan purposes - additional assessment required for geomorphology, mixing zone, benthos, fish communities and habitat and hydrogeological

(Abbreviated)	Relevance to Master Plan	
June 2009	<ul style="list-style-type: none"> - provision of future municipal servicing of the existing Midhurst area provides potential to decommission existing septic systems which would decrease total phosphorus loading to Willow Creek - Effluent total ammonia concentrations should be maintained at less than 1.0 mg/L - un-ionized ammonia concentrations will exceed PWQO in the mixing zone and therefore mixing zone characteristics will have to be established - water temperature in Willow Creek will not be significantly increased – maintain as a cool water/cold water system - Flows will remain well within historic average and flood flow levels – further impact analysis of flow impact will be undertaken in Phase 3 of the Class EA process 	characteristics including effluent diffusion.
Fire Flow and Water Storage Calculation Spreadsheet, Black & Veatch June 4, 2009	- provides calculations for reduced water storage volumes for future additional population projection	- rational accepted but initial water storage volume will be established for Master Plan projected population

2.2.4 Walton Property

On August 12, 2008, Ainley was provided with two Reports related to the proposed development of the Walton Property, which is located at the extreme south end of Development Area 2. The Table below outlines the titles of the Reports, provides summaries of the contents and comments on the relevance of the Reports with respect to the servicing Master Plan.

Report Title (Abbreviated)	Summary of Contents	Relevance to Master Plan
Planning Report, Application for Official Plan Amendment, Walton Property – April 2008	<ul style="list-style-type: none"> - EIS has been completed - relies on water and wastewater servicing from Geranium lands to the north - no evaluated wetland - no ANSIs - no County Greenlands - Butternut Trees are present but are diseased - no significant plant species - no significant wildlife habitat of endangered or threatened species - high proportion of forest breeding birds classed as area-sensitive species and therefore, the forest must not be disturbed, limiting area that can be developed - un-named watercourse provides coldwater fish habitat and minor marsh habitat within the valley – insufficient for breeding fowl 	<ul style="list-style-type: none"> - background report for small (30 lot) development
Hydrogeological Investigation – February 1993	<ul style="list-style-type: none"> - old report recommends individual wells – no longer valid - recommends septic waste disposal systems 	<ul style="list-style-type: none"> - none

It is noted that, for planning purposes, the Walton Property population is included in the population forecast for Area 2 (Doran Road south).

2.2.5 URS Report

In addition to the background reports prepared by the developers, AAL retained URS to comment on available reports from different transportation agencies and make recommendations for different Transportation alternatives. The URS documents include existing Traffic analysis i.e.; network analysis, future conditions transportation assessment, such as development of alternatives, future traffic analyses, such as network analysis, screening of alternatives, and Transportation Plan, such as Transportation

demand management and other network considerations. A copy of the URS Report is included in *Appendix C*.

2.2.6 Hydrogeological Reports

A Hydrogeological Study was completed by Golder Associates and was documented in a Report titled “Midhurst Water Supply Exploration Program Supporting Document – December 2008”. The Report determined that Aquifer A3 has adequate groundwater flow to support a maximum day taking of 213 L/s and an average day taking of 133 L/s. Both the Doran Road and Carson Road developments can be supplied water from this source. The Report recommends that wells along Russell Road should be spread out to maximize capture and to minimize interference. Interference with the operation of private wells is not anticipated.

A Hydrogeological Assessment was also undertaken by Ian Wilson and was documented in a Report titled “Well Evaluation Production Well 1 Midhurst Rose Alliance Inc. - December 19, 2008”. The Report determined the following:

- Well 1 is capable of “easily yielding the maximum screen transmitting capacity of 45 L/s
- Additional well field development is warranted
- Maximum lower aquifer yield potential is theoretically in excess of 100 L/s
- Bacteriological quality is acceptable
- Chemical quality is acceptable
- Elevated iron and manganese can be treated
- Lower aquifer is “considered a groundwater source secure from the influence of surface water”.
- At a combined capacity of 100 L/s, there will be no interference with existing municipal and domestic wells
- Operation of wells in aquifer A2 will not be influenced by withdrawals from the lower aquifer A3

Although these Studies are considered to be adequate for Master Plan purposes, it is recommended that additional assessment/studies be undertaken as part of Phase 3 of the future Class EA planning process to address the following:

- Testing of production size wells to determine exact location of all supply wells and to confirm that a total pumping rate of 195 L/s (design MDD) is feasible without impacting existing wells – identify effects of taking on adjacent municipal wells (Midhurst and Barrie) (Both Golder and Wilson Reports);
- Confirmation of well recovery at design demand rate (Golder Report);

- Document zone budget to show the water balance and to illustrate where surface water resources may be affected by the proposed large water taking in order to determine monitoring requirements;
- Assess hydraulic response with respect to leakage to the deeper aquifer or explain reason for dismissal of this matter;

A copy of both the Golder and the Wilson Reports are included in *Appendix C* along with a copy of letter dated February 11, 2009 from Wilson Associates, responding to AAL comments.

2.2.7 Traffic Noise Assessment

A Noise Impact Assessment was completed by J.E. Coulter Associates Limited and outlined in a Report dated April 15, 2009. The noise report assessed the anticipated noise impact of proposed Alternative 6 in the Township of Springwater. The study used the Ministry of Transportation and Ministry of Environment Protocol as the basis for noise analysis.

This report sets out the impact evaluation criteria with or without the project at point of 10 years after the project completion. The protocol has stipulated that mitigation be considered when the increment in sound levels between the proposed future condition and proposed do nothing condition (based on a 10-year traffic forecast after completion of the project) is 5 dB or greater at the affected noise-sensitive receivers. Increases in sound level of less than 5 dB are considered low, and impacts of less than 3 dB are considered insignificant. The report includes noise impact descriptions, road traffic projections, predicted sound levels, and provided noise impact summary and conclusions.

The report concludes that in the case of the future “project proceeding”, the net increase in the sound levels at six of the seven receptors considered will be 1.8 dB or less. At R2 (an isolated single residence) the relative traffic volume increase due to the project in place will account for a 6.2 dB increase in the sound levels. This increase reflects a moderate noise impact, resulting in the consideration of noise control measures. Consideration was given to the feasibility of constructing a noise barrier for R2 where the noise impact is above 6 dB. The report advised that this measure is not recommended, because of the impracticality of constructing the noise barrier and given the minor excess of the sound level above the provincial noise criterion.

A copy of the Coulter Noise Assessment is included in *Appendix C*.

Subsequent to submitting the noise analysis report, Coulter provided some additional recommendations for the affected receiver as follows:

The MTO/MOE protocol has no mechanism for noise impacts where mitigation (i.e., acoustic barriers) are not feasible. In the detailed design stage, the possibility of using quieter asphalt and/or shifting the centreline of Pooles Road further north (estimate: 10-15m) from the affected receiver (R2) should be investigated. This would reduce the noise impact to less than 5 dB and remove the need for consideration of barriers.

2.3 Existing Municipal Water Supply System

A portion of the Midhurst Secondary Plan area is currently serviced by a municipal water supply system. The existing water supply works serving the Midhurst area are identified in Certificate of Approval (C. of A.) No. 5775-6BNJ24. According to the C. of A., the total rated capacity of the water supply works is 4932 L/min (7102 m³/day). The Permit to Take Water (PTTW) No. 0507-6B9S5G, allows a total water taking of 6,479 m³/day (4499 L/min). The general locations of the existing wells are shown on Plate 9 of the Public Information Centre information – *Appendix F*.

At the Idlewood well location there are two existing groundwater wells; Well No. 2 is a standby well rated at 7.2 L/s against a TDH of 100.9 m. Well No. 3 is rated at 33.3 L/s against a TDH of 111.3 m. Water from the wells is treated using a sodium hypochlorite disinfection system and an iron/manganese sequestration system at the well pumphouse. Water from both wells enters through a common header to a 190 meter long, 450 mm diameter chlorine contact chamber following chemical addition in the pumphouse to ensure adequate contact time.

The Greenpine well location is comprised of one existing groundwater well (Well No. 4) rated at 22.7 L/s against a TDH of 39.0 m. Water from the well is treated using a sodium hypochlorite disinfection system for primary and secondary disinfection and followed by sodium silicate injections from an iron/manganese sequestration system at the well pumphouse. Following chemical injection water enters a 65m³ underground concrete reservoir under the pumphouse. Two vertical turbine pumps rated at 22 L/s pump water from the reservoir into the distribution system.

The Carson Rd well location is comprised of one existing groundwater well rated at 12.4 L/s against a TDH of 119 m. Water from the well is treated using a sodium hypochlorite disinfection system and an iron/manganese sequestration system. Following chemical injection, water enters a chlorine contact chamber to provide a minimum contact time of 15 minutes before reaching the distribution system. A 40 kW diesel generator set provides a stand-by power source for the high lift pump station.

The distribution system is comprised of PVC pipes ranging in diameter from 150 mm to 250 mm.

There are 2 existing water storage standpipes each with a current working volume of 996 m³ (to floor level). For the purposes of this assessment, the total existing useable water storage volume in the standpipes is considered to be 1992 m³ (2 x 996).

In addition, the Greenpine well site includes a 65 m³ inground reservoir. Therefore, the total available water storage volume is 2057 m³.

2.4 Natural Environment

Based on a review of the background reports provided by the Developers, the following Tables provide summaries of the existing conditions at the potential servicing sites (wells, water reservoirs water and wastewater treatment plants). The locations of any required water booster stations and wastewater pump stations will be confirmed and assessed as part of the future Phase 3 Class EA planning process. Natural environment assessments of any water booster stations and wastewater pump stations will be completed once the locations have been confirmed.

Potential Water Works Sites

Potential Facility/Location	Natural Environment Comments
Anten Mills well site – north of Anten Mills	<ul style="list-style-type: none"> - existing snowmobile trail - decommissioned railway line - adequate area for well pumphouse with no removal of woody vegetation - vegetation is very common, not significant - no trees need to be removed but if they are removed, this is not a major ecological impact - well/pumphouse could be constructed without resulting in any adverse impacts on significant natural heritage resources
Russell Road site at Storrie Road	<ul style="list-style-type: none"> - unopened road allowance - very little natural vegetation - vegetation is common and not ecologically significant - well/pumphouse could be constructed without resulting in any adverse impacts on significant natural heritage resources
Doran Rd north well and potential water treatment works – east end of Beer property within the Maple Lane Estates Development	<ul style="list-style-type: none"> - no direct fish habitat - no woodlot of value - no conservation concern - no wetland habitat - no environmental features or functions - no archaeological resources - surface water does not flow from one field to another - no water courses - hedgerows have limited value to wildlife - no tree species of conservation concern
Additional well sites along Russell Road	<ul style="list-style-type: none"> - no assessment done, will need to be done as well sites are identified and tested
Carson Rd water reservoir – within the east side of the Carson Rd neighbourhood Development	<ul style="list-style-type: none"> - Most of area is currently agricultural and is suitable for Development - EIA needed
Doran Rd south water reservoir and potential water treatment works – within Development Area 2, south east section	<ul style="list-style-type: none"> - EIA needed
Doran Rd water treatment works and potential reservoir – within the Beer property/Midhurst Lane Estates Development	<ul style="list-style-type: none"> - See above, same as Doran Rd North well site

Potential Wastewater Treatment Plant Sites

Potential Facility Location	Natural Environment Comments
Carson Rd neighbourhood wastewater treatment plant – northwest corner of Development Area 3	<ul style="list-style-type: none"> - Black Creek is a known to contain both cool and cold water fish habitat and supports brook trout - Separation between tile fields and surface water to be maximized - Further reviews required - Most of the area is agricultural and is suitable for development - EIA needed
Doran Road north wastewater treatment plant and tile fields – within the Beer property/Midhurst Lane Estates Development	<ul style="list-style-type: none"> - See above, same as for water works - Servicing Report details locations of proposed tile fields
Doran Rd south wastewater treatment plant – southwest portion of Development Area 2	<ul style="list-style-type: none"> - Willow Creek is known to contain both cool and cold water fisheries and may contain sensitive fish habitat - Separation between tile fields and surface water to be maximized - Further reviews required

3.0 Population Projections

Development unit projections were provided by the Township (see Clause 1.4) with respect to the three Development Areas of the Midhurst Secondary Plan Area. Based on a density of 40 persons per hectare (13.33 units per hectare at 3 persons per unit) the populations are predicted to be as follows:

Area 1 = 2,379 units = 7,137 persons

Area 2 = 2,920 units = 8,760 persons

Area 3 = 2,559 units = 7,677 persons

For the design of water and wastewater services, allowances will be made to include the existing population of the Midhurst Secondary Plan Area as well as an allowance for future employment/government administration population. The existing serviced (water supply) population is estimated to be 3,675 persons (1225 units) and the existing unserved population is estimated to be 339 persons (113 units). The Class EA Advisory Committee determined that, for the purposes of the Master Plan, an allowance of 350 units (about 1,050 equivalent residential persons) would be used for employment/government lands.

The total design population is derived as follows:

Existing serviced	= 1,225 units = 3,675 persons
Existing unserved	= 113 units = 339 persons
Development Area 1	= 2,379 units = 7,137 persons
Development Area 2	= 2,920 units = 8,760 persons
Development Area 3	= 2,559 units = 7,677 persons
Allowance for employment lands	= 350 units = 1,050 persons
Equivalent Population for Future Growth	= 24,624 persons
Total Design Population	= 9,546 units = 28,638 persons

As noted previously, the design population may change in the future to allow for additional development proposals and for an increase in equivalent population for employment lands. The design population will be reassessed as needed as part of any future Class EA planning Phases.

It should also be noted that the proposed water and wastewater servicing options could be staged in accordance with development phasing, which will be determined by the Township. It is also noted that the provision of municipal wastewater servicing to the existing Midhurst population (estimated to be 4,014 persons) is not considered to be necessary at this time. Therefore, for the initial design of the water supply and wastewater treatment facilities, a population of 24,624 persons will be used. However, expansion of the wastewater treatment facility(ies) must be feasible should the Township decide to service existing Midhurst in the future. The wastewater collection system is to be designed to service a population of 28,638 persons, allowing for the future servicing of existing Midhurst.

4.0 Problem Statement

The Problem Statement was identified in the Notice of Study Commencement. It was revised slightly to reflect comments received during Phase 1. The final Problem statement is as follows:

The purpose of the Master Plan Study is to plan and provide preliminary design for the water, wastewater and transportation projects to service the population growth based on the outcome of the Township's Secondary Plan.

5.0 Phase 1 Public Notification

A Notice of Study Commencement was published in the Barrie Advance on June 14 and June 21, 2008. A copy of the Notice is included in *Appendix D* along with a copy of the letter that was sent to review agencies.

As a result of the publication of the Notice of Study Commencement, responses were received from several property owners/residents and from several review agencies. Copies of those letters and emails are included in *Appendix D*. Ainley prepared response letters on behalf of the Township and copies of those letters are also included in *Appendix D*.

A Communications plan was prepared and was updated throughout the Master Plan process to document comments received and responses issued. The most recent version of the Communications Plan is included in *Appendix E*.

6.0 Description of Transportation System

In the community of Midhurst, there are three proposed development areas, as well as proposed employment lands and commercial institutions, which are outlined in the Secondary Plan. These developments will create significant traffic growth in the Township of Springwater. Therefore a review of the entire traffic system is necessary.

With respect to traffic, it is proposed to increase the existing community of Midhurst from approximately 5,900 to 9,800 units. A review was undertaken based on three development scenarios provided by The Planning Partnership, dated March 2008. As part of the review, a trip generation forecast was developed by comparing the three scenarios and based on the data provided, potential transportation improvement needs were outlined.

To accommodate the future traffic growth with respect to developing a comprehensive Master Plan for the Midhurst area, the screen line analysis was completed according to traffic distribution in the Road network. Based on the analysis, different alternatives were selected and have been evaluated. Finally, through the Class Environmental Assessment planning process, and with necessary improvements proposed, transportation alternatives have been selected.

Transportation options/alternatives to address the traffic growth from the three development areas and from the Springwater Growth management Plan include: Do Nothing, Re-Construction/Extension of Existing Roads and Intersection Improvements for each of the Development areas.

As noted in the "Background Summary" of the "Midhurst Secondary Plan", the Midhurst Secondary Plan area consists of approximately 3,500 ha with a current population of about 3,500 people. At present, the existing system of roads throughout the developed area appears to be operating with sufficient traffic capacity. It is noted that for the purposes of this Master Plan, it has been determined that the existing population within the Midhurst Secondary Plan area is about 4014 persons. This figure has been used for all water and wastewater assessments.

7.0 Water Demand/Wastewater Flow Projections

7.1 Design Criteria

The following design criteria is recommended:

Water Supply

Existing Population (serviced and unserviced)	= 4,014 persons
Existing ADD based on historical demand	= 1.188 m ³ /unit/day
Existing MDD factor based on historical data	= 2.6

Design population (includes 1,050 persons for Employment lands)	= 24,624 persons
Future ADD (380 L/c/d x 3 persons/unit)	= 1.14 m ³ /unit/day
Future MDD factor per MOE Guidelines (25,000 to 50,000 pers)	= 1.8

During the planning process, substantiated suggestions were made by the Developers noting that the MOE fire flows are considered to be too high, resulting in excessive water storage volumes which will lead to operational concerns especially in the initial phases of development. It is considered that water quality will be impaired due to the lack of recycling within the large storage volumes as a result of loss of chlorine residual. In the absence of any information on the type of construction, it is common practice to refer to the MOE Guidelines. For a total design population of 28,638 persons, the MOE Table suggests a fire flow of 326 L/s for 5 hours. However, a submission was made by the Developer Group, proposing to reduce the fire flow requirement based on the fact that the type of construction is known. The Developer's proposal suggested the use of AWWA Manual of Water Supply Practices M31 and the Fire Underwriters Survey Document titled "Water Supply for Public Fire Protection. Based on those two documents and construction information provided in an email from Black & Veatch (retained by Geranium Corporation) dated April 6, 2009, the following fire flow rates were suggested:

- Fire Underwriters, page 16 – one and two story family dwellings = 67 L/s (4,000 L/min.) for 1.5 hours
- Fire Underwriters – townhouses, apartments and mixed use = 133 L/s (8,000 L/min.) for 2 hours
- AWWA M31 – commercial and employment lands = 220 L/s (13,200 L/min.) for 3 hours.

Black & Veatch subsequently suggested that, in order to provide a reliable fire flow to the future employment lands, as well as to the future residential developments, a fire flow rate of 133 L/s should be provided from both the east and west sides of any new water supply system. In addition, they recommended that in the event that one overall supply system is selected as the Preferred Solution, some redundancy should be provided in either the amount of water storage or in the transmission capabilities of the system. The proposal by the Developer Group was accepted as being reasonable and therefore the fire flow rate will be (in total) 266 L/s for 3 hours.

Water storage volumes will be calculated in accordance with MOE Guidelines.

Wastewater

Design population (includes existing)	= 28,638 persons
Domestic ADF, existing and future (340 L/c/d x 3 persons/unit)	= 1.02 m ³ /unit/day
Extraneous flow rate, existing and future (90 L/c/d)	= 0.27 m ³ /unit/day
Peak Factor – Harmon for Domestic flows	
Peak Factor – 3 for extraneous flows	

7.2 Water Demands

7.2.1 Overall Water Demands

Using the design criteria developed in previously, the overall design water demands for the Midhurst Secondary Plan area (including the currently serviced population) are derived as follows:

Existing serviced pop. – ADD = 1,225 units x 1.188 m ³ /unit/day	= 1,455.3 m ³ /day
Existing serviced pop. – MDD = 1,455.3 m ³ x 2.6	= 3,783.8 m ³ /day
Future serviced pop. – ADD = 8,321 units x 1.14 m ³ /unit/day	= 9,485.9 m ³ /day
Future serviced pop. – MDD = 9,485.9 m ³ x 1.8	= 17,074.7 m ³ /day
Combined MDD (existing and future) = 3,783.8 + 17,074.7	= 20,858 m³/day (241.4 L/sec)

The existing system is approved (Permit to Take Water) for a flow rate of 6,479 m³/d resulting in a capacity shortfall of 14,379 m³/d (166.4 L/sec).

The recommended water storage volume based on the future MDD and the recommended fire flow rate is derived as follows:

Fire Storage = 266 L/sec x 3 hours (Fire Underwriters and AWWA)	= 2,873 m ³
Equalization Storage = 25% of 20,858.5 m ³	= 5,215 m ³
Emergency Storage = 25% (2873 + 5215)	= 2,022 m ³
Total recommended water storage volume	= 10,110 m³

The existing storage volume is about 1579 m³ resulting in a storage capacity shortfall of 8,531 m³.

One of the water supply options is to develop four separate systems (existing Midhurst, existing Del Trend and two new systems to service the east and west proposed new developments). The water demands for the existing Midhurst and the two new developments are derived hereinafter.

7.2.2 Existing Midhurst

Based on historical data, the suggested design water demands for the existing Midhurst area are derived as follows:

Existing serviced pop. – ADD = 1,225 units x 1.188 m ³ /unit/day	= 1,455.3 m ³ /day
Existing serviced pop. – MDD = 1,455.3 m ³ x 2.6	= 3,783.8 m ³ /day
Future serviced pop. – ADD = 113 units x 1.14 m ³ /unit/day	= 128.8 m ³ /day
Future serviced pop. – MDD = 128.8 m ³ /day x 2.6	= 334.9 m ³ /day
Combined MDD = 3,783.8 + 334.9	= 4,118.7 m³/day (48 L/s)

Under this scenario, it is assumed that the spare residual capacity ($6,479 - 4,118.7 = 2,360.3 \text{ m}^3/\text{d}$) will be reserved for future infilling and development within the existing Midhurst community and will not be available for use by the Secondary Plan Developers.

The existing water storage capacity was assessed as follows:

Water storage - Fire	$= 74 \text{ L/sec} \times 2 \text{ hours (MOE)}$	$= 532.8 \text{ m}^3$
- Equalization	$= 25\% \times 4,118.7 \text{ m}^3$	$= 1,029.7 \text{ m}^3$
- Emergency	$= 25\% (532.8 + 1,029.7)$	$= 390.6 \text{ m}^3$
Total recommended storage volume		$= 1,953 \text{ m}^3$

The existing useable water storage volume is 1579 m^3 and therefore, an additional storage volume of about 374 m^3 is required to service the existing population.

7.2.3 Doran Road Developments

The suggested design water demands for Development Areas 1 and 2 are derived as follows, allowing for the servicing of 40% of the future employment lands:

Design population	$= ((5,299 \text{ units} + (40\% \times 350)) \times 3 \text{ ppu})$	$= 16,317 \text{ persons}$
Future serviced pop. - ADD	$= 5,439 \text{ units} \times 1.14 \text{ m}^3/\text{unit}/\text{day}$	$= 6,200.5 \text{ m}^3/\text{day}$
Future serviced pop. - MDD	$= 6,200.5 \text{ m}^3/\text{day} \times 1.8$	$= 11,161 \text{ m}^3/\text{day}$ (129.2 L/sec)

Water storage - Fire	$= 133 \text{ L/sec} \times 3 \text{ hours (Fire Underwriters)}$	$= 1,436.4 \text{ m}^3$
- Equalization	$= 25\% \times 11,161 \text{ m}^3/\text{d}$	$= 2,790.3 \text{ m}^3$
- Emergency	$= 25\% (1,436 + 2,790)$	$= 1,056.7 \text{ m}^3$
Total recommended storage volume		$= 5,284 \text{ m}^3$

7.2.4 Carson Road Development

The suggested design water demands for Development Area 3 is derived as follows, allowing for the servicing of 60% of the future employment lands:

Design population	$= ((2,559 \text{ units} + (60\% \times 350)) \times 3 \text{ ppu})$	$= 8,307 \text{ persons}$
Future serviced pop. - ADD	$= 2,769 \text{ units} \times 1.14 \text{ m}^3/\text{unit}/\text{day}$	$= 3,156.7 \text{ m}^3/\text{day}$
Future serviced pop. - MDD	$= 3,156.7 \text{ m}^3/\text{day} \times 1.8$	$= 5,682.1 \text{ m}^3/\text{day}$ (66 L/sec)

Water storage - Fire	$= 133 \text{ L/sec} \times 3 \text{ hours (Fire Underwriters)}$	$= 1,436.4 \text{ m}^3$
- Equalization	$= 25\% \times 5,682.1 \text{ m}^3/\text{d}$	$= 1,420.5 \text{ m}^3$
- Emergency	$= 25\% (1,436 + 1,420)$	$= 714.2 \text{ m}^3$
Total recommended storage volume		$= 3,571 \text{ m}^3$

7.2.5 Doran Road and Carson Road Developments – One New System

Another water supply option that was identified after the August PIC (following the final submission of the Golder Hydrogeological Report dated December, 2008), is to develop one new water supply system to service all of the proposed future developments plus the 350 equivalent units to allow for future employment. The water demands for this option are derived as follows:

Design population = (8,208 units x 3ppu)	= 24,624 persons
Future serviced pop. – ADD = 8,208 units x 1.14 m ³ /unit/day	= 9,357.1 m ³ /day
Future serviced pop. – MDD = 9,357.1 m ³ /day x 1.8	= 16,842.8 m³/day (195 L/sec)

Water storage – 266 L/sec for 3 hours	= 2,873 m ³
- Equalization = 25% x 16,843 m ³ /d	= 4,211 m ³
- Emergency = 25% (2,873 + 4,211)	= 1,771 m ³
Total recommended storage volume	= 8,855 m³

The water storage would be split between the east and west developments in accordance with the volumes calculated above as follows:

- Doran Road side (east) = 5,284 m³
- Carson Road side (west) = 3,571 m³

Disinfection will be provided at the Doran Road facility and therefore, sufficient additional volume will need to be provided for chlorine contact. Top-up chlorination may need to be provided at the Carson Road facility but no additional storage volume will be needed for chlorine contact.

7.3 Wastewater Flows

7.3.1 Overall – One Plant

Using the design criteria developed previously, the design wastewater flows for the Midhurst Secondary Plan area (including employment lands and allowing for existing development) are derived as follows for the “one plant” option:

Design Population = 9,546 units x 3	= 28,638 persons
Domestic ADF – existing and future = 9,546 units x 1.02 m ³ /unit/d	= 9,736.9 m ³ /d
Extraneous flow – existing and future = 9,546 units x 0.27 m ³ /unit/d	= 2,577.4 m ³ /d
Total ADF – existing and future	= 12,314.3 m³/d
Peak Day Domestic = 9,736.9 m ³ /d x 2.5 (Harmon PF)	= 24,342.3 m ³ /d
Peak Day Extraneous Flow = 2,577.4 x 3	= 7,732.2 m ³ /d
Total Combined Peak Day Flow	= 32,074.5 m³/d (371 L/sec)

7.3.2 Three Separate Systems

Another of the wastewater treatment options is to develop three separate systems to service Development Areas 1, 2 and 3 with expansion capabilities to service the existing Midhurst properties in the future if necessary. The wastewater for the three new developments are derived as follows:

Doran Road Development Area # 1 (no employment lands)

Design Population = 2,379 units x 3 ppu	= 7,137 persons
Domestic ADF = 2,379 units x 1.02 m ³ /unit/day	= 2,426.6 m ³ /day
Extraneous flow = 2,379 units x 0.27 m ³ /unit/day	= 642.3 m ³ /day
Total ADF	= 3,068.9 m³/day
Peak Day Domestic = 2,426.6 m ³ /d x 3.1 (Harmon PF)	= 7,522.5 m ³ /d
Peak Day Extraneous Flow = 642.3 m ³ /d x 3.1	= 1,991.1 m ³ /d
Total Combined Peak Day Flow	= 9,513.6 m³/d (110 L/sec)

Doran Road Development Area # 2 (no employment lands)

Design population = 2,920 units x 3ppu	= 8,760 persons
Domestic ADF = 2,920 units x 1.02 m ³ /unit/day	= 2,978.4 m ³ /day
Extraneous flow = 2,920 units x 0.27 m ³ /unit/day	= 788.4 m ³ /day
Total ADF	= 3,766.8 m ³ /day
Peak Day Domestic = 2,978.4 m ³ /d x 3 (Harmon PF)	= 8,935.2 m ³ /d
Peak Day Extraneous Flow = 788.4 x 3	= 2,365.2 m ³ /d
Total Combined Peak Day Flow	= 11,300.4 m³/d (131 L/sec)

Doran Road Development Areas # 1 and 2 (no employment lands)

Design Population = 5,299 units x 3 ppu	= 15,897 persons
Domestic ADF = 5,299 units x 1.02 m ³ /unit/day	= 5,405.0 m ³ /day
Extraneous flow = 5,299 units x 0.27 m ³ /unit/day	= 1,430.7 m ³ /day
Total ADF	= 6,835.7 m³/day
Peak Day Domestic = 5,405 m ³ /d x 2.75 (Harmon PF)	= 14,863.8 m ³ /d
Peak Day Extraneous Flow = 1,430.7 m ³ /d x 3	= 4,292.1 m ³ /d
Total Combined Peak Day Flow	= 19,155.9 m³/d (222 L/sec)

Carson Road Development Area # 3 (including employment lands)

Design population = (2,559 units + 350 employment units) x 3ppu	= 8,727 persons
Domestic ADF = 2,909 units x 1.02 m ³ /unit/day	= 2,967.2 m ³ /day
Extraneous flow = 2,909 units x 0.27 m ³ /unit/day	= 785.4 m ³ /day
Total ADF	= 3,752.6 m³/day
Peak Day Domestic = 2,967.2 m ³ /d x 3 (Harmon PF)	= 8,901.6 m ³ /d
Peak Day Extraneous Flow = 785.4 x 3	= 2,356.2 m ³ /d
Total Combined Peak Day Flow	= 11,257.8 m³/d (130 L/sec)

8.0 Traffic Projections

8.1 Development Area 1 – Midhurst Heights, Midhurst Rose Alliance Inc.

8.1.1 Existing Conditions

At present, an excellent Level of Service (LOS) has been assigned at all boundary road intersections (LOS-A or LOS-B). LOS-A corresponds to the best operating conditions with minimum delays, whereas LOS-F corresponds to the poorest operations resulting from high intersection delays. In all cases, delays to the stop movements are minimal and the intersections operate at 1 to 12% of their capacity. In this regard, there is sufficient reserve capacity available to accommodate future growth. The intersection at Doran Road and Gill Road, Doran Road and Russell Road and Russell Road and Forbes Road all show a good level of service (LOS) from A to B.

8.1.2 Traffic Projections

Background traffic volumes for the horizon years 2018 and 2028 have been estimated considering population data and growth projections presented in the Directions Report, 'Developing a Growth Management Strategy For the Simcoe County Area'. The report indicates that the population of Springwater is expected to grow at an annual rate of 1.2% during the period of 2006 to 2031.

For the purpose of this study an annual growth rate of 1.2% has been applied for the period of 2008 to 2028 for all the boundary roads through the study area. This growth rate translates to an overall increase of 13% over the 10- year planning period and 27% over the 20-year period.

8.1.3 Description of the Transportation System Options – Midhurst Heights, Midhurst Rose Alliance Inc.

The following transportation options were initially developed to address the individual needs of each development area. A traffic analysis was completed by URS, report dated October 31, 2008 and is included in *Appendix C*.

8.1.3.1 Option A – Do Nothing

This Option would involve limiting Traffic growth to the capacity of the existing road network system. The existing road network system can accommodate present traffic volume although it does not meet the growth requirements of the Midhurst Secondary plan. No further assessment of this option is therefore necessary.

8.1.3.2 Option B – Intersection Improvements

- A traffic signal at the intersection of Doran Road with Gill Road, in addition to an eastbound left turn lane, a westbound left turn lane and a southbound right turn lane.

- A traffic signal at the intersection of Doran Road with Russell Road, an eastbound left turn lane in addition to a northbound left turn lane and a southbound right turn lane.
- A traffic signal at the intersection of Russell Road with Forbes Road, eastbound and westbound left turn lanes in addition to a northbound right turn lane.
- A traffic signal at the intersection of Doran Road with the 1st south site access proposed from the development area, northbound and southbound left turn lanes in addition to eastbound and westbound left turn lanes and an eastbound right turn lane.
- A traffic signal at the intersection of Doran Road with the 2nd south site access proposed from the development area, northbound and southbound left turn lanes in addition to eastbound and westbound left turn lanes.

8.2 Development Area 2: Geranium Lands – Doran Road

8.2.1 Existing Conditions

The Doran Neighbourhood has a potential total future development area of approximately 322 ha (797 acres). It is located in the northeastern quadrant of the Midhurst Settlement Area and there are 3100 proposed residential units. The Doran Neighbourhood is generally bounded by Doran Road and Walt Road to the north, the Midhurst Settlement Area boundary to the east, environmental lands to the south, and the existing residential development and Russell Road to the west.

At present an excellent Level of Service has been assigned at all road intersections. In all cases, delays to the stop movements are minimal and the intersections operate at 1 to 12% of their capacity. In this regard, there is sufficient reserve capacity available to accommodate future growth.

All existing unsignalized intersections currently operate with low delays during both the morning and afternoon peak periods. This is a function of the low traffic volumes currently experienced throughout the area. Under 2028 future total traffic volumes, the area's unsignalized intersections will operate acceptably, with anticipated delays of 9 to 31 seconds in the morning and afternoon peak hours. This corresponds to a peak operating Level of Service (LOS) of B to D in either peak hour.

8.2.2 Traffic Projections

8.2.2.1. Existing Traffic Volumes

To establish baseline traffic volumes in the area, a series of Turning Movement Counts (TMC's) were undertaken. These counts were taken at relevant intersections in the study area in March and April of 2008 by the BA Group. The counts were completed during typical morning (7am-9am) and typical afternoon (4pm-6pm) commuter peak periods.

8.2.2.2. Horizon Year

It is anticipated that Doran Neighbourhood will be built-out over a twenty-year period. As a result, this study has analyzed the traffic impacts at the full build-out horizon year of 2028.

8.2.2.3 Background Traffic Growth

8.2.2.3a Other Midhurst Settlement Area Traffic

The majority of ‘background’ traffic growth (i.e. traffic growth generated by development other than the proposed Doran Road OPA area) experienced within the study area is associated with the build out of the other community areas in Midhurst. This includes planned residential development within the lands located north of Doran Road, comprising approximately 1,300 dwelling units. To account for these other community areas, traffic was generated for these areas and assigned to the road network based on the principles outlined in Sections 4.4 and 4.5. of the BA Group Report.

8.2.2.3b Other Corridor Growth on Regional Highways and County Roads

To account for ‘regional’ traffic growth on arterial roads in the study area, an additional corridor growth rate, based on typical regional experience, has been applied to selected routes within the study area.

8.2.3 Description of Transportation System Options - Development Area 2: Geranium Lands – Doran Road

Transportation options were developed initially to address the individual needs of the development area and are presented in the following sections. A traffic analysis was completed by URS, report dated October 31, 2008 and is included in *Appendix C*.

8.2.3.1 Option A – Do Nothing

This Option would involve limiting Traffic growth to the capacity of the existing road network system. The existing road network system can accommodate present traffic volumes although it does not meet the growth requirements of the Midhurst Secondary plan. No further assessment of this option is therefore necessary.

8.2.3.2 Option B - Re-construction / Extension of Existing Roads

- 2-lane re-construction of Pooles Road from Russell Road to Old Second Road South with sidewalks on at least one side.
- 2-lane re-construction of Forbes Road from Highway 400 to Russell Road and from Russell Road to Doran Road.
- 2-3 lane road re-construction required from Doran Road to Pooles Road with sidewalks on at least one side.
- 2-3 lane re-construction required from Russell Road to Gill Road with sidewalks on at least one side.

- 3-lane re-construction required for Finlay Mill Road for traffic coming through Forbes Road, Russell Road and Doran Road to County Road 27 with sidewalks on at least one side.

NEW TRAFFIC SIGNALS IMPROVEMENTS:

- Doran Road at access A1 (westerly access). (A1- Assumed community access point for Area-1 at the intersection of Doran Road and Gill Road).
- Doran Road at Russell Road.
- Pooles Road at Russell Road.

8.3 Development Area 3: Geranium Lands – Carson Road

8.3.1 Existing Conditions

Carson Neighbourhood is a potential total future development area of approximately 234 ha (578 acres) located in the southwest quadrant of the Midhurst Settlement Area, there are 2500 proposed residential units. The Carson Neighbourhood is generally bounded by Snow Valley Road to the north, a wooded area and an existing estate residential development to the east, the Midhurst Settlement Area boundary to the south, and a tributary of the Black Creek to the west.

At present excellent 'Level of Service', LOS-A or B are provided at all road intersections. In all cases delays to the stop movements are minimal and the intersections operate at 1 to 12% of their capacity. In this regard there is sufficient reserve capacity available to accommodate future growth.

All existing unsignalized intersections currently operate with low delays during both the morning and afternoon peak periods. This is a function of the low traffic volumes currently experienced throughout the area. Under 2028 Future Total Traffic volumes the area's unsignalized intersections will operate acceptably with anticipated delays of 12 to 18 seconds in the morning and afternoon peak hours.. This corresponds to a peak operating 'Level of Service' (LOS) of B to C in either peak hour.

8.3.2 Traffic Projections

8.3.2.1 Existing Traffic Volumes

To establish baseline traffic volumes in the area, a series of Turning Movement Counts (TMC's) were undertaken. The counts were taken at relevant intersections in the study area in March and April of 2008 by BA group. The counts were completed during typical morning (7am-9am) and typical afternoon (4pm-6pm) commuter peak periods.

8.3.2.2 Horizon Year

Given the size and scale of the proposed development, it is anticipated that Carson Neighbourhood will be built-out over a 20-year period. As a result, this study has analyzed the traffic impacts at the full build-out horizon year of 2028.

8.3.2.3. Background Traffic Growth

8.3.2.3a Other Midhurst Settlement Area Traffic

The majority of 'background' traffic growth (i.e. traffic growth generated by development other than the proposed Carson Road OPA area) experienced within the study area is associated with the build out of the other community areas in Midhurst. To account for these other community areas, traffic was generated and assigned to the road network based on the principles outlined in Sections 4.4 and 4.5 or the BA Group Report.

7.3.2.3b Other Corridor Growth on Regional Highways and County Roads

The primary 'regional' route in the Carson Road OPA study area is the Highway 26/27 corridor. To account for future regional traffic growth in this corridor, an additional corridor growth rate has been applied. The Simcoe County TMP recommends that Wilson Drive become a new major north-south corridor for travel between Barrie and Highway 26. The TMP also notes that the Wilson Drive improvements would be completed within the 'medium term' horizon, which is presumed to be approximately 15 years. In light of this, a corridor growth rate has been assumed on Wilson Drive that reflects the nature of the new corridor and its potential timing.

8.3.3 Description of Transportation System Options: Development Area 3: Geranium Lands – Carson Road

Transportation options were initially developed to address the individual needs of the development area and are presented in the following sections. A traffic analysis was completed by URS, report dated October 31, 2008 and is included in *Appendix C*.

8.3.3.1 Option A – Do Nothing

This Option would involve limiting Traffic growth to the capacity of the existing road network system. The existing road network system can accommodate present traffic volumes although it does not meet the growth requirements of the Midhurst Secondary plan. No further assessment of this option is therefore necessary.

8.3.3.2 Option B - Reconstruction / Extension of Existing Roads / Intersection Improvement

- Reconstruction of Carson Road and Wilson Drive to include 2-3 lanes with sidewalks on at least one side.

Note: the Simcoe County Transportation Master Plan also proposes Wilson Drive upgrade.

- Reconstruction of Anne Street from Carson Road to the City of Barrie limits to 2-3 lanes with sidewalks on at least one side.

NEW TRAFFIC SIGNALS IMPROVEMENTS:

- Wilson Drive at Carson Road.
- Anne Street at Carson Road.

8.3.4 Potential Overall Area Transportation Solutions to be Considered

The previous sections of this report presented the individual transportation system options developed for each individual development area. The full integration of the individual development areas and additional transportation improvements were considered. Some of the improvements were extracted from other ongoing or completed studies such as the Simcoe County Transportation Master Plan and improvements proposed separately, such as, by the Ministry of Transportation. It was necessary to consider these improvements due to varying degrees of impact and/or benefit in relation to the individual transportation options for the individual three development areas. The improvements are presented as follows:

- Consider a Barrie Bypass (4- lanes) in the horizon year 2031 as proposed by the Ministry of Transportation and County of Simcoe. The proposed bypass would connect to Highway 400 at Forbes Road extending around Midhurst and west of the City of Barrie connecting to Highway 400 at the Town of Innisfil interchange to the south.
- Potential new interchange along Highway 400 at Pooles Road or Highway 400 at Partridge Road. A new interchange could significantly reduce the impacts to the existing community. However, the need for a new interchange could potentially be impacted by a variety of factors, such as reduced development units, and/or embracing strong travel demand reduction mechanisms such as introduction of transit service, promotion of other travel modes, or mixed-use community development.
- Complete the St. Vincent Street connection south of Gill Road.
- Extend the 4-lane section of County Road 27 to the new Craig Road connection.

According to Growth Management Study (GMS) of Springwater Township:

- Incorporation of a new north-south connection between Carson Road to Snow Valley Road as a future extension of Anne Street to improve north-south connectivity through the study area for Carson Neighbourhood Traffic with sidewalks on at least one side.
- Incorporation of a new east-west connection between the Highway 26/27 corridor and St. Vincent corridor (2-3 lanes) as a future east extension of Carson Road is a desirable improvement to improve east-west connectivity through the study area for Carson Neighbourhood Traffic with sidewalks on at least one side.
- Incorporation of a new southeastern connection between Pooles Road by extending Russell Road to St. Vincent Street (2-3 lanes) to improve north – south connectivity through the study area for Doran Neighbourhood Traffic with sidewalks on at least one side.
- Incorporation of a new east-west connection from Forbes Road through Craig Road to Highway 26/27 (2-3 lanes) to improve east-west connectivity through the Study area for Alliance neighbourhood traffic with sidewalks on at least one side.

9.0 Phase 2 Public Information Centre

The Phase 2 Public Information Centre was held on August 28, 2008. A Notice of Public Information Centre (PIC) was published in the “Barrie Advance” on August 14, 2008 and on August 28, 2008. The Notice was also sent to various review agencies. A copy of the Notice and a list of recipients is included in *Appendix F*.

A copy of the PIC Presentation Material is also included in *Appendix F*. Comments were received as a result of the PIC and responses were provided. Copies of the related correspondence and the comments are provided in *Appendix F*.

A summary of the comments is provided in the Communication Plan (*Appendix E*).

10.0 Description of Water Supply Options

10.1 General

Five water supply Options were presented at the PIC that was held on August 28, 2008. The Options included Do Nothing, supply from Barrie and local groundwater supplies. Descriptions of the five Options are provided in the Clauses following.

10.2 Option A – Do Nothing

This Option would involve limiting growth to the capacity of the existing water supply system. At present, there appears to be a spare capacity of about 2,360 m³ (6,479 – 4,119 = 2,360 m³/day). Using the existing ADD rate of 1.188 m³/unit/day and an anticipated future MDD factor of 1.8, that spare capacity would service 1,260 units (2,695/1.188 x 1.8 = 1,260). This is far less than the proposed growth as defined by the Midhurst Secondary Plan (8,208 future growth units including an equivalent allowance of 350 units for future employment lands). Capital works would include extensions to the existing water distribution system complete with booster stations where necessary and an increased water storage volume.

This Option has a fatal flaw in that it does not meet the growth requirements of the Midhurst Secondary plan. Therefore, no further assessment of this Option is necessary.

10.3 Option B – Water Supply From City of Barrie

The City of Barrie is currently serviced by 14 municipal wells. The “peak day demand” in 2007 was 75,517 m³ (75.5 ML/d). The City is in the process of designing and constructing a new surface water treatment plant which will have a Phase 1 capacity of 60 ML/d and an ultimate capacity of 240 ML/d. Based on a preliminary discussion with Ralph Scheunemann, P. Eng., Planning Engineer for the City, the City may be interested in supplying water to the Midhurst area but a more detailed request is required and a City staff report would need to be prepared by Mr. Scheunemann. It was determined by the Advisory Committee that a preliminary cost assessment of the Barrie water supply option would be undertaken prior to formally approaching the City, if serious consideration is to be given to this option.

This Option would likely involve two connections to the City water distribution system on Bayfield Street and on Anne Street or St. Vincent. For the purposes of preliminary assessment, connections on Bayfield and Anne will be assumed.

The basic outline of this Option is shown on Plate 10 of the PIC Material (Appendix F).

A preliminary capital cost estimate was prepared for the PIC and is detailed in Appendix G. The total estimated capital cost is \$37,300,000.

It was subsequently determined that no further assessment of this option was necessary (see email to the City dated August 14, 2008, copy in *Appendix F*).

10.4 Option C – Expand Existing municipal Well Site Capacities

This Option would involve either the development of new wells on the sites of the existing municipal wells or increasing the capacity of the existing wells. Based on previously completed hydrogeological assessments, the development of additional wells in the immediate Midhurst area is not considered to be feasible. In addition, increasing the capacity of the existing wells is also not considered to be feasible due to hydrogeological restrictions. Since this Option does not meet the growth requirements of the Midhurst Secondary Plan, it is considered to have a fatal flaw and therefore, no further assessment of this Option is necessary.

The basic outline of this Option is shown on Plate 11 of the PIC Material (*Appendix F*).

10.5 Option D – Develop New Municipal Wells on New Sites – One Overall System

The Developer Groups have completed hydrogeological assessments, which indicate the potential for new municipal wells beyond the limits of the currently developed Midhurst area. The location of the sites are described as follows:

- TW 12/08 and TW 14/08 were drilled on the Rail Trail, north of Anten Mills off of Coughlin Road. It is estimated that yield from a well at this site would be 55 L/sec or more. However, the absence of a confining layer and the presence of shallow private wells presents challenges to developing a water supply at this location. Although modeling indicates that a total water taking rate of 154 L/s is possible, according to Golder, such a taking could impact the shallow private wells. Golder further advises that “The impacts to private water supplies are expected to be manageable provided that the maximum day pumping rate is limited to 80 L/sec., which could service the Carson Road Neighbourhood.”
- TH3 and TH2 were drilled within the Alliance lands, north of Doran Road. It is considered that Aquifer 3 at TH3 will allow the development of a primary well with a capacity of at least 40 L/s and a secondary well with a capacity of 20 L/s. At the site of TH2, it is suggested that a well can be drilled into Aquifer 2 with a yield of between 20 to 40 L/s. Well testing on the Alliance lands (Doran Road north) showed that a well could be developed to produce about 45 L/s.
- TW 17/08 was drilled on the unopened road allowance of Russell Road just north of Storrie Road. According to Golder, the well drilling contractor noted that the aquifer encountered at this location was similar to that found on the Alliance lands, north of Doran Road. A test well was pumped and the results suggest that the aquifer at this location has the potential to yield 50 L/s.
- In addition, Golder drilled a well (TW18/08) at a location at the south end of Russell Road. The results indicate similar conditions to those found at TW 17/08. According to Golder, “...modeling indicates that adequate groundwater flow through the aquifer is present to support a maximum day taking of 213 L/sec and an average day taking of 133 L/s. Both the Doran Road Neighbourhood and the Carson Road Neighbourhood could be supplied by this source.”

This Option would involve the construction, testing and development of sufficient new wells to meet the future water demand. It is likely that the new wells would be developed at the locations identified above within the Russell Road and Doran Road locations (TH3, TH2, TW 17/08 and TW18/08). Trunk water mains would be required to deliver water from the new wells to the site of the proposed water treatment facility. It is suggested that an in-ground reservoir will be required as part of the treated water facility in order to store treated water for high lift pumping purposes. The raw water from the various wells will be pumped to the treatment facility for disinfection and possibly treatment for elevated iron and manganese. The reservoir would be sized to provide adequate capacity for high lift pump cycling. High lift pumps would be installed to meet average day, maximum day, peak hour and fire flow demands. Under this option, the new water supply system would be linked in to the existing water distribution system using pressure reducing valves (PRVs) where necessary. The new eastern system could be linked to the new west system using the existing mains within the Midhurst system and through the installation of pressure reducing valves where necessary. The requirement for a booster station would need to be assessed.

The basic outline of this Option is shown on Plate 12 of the PIC Material (*Appendix F*).

Subsequent to the PIC, it was determined that the Anten Mills well site is not recommended for further development due to the potential to impact adjacent existing wells. Test wells TW 17/08 and TW 18/08 were not identified as potential water supplies for the PIC and are not shown on Plates 12 or 14 (*Appendix F*). However, those sites are potential water sources that need to be considered. Parcels of land will be needed at the Russell/Storrie Rd location and at any other sites along Russell Road to accommodate wells. It is suggested that the minimum dimension for a well site should be in the order of 20 m square.

A preliminary capital cost estimate was prepared for the PIC and is detailed in *Appendix G*. The total estimated capital cost is \$25,800,000.

10.6 Option E – Develop New Municipal Wells on New Sites – Four Separate Systems

This water servicing option is based on the development of four separate systems to service the following:

- System # 1 – existing Midhurst system
- System # 2 – existing Del Trend system
- System # 3 – Doran Road Development Areas 1 and 2
- System # 4 – Carson Road Development Area 3

The Midhurst water supply system is adequately sized to handle existing demands with the exception of the water storage which may be slightly deficient according to MOE Guidelines.

The Del Trend system is adequately sized to meet the demands of imminent development within limits of that service area. A recent expansion of the in-ground reservoir capacity has been undertaken by the Township.

The infrastructure required for system # 3 to service the Doran Road Development Areas 1 and 2 would include the following:

- Development of well supply with a total, minimum rated capacity of 11,161 m³/day (129.2 L/sec) – 4 wells at locations either within the eastern Development areas, at the Russell/Storrie Road location or along Russell Road, each with a capacity of about 40 L/s.
- Consideration of the provision of a stand-by well with a capacity of at least 40 L/sec.,
- Water storage with a useable volume of 5,284 m³ (plus chlorine contact volume),
- Water treatment facilities to provide disinfection (chlorination), chlorine contact and adequate chlorine residual throughout the distribution system complete with high lift pumping capabilities,
- Distribution system complete with fire hydrants, valves and service connections etc. and,
- Consideration of valved connection(s) (PRVs) to the existing Midhurst system for emergency purposes only – not for sharing of storage volumes.

The infrastructure required for system # 4 to service the Carson Road Development Area 3 would include the following:

- Development of Anten Mills well supply with a total, minimum rated capacity of 5,682 m³/day (66 L/sec) – 2 wells, each with a rated capacity of 40 L/s.
- Consideration of the provision of a stand-by well with a capacity of at least 40 L/sec.,
- Transmission watermain from Anten Mills to the Carson Road Development,
- Water storage with a useable volume of 3,571 m³ (plus chlorine contact volume),
- Water treatment facilities to provide disinfection (chlorination), chlorine contact and adequate chlorine residual throughout the distribution system complete with high lift pumping capabilities,
- Distribution system complete with fire hydrants, valves and service connections etc. and,
- Consideration of valved connection(s) (PRVs) to the existing Midhurst system for emergency purposes only – not for sharing of storage volumes.

Details of this Option are shown on Plate 13 of the PIC Material (*Appendix F*). However, the Russell/Storrie Road location is not shown on Plate 13 (*Appendix F*).

A preliminary capital cost estimate was prepared for the PIC and is detailed in *Appendix G*. The total estimated capital cost is \$27,100,000.

10.7 Option F – Develop New Municipal Wells on New Sites – Three Separate Systems

This final water servicing option was developed subsequent to the August 2008 PIC and is based on the development of three separate systems to service the following:

System # 1 – existing Midhurst system

System # 2 – existing Del Trend system

System # 3 – Doran Road Development Areas 1 and 2 as well as Carson Road Development Area 3 and future employment lands

The Midhurst water supply system is adequately sized to handle existing demands with the exception of the water storage which may be slightly deficient according to MOE Guidelines.

The Del Trend system is adequately sized to meet the demands of imminent development within limits of that service area. A recent expansion of the in-ground reservoir capacity has been undertaken by the Township.

The infrastructure required for system # 3 to service the future development areas 1, 2 and 3 as well as the future employment lands is as follows:

- Development of well supply with a total, minimum rated capacity of 16,842.8 m³/day (195 L/sec) – 5 wells at locations within Development areas # 1 and 2, at the Russell/Storrie Road location or along Russell Road, each with a capacity of about 40 L/s.
- Consideration of the provision of a stand-by well with a capacity of at least 40 L/sec.,
- Water storage in the Doran Road area with a useable volume of about 5,284 m³ (plus chlorine contact volume) to service Development Areas 1 and 2 and 40% of the demand to the future employment lands
- Water treatment facilities to provide disinfection (chlorination), chlorine contact and adequate chlorine residual throughout the distribution system with a capacity of 195 L/s including high lift pumping capabilities for ADD, MDD, Peak hour and fire flow to service Development Areas 1 and 2 and to pump MDD to Development Area 3
- Distribution systems (one for each development) complete with fire hydrants, valves and service connections etc.
- A dedicated, high pressure transmission main and a dedicated high lift pump station to provide water from the treatment facility located within Development Areas 1 and 2 to Development Area 3
- Water storage in the Carson Road area with a useable capacity of 3,571 m³ complete with high lift pumps to provide ADD, MDD, peak hour and fire flow to service Development Area 3 and 60% of the demand to the future employment lands and,
- Consideration of valved connection(s) (PRVs) to the existing Midhurst system for emergency purposes only – not for sharing of storage volumes.

Details of this Option are shown on Plate 13B (copy included in *Appendix F*).

A preliminary capital cost estimate has been prepared and is detailed in *Appendix G*. The total estimated capital cost is \$25,800,000.

11.0 Description of Wastewater Treatment Options

11.1 General

Six wastewater treatment Options were presented at the PIC that was held on August 28, 2008. The Options included Do Nothing, conveying wastewater to the City of Barrie for treatment and disposal, conveying wastewater to the Snow Valley treatment plants and building new treatment plants in the Midhurst area with local subsurface effluent disposal. Descriptions of the six Options are provided in the Clauses following.

11.2 Option A – Do Nothing

As part of the Class EA process, the Proponent must consider the Do Nothing Option. In the case of the Midhurst area, the Township would allow growth to occur based on individual private septic systems rather than communal or municipal wastewater facilities. The level of development would be reduced. This Option has a fatal flaw in that it does not address the growth requirements of the Midhurst Secondary Plan. Therefore, this Option is eliminated from further assessment.

11.3 Option B – Convey Wastewater to the City of Barrie System

The City of Barrie is currently serviced by its main wastewater treatment plant which has a capacity of 54 ML/d. The City is in the process of constructing an expansion to the WPCP which will increase the capacity to 76 ML/d. As noted previously, based on a preliminary discussion with Ralph Scheunemann, P. Eng., Planning Engineer for the City, the City may be interested in receiving and treating wastewater from the Midhurst area but a more detailed request is required and a City staff report would need to be prepared by Mr. Scheunemann. It was determined by the Advisory Committee that a preliminary cost assessment of the Barrie wastewater option would be undertaken prior to formally approaching the City.

This Option would likely involve the construction of a major wastewater pump station at the intersection of Highway 26 and Carson Road with a sewage forcemain from that location all the way to the WPCP. This is based on the understanding that the City's north end sewer system does not have the capacity to receive the projected instantaneous peak flow from Midhurst (446 L/sec).

The components of this Option include:

- Municipal wastewater collection system gravitating to the intersection of Highway 26 and Carson Road including local wastewater pump stations where necessary (capacities to be determined)
- Main wastewater pump station designed to handle the instantaneous peak design flow rate of 446 L/sec (can be phased).

- Forcemain (in the order of 600 mm dia. to provide flushing velocity of 1.5 m/s at flow rate of 446 L/sec) from the main station along Carson Road, Anne Street and Brock Street to the WPCP (assumed route, to be confirmed) – estimated distance of 8.1 km.
- Inlet modifications at the WPCP

The basic outline of this Option is shown on Plate 15 of the PIC Material (*Appendix F*).

A preliminary capital cost estimate was prepared for the PIC and is detailed in *Appendix G*. The total estimated capital cost is \$82,100,000.

11.4 Option C – Convey Wastewater to the Snow Valley Treatment Plants

This Option involves the transmission of wastewater from the Midhurst area to the existing (and future) wastewater treatment plants in the Snow Valley/Centre Vespra area. At the present, there are two existing plants servicing Snow Valley. The capacities of those two plants are well below what would be required to service the Midhurst Service Area. A future WPCP is to be constructed north of Centre Vespra to handle wastewater from a future development. The capacity of the facility and its related effluent disposal system will be site specific and will be well below what is needed to service Midhurst. Therefore, the lack of capacity is considered to be a fatal flaw and no further assessment of this option is necessary. However this option was presented at the PIC.

The works required to realize this Option are as follows:

- Municipal wastewater collection system gravitating to the intersection of Highway 26 and Snow Valley Road including local wastewater pump stations where necessary (capacities to be determined)
- Main wastewater pump station designed to handle the instantaneous peak design flow rate of 446 L/sec (can be phased).
- Forcemain (in the order of 600 mm dia. to provide flushing velocity of 1.5 m/s at flow rate of 446 L/sec) from the main station along Snow Valley Road to the three WPCP locations (may require additional pump station on Snow Valley Road to divide flow into three).
- Expansions of two existing WPCPs and expansion of future Centre Vespra plant.
- Development of new subsurface effluent disposal fields within Development lands in Midhurst Secondary Plan area.

The basic outline of this Option is shown on Plate 16 of the PIC Material (*Appendix F*).

11.5 Option D – Single New Wastewater Treatment Plant with Local Effluent Disposal

This Option involves the transmission of wastewater from the Midhurst area to a new wastewater treatment plant which would be located within one of the three Development areas. The plant would be phased to handle the estimated future ADF of 12,314 m³/d. The collection system and pump stations

would be sized to handle the instantaneous peak design flows. The Developer Groups have identified three possible locations for a WPCP. The locations are shown on Plate 17 of the PIC Material (*Appendix F*) and are labelled Options D1, D2 and D3. Regardless of the location of the plant, due to the topography of the Midhurst Secondary Plan area, a main sewage pump station will be required somewhere within the Highway 26 corridor. Although some of the flows should be able to gravitate to the plant, the main station will need to be fairly significant in capacity.

The works required to realize this Option are as follows:

- Municipal wastewater collection system with a majority of the flow gravitating to the intersection of Highway 26 and Snow Valley Road (central location) including local wastewater pump stations where necessary (capacities to be determined)
- Main wastewater pump station designed to handle the instantaneous peak design flow (to be determined and could be phased).
- Forcemain (assumed to be 500 mm dia.) from the main station to the WPCP location.
- Development of new subsurface effluent disposal fields within Development lands in Midhurst Secondary Plan area. (may need to pump some effluent across Midhurst to other Development Area)

The basic outline of this Option is shown on Plate 17 of the PIC Material (*Appendix F*).

A preliminary capital cost estimate was prepared for the PIC and is detailed in *Appendix G*. The total estimated capital cost is \$72,100,000.

Subsequent to the PIC, an alternative to the main pump station option was developed. Under this alternative option, a manifolded forcemain system would be constructed which would allow smaller drainage area pump stations to use a common forcemain system to pump to the wastewater treatment plant. This would allow servicing of individual areas (including the initial Development areas) without the construction of a main pump station in Midhurst. It is considered that this alternative option will facilitate the phasing of future development.

11.6 Option E – Multiple (Three) New Wastewater Treatment Plants with Local Effluent Disposal

This Option involves the design and construction of three WPCPs, one for each of the Development Areas. For the purposes of this Master Plan, the three plants are referred to as:

- Doran Road North WPCP (ADF = 3,069 m³/d)
- Doran Road South WPCP (ADF = 3,767 m³/d)
- Carson Rd West WPCP (ADF = 3,753 m³/d)

None of the above-mentioned design flows allow for the existing developed area of Midhurst. If sanitary sewer servicing is required in the future, all three plants may need to be expanded. Allowances should be made in the original design for such expansions.

The works required to realize this Option are as follows:

Doran Road North

- Municipal wastewater collection system gravitating to the Environmental Centre as shown on the Sanitary Servicing Plan (1282-SAN) which is included in the “Master Servicing Report” dated December 2006 and revised July 2008.
- WPCP rated at 3,069 m³/d (with potential for expansion to service a portion of existing Midhurst if necessary in the future)
- Subsurface effluent disposal fields

Doran Road South

- Municipal wastewater collection system gravitating to the WPCP location proposed by the Developer and referred to as WWTP 2 on Drawing 2.1 of the “Secondary Plan Servicing Support” document date August 2008.
- WPCP rated at 3,767 m³/d (with potential for expansion to service a portion of existing Midhurst if necessary in the future)
- Subsurface effluent disposal fields

Carson Road West

- Municipal wastewater collection system gravitating to the WPCP location proposed by the Developer and referred to as WWTP 3 on Drawing 2.1 of the “Secondary Plan Servicing Support” document date August 2008.
- WPCP rated at 3,753 m³/d (with potential for expansion to service a portion of existing Midhurst if necessary in the future)
- Subsurface effluent disposal fields

The basic outline of this Option is shown on Plate 18 of the PIC Material (*Appendix F*).

A preliminary capital cost estimate was prepared for the PIC and is detailed in *Appendix G*. The total estimated capital cost is \$80,800,000.

11.7 Option F – Two New Wastewater Treatment Plants with Local Effluent Disposal

This Option involves the design and construction of two WPCPs, one for the east side of Midhurst and the other for the west side. For the purposes of this Master Plan, the two plants are referred to as:

- WPCP - east (ADF = 6,836 m³/d)
- WPCP – west (ADF = 3,753 m³/d)

Neither of the above-mentioned design flows allow for the existing developed area of Midhurst. If sanitary sewer servicing is required in the future, both plants may need to be expanded. Allowances should be made in the original design for such expansions.

The works required to realize this Option are as follows:

WPCP - east

- Municipal wastewater collection system gravitating to a central WPCP site.
- WCPC rated at 6,836 m³/d (with potential for expansion to service a portion of existing Midhurst if necessary in the future)
- Subsurface effluent disposal (either tile fields or injection wells)

WPCP - west

- Municipal wastewater collection system gravitating to the WPCP location proposed by the Developer and referred to as WWTP 3 on Drawing 2.1 of the "Secondary Plan Servicing Support" document date August 2008.
- WCPC rated at 3,753 m³/d (with potential for expansion to service a portion of existing Midhurst if necessary in the future)
- Subsurface effluent disposal (either tile fields or injection wells)

The basic outline of this Option is shown on Plate 18 of the PIC Material, revised to show a central location for the Plant site. (*Appendix F*).

A preliminary capital cost estimate was prepared for the PIC and is detailed in *Appendix G*. The total estimated capital cost is \$78,700,000.

11.8 Option G – One New Wastewater Plant with Surface Water Disposal

Subsequent to the August 2008 PIC and as a result of discussions with the MOE, it was determined that wastewater effluent discharge to a surface water location would be feasible. Considering the high level of treatment that would be required to discharge effluent to either subsurface tile fields or to groundwater injection wells, the surface water discharge option would be less costly and more environmentally responsible. A summary of the correspondence and meetings relating to this subject is as follows:

- Letter dated October 30, 2008 from Ernie Hartt (MOE) to Bryan MacKell (Simcoe County) requesting a meeting with County and relevant municipal staff to "address and discuss the issues related to subsurface effluent disposal...". The letter expresses a concern over the "lack of experience with these large systems and hence a heightened level of risk due to imperfect knowledge.";

- October 31, 2008 email from Chummei Liu (MOE) expressing concern re: “lack of experience with these large systems and hence a heightened level of risk due to imperfect knowledge”. Request a meeting with the County and Township staff. (see copy of email in *Appendix H*);
- Letter dated November 7, 2008 from John M. Alati (Davies Howe Partners), Lawyer representing Geranium Corporation to Ernie Hartt (MOE) providing evidence re: system experience and knowledge including examples of underground injection of wastewater effluent and offering to participate in any meetings with the County (see copy in *Appendix H*);
- Letter dated January 6, 2009 from Bryan MacKell (Simcoe County) to Cindy Hood (MOE) requesting a status update and expressing the urgency of the matter (see copy in *Appendix H*);
- Meeting Notes dated January 23, 2009. Technical meeting to advise the Developer Group of the information gained from the MOE with respect to large subsurface wastewater effluent disposal systems. Additional work is needed to respond to the MOE’s concerns. (see copy of Notes in *Appendix B*);
- Minutes of meeting with NVCA dated April 28, 2009 to inform the Conservation Authority of the status of the Master Plan and to advise NVCA staff of the intent to pursue a surface water effluent discharge location on Willow Creek. (see copy of minutes, including PowerPoint presentation, in *Appendix B*);

Reference should also be made to following Reports, copies of which are also included in *Appendix H*:

- Black & Veatch, Technical Memorandum dated February 13, 2009, to investigate the feasibility of a wastewater treatment plant looking at liquid-stream treatment processes to achieve required effluent quality for surface water discharge.
- Gartner Lee Limited (AECOM), Report – Preliminary Assessment of the Effects of Sewage Effluent Discharge Scenarios from the proposed Midhurst Development Projects to Alternative Ground and Surface Receiving Waters (draft for discussion) dated March 2009
- Gartner Lee Limited (AECOM), Report – Interim Assimilation Analysis: Discharge of Treated Sewage Effluent from the Proposed Midhurst WWTP to Willow Creek, dated June 2009

As a result of the MOE’s position on large subsurface effluent disposal systems and considering the high level of wastewater treatment that will be required, it is considered that a wastewater effluent discharge to a surface water location on Willow Creek is feasible and as such, further assessment of this option be undertaken as part of future Class EA planning (Phase 3).

With the above in mind, an additional wastewater treatment option was developed and is shown on Plate 17B (Copy included in *Appendix F*).

This Option involves the design and construction of one WPCP to be located on the west side of the Carson Road Development area with an ultimate capacity of 12314 m³/d (includes servicing of existing Midhurst). The required capacity to service the future Developments only would be in the order of 10600 m³/d derived as below. This capacity of 10600 has been identified in order to discuss the Developer's future needs.

- Design Population = 8,208 equivalent units x 3	= 24,624 persons
- Domestic ADF = 8,208 units x 1.02 m ³ /d	= 8,372.2 m ³ /d
- Extraneous flow = 8,208 units x 0.27 m ³ /unit/d	= 22,16.2 m³/d
- Total ADF	= 10,588.4 m ³ /d
- Peak Day Domestic = 8,372.2 m ³ /d x 2.56 (Harmon PF)	= 21,432.8 m ³ /d
- Peak Day Extraneous Flow = 2,216.2 x 3	= 6,648.6 m ³ /d
- Total Combined Peak Day Flow	= 28,081 m³/d

The works required to realize this Option are as follows:

- Municipal wastewater collection system made up of numerous sewage pump stations serving designated drainage areas with a manifolded forcemain system discharging to the water pollution control plant (WPCP).
- WPCP rated at 10,600 m³/d (with potential for expansion to service a portion of existing Midhurst if necessary in the future)
- Effluent discharge pipe and outlet to Willow Creek

A preliminary capital cost estimate was prepared and is detailed in *Appendix G*. The total estimated capital cost is \$68,100,000.

12.0 Description of Transportation Options

The previous sections presented a summary review of the performance of the existing roadway system, a review of expected traffic growth and projections, a review of transportation options developed for the individual development areas and finally a review of transportation improvements proposed for the study area as a measure of the benefit on the overall study area.

As part of the (what study) study it was necessary to fully integrate all options considered to develop an assessment of the overall transportation system with and without various improvements to address traffic growth. This section of the report outlines the transportation alternatives developed to provide a transportation solution for the overall study area. The detailed traffic analysis completed for the alternatives was completed by URS, the Report is included in *Appendix C*. A summary of the report is included in Section 2

12.1 Alternative 1 - Do Nothing

Alternative 1 (Do Nothing) assumes the existing infrastructure condition of the Midhurst area without any road network improvements for the future full build out.

12.2 Alternative 2 - Proposed Simcoe Area Network Improvements

Alternative 2 is the “Proposed Simcoe Area Network Improvements” for the future full build out condition. This Alternative shows the proposed road network improvements identified by Simcoe County as outlined in their recent County of Simcoe Transportation Master Plan, Final Report, June 2008. This includes the proposed Barrie Bypass as a long-term improvement, as well as widening at County Road 27 (north of Highway 26 to Horseshoe Valley Road) and Wilson Drive (from Snow Valley Road to Sunnidale Road where Wilson Drive turns into Ferndale Drive) to four-lane roads as a short-term improvement. Widening of County Road 27 and Wilson Drive to four-lane roads are mentioned in the Simcoe Transportation Master Plan as one of the preferred short-term improvement alternatives in the Midhurst area (until the Barrie Bypass is constructed), therefore these two improvements were carried forward into all other alternatives.

However, the Barrie Bypass is a long-term conceptual plan outlined in the same TMP report. However, the proponency of this type of improvement is with the MTO of which it is our understanding that MTO has no mandate to provide this improvement (as it is not provided for in the Places To Grow “Growth Plan”). Therefore, it is only included in this alternative and not carried forward in other alternatives. Furthermore, a preliminary cost estimate was not completed but it is considered that it would be in excess of \$100 million.

12.3 Alternative 3 - Proposed By Developers

Alternative 3 is “Proposed By Developers” and comprises those improvements identified by area landowner/developers in their traffic studies. This alternative is based on the proposed road network improvements recommended by the developer’s consultants, BA Group and C.C. Tatham & Associates Ltd. This alternative summarizes all of the recommended alternatives proposed by these consultants, which includes road reconstruction and upgrades on Russell Road, Doran Road, Finlay Mill Road, Carson Road and Anne Street to be two to three lane roads with sidewalks on at least one side. In addition, an east-west connection between the Highway 26/27 corridor and St. Vincent Street corridor as a future easterly extension of Carson Road is proposed to improve east-west connectivity through the study area for Carson neighbourhood development traffic. Furthermore, a new southeast arterial as an extension of Russell Road south of Pooles Road connecting to the St. Vincent Street is proposed. Again, a preliminary cost estimate was not completed but it also considered that it would be in excess of \$100 million.

12.4 Alternative 4 – No Highway 400 Interchange with Link Connection From St. Vincent Street to Gill Road

Alternative 4 is based on the proposed improvements recommended for the Midhurst area to address traffic deficiencies in the future full build out condition. This alternative includes reconstruction/upgrade of existing two-lane roads to provide auxiliary turn lanes and/or improve general platform integrity at Russell Road, Walt Road, Old Second Road (between Walt Road and Pooles Road), Pooles Road, Doran Road, Finlay Mill Road, Carson Road and Anne Street. Notable improvements include:

- Widening of St. Vincent Street (south of Pooles Road) to a four-lane road with auxiliary turn lanes, as required;
- A new extension of Gill Road to St. Vincent Street;
- A new extension of Craig Road to County Road 27 as a two-lane road with auxiliary turn lanes, as required;
- Widening of County Road 27 (from north of Highway 26 to Horseshoe Valley Road) to a four-lane road (as identified by Simcoe County); and
- Widening of Wilson Drive (from Snow Valley Road to Sunnidale Road) to a four-lane road (as identified by Simcoe County).

A preliminary capital cost estimate was prepared and is detailed in *Appendix G*. The total estimated capital cost is \$68,700,000.

This preliminary cost estimate only includes the cost for road network selected for this option within the Midhurst community. This estimate does not include costs such as Wilson drive from Snow Valley Road to Highway 26 and beyond, or County Road 27 from Craig Road to the Horseshoe Valley Road and beyond. The cost sharing and distribution of the cost for the different agencies interests and involvement have not been taken into consideration in preparing the preliminary estimate at this stage.

12.5 Alternative 5 – Partial Highway 400 Interchange With No Link Connection From St. Vincent Street to Gill Road

Alternative 5 is similar to Alternative 4 but with no link connection to St. Vincent Street from Gill Road. This alternative includes reconstruction/upgrades of existing two-lane roads to provide auxiliary turn lanes and/or improve general platform integrity at Russell Road, Walt Road, Old Second Road (between Walt Road and Pooles Road), Pooles Road, Doran Road, Finlay Mill Road, Carson Road, St. Vincent Street and Anne Street. Notable improvements includes:

- A new partial interchange at Pooles Road on Highway 400 providing movements to and from south;
- A new extension of Craig Road to County Road 27 as a two-lane road with auxiliary turn lanes, as required;
- Widening of County Road 27 (from north of Highway 26 to Horseshoe Valley Road) to a four-lane road (as identified by Simcoe County); and
- Widening of Wilson Drive (from Snow Valley Road to Sunnidale Road) to a four-lane road (as identified by Simcoe County).

As an alternative consideration to providing a new interchange at Pooles Road, a potential interchange was considered at Partridge Road since there is already an existing overpass at that location. However, given that this alternative location would result in more road upgrades (for Old Second Road and Partridge Road), more out-of-way travel and potentially less attraction to users (and thereby less reduction of traffic through the existing Midhurst community), need for widening / improvements of the Partridge road structure, the secondary alternative was deemed to be infeasible.

This alternative was developed to study the impacts of traffic diversion from Highway 26/27 and St. Vincent Street to Highway 400.

The basic outline of this Option is shown on Plate 18 of the PIC Material (*Appendix F*). However, it has been revised to show a central location for the Plant site.

A preliminary capital cost estimate was prepared and is detailed in *Appendix G*. The total estimated capital cost is \$71,700,000.

This preliminary estimate only includes the cost for road network selected for this option within the Midhurst development. This estimate does not include costs such as Wilson Drive from Snow Valley Road to Highway 26 and beyond, or County Road 27 from Craig Road to the Horseshoe Valley Road and beyond. The cost sharing and distribution of the cost for the different agencies interests and involvement have not been taken into consideration in preparing the preliminary estimate at this stage.

12.6 Alternative 6 – Partial Highway 400 Interchange With Link Connection From St. Vincent Street to Gill Road

This alternative includes reconstruction /upgrade of existing two-lane roads to provide auxiliary turn lanes and/or improve general platform integrity at Russell Road, Walt Road, Old Second Road (between

Walt Road and Pooles Road), Pooles Road, Doran Road, Finlay Mill Road, Carson Road, St. Vincent Street and Anne Street. Notable improvements includes:

- A new partial interchange at Pooles Road on Highway 400 providing movements to and from south;
- A new extension of Craig Road to County Road 27 as a two-lane road with auxiliary turn lanes, as required;
- Widening of County Road 27 (from north of Highway 26 to Craig Road) to a four-lane road (as identified by Simcoe County); and
- Widening of Wilson Drive (from Snow Valley Road to Sunnidale Road) to a four-lane road (as identified by Simcoe County).

The basic outline of this Option is shown on Plate 18 of the PIC Material (*Appendix F*). However, it has been revised to show a central location for the Plant site.

A preliminary capital cost estimate was prepared for the PIC and is detailed in *Appendix G*. The total estimated capital cost is \$78,600,000.

This preliminary estimate only includes the cost for road network selected for this option within the Midhurst development. This estimate does not include costs such as Wilson drive from Snow Valley Road to Highway 26 and beyond, or County Road 27 from Craig Road to the Horseshoe Valley Road and beyond. The cost sharing and distribution of the cost for the different agencies interests and involvement have not been taken into consideration in preparing the preliminary estimate at this stage.

13.0 Evaluation Criteria/Weighting and Ranking

The list of evaluation criteria for water and wastewater options is based on the criteria as suggested by the MEA in the Class EA Document. The criteria and weighting are as follows:

Criteria	Weighting (%)
Response to Secondary Plan Growth	15
Fisheries	2
Wetlands, Floodplains and Shorelines	2
Woodlands	10
Groundwater	10
Air Quality, Noise and Vibration	10
Sensitive Species & ANSI/PSW	2
Social Impacts on Residents	15
Social Impacts on Social Features	5
Archaeological	5
Construction Design, Land Ownership and Policies	10
Utilities	5
Operational Considerations	4
Capital Cost	5
Total Weighting	100

The list of evaluation criteria for Transportation alternatives is based on the criteria as suggested by the MEA in the Class EA Document. The criteria and weighting are as follows:

Criteria	Weighting(%)
Response to Secondary Plan Growth	15
Fisheries	10
Wetlands, Floodplains and Shorelines	2
Woodlands	10
Groundwater	2
Air Quality, Noise and Vibration	10
Sensitive Species & ANSI/PSW	2
Social Impacts on Residents	15
Social Impacts on Social Features	5

Archaeological	5
Construction Design, Land Ownership and Policies	10
Utilities	5
Operational Considerations	4
Capital Cost	5
Total Weighting	100

Social impacts on residents are effects such as noise, dust, odour, parking issues, inconvenience, loss of access to area features etc. Social features include public areas or building such as parks, schools etc.

Ranking of each criterion for each option is presented in tabular form in *Appendix I*. Rankings were determined based on a review of impacts of each option on the environmental criteria. For example, the extension of watermain through a sensitive environmentally protected area would receive a high ranking number while the development of a well within an existing well field would receive a low ranking.

14.0 Evaluation of Water Supply Options

The evaluation of water supply options is presented in tabular form in *Appendix I*. A Summary Score Analysis (weighted rankings) is also included in *Appendix I* for the water supply options. The numerical scores ranged from 23 to 43 with the lower number being the most favourable score.

Based on the evaluation, water supply Options A and C were eliminated from further consideration. Based on the most recent hydrogeological Report, the most favourable water supply Option was determined to be Option F.

15.0 Evaluation of Wastewater Treatment Options

The evaluation of wastewater treatment options is presented in tabular form in *Appendix I*. A Summary Score Analysis (weighted rankings) is also included in *Appendix I* for the wastewater treatment options. The numerical scores ranged from 28 to 48 with the lower number being the most favourable score.

Based on the evaluation, water supply Options A and C were eliminated from further consideration. The most favourable water supply Option was determined to be Option G.

16.0 Evaluation of Transportation Options

The evaluation of transportation options is presented in tabular form in *Appendix I*. A Summary Score Analysis (weighted rankings) is also included in *Appendix I* for transportation options. The numerical scores ranged from 39 to 67 with the lower number being the most favourable score.

Based on the evaluation, transportation Alternative 1 was eliminated from further consideration. The most favourable transportation alternative was determined to be Alternative 6.

17.0 Preferred Solutions

17.1 General

Following the evaluations and assessments of the various servicing alternatives and options, AAL presented Recommended Solutions to the Township Planning Committee on Monday May 25, 2009. A copy of the PowerPoint presentation is included in *Appendix B*. The same recommendations were made to the Advisory Committee on Wednesday May 27, 2009.

17.2 Water Servicing

The Preferred Solution (Option F as shown on Plate 13B – *Appendix F*) for the provision of water servicing for the three identified Development Areas and the designated employment area is summarized as follows:

1. Develop and equip a combination of wells within both the Doran Road North (Alliance Development) and the Doran Road South (Geranium Development) areas and along Russell Road to provide an approximate MDD of 200 L/s to service 8208 equivalent residential units (estimated equivalent population of 24,624 persons). It is suggested that additional capacity be provided for a backup supply of approximately 40 L/s (one additional well to be developed and equipped). Exact locations of wells to be determined in Phase 3 of a future Class EA planning process;
2. Design and construct water treatment facility (chlorination and iron sequestration or filtration) complete with in-ground water storage (approximate useable volume of 5,300 m³ based on a fire flow rate of 133 L/s for 3 hours), high lift pumping capabilities and standby power source at a location within future development lands and easily accessible to existing roads. Final location to be determined based on further engineering assessment to be undertaken as part of a future Phase 3 Class EA planning process;
3. Design and construct raw water transmission watermains from all wells to the treatment/storage/high lift pumping facility, along existing road allowances or within future development road allowances. Size and alignment to be determined;
4. Design and construct treated water transmission mains from the treatment facility to the various Development areas as required including a high pressure transmission main across existing Midhurst with connections to the existing water distribution system through pressure reducing valves and with consideration for a future duplicate high pressure transmission main to provide system redundancy;
5. Design and construct internal water distribution system to service proposed development layout, and;
6. Design and construct in-ground water storage facility (approximate useable volume of 3600 m³ based on a fire flow rate of 133 L/s for 3 hours), complete with high lift pumping capabilities and standby power source for water supply to the Carson Road Development and to the future employment lands.

The estimated capital cost for the proposed works is \$25,800,000.

Future improvements to the existing Midhurst water supply, storage and distribution system may be necessary to allow for infilling within the Secondary Plan Area.

17.3 Wastewater Servicing

The Preferred Solution (Option G as shown on Plate 17B – *Appendix F*) for the provision of wastewater servicing for the three identified Development Areas and the designated employment area is summarized as follows:

1. Design and construct wastewater treatment plant with an approximate ADF capacity of 10,600 m³/d (peak day flow rate of 28,081 m³/d) with tertiary treatment and effluent limits as follows:
 - Nitrate Nitrogen less than 9.8 mg/L monthly average of weekly samples
 - Total Phosphorus (TP) less than 0.03 mg/L monthly average of weekly samples
 - Total ammonia concentration should be less than 1 mg/L
 - CBOD5 less than 10 mg/L annual average
 - Total Suspended Solids (TSS) less than 15 mg/L annual average
 - pH maintained between 6.0 and 9.5 at all times
2. The plant can be constructed in stages but must be expandable in the future to accommodate the servicing of existing Midhurst (future total ADF of approximately 12,314 m³/d)
3. Effluent discharge pipe from the plant to Willow Creek, north of Highway 26, sized to service the entire Secondary Plan area including existing Midhurst.
4. Design and construct wastewater collection system complete with pump stations and manifolded forcemain system as required, to service proposed development layout and, in the future, existing Midhurst.

The estimated capital cost for the proposed works is \$68,100,000.

17.4 Transportation

AAL has reviewed all of the relevant assessments and reports that were prepared by various proponents. AAL also analyzed the Environmental Impact analysis for all of the alternatives and came to a conclusion that Alternative 6 has a lower impact among all other alternatives. Therefore, for the long-term environmental and economical benefits of the Midhurst development area, the following road network improvements are recommended:

- 2-lane re-construction of Pooles Road from Highway 400 to Silverwood Crescent towards St. Vincent Street with the addition of auxiliary Turning Lanes
- 2-lane new construction of Forbes Road from Old Second Road to Russell Road with the addition of auxiliary Turning Lanes and Construction of Traffic control devices
- 2-lane new construction of Craig Road from Russell Road to County Road 27 with the addition of auxiliary Turning Lanes and Construction of Traffic control devices

- 2-lane re-construction of Walt Road from Old Second Road to Russell Road
- 2-lane re-construction of Russell Road from Forbes Road to Pooles Road with the addition of auxiliary Turning Lanes and Construction of Traffic control devices.
- 2-lane re-construction of Doran Road from Russell Road to Gill Road with the addition of auxiliary Turning Lanes and construction of Traffic control devices
- 2-lane re-construction of Finlay Mill Road with the addition of auxiliary Turning Lanes and construction of Traffic control devices
- 2-lane re-construction of Gill Road from Craig Road to Doran Road with the addition of auxiliary Turning Lanes and construction of Traffic control devices
- 2-lane new construction of Gill Road from Doran Road to Wattie Road with the addition of auxiliary Turning Lanes and construction of Traffic control devices
- 2-lane re-construction of St. Vincent Street from Wattie Road to the Barrie City limits with the addition of auxiliary Turning Lanes and construction of Traffic control devices
- 2-lane re-construction of Carson Road from Highway 27 to Wilson Drive with the addition of auxiliary Turning Lanes and construction of Traffic control devices
- 2-lane re-construction of Anne Street from Carson Road to the Barrie City Limits
- 4-lane new construction of Wilson Drive from Snow Valley Road to the Barrie City Limits with the addition of auxiliary Turning Lanes and construction of Traffic control devices
- 4-lane new construction of County Road 27, from existing 4 lanes to new Craig Road extension with the addition of auxiliary Turning Lanes and construction of Traffic control devices
- 2-lane re-construction of Old Second Road from Pooles Road to Walt Road
- New interchange at Pooles Road with Highway 400
- 2-lane re-construction of Snow Valley Road from Wilson Drive to County Road 27

The following intersection improvements are recommended:

- A traffic signal at the intersection of Doran Road and Gill Road
- A traffic signal at the intersection of Doran Road and Russell Road
- A traffic signal at the intersection of Russell Road and Forbes Road
- A traffic signal at the intersection of County Road 27 and Craig Road
- A traffic signal at the intersection of County Road 26 and County Road 27
- A traffic signal at the intersection of County Road 27 and Finlay Mill Road
- A traffic signal at the intersection of St. Vincent Street and Pooles Road
- A traffic signal at the intersection of Carson Road and Wilson Drive
- A traffic signal at the intersection of Carson Road and Highway 26/27
- A traffic signal at the intersection of Wilson Drive and Snow Valley Road

The following intersection/interchange improvements are recommended:

- Gill Road and Craig Road
- Pooles Road and Russell Road
- Carson Road and Anne Street
- Partial interchange with Highway 400 at Pooles Road

18.0 Transportation Summary, Conclusions and Future Work

Alternative 6 has been selected as the preferred option because among all of the alternatives it provides an optimal road networking system and can accommodate future traffic growth with lower negative impact to the Midhurst Community. Improvement costs for Alternative 6 are slightly higher than for Alternatives 4 and 5, but Alternative 6 provides significantly less impact in regards to operational considerations, social impacts on residences, air quality, noise and vibration, fisheries and wetlands and flood plain restoration.

Alternative 6 properly addresses the potential poor operating conditions and impacts to existing residents along Pooles Road between St. Vincent Street and Russell Road.

Improving the new interchange on Highway 400 at Pooles Road reduces the traffic impact between Gill Road and Russell Road. A new connection at St. Vincent Street with Gill Road provides a smooth Traffic in/out movement into the Midhurst Community thus providing the less impact.

Considering the future employment density increase adjacent to Snow Valley Road, it is also recommended that a 2-lane reconstruction of Snow Valley Road with intersection improvements at Wilson Drive and Snow Valley Road be considered.

18.1 Improvement Complexities

Each road link was reviewed individually and associated tasks and activities were identified including all possible environmental impacts. It was found that the improvements of the road networks of the Midhurst Community may be complex to varying degrees. Based on the project complexities, the assignments can be grouped under various classes of Environmental Assessment (EA) Schedules. The various projects are identified below with their respective Environmental Assessment categorization and Environmental Assessment category description.

18.2 Status of Municipal Road Projects Under the Class Environmental Assessment for Alternative 6

The status of Municipal Road project under the Class EA for Alternative 6 was included with the capital cost estimate in *Appendix G*.

18.3 Phasing of Road Improvements

A phasing of the road improvements is an important subject with regards to the rate of planned and approved development. This will require a review of the phasing of the developments in each of the three areas in conjunction with the work outlined in this report. For example the capacity of roadway links recommended for lane widening to 4-lane were identified based on the full build-out condition with a 20-year forecast horizon. The 4-lane needs can be determined for the roadway link with the timing of the planned developments.

18.4 Transit Facilities

The implementation of transit service in the Midhurst area is a key goal in terms of reducing automobile impacts in the area as well as reducing environmental impacts associated with single occupant vehicle travel.

The County of Simcoe TMP identifies the provision of local transit service within the Midhurst community area, of which the service would be directly integrated with local service extending from the City of Barrie area to the south. A Specific public transit network, including the development of transit standards, will be developed as part of future planning phases of the Class EA.

The development and configuration of the road network of the Midhurst community area is in support of the implementation of local transit service. Trunk transit lines could be routed along the major collectors and arterial roads, however transit routing would also be internal to the development block areas in order to provide convenient service and optimize passenger catchment.

The provision of a transit route along the community areas within the Midhurst community could provide for good route coverage so that most residences, all schools, neighbourhood centres and public facilities are within a walking distance to a bus stop. Bus stop spacing should be approximately 250-300 metres (not less than 200 metres).

In order to promote safe and efficient use of the transit service in the community, the following principles should be considered:

- Roads identified for a transit route or a potential transit route would need to meet the design needs for roads with transit service. That is, these roads should be designed according to the transit agencies requirements for overall minimum pavement width, lane widths, and a curb radius adjacent to a turning transit route
- Transit pads to accommodate a pedestrian standing area are to be installed at all stop locations. Transit shelters should be installed at high volume stop locations
- The future transit routing plan must be complimented with a comprehensive network of sidewalks and sidewalk connections throughout the community to facilitate walking to transit stops. This would include sidewalks on all streets and sidewalk connections between adjacent road rights-of-way (i.e. at single-loaded local roads) to link the adjacent sidewalks.

18.5 Bikeway Network

Similar to the need for transit service in the area, the implementation of an overall network of cycling facilities in the Midhurst area is a key goal in terms of reducing automobile impacts in the area, as well as reducing environmental impacts associated with single-occupant vehicle travel.

Based on the County of Simcoe TMP, the standards for on-road active transportation infrastructure within County Road rights-of-way is based on the roadway classification (i.e. low volume roads would allow on-road bike lanes – high volume roads would allow off road paths in boulevard areas). Also, based on the TMP, many residents expressed a desire for improved focus on active transportation infrastructure. This includes the development of, or linking of, pedestrian/ bicycle paths between

communities, the need to accommodate pedestrians and cyclists with sidewalks on both sides of local roads, and the creation of cycling paths in designated areas. There are several benefits to providing bikeways in the Midhurst community, as it will encourage some residents to use bikeways as their regular commute route, increase the safety of cyclists on roads, as well as improving the surrounding environment. Providing bikeways will reduce the number vehicles on the roads traveling to short distances such as school, local shops, neighbourhood centres and public facilities. A Specific Bikeway network, including the development of standards, will be developed as part of future planning phases of the Class EA.

The following principles should be considered for the development of the future bikeway network in Midhurst:

- Arterials and major collector roads should be considered to include a bikeway (either with an exclusive bike lane, wide outside shared lane, or boulevard path)
- The width of multi-use pathways should be in consideration of pedestrians, cyclists and in-line skaters
- Where major multi-use pathways cross high volume, high speed and/or multi-lane arterial roads mid-block, it is recommended that demand-activated signalized crossings be considered
- Install bicycle lock-up facilities at appropriate locations, such as at significant transit stop locations, commercial areas (office and retail), schools, major parks and tourism destinations.

18.6 Pedestrian Provisions

A comprehensive network of sidewalks and sidewalk connections are required to provide for convenient movement between transit stops, residential lands, commercial lands, schools and parks.

The following principles should be considered for the development of the future pedestrian network in Midhurst:

- Sidewalk connections should be incorporated to link sidewalks within road rights-of-way to paths and other walkways at schools and open space areas
- The community should be planned to provide pedestrian access to pedestrian and transit routes. It is desirable to provide pedestrian connections or openings to transit routes along arterial roads every 250 metres
- In general, all roads should include 1.5-metre wide hard-surface sidewalks along one or two sides of the street. Sidewalks are to be designed to the appropriate municipal standard.

It is recommended for all arterial or collector roads to include sidewalks along both sides of the road. The sidewalks should be judiciously located to provide for optimum pedestrian movement efficiency and safety. In general, the following sidewalk placement guidelines should be considered for identifying the appropriate side of the street for the sidewalk:

- Adjacent to schools, parks, open spaces, and significant pedestrian traffic generators
- Adjacent to medium/high-density residential, commercial, institutional or mixed-use developments

- Adjacent to transit routes and stops
- Along potential pedestrian origin-destination patterns and desire-lines
- Along the side of the road with the minimum number of road crossings
- Along the side of the road with the minimum number of intersecting high traffic volume roads and entrances
- Along the north and/or east side of the road to maximize sun melt exposure.

18.7 Transportation Demand Management

The implementation of transportation demand management (TDM) mechanisms to reduce vehicular trip and environmental impacts could be employed with the development of the Midhurst community. These mechanisms include:

- Increasing and promoting an appropriately developed network for other travel choices (transit, walking, bicycling) as described elsewhere in this study report
- Promoting stakeholder benefits (energy conservation, road and parking facility cost savings, increased road safety, increased travel choices) and providing incentives to target audiences
- Enabling programs, alternative mode improvements, driving disincentives and parking programs
- Creating and supporting partnerships and initiatives that promote transportation options
- Working with business to:
- Create such employee incentives as substantially reduced transit passes (the cost of which can be offset by reduced parking lot expenses)
- Promote non-automotive modes of travel
- Initiate programs that help to reduce traffic volumes during peak periods (staggered hours, flextime, off-site work, tele-commuting)
- Providing preferentially located and priced parking for car pools
- Developing interactive programs that illustrate the impacts of transportation choices on personal safety, health and the environment with a long-term goal to change behaviour. While many of these TDM strategies can be recommended and implemented through the planning stages of the Midhurst community (i.e. such as development of comprehensive transit, sidewalk and trail system), many cannot be implemented until the actual construction of the development plans since it requires the adoption of a TDM philosophy within the operation and management of the subject community.

In any event, the development of the Midhurst community can aid in the achievement of these strategies to attain a transportation demand management program that includes well-balanced travel modes. Specifically, the Midhurst community should include the following TDM measures to ensure well-balanced transportation demands amongst the various travel modes:

- A comprehensive development plan that combines a variety of uses (residential, employment, and commercial) in close proximity as outlined in the recent Midhurst Secondary Plan

- Promotion of alternative modes of travel through provision of a well-served transit plan, and an extensive network of cycling and pedestrian facilities (sidewalks and paths).

Once the planning for the actual construction and occupation of specific buildings take place, the individual plans of the Midhurst community should include consideration of the TDM measures within the operation and management of each site. These measures could include:

- Employee incentives with reduced transit passes
- Initiate programs that help to decrease traffic volumes during peak periods (staggered hours, flextime, off-site work, tele-commuting)
- Provide recreational/fitness facilities and/or child care facilities
- Providing links to local cycling paths, and providing bicycle storage facilities
- Developing programs that emphasize the health, lifestyle and environmental benefits of non-auto modes.

The County of Simcoe TMP identifies the provision of carpool lots as part of its broad transportation demand management plan. No locations are identified in the County of Simcoe TMP for the Midhurst area. The nearest identified locations are at the County Road 27/Horseshoe Valley Road intersection and in the Minesing community. However, in recent discussions with County staff during the preparation of this Midhurst Transportation Master Plan, staff noted that a carpool lot is being contemplated in the area of the Highway 26 / County Road 27 intersection.

It is recommended that the County in cohort with the Township of Springwater consider an additional commuter carpool lot in the Midhurst area along Highway 26/27 or County Road 27.

In order to optimize carpool trip making, it would be desirable to locate the facility in a location centrally where as many trips congregate. Potentially, this would be along Highway 26/27 between Snow Valley Road and Carson Road.

The recommendation for an additional carpool facility has also been articulated by the BA Group in their review of the background transportation materials during the course of the Midhurst Secondary Plan study.

18.8 Truck Routes

Large and heavy vehicles have historically utilized Doran Road as a shortcut through the Midhurst community. However, the enhancement of the road network in the Midhurst area provides for improved truck routing opportunities in order to provide for more efficient truck movements and reduce the impacts or safety considerations in the stable existing residential areas. In that regard, regional truck movements should be promoted along significant Provincial and County corridors, namely Highway 26 and County Road 26/27. The Township can promote the diversion of truck traffic via Doran Road through the completion of the new link connecting Highway 400 to County Road 27 via Craig Road and Forbes Road.

19.0 Mitigation Measures

Mitigation measures for a servicing scheme of this magnitude will need to be developed for each aspect of the proposed works. There are numerous road re-construction projects that fall into the category of a Schedule B Class EA and as such, those projects may proceed directly to final design with no further assessment. All other projects, water, wastewater and the remaining transportation works, will require additional planning under Phases 3 and 4 of the MEA Class EA process, which will include the identification of mitigation measures.

At the present time, it is considered that mitigation measures for the Schedule B projects (road re-construction works with a value of less than \$2.2 million) can be identified. The MEA Class EA Document outlines "Typical Mitigating Measures for Potential Adverse Environmental Effects" (Appendix 2 of the MEA Class EA Document). It is suggested that the following Effects be addressed and mitigated as part of final design:

1. Surface water drainage – erosion, siltation and sedimentation during construction
2. Groundwater – dewatering and spills during construction
3. Loss of Vegetation – tree removal as a result of construction
4. Timing of construction – loss of nesting and breeding periods
5. Noise and dust – during construction
6. Pedestrian and traffic movement – impacts during construction
7. Contamination of soils – as a result of construction
8. Mixing of topsoil with subsoil
9. Exhaust emissions from construction activities

20.0 Permits and Approvals

The proposed works will require numerous permits and approvals prior to construction. The suggested list is as follows:

Transportation Works

- NVCA – Permit for Development, Interference with Wetlands & Alterations to Shorelines & Water Courses;
- NVCA – Letter of Advice to the DFO re: work within Willow Creek, Fisheries review and assessment of loss of habitat;
- DFO – Approval if a Letter of Advice is not provided by NVCA;
- MOE – Approval for storm sewers;
- Municipal Approvals for roadway and bridge design; and
- Municipal Road Occupancy Permits.

Water Works

- MOE - Water Taking Permit for each test well and production;
- MOE - Water Taking Permit (if necessary for construction);
- MOE – Certificate of Approval (or License) for water supply and treatment works;
- MOE – Certificate of Approval (or License) for any new watermains;
- MOE – Certificate of Approval (or License) for water storage facilities;
- NVCA – Permit for Development, Interference with Wetlands & Alterations to Shorelines & Water Courses;
- NVCA – Letter of Advice to the DFO re: work within Willow Creek, Fisheries review and assessment of loss of habitat;
- DFO – Approval if a Letter of Advice is not provided by NVCA;
- Municipal Approvals for all proposed water works; and
- Municipal Road Occupancy Permits.

Wastewater Works

- MOE - Water Taking Permit (if necessary for any construction);
- MOE – Certificate of Approval (or License) for wastewater treatment works including the effluent discharge facility;
- MOE – Certificate of Approval (or License) for any new sanitary sewers, pump stations and forcemains;

- NVCA – Permit for Development, Interference with Wetlands & Alterations to Shorelines & Water Courses;
- NVCA – Letter of Advice to the DFO re: work within Willow Creek, Fisheries review and assessment of loss of habitat;
- DFO – Approval if a Letter of Advice is not provided by NVCA;
- Municipal Approvals for all proposed wastewater works; and
- Municipal Road Occupancy Permits.

21.0 Applicable Class EA Schedules

A list of future Class EA requirements was prepared based on the Preferred Solutions for water and wastewater servicing and for transportation. The list is presented in the following table.

Description of Works	Class EA Schedule	Comments
Construct new water system including a new well and water distribution system (page 1-19 of MEA Class EA Document)	'C'	Phases 3 and 4 to be completed by Township with input from Developers
Internal water distribution system	Draft Plan or Site Plan Approval	To be completed by Developers
Construct new sewage system including outfall to receiving water body and/or a constructed wetland for treatment (page 1-18 of MEA Class EA Document)	'C'	Phases 3 and 4 to be completed by Township with input from Developers
Internal wastewater collection system	Draft Plan or Site Plan Approval	To be completed by Developers
2-lane re-construction of Pooles Road from Highway 400 to Silverwood Crescent towards St. Vincent Street	'A+'	Subject to comments received to date and the approval of Township Council, the Township may proceed to final design and construction subject to receipt of funding
New interchange at Pooles Road with Highway 400	'C'	Phases 3 and 4 to be completed by Township with input from Developers
2-lane new construction of Gill Road from Doran Road to Wattie Road	'B'	Subject to comments received as a result of the Completion of the Master Plan and the approval of Township Council, the Township may proceed to final design and construction subject to receipt of funding
2-lane new construction of Forbes Road from Old Second Road to Russell Road	'B'	Subject to comments received as a result of the Completion of the Master Plan and the approval of Township Council, the Township may proceed to final design and construction subject to receipt of funding
2-lane new construction of Craig Road from Russell Road to County Road 27	'C'	Phases 3 and 4 to be completed by Township with input from Developers
4-lane new construction of County Road 27, from existing 4 lane to new Craig Road extension	'B'	Subject to comments received as a result of the Completion of the Master Plan and the approval of Township Council, the Township may proceed to final design and construction subject to

		receipt of funding
2-lane re-construction of Snow Valley Road from Wilson Drive to County Road 27	'A+'	Subject to comments received to date and the approval of Township Council, the Township may proceed to final design and construction subject to receipt of funding
4-lane new construction of Wilson Drive from Snow Valley Road to the Barrie City Limits	'C'	Phases 3 and 4 to be completed by Township with input from Developers
2-lane re-construction of Old Second Road from Pooles Road to Walt Road	'A+'	Subject to comments received to date and the approval of Township Council, the Township may proceed to final design and construction subject to receipt of funding
2-lane re-construction of Walt Road from Old Second Road to Russell Road	'A+'	Subject to comments received to date and the approval of Township Council, the Township may proceed to final design and construction subject to receipt of funding
2-lane re-construction of Russell Road from Forbes Road to Pooles Road	'A+'	Subject to comments received to date and the approval of Township Council, the Township may proceed to final design and construction subject to receipt of funding
2-lane re-construction of Doran Road from Russell Road to Gill Road	'A+'	Subject to comments received to date and the approval of Township Council, the Township may proceed to final design and construction subject to receipt of funding
2-lane re-construction of Gill Road from Craig Road to Doran Road	'B'	Subject to comments received as a result of the Completion of the Master Plan and the approval of Township Council, the Township may proceed to final design and construction subject to receipt of funding
2-lane re-construction of St. Vincent Street from Wattie Road to the Barrie City limits	'A+'	Subject to comments received to date and the approval of Township Council, the Township may proceed to final design and construction subject to receipt of funding
2-lane re-construction of Finlay Mill Road	'A+'	Subject to comments received to date and the approval of Township Council, the Township may proceed to final design and construction subject to receipt of funding
2-lane re-construction of Carson Road from Highway 27 to Wilson Drive	'A+'	Subject to comments received to date and the approval of Township Council,

		the Township may proceed to final design and construction subject to receipt of funding
2-lane re-construction of Anne Street from Carson Road to the Barrie City limits	'A+'	Subject to comments received to date and the approval of Township Council, the Township may proceed to final design and construction subject to receipt of funding

22.0 Phase 2 Notice of Completion

A Notice of Study Completion was published in the local newspaper on July 9 and 16. A copy of the Notice was sent to various review agencies and is included in *Appendix J* along with copies of related letters to the review agencies.

Authorization to proceed with the publication of the Notice of Completion was received by the Advisory Committee on June 29, 2009 in the form of the Township's Planning Committee Report dated June 22, 2009 (copy included in *Appendix J*).

23.0 Summary of Commitments made during Master Planning Process

The following commitments were made as a result of the Master Plan process:

- Commitment made by the Township to Developers to reassess the location of the proposed Wastewater Treatment Plant from within Development Area 3 to a location just north of Snow Valley Road at the intersection of Wilson Drive
- Commitment made by the Township to the Developers to reassess the location of the proposed Water Treatment Facility, considering three new sites, two within Development Area 1 and the third near the intersection of Pooles Road and Russell Road within Development Area 2;
- Commitment by Alliance Homes to “provide any necessary dedications and/or easements for the proposed Midhurst Water Treatment Plant (MWTP), municipal grade production well, access roads and raw water/treated water servicing corridors within their lands.” noting that “These dedications would be provided to the Township at the appropriate time.” and that “This commitment is given regardless of the if their lands are included within the initial phase of development the Secondary Plan.”;
- Commitment by Geranium Corporation to “post appropriate security to ensure that construction costs are covered in the event that it is necessary to construct internal works, and/or an internal roadway to connect the proposed site(s) to an existing municipal street, and/or, to connect municipal services to/from the site(s) of such proposed plants(s).” Geranium requests that Alliance make a similar commitment;
- Commitment made by Alliance Homes to either protect or conduct additional investigation with respect to area H-1 as identified in the Stage 1 – 2 Archaeological Report for 154 Doran Road dated, December 2007 by Archeoworks;
- Commitment by both Developers and the Township to provide treatment for elevated levels of iron and manganese in the water supply;
- Commitment by Geranium Corporation to complete Stage 2 Archaeological Assessments for both Development Areas 2 and 3 and all proposed well sites including a Stage 3 test excavation of the Coutts Property;
- Commitment by Geranium Corporation to complete Environmental Impact Assessments (EIA) for Development Areas 2 and 3;
- Commitment by both Developers to construct develop and test production wells along Russell Road and to identify the sites of those wells and to undertake the following background reviews:

- Stage 2 Archaeological Assessments

- Geotechnical Assessments
- Natural Environment Assessments
- Noise Assessments
- Commitment by both Developers and the Township to complete the following background reviews for all future sewage pump station sites:
 - Stage 2 Archaeological Assessments
 - Geotechnical Assessments
 - Natural Environment Assessments
 - Noise Assessments
- Commitment by both Developers and the Township to continue with the assessment of the best suitable wastewater treatment technologies and to determine the preferred treatment option;
- Commitment by both Developers and the Township to NVCA to provide a copy of the final Assimilation Analysis for Willow Creek and to reference IGAP assimilative analyses;
- Commitment by both Developers and the Township to NVCA to provide “safe guards” with respect to plant upsets in order to protect Willow creek and the Minesing wetlands;
- Commitment by both Developers and the Township to the NVCA to give consideration to undertaking the assessment of Willow Creek based on all potential developments within the watershed (note that the intent of the Master plan was to consider approved development only as identified in the OP or in the Secondary Plan and therefore, the assessment of all potential developments within the watershed may not be undertaken);
- Commitment from the Developers and the Township to complete the Class EA planning process for any identified Schedule C. works;
- Commitment by both the Developers and the Township to develop a public transit network to service Midhurst as an extension of the Barrie system; and
- Commitment by both the Developers and the Township to develop a bikeway network to service Midhurst.