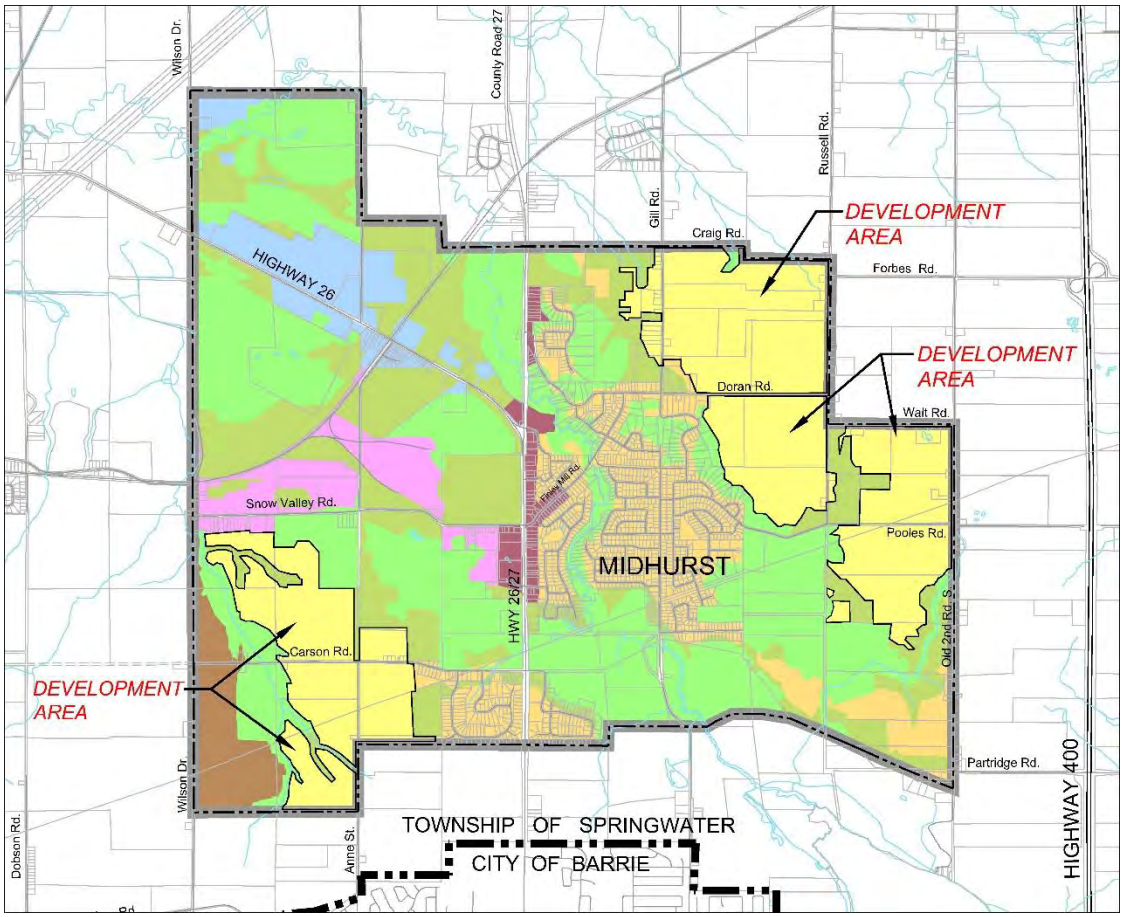
# Township of Springwater

# Midhurst Water, Wastewater & Transportation (Phase 3 and 4)

# Environmental Study Report




**Volume 5 of 6**
**Appendix Z to DD**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**File: 113027**
**March 2020**

# APPENDIX 'Z'

## Midhurst Forcemain Route Options Analysis

Ainley GROUP CONSULTING ENGINEERS PLANNERS

# MEMORANDUM

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To: File Copies to:

From: RM

Date: Mar. 21, 2016

Ref: **Midhurst forcemain route options** File: **113027**

## INTRODUCTION

Subsequent to the completion of the Midhurst Master Plan Document (July 2009), several suggestions have been put forward for the routing of the raw sewage forcemain from the Doran Road development area, west to the proposed site of the WWTP in the Carson Road development area. An analysis of these new routes as compared to the original route is required as a follow up to the Master Plan. The five routes that have been considered are shown on the attached plans. It has been assumed that the starting point for all five route options is the extreme northwest corner of the Doran Road development property on Gill Road. It has also been assumed that the end point of all routes is within the proposed site of the WWTP on the north side of Snow Valley Road, east of Wilson Drive. The five routes are described in general terms as follows:

Route # 1 – Craig Rd extension to railway line and southwest to site

Route # 2 – As above but avoiding the railway line – using County lands and possibly private properties

Route # 3 – Craig Rd extension to County Rd 27/Hwy 26 and along Snow Valley Rd to site

Route # 4 – Gill Rd to Doran Rd and west on Doran across walking trail (and Willow Creek) to County Rd 27/Hwy 26 and along Snow Valley Rd to site

Route # 5 – As per Master Plan – Gill Rd to Doran Rd to Finlay Mills Rd and along Snow Valley Rd to site

The proposed pipe diameter for all five routes is 350 mm (based on an ultimate flow rate of 222L/s from the Doran Rd development area) and assuming a max velocity of 3 m/s. (Actual velocity at 222 L/s in a 350 mm dia pipe is 2.3 m/s).

The analysis is based on:

- Pipeline length and power requirements
- Availability of Approvals and property
- Construction feasibility and impacts
- Environmental Issues

- Capital cost estimate
- Operating requirements

## PIPELINE LENGTH AND POWER REQUIREMENTS

Approximate pipeline lengths and power requirements based on a flow rate of 222 L/s are provided in Table 1.

TABLE 1 – Headloss and Power

| Route # | Approx. Length in km | Headloss (pipe only) m | Power Requirement (70% efficiency) kW | Ranking |
|---|---|---|---|---|
| 1 | 4.65 | 71.9 | 224 | 2 |
| 2 | 4.53 | 70.1 | 218 | 1 |
| 3 | 6.26 | 96.8 | 301 | 5 |
| 4 | 5.47 | 84.6 | 263 | 4 |
| 5 | 5.11 | 79.1 | 246 | 3 |

Route # 2 is the shortest and as a result, less power is required to pump raw sewage from the Doran Road site to the WWTP along this route.

## AVAILABILITY OF APPROVALS

The five routes will require approval from road authorities and possibly from the railway authority and from private property owners. A summary of the approval requirements is provided in Table 2.

TABLE 2 – Summary of Approvals Required

| Approval Authority/Route # | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Gill Road – Twp | Yes | Yes | Yes | Yes | Yes |
| Craig Rd Extension – Twp | Yes | Yes | Yes | No | No |
| Cty Rd 27 – Cty of Simcoe | Yes – crossing only | Yes – crossing only | Yes | Yes | No |
| Hwy 26 – MTO | Yes – crossing only | Yes – crossing only | Yes | Yes | Yes – crossing only |
| Snow Valley Rd. – Cty Rd 43 – Cty of Simcoe | No | No | Yes | Yes | Yes |

| | | | | | |
|---|---|---|---|---|---|
| Railway Line – CN/CPR | Yes | No | No | No | No |
| County of Simcoe Forest Lands north of Hwy 26 | Yes | Yes | No | No | No |
| Private properties south of Hwy 26 | No | Yes | No | No | No |
| Anne St – Twp | Possibly to avoid rail line | Yes – crossing only | No | No | No |
| Doran Road – Twp | No | No | No | Yes | Yes |
| Nature Trail and Park – Twp | No | No | No | Yes | No |
| Finlay Mill Rd - Twp | No | No | No | No | Yes |
| **Ranking** | 5 | 4 | 3 | 2 | 1 |

It is considered that obtaining approvals from the County for the crossing of the forested lands, the railway and the private properties will be onerous if not impossible. Although Routes # 1 and 2 are shorter than the other routes, they are not considered to be feasible with respect to the property owner approvals. Routes # 3 and 4 require approvals from both the County of Simcoe (County Roads 27 and 43) and from the MTO (Hwy 26) in order to install the pipeline along those roads. This is considered to be more onerous than a simple crossing. Route # 5 uses existing Township Roads as much as possible with a crossing of Hwy 27 and an alignment along Snow Valley Road (County Rd 43).

It is considered that Route # 5 is the best option with respect to approvals.

**CONSTRUCTION FEASIBILITY**

There are several factors which may affect the feasibility of construction. These include:

- Feasibility of trenchless technology methods or open trench construction
- Ground conditions including water table level
- Severity of topography
- Creek crossings
- Impact on traffic and residences
- Existing utilities

Each of the five routes was assessed based on these factors. Tables 3 to 7 summarize the considerations.

TABLE 3 – Route 1 - Construction Factors

| Factor | Comment |
|---|---|
| Feasibility of construction | • Open trench can be used on Gill Road<br>• Assuming pipeline is constructed in conjunction with Craig Rd extension, open cut method can be used for that section<br>• Trenchless method may be required across County Forest lands to avoid loss of forest<br>• Construction within railway ROW will be difficult considering train traffic – may require directional drilling with special safety requirements. Likely not feasible. |
| Ground Conditions | • Assumed to be sand with manageable water table over entire route |
| Topography | • Variable topography along Craig Rd extension and across County forest lands will add to the complexity of design and construction |
| Creek Crossings | • Two creek crossings on Craig Rd extension and crossing of Willow Creek within County forest lands |
| Impact on Traffic and Residences | • Minimal impact on traffic on Gill Rd and at crossings of County Rd 27 and Hwy 26<br>• Impact during construction to existing residences on County Rd 27 at pipeline crossing – may require property to be purchased depending on actual final pipeline alignment |
| Existing utilities | • Overhead utilities on Gill Rd and at crossings of County Rd 27 and Hwy 26<br>• Crossing of existing Twp watermain required on Hwy 26 |

TABLE 4 – Route 2 – Construction Factors

| Factor | Comment |
|---|---|
| Feasibility of construction | • Open trench can be used on Gill Road<br>• Assuming pipeline is constructed in conjunction with Craig Rd extension, open cut method can be used for that section<br>• Trenchless method may be required across County Forest lands to avoid loss of forest<br>• Trenchless method may be required across private lands to the south of |

| | |
|---|---|
| | Hwy 26 and across Anne St. |
| Ground Conditions | • Assumed to be sand with manageable water table over entire route |
| Topography | • Variable topography along Craig Rd extension and across County forest lands will add to the complexity of design and construction |
| Creek Crossings | • Two creek crossings on Craig Rd extension and crossing of Willow Creek within County forest lands |
| Impact on Traffic and Residences | • Minimal impact on traffic on Gill Rd and at crossings of County Rd 27 and Hwy 26<br>• Impact during construction to existing residences on County Rd 27 at pipeline crossing – may require property to be purchased depending on actual final pipeline alignment<br>• Impact during construction to existing residences on Hwy 26 at pipeline crossing – may require property to be purchased depending on actual final pipeline alignment |
| Existing utilities | • Overhead utilities on Gill Rd and at crossings of County Rd 27 and Hwy 26<br>• Crossing of existing Twp watermain required on Hwy 26 |

TABLE 5 – Route 3 – Construction Factors

| **Factor** | **Comment** |
|---|---|
| Feasibility of construction | • Open trench can be used on Gill Road<br>• Assuming pipeline is constructed in conjunction with Craig Rd extension, open cut method can be used for that section<br>• County may require trenchless method along Cty Rd 27 and across Willow Creek to avoid damage to the Creek.<br>• Traffic safety will be a major concern to both the County and the MTO during construction along County Rd 27, Hwy 26 and on Snow Valley Rd (Cty Rd 43). |
| Ground Conditions | • Assumed to be sand with manageable water table over entire route |
| Topography | • Variable topography along Craig Rd extension will add to the complexity of design and construction |
| Creek Crossings | • Two creek crossings on Craig Rd extension and crossing of Willow Creek on Cty Rd 27 |
| Impact on Traffic and | • Minimal impact on traffic on Gill Rd |

| | |
|---|---|
| Residences | • Impact during construction to existing residences and businesses on County Rd 27 and Hwy 26 – may require property to be purchased depending on actual final pipeline alignment along Craig Rd extension<br>• Major impact during construction to existing residences and businesses on Snow Valley Road |
| Existing utilities | • Overhead utilities on Gill Rd. Cty Rd 27, Hwy 26 and along Snow Valley Road<br>• Crossing of existing Twp watermains required on Hwy 26 and along Snow Valley Road<br>• Possible gas mains along Snow Valley Road |

TABLE 6 – Route 4 – Construction Factors

| **Factor** | **Comment** |
|---|---|
| Feasibility of construction | • Open trench can be used on Gill Rd. and Doran Rd.<br>• Trenchless method will be required along Twp trail and across Willow Creek and park<br>• Traffic safety will be a major concern to both the County and the MTO during construction along County Rd 27, Hwy 26 and on Snow Valley Rd (Cty Rd 43). |
| Ground Conditions | • Assumed to be sand with manageable water table over entire route |
| Topography | • Generally not a factor except at crossing of Willow Creek on Twp trail. |
| Creek Crossings | • Willow Creek on Twp trail |
| Impact on Traffic and Residences | • Moderate impact on traffic and residences on Gill Rd<br>• Major impact on traffic and residences on Doran Road including access to school<br>• Disruption of use of trail during construction in that area<br>• Impact during construction to existing residences and businesses on County Rd 27 and Hwy 26 – may require property to be purchased depending on actual final pipeline alignment<br>• Major impact during construction to existing residences and businesses on Snow Valley Road |
| Existing utilities | • Overhead utilities on Gill Rd., Doran Rd., Cty Rd 27, Hwy 26 and along Snow Valley Road<br>• Crossing of existing Twp watermains required on Doran Rd., Hwy 26 |

| | |
|---|---|
| | and along Snow Valley Road<br>• Possible gas mains along Doran Rd. and Snow Valley Road |

TABLE 7 – Route 5 – Construction Factors

| **Factor** | **Comment** |
|---|---|
| Feasibility of construction | • Open trench construction method can be used on all streets along this route<br>• Crossing of Willow Creek on Finlay Mill Rd may require insulated pipe to be supported by existing bridge or trenchless installation under the creek. Both methods are considered to be feasible |
| Ground Conditions | • Assumed to be sand with manageable water table over entire route |
| Topography | • Generally not a factor |
| Creek Crossings | • Willow Creek on Finley Mill Rd. |
| Impact on Traffic and Residences | • Moderate impact on traffic and residences on Gill Rd<br>• Major impact on traffic and residences on Doran Road and on Finlay Mill Road<br>• Major impact during construction to existing residences and businesses on Snow Valley Road |
| Existing utilities | • Overhead utilities on Gill Rd., Doran Rd., and along Snow Valley Road<br>• Crossing of existing Twp watermains required along entire route<br>• Possible gas mains along Doran Rd. Finlay Mill Road and Snow Valley Road |

Route # 5 is considered to be the best option based on construction feasibility factors. It is the only route that entirely follows existing roads.

**ENVIRONMENTAL ISSUES**

Each Route was assessed based on the list of effects as provided in Appendix 2 of the MEA Class EA Document (copy of Appendix 2 attached). The following is a "high level" assessment only.

SURFACE DRAINAGE SYSTEM

All five routes will require erosion control measures to mitigate damage to water courses during construction and mitigation measures to prevent ponding of water off site. It is considered that no particular route is the best with respect to surface water drainage.

GROUNDWATER

It is considered that none of the five routes will impact groundwater to any great extent. Measures will be required to prevent contamination of groundwater supplies along all five routes. It is considered that no particular route is the best with respect to groundwater issues.

FISH, AQUATIC WILDLIFE AND VEGETATION

Three of the routes (Routes 1, 2 and 3) require crossing of three creeks. Routes 4 and 5 require only one crossing of Willow Creek. Although all crossings will likely be carried out using trenchless technology, the potential for impact to fish, aquatic wildlife and vegetation is always present. Therefore, Routes 4 and 5 are considered to be the best alternatives. It is also considered that since the crossing of Willow Creek on Finlay Mill Road will be easier than along the Township trail, Route 5 is the best option with respect to protection of aquatic life.

TERRESTRIAL VEGETATION AND WILDLIFE

Routes 1, 2, 3 and 4 all have some portion of construction through green field areas. Therefore, Route # 5 is considered the best option with respect to protection of terrestrial vegetation and wildlife.

HERITAGE RESOURCES

Although archeological assessments have not been undertaken to date on any of the proposed routes, it is noted that Route 5 (since it is along established roadways) is the least likely to encounter heritage resources. Regardless of the route selected, some form of archeological assessment will be completed as part of the final design process. It is considered that Route 5 is the best option to protect/avoid heritage resources.

AGRICULTURAL

It is considered that none of the routes will impact agricultural lands.

RESIDENTIAL, INSTITUTIONAL, COMMERCIAL AND INDUSTRIAL

Routes 1 and 2 will have the least impact on existing developed properties (on Gill Rd and at crossing of County Rd 27). Routes 3, 4 and 5 will have a greater level of impact on existing residential and commercial properties along Gill Rd, Doran Rd., Finlay Mill Rd., Hwy 26 and Snow Valley Road. However, it is considered that the most severe impact will be along Route 5 – Finlay Mill Rd. (more residential). Therefore, Routes 1 and 2 are considered to be the best options for avoiding impact to existing residential and commercial properties.

OUTDOOR RECREATION

Routes 1 and 2 may have a slight impact on the recreational availability of the County forest lands and Route 4 will impact the use of the Township trail and park during construction. Therefore, it is considered that Routes 3 and 5 are the best options for avoiding access to recreational facilities during construction.

SOILS GEOLOGY

Route 5 is the only route that is entirely along existing road allowances and therefore is the only route that will have minimal impact on existing soils (loss of topsoil and erosion of soils).

TOPOGRAPHY/LANDFORMS

Route 5 is the only route that is entirely along existing road allowances and therefore is the only route that will have minimal impact on existing landforms.

CLIMATIC FEATURES

Routes 1, 2 and 3 may involve removal of vegetation to allow for the installation of the pipeline. Route 4 may also require removal of vegetation along the Township trail. Therefore, Route 5 is the only route that will ensure no major loss of existing vegetation thus protecting climatic features.

PUBLIC HEALTH

It is considered that the major effect related to public health is the exhaust emissions from construction equipment. Although construction activities along all five routes will produce exhaust emissions, the effect along Route 5 will have the worst impact (proximity to existing residences). Routes 1 and 2 would have the least impact on public health.

OPERATIONAL AND CONSTRUCTION NOISE

There should not be any operational noise produced as a result of the installation of the forcemain along any of the routes. However, noise will be produced during periods of forcemain construction. The noise will impact existing residences, schools and commercial establishments. Routes 1 and 2 would have the least impact with respect to construction noise.

SUMMARY

A summary of environmental impact rankings is provided in Table 8.

TABLE 8 – Environmental Effects - Rankings

| **Effect** | **Route 1** | **Route 2** | **Route 3** | **Route 4** | **Route 5** |
|---|---|---|---|---|---|
| Surface Drainage System | equal | equal | equal | equal | equal |
| Groundwater | equal | equal | equal | equal | equal |
| Fish, Aquatic Wildlife and Vegetation | high | high | high | moderate | minimal |
| Terrestrial Vegetation and Wildlife | high | high | moderate | moderate | minimal |
| Heritage Resources | moderate | moderate | moderate | moderate | minimal |
| Agricultural | equal | equal | equal | equal | equal |
| Residential, Institutional, Commercial and Industrial | minimal | minimal | moderate | moderate | high |
| Outdoor Recreation | moderate | moderate | minimal | high | minimal |
| Soils Geology | moderate | moderate | moderate | moderate | minimal |
| Topography/Landforms | high | high | high | moderate | minimal |
| Climatic Features | moderate | moderate | moderate | moderate | minimal |

| | | | | | |
|---|---|---|---|---|---|
| Public Health | minimal | minimal | moderate | moderate | high |
| Operational and Construction Noise | minimal | minimal | moderate | moderate | high |
| **Overall Ranking** | **moderate** | **moderate** | **moderate** | **moderate** | **minimal** |

The above evaluations and rankings are subjective and assume equal weighting for all listed effects. Route 5 has a slightly less impact on the environment as compared to the other four routes. However, if weighting factors were to be applied to each effect, this assessment would need to be revisited.

**CAPITAL COST ESTIMATE**

Unit prices for pipeline installation include all construction requirements (reinstatement) and are as follows

- $1000 /m for 350 mm dia pipe by open trench in an existing road allowance
- $1200/m for 350 mm dia pipe installed by trenchless methods
- %5,000/m for encased crossings of Hwy.
- $1500/m for 350 mm dia pipe installed by open trench across greenfield area (wooded area)
- $800/m for 250 mm dia pipe by open trench in an existing road allowance
- $50,000 for valve chambers (assume one every 500 m of pipeline length – add 2 additional on Routes 1 and 2 to allow for variable topography)

A spreadsheet is attached, outlining the preliminary capital cost estimates. Based on this analysis, Route # 5 is the best option.

**OPERATING REQUIREMENTS**

The primary factor related to the operation and maintenance of the forcemain is accessibility. Length and number of valve chambers was also considered. The assessment is provided in Table 9.

TABLE 9 – Operation and Maintenance Assessment

| **Factor**<br><br>**Route#** | **Accessibility** | **Length km** | **No. of Valve Chambers** | **Ranking** |
|---|---|---|---|---|
| 1 | - difficult within County forest lands (need road)<br>- dangerous along railway and may not be allowed<br>- road access along Gill Rd and Craig Rd | 4.65 | 9 | Worst |
| 2 | - difficult within County forest lands (need road)<br>- difficult within private lands south of Hwy 27 (need road)<br>- road access along Gill Rd and Craig Rd | 4.53 | 9 | Worst |
| 3 | - safety concern along County Rd 27 and Hwy 26<br>- road access along Gill Rd, Craig Rd and Snow Valley Rd | 6.26 | 12 | Moderate |
| 4 | - difficult access along Twp trail and across park lands<br>- safety concern along County Rd 27 and Hwy 26<br>- road access along Gill Rd., Doran Rd., and Snow Valley | 5.47 | 11 | Moderate |

| | | | | |
|---|---|---|---|---|
| | Road | | | |
| 5 | - road access available for entire length<br>- safety concern at crossing of Hwy 27 | 5.11 | 10 | Best |

Based on the factors considered, Route # 5 is the best option for ease of accessibility.

**CONCLUSION**

Route # 5 is the best option in every assessment category except for pipeline length and power requirements. Although Route #5 is not the shortest route, the following factors make it the best option:

- Easily available approvals and no private property required
- Most feasible for construction allowing for mitigation of construction impacts in residential areas
- Least impact on the environment
- Least capital cost
- Easy access for operation and maintenance

In conclusion, it is recommended that Route # 5 (as presented in the Master Plan) be adopted as the forcemain route from the Doran Road development area to the proposed site of the WWTP.

S:113027/correspondence/memos/RM Forcemain Route Options Nov 2015

# MIDHURST FORCEMAIN CAPITAL COST ANALYSIS

Ainley Group File Number: 113027

| | | Route 1 | | Route 2 | | Route 3 | | Route 4 | | Route 5 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Unit Cost | Quantity | Cost | Quantity | Cost | Quantity | Cost | Quantity | Cost | Quantity | Cost |
| Open Cut - Road 350mm diameter | $1,000 /m | 330 m | $330,000 | 330 m | $330,000 | 4000 m | $4,000,000 | 4370 m | $4,370,000 | 4900 m | $4,900,000 |
| Open Cut - Road 250mm diameter | $800 /m | 1000 m | $800,000 | 1000 m | $800,000 | 1000 m | $800,000 | | | | |
| Creek Crossing - Directional Drill 350mm diameter | $1,200 /m | 300 m | $360,000 | 300 m | $360,000 | 260 m | $312,000 | 100 m | $120,000 | 100 m | $120,000 |
| Encased crossing of Hwy 26 | $5,000 /m | 50 m | $250,000 | 50 m | $250,000 | 50 m | $250,000 | 50 m | $250,000 | 50 m | $250,000 |
| Highway 26 Direction Drill 350mm diameter | $1,200 /m | | | | | 1000 m | $1,200,000 | 1000 m | $1,200,000 | | |
| Open Cut - Greenfield 350mm diameter | $1,500 /m | 3920 m | $5,880,000 | 3800 m | $5,700,000 | 1000 m | $1,500,000 | | | | |
| Valve Chamber | $50,000 | 11 | $550,000 | 11 | $550,000 | 12 | $600,000 | 11 | $550,000 | 10 | $500,000 |
| CONSTRUCTION COST | | $8,170,000 | | $7,990,000 | | $8,662,000 | | $6,490,000 | | $5,770,000 | |
| Property Allowance | | $200,000 | | $400,000 | | N/A | | N/A | | N/A | |
| SUBTOTAL | | $8,370,000 | | $8,390,000 | | $8,662,000 | | $6,490,000 | | $5,770,000 | |
| ENGINEERING (15%) | | $1,255,500 | | $1,258,500 | | $1,299,300 | | $973,500 | | $865,500 | |
| CONTINGENCY (5%) | | $418,500 | | $419,500 | | $433,100 | | $324,500 | | $288,500 | |
| **TOTAL CAPITAL COST** | | **$10,044,000** | | **$10,068,000** | | **$10,394,400** | | **$7,788,000** | | **$6,924,000** | |

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routes

Township of Springwater

# TOWNSHIP OF SPRINGWATER
# FORCEMAIN OPTIONS
# ROUTE 1

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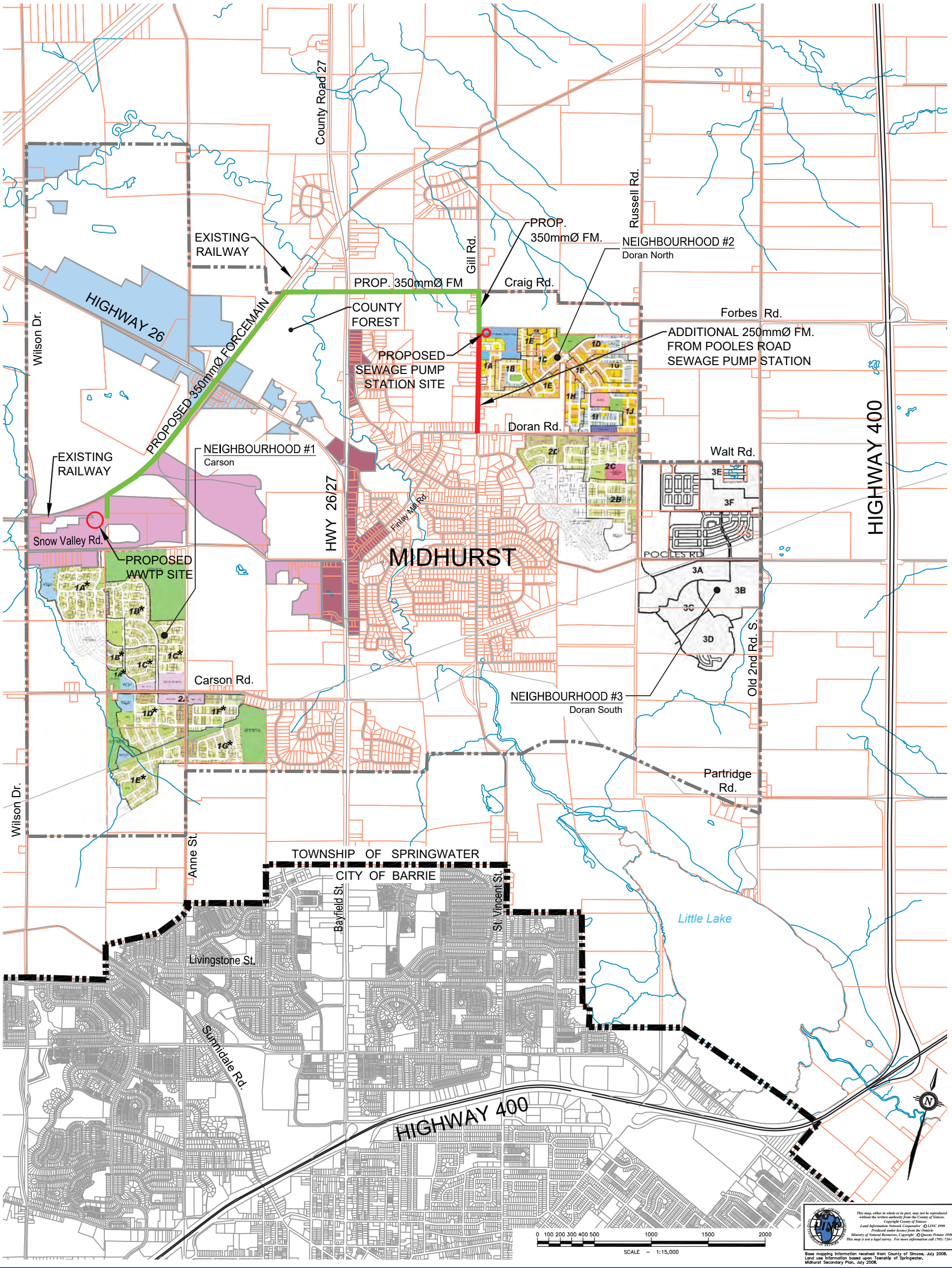


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## MIDHURST SECONDARY PLAN SERVICING

DWG. 113027-FM1

Township of Springwater

# TOWNSHIP OF SPRINGWATER
# FORCEMAIN OPTIONS
# ROUTE 2

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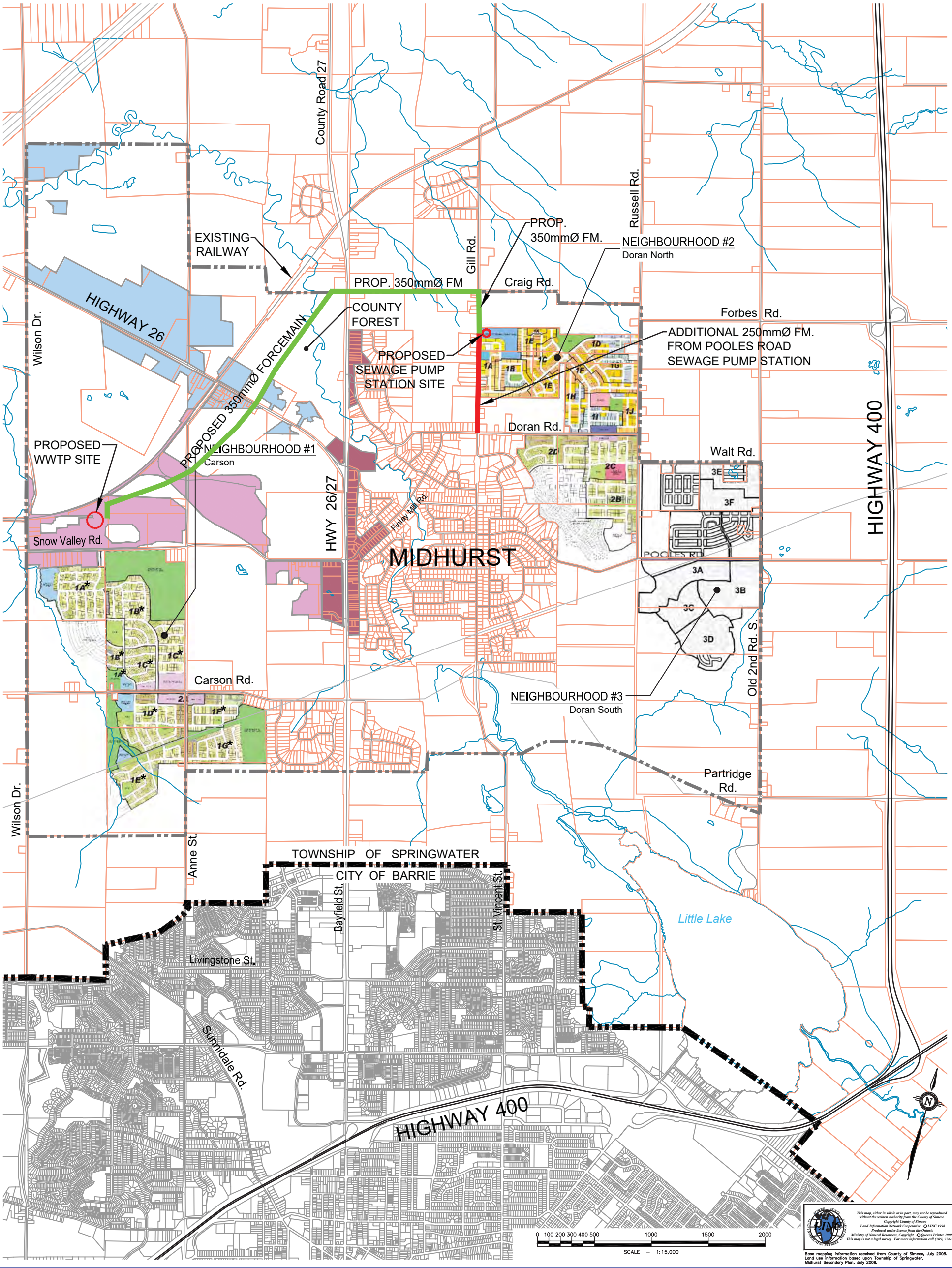


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Land use information based upon Township of Springwater, Midhurst Secondary Plan, July 2008.

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## MIDHURST SECONDARY PLAN SERVICING

DWG. 113027-FM2

Township of Springwater

# TOWNSHIP OF SPRINGWATER
# FORCEMAIN OPTIONS
# ROUTE 3

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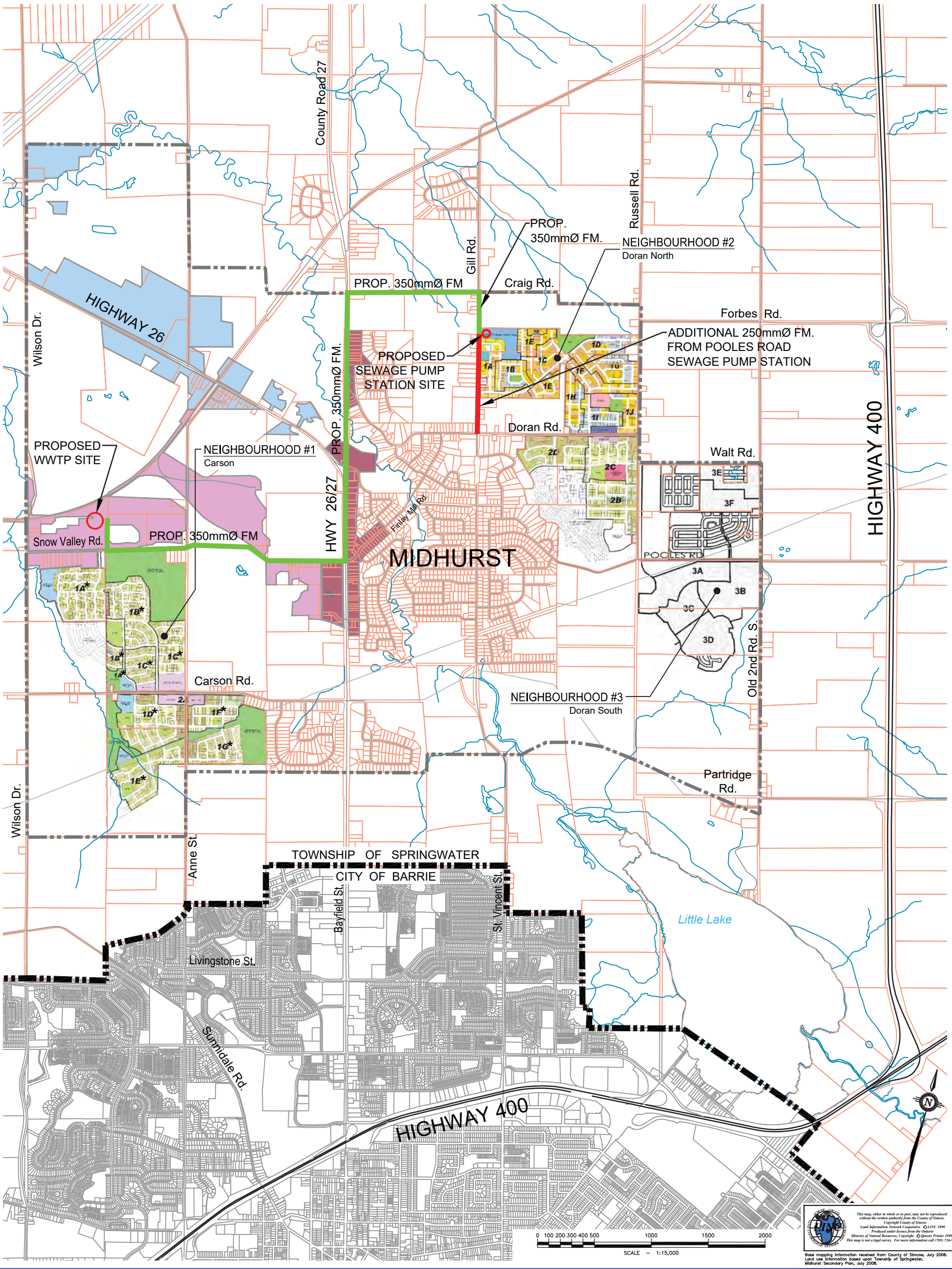


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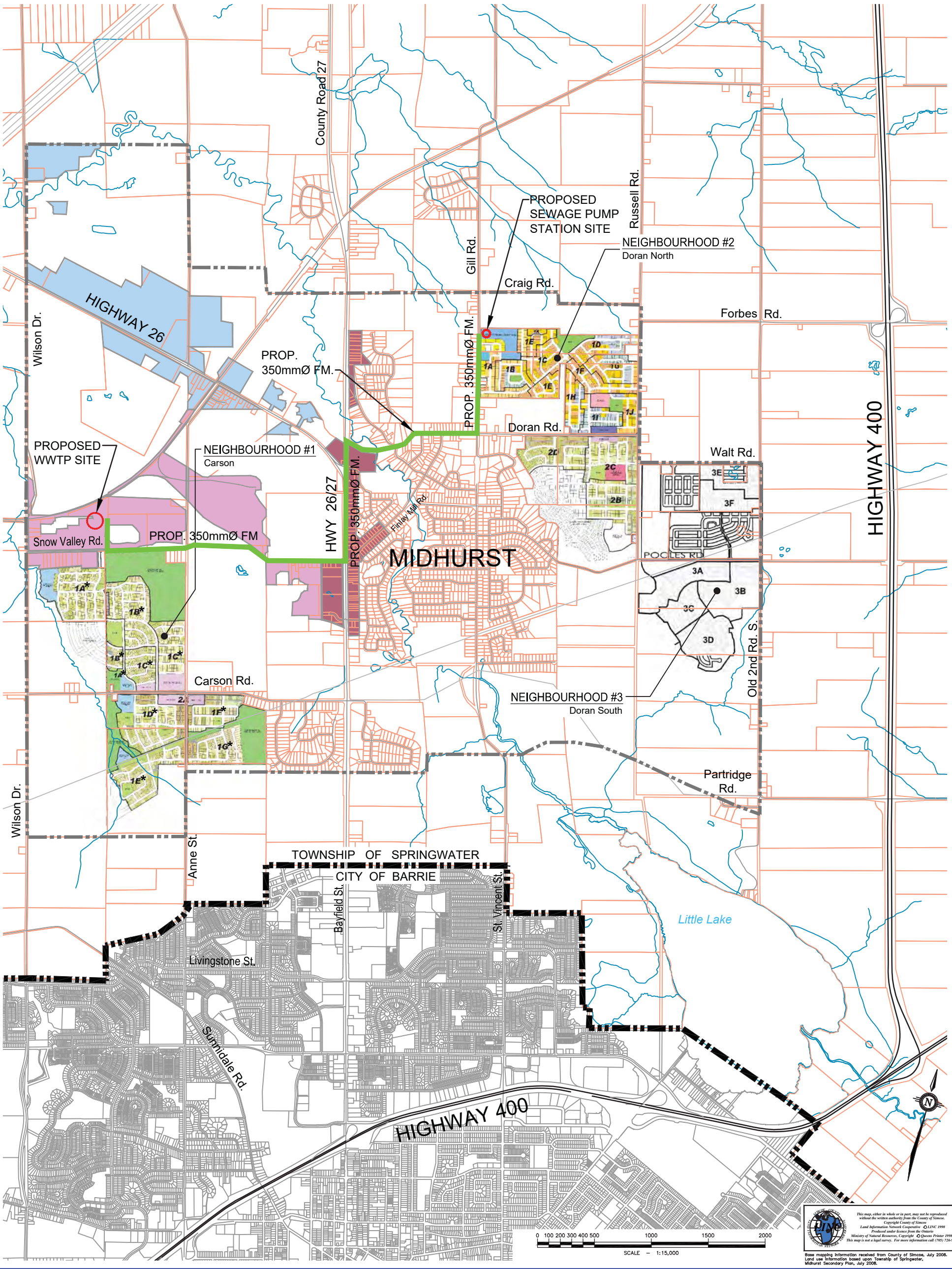
## MIDHURST SECONDARY PLAN SERVICING

DWG. 113027-FM3

Township of Springwater

# TOWNSHIP OF SPRINGWATER
# FORCEMAIN OPTIONS
# ROUTE 4

Ainley CONSULTING ENGINEERS PLANNERS

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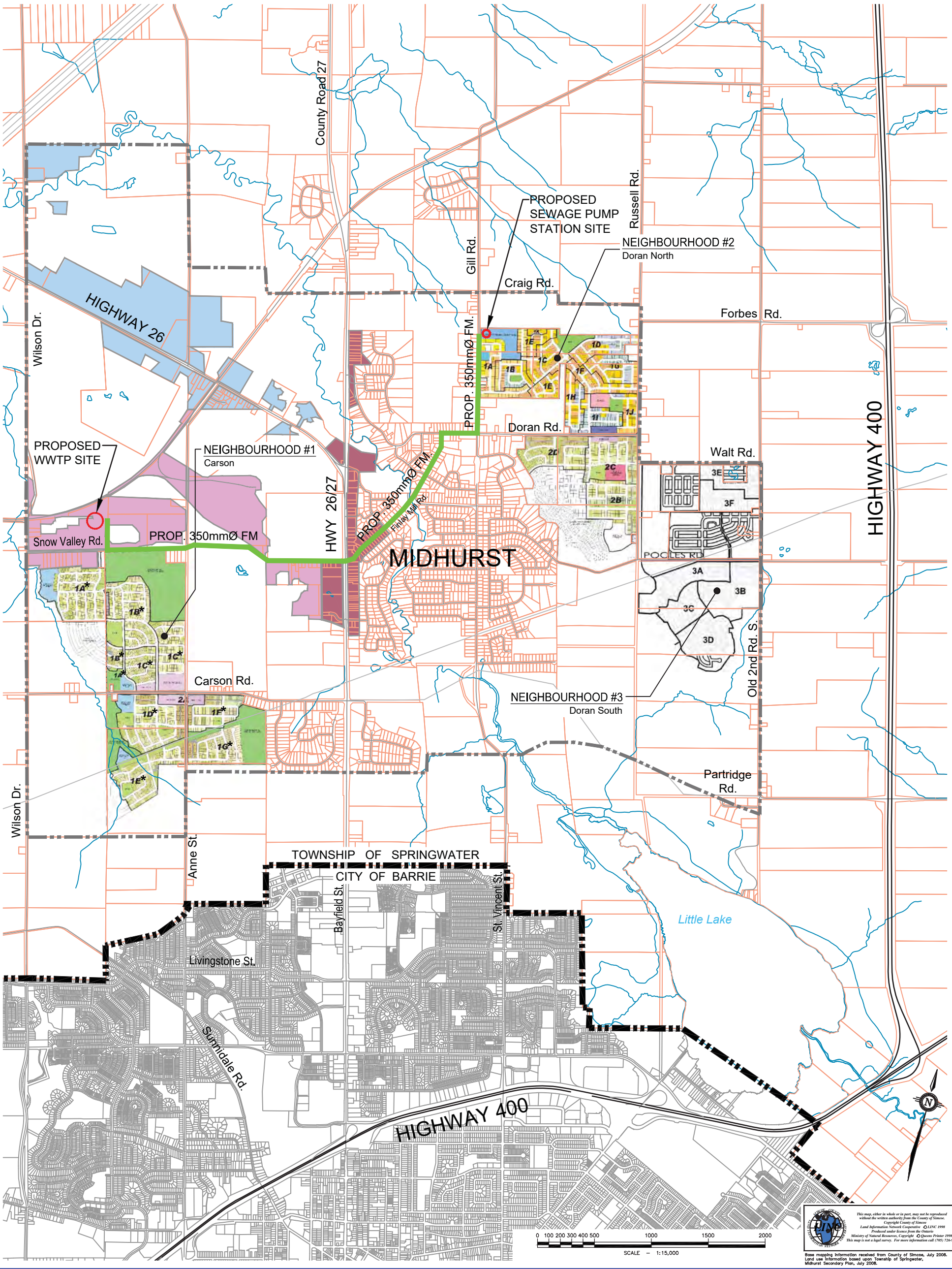
## MIDHURST SECONDARY PLAN SERVICING

DWG. 113027-FM4

Township of Springwater

# TOWNSHIP OF SPRINGWATER
# FORCEMAIN OPTIONS
# ROUTE 5

Ainley CONSULTING ENGINEERS PLANNERS

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## MIDHURST SECONDARY PLAN SERVICING

DWG. 113027-FM5

# APPENDIX 'AA'

## Special Council Meeting
## March 8, 2017

# MEMORANDUM

**Ainley & Associates Limited**
280 Pretty River Parkway, Collingwood, ON L9Y 4J5
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Email: collingwood@ainleygroup.com

To: **Midhurst Class EA Steering Committee**

From: **Joe Mullan**

Date: **April 21, 2017**

Ref: **Midhurst Class EA**
**Special Council Meeting of March 8, 2017**
**Responses to Delegations/Presentations**

File: **113027**

During the Township of Springwater Special Council Meeting of March 8, 2017, six formal delegations/presentations and five individuals who provided comments in relation to the Midhurst Class EA.

In response to these delegations/presentations and comments we have prepared the following high-level summaries of the comments/concerns raised and our responses.

It should be noted that the delegations/presentations were made to Council and nothing was formally received through the Class EA process. Therefore our interpretation of their comments is based upon the slides submitted to the Township (where available) and the presentations taken from the YouTube video. Further as these individuals have not submitted material through the Class EA process, we are not proposing to respond directly to them, but will be adding this Memorandum and associated attachments into the Environmental Study Report.

## 1. Bernard Pope representing the Simcoe County Federation of Agriculture

*a) Farmers are under scrutiny because of the Surface Water Protection Act and therefore the Developers should have no exemptions from that legislation.*

Agreed, the proposed developments within Midhurst are not exempt from meeting the requirements/conditions of the Surface Water Protection Act. In addition, the works proposed under the Midhurst Class EA, will also meet the Surface Water Protection Act.

*b) Wants conditions placed on any Township Development Approvals, protecting the farmers from any surface water damage that may occur as a result of the proposed development.*

The Standard Township Subdivision Agreement includes clauses protecting the downstream landowners.

Independent of the Midhurst Class EA, an Overall Stormwater Drainage Plan is being prepared for the Midhurst Secondary Plan. The stringent conditions that have been imposed on the Stormwater associated with the developments within the Midhurst Secondary Plan will protect the downstream watercourses. In particular, through the NVCA's Minutes of Settlement and Draft Plan Conditions associated with each development, the stormwater management system(s) must, among many other things, have:

- The ability to hold back the first 25 mm of storm runoff for a period of 48 hours.

- The ability to infiltrate back into the ground, close to the source, aiming for the first 25 mm of rainfall while also ensuring a healthy hydrologic cycle.

*c) Wants no pollution downstream MSP area.*

The impacts of the proposed Developments on the watershed (Creeks and Minesing Wetlands) have been assessed and documented in detail as part of the Class EA planning process. The completion of the Overall Phosphorus Budget for the Midhurst Secondary Plan has confirmed that the have there will be no measurable increase in Phosphorus in the Creek as a result of the Midhurst Secondary Plan. In addition, the Midhurst Developers Group is committed to working with the Nottawasaga Valley Conservation Authority (NVCA) & Ministry of Environment & Climate Change (MOECC) to achieving a net-zero increase in phosphorus, if required.

*d) Stormwater management ponds cannot be allowed to overflow onto agricultural lands – deposition of silt on farmlands is illegal.*

Agreed. All stormwater flows from the new development will be designed and constructed to prevent any impact to downstream lands.

*e) Roundabouts and intersection improvements on any new roads must be designed to be large enough in diameter to accommodate large farm equipment.*

Agreed. The design of any proposed traffic roundabouts will consider large farm equipment.

*f) Curbs on roundabouts must not be vertical.*

Agreed.

g) *Width of new roads should be designed to accommodate large farm equipment*.

The new roads within the proposed developments will be designed and constructed in accordance with the Township Standards. However, it is not anticipated that large Farm Equipment will be travelling through the new residential subdivisions.

*h) Width of reconstructed existing roads should be designed to accommodate large farm equipment.*

Noted. This will be a design consideration.

*i) Shoulders at reconstructed intersections should not have raised curbs.*

Usually when reconstructing an existing intersection in built up areas to accommodate “new” left or right lanes there are property restrictions, and it may not be possible to provide adequate protection between the travelled roadway and the pedestrians at the intersections, without the use of a “barrier” curb. However, most of the existing intersections that are to be reconstructed will not have large Farm Equipment travelling through them. In areas where this is possible, the request will be taken into consideration.

*j) Speed limits should be set to allow for slow farm vehicles and speed limits must be enforced.*

The speed limits on new roads within the proposed developments will be set at 50km/hr and on upgraded existing roads, the speed limit will be determined in consultation with the Township and/or County (where applicable).

The enforcement of speed limits is OPP matter.

*k) Incorporate all of the above into Township policies for any new road works.*

Request noted. Discussion will be held with Township.

**2. Tim Lotimer – Lotimer & Associates Ltd. representing the Midhurst Ratepayers Association**

In response to the comments from Mr. Lotimer, Golder Associates have prepared the attached Memorandum dated April 8, 2017. We have identified the key issues that were raised and provide an overview of the response provided by Golder.

*a) The hydrogeological study does not include a complete survey of private wells use and the potential for impacts to these private wells.*

A complete survey of private wells has not been done nor is it required by the Ministry of Environment & Climate Change (MOECC) when applying for a Permit To Take Water (PTTW). In addition when Golder when applied for and received the PTTW's for the Township of Springwater at Anton Mills, Minesing, or Del Trend, plus dozens of other municipalities in Simcoe County a complete survey of private wells was note required. Furthermore, neither the Township of Springwater, the City of Barrie nor any other municipality in Simcoe County have ever done this for any of their municipal water systems.

When compared to a door-to-door survey, an examination of potential impacts through an examination of the water well records and the development of a calibrated computer model, results in more actual usable data that can be used to evaluate the available water resources of an entire area. Thus, in Golder's professional opinion, a door to door survey are not the most reliable way to measure impacts.

Slide 6 of Mr. Lotimer's presentation is misleading because it gives the impression that a large number of wells may experience significant drawdown. Slide 6 shows the drawdown cone for Aquifer 3, however, almost all of the private wells in the area are completed within shallower aquifer A1 or Aquifer A2, which is hydraulically separated from direct drawdown from wells operating in Aquifer A3 or A4 and has nominal drawdown compared to A3.

*b) An assessment of the possible limitations to land use within the new Well Head Protection Areas has not been completed.*

The recently approved Source Water Protection Plan for Midhurst, Del Trend and Snow Valley, Water Systems, all of which draw water from deep Aquifer A3, indicates the only area of high aquifer vulnerability is within a 100m radius around the supply wells themselves ("WHPA-A) (Approved Assessment Report: "*Nottawasaga Valley Source Protection Area – South Georgian Bay-Lake Simcoe Source Protection Committee*, 2015). Outside of the WHPA-A no land use restrictions on farming and domestic land use practices were recommended as part of the Source Water Protection Plan. The 100 m WHPA-A for the proposed wells is **within** the proposed development area for houses.

This is a common circumstance throughout Simcoe County and Barrie where municipal wells are within built-up areas and homes are located within the WHPA-A.

*c) The hydrogeological study does not include an assessment of stream flow reductions along reaches of Willow and Matheson Creek.*

Groundwater baseflow reductions within the Willow Creek watershed were evaluated and described in Section 6.3 of Appendix M of the Hydrogeological Study. It was found that post-development baseflow loss was minor throughout the year with a maximum reduction of less

than 10%. Golder also predicts that groundwater taking for the Midhurst Secondary Plan Area will lead to a maximum baseflow reduction in Willow Creek of 8.7% in the late summer. Ministry of Environment & Climate Change (MOECC) / Ministry of Natural Resources and Forestry (MNRF) threshold is 20% in a cold water stream. The predicted baseflow loss is well below the 20% maximum allowed. In addition, the Department of Fisheries (DFO) requirement is that a cumulative flow alteration of less than 10% of the instantaneous flow will "…have a low probability of detectable impacts to ecosystems that support commercial, recreational of Aboriginal fisheries." Therefore, the predicted reduction of 8.7% is undetectable and therefore, not a concern.

In addition, the base flow reduction calculations, do not take into consideration the 140L/s of treated effluent that will be discharged back into Willow Creek, nor the extensive use of Low Impact Development measures through the Midhurst Secondary Plan which will promote groundwater recharge.

*d) The hydrogeological study does not include an assessment of the impact to the Minesing wetland complex.*

See response to item c) above.

*e) Township should measure the normal pumping level in all private wells within the Willow Creek sub-watershed and compare this to the predicted interference from future pumping of new wells.*

See response to item a) above.

*f) A complete door-to-door survey of existing wells should be completed – not found in Golder information.*

See response to item a) above.

*g) Ministry of Environment & Climate Change (MOECC) well records are incomplete and there are wells within both the deep and shallow aquifers that are within the zone-of-influence of future pumping.*

Within the attached Memo from Golder the following is noted:

- There are no wells located within the 2-metre drawdown cone for any of the proposed wells in Aquifer A1. There are 11 wells located within the 1.5-metre drawdown cone, which have a water column above the well screen of between 6 and 14 m. None of these wells are expected to be vulnerable to a loss of water as a result of the proposed water taking;

- There are 16 wells within the 2-metre drawdown cone for Aquifer A2 and they have a water column above the well screen of between 10 and 34 m. None of these wells are expected to be vulnerable to a loss of water supply as a result of the proposed water taking.

- There are three wells within the 2-metre drawdown cone for Aquifer A3 and these wells have a water column above the well screen of between 46 and 71 m. It is not expected that these wells will be vulnerable to a loss of water supply as a result of the proposed water taking.

- There are three wells within the 2-metre drawdown cone for Aquifer A4 and one well constructed in the bedrock aquifer. These wells have a water column above the well screen of between 69 and 112 m. It is not expected that these wells will be vulnerable to a loss of water supply as a result of the proposed water taking.

Golder also re-confirms that impacts to private water supply wells are not expected.

In addition, and prior to a Permit to Take Water (PTTW) of the various wells being received from Ministry of Environment & Climate Change (MOECC) over the next 20 years detailed aquifer performance testing is required in conjunction with the application for a Permit to Take Water. Also, the Permit to Take Water process involves the MOECC posting the proposed application for Public comment on the Environmental Registry of the Ontario Ministry of Environment & Climate Change.

*h) Pumping from deep aquifers causes drawdown in shallower aquifers.*

See response to item g) above.

*i) Some of the new wells will capture water that currently flows to existing Midhurst municipal wells – cause impact.*

The slight overlap in the 10 to 25 year time of travel capture zone for the Greenpine and Idlewood wells with TW21 and TW24 in no way affects the ability of the existing wells to continue to provide water. The groundwater flow model accounts for all of the municipal water taking in Midhurst, not just the new wells.

*j) Proposed water taking is considered to be consumptive.*

Virtually all municipal groundwater taking in Simcoe County and City of Barrie is a consumptive water use. Defining a water taking as consumptive does not mean that the water taking is not sustainable. The aquifer testing and groundwater flow model both indicate that the groundwater supply for existing Midhurst, the future Midhurst development, including the groundwater use in the City of Barrie, is sustainable." See also, the Hutchinson Environmental Service Limited (HESL) Memorandum dated March 30, 2017.

*k) Pumping of wells can reduce the groundwater discharge to a wetland or a stream.*

See response to item c) above.

*l) Sewage discharge does not replace the water that will be removed from the streams as a result of well pumping.*

Baseflow reduction is less than 10% - well below the 20% maximum as established by the MNRF and the 10% limit determined by the Department of Fisheries (DFO).

*m) Combined pumping of all new wells at the required volume should be undertaken for at least 30 days to determine impact to existing wells and aquifers.*

Golder has confirmed that the 3 day pumping tests, such as those conducted in Midhurst, are an industry standard and reliable method of estimating well yield and aquifer properties.

In addition, extending the length of these tests would not provide more accurate/useful results. It is the first day of pumping data that are important in analysis of aquifer transmissivity and storage. Thirdly, long-term groundwater impacts were predicted using a calibrated groundwater model that simulated all proposed operational wells using full build-out pumping rates. The model considers a 10-year simulation provides better data, than the approach suggested by Mr. Lotimer.

Finally, the groundwater flow model was calibrated based on the results of the pumping tests. These included the interference among the aquifers that was noted at TW21. The drawdown predicted in the shallow wells is representative of the results of the pumping tests.

*n) What is the water quality like?*

All water quality data is contained in Chapter 4 and related appendices of the Hydrogeological Study and complies with the Ontario Drinking Water Objectives.

**3. Michele Bowman – 2433 Russell Road (based on YouTube presentation and hard copy of comments)**

*a) Objects to proposed 4 lanes on Russell Rd.*

Subsequent to the Public Information Centre and the questions raised by the interested parties about the timing of the 4 lanes on Russell Road, we have re-evaluated the timing and are now proposing that the 4 lanes on Russell Road not be constructed until Phase 2 Stage 1. At that time (estimated to be after 2031) the 4 lanes are required to provide a suitable route for the traffic from the proposed development areas south of Doran and Walt Road, travelling south, to get easy access to Highway 400.

*b) Suggests that Craig Road be designed as a 4 lane road and leave Russell as 2 lane – will encourage traffic to by-pass Midhurst via Craig Rd.*

This option would not provide a suitable route for the traffic from the proposed development areas south of Doran and Walt Road to get easy access to Highway 400 and would in turn promote more traffic to utilizes Pooles Rd & St Vincent St to travel south.

*c) Opposed to 5 lanes of road at the intersection of Doran and Russell (location of her driveway) – this will require encroachment onto her property.*

The design of the intersection upgrade at Doran Road and Russell Road will require 5 lanes as a result of the 4-lane roadway and a turning lane. It is not anticipated that any property will be required on the east side of Russell Road to accommodate this.

*d) Objects to commercial development on west side of Russell and along Doran Rd. – relocate commercial to proposed Craig Rd. alignment.*

This is a Planning matter and outside the scope of the Class EA.

*e) Objects to the proposed height of the buildings across from her property.*

This is a Planning matter and outside the scope of the Class EA.

*f) Wants a lower speed limit on Russell Rd.*

We anticipate the speed limit on Russel Rd will be 50km/hr, however, this will be determined by the Township after the reconstruction.

*g) Wants a bicycle/running trail along Russell Rd.*

We agree and the proposed concert for Russel Road, includes a trail along the east side.

*h) Wants maximum tree planting along Russell Rd as a buffer from the development.*

Most of the east side of Russell Road, north of Walt Road will not be developed and stay and should not require additional tree planting. However in areas in front of exiting houses we would be in favour of additional tree planting being included as part of the detailed design in the future.

*i) Wants a rural type of ditch system.*

We acknowledge the request and anticipate that during Phase 1 Russell will stay as a rural cross-section, however to accommodate the four lanes after 2013 will require curb and gutter.

*j) Wants Township to "create a natural blend to the rural community."*

Acknowledged and where possible this will be incorporated into the design.

*k) Create a Township standard that will enforce the developers to construct a 7.5 m wide buffer between the existing rural community and the proposed development or lower the building height to single floor along Russell and Doran.*

This is a Planning matter and outside the scope of the Class EA.

*l) Wants the creation of a "trail destination park" for community use.*

This is a Planning matter and outside the scope of the Class EA.

*m) Does not want the creation of a destination for commercial traffic on Doran Rd.*

This is a Planning matter and outside the scope of the Class EA.

*n) Does not want any of her property to be expropriated.*

As noted above, it is not the intent of the Class EA planning process to take any of her property.

*o) North and South Doran Road Developments could have a through traffic route within its boundaries to Craig Rd minimizing the effect on existing residents.*

The proposed development north and south of Doran do included a arterial "north-south" road that will connect with Craig Road, however, this does not negate the need for the improvements on Russell Road.

**4. Harold Parker – 1839 George Johnston Road**

*a) Wants the Township to consider all drainage corridors within the Midhurst Secondary Plan – Willow Creek and Matheson Creek to be Municipal Drains – Wants a development management plan for the watershed.*

The request to turn Willow Creek and Matheson Creek into Municipal Drains is outside the scope of the Midhurst Class EA.

Independent of the Midhurst Class EA, an Overall Stormwater Drainage Plan is being prepared for the Midhurst Secondary Plan. The stringent conditions that have been imposed on the Stormwater associated with the developments within the Midhurst Secondary Plan will protect the downstream watercourses. In particular, through the NVCA's Minutes of Settlement and Draft Plan Conditions associated with each development, the stormwater management system(s) must, among many other things, have:

- The ability to hold back the first 25 mm of storm runoff for a period of 48 hours.

- The ability to infiltrate back into the ground, close to the source, aiming for the first 25 mm of rainfall while also ensuring a healthy hydrologic cycle.

*b) Concerned about the Water demand (quantity?) on the fresh water system.*

Although the proposed water taking is consumptive, sufficient hydrogeological assessment has been completed showing that there will be no impact on existing private wells and that the water supply for all uses will be sustainable. It is also noted that there will be no significant impact to the baseflow in Willow Creek as a result of the proposed water taking.

Also, refer to Fact Sheet # 2.

*c) Concerned about increased erosion in the Creeks as a result of the Developments.*

A fluvial geomorphological assessment of Willow Creek was undertaken as part of the Class EA planning process. That report concluded that the addition of the treated effluent discharge to Willow Creek in the vicinity of Highway 26 is not anticipated to increase downstream erosion rates above existing, natural levels.

*d) Development will increase downstream sedimentation and will result in more flooding.*

The highest potential for sedimentation as a result of the proposed development will occur during construction of the development servicing (pipes and roads). Mitigation measures will be put into place to intercept sedimentation before it reaches the watershed. Following completion of the servicing, house construction will begin. Sedimentation prevention methods will remain in place during that phase of construction. Following all construction, the potential for sedimentation will be greatly reduced and any sediment that does occur will be collected in the stormwater management ponds.

*e) Therefore, a watershed maintenance program is required for the future protection of the Creeks and the wetland – wants a "Municipal Drain" implemented for downstream protection.*

See response to item a) above.

*f) Wants the Twp to take responsibility for the protection of the creeks (The Mayor noted that the preparation of a Master Drainage Plan is a separate issue – not part of the Class EA).*

See response to item a) above.

*g) Wants "full disclosure to the public for plans of the watercourse'*

The Class EA planning process will be documented in an Environmental Study Report (ESR) which will be made available for public and review agency comment. This will outline the proposed water, wastewater and transportation projects that have been deemed necessary to service the proposed developments.

**5. Kate Harries – Aware Simcoe, 1186 Flos Rd East (based on review of YouTube presentation and written concerns)**

*a) Concerned about impact on numerous fish species (75) but in particular, Salmon, Rainbow Trout (Steelhead Walleye and Sturgeon. Development impact on coldwater fishery habitat will*

*increase particulate (sediment) which will adversely affect the fish. Development will also increase weed growth*

The highest potential for sedimentation as a result of the proposed development will occur during construction of the development servicing (pipes and roads). Mitigation measures will be put into place to intercept sedimentation before it reaches the watershed. Following completion of the servicing, house construction will begin. Sedimentation prevention methods will remain in place during that phase of construction. Following all construction, the potential for sedimentation will be greatly reduced and any sediment that does occur will be collected in the stormwater management ponds.

*b) Wants no impact to the Creeks.*

The impacts of the proposed Developments on the watershed (Creeks and Minesing Wetlands) have been well assessed and documented as part of the Class EA planning process.

In particular, a detailed assessment of the cumulative loading of phosphorus from the Midhurst Secondary Plan (both Stormwater Management and the Wastewater Treatment Plant) discharging to Willow Creek and the Minesing Wetland has been completed and it concluded that the cumulative "net" phosphorus load after the buildout of the entire Midhurst Secondary Plan represents less than 0.5% of the current phosphorus load flowing through the Minesing Wetland on an annual basis. However, if deemed necessary by the Ministry of Environment & Climate Change (MOECC), a a phosphorous offsetting program; whereby works would be undertaken at key spots throughout the watershed, to reduce the amount of phosphorous entering the creek and therefore, offset the additional load from the expanded Wastewater Treatment Plant and ensuring no negative impact on the watershed.

Also, see Fact Sheet # 2.

*c) Wants LID measures put into place*

See Fact Sheet #4

*d) Wants the Township to consider the use of "Naturalized Stormwater Management Ponds"*

The design of the Stormwater Management Ponds will be completed in conjunction with the NVCA and in accordance with the latest Township Engineering Standards.

*e) Concerned about loss of agricultural land and impact of urban uses on existing farm operations.*

This is a Planning matter and outside the scope of the Class EA.

*f) Concerned about the impact on water quality and temperature in the Willow Creek and in the Minesing Wetlands.*

See Fact Sheet # 2 regarding Water Quality.

Effluent discharge will have a minimal effect on water temperatures in the creek. A mass balance model was built using predicted effluent temperatures (validated by comparison with effluent temperature data from existing Wastewater Treatment Plant in southern Ontario) and monthly average and 75$^{th}$ percentile temperatures in Willow Creek near the proposed discharge point. At average water temperatures, the maximum temperature increase in Willow Creek was 1.05°C (at Full Build Out and minimum creek flows), which was predicted for January. Through the summer (June 1 to August 31), the maximum temperature increase was 0.85°C, equating to a

final downstream temperature of 18.6°C. At 75th percentile Willow Creek water temperatures, Full Build out and minimum creek flows, the maximum fully mixed downstream temperature was 19.43°C (experienced in July), which was a 0.08°C increase over upstream Willow Creek upstream temperatures of 19.35°C. These are conservative downstream temperature estimates since the effluent will be cooled as it travels along the 4.5km buried forcemain from the WWTP on Snow Valley Road to the discharge point at Willow Creek and will exchange heat with the atmosphere after discharge.

The PWQO for water temperature is, "The natural thermal regime of any body of water shall not be altered so as to impair the quality of the natural environment. In particular, the diversity, distribution and abundance of plant and animal life shall not be significantly changed." (MOE 1994 ). We reviewed the thermal tolerances of resident trout species as representative coldwater organisms. We have captured Brown Trout within Willow Creek and Ministry of Natural Resources and Forestry (MNRF) have indicated that others have collected them in Willow Creek as well. Although Brook Trout have a lower thermal tolerance than Brown Trout and were included in fish species lists of Willow Creek provided by NVCA and MNRF, we have not captured Brook Trout in field surveys within Willow Creek and Scientific Collection results provided by MNRF indicate Brook Trout only in tributaries to Willow Creek.

Water temperature appears to be the most important factor separating trout streams from non-trout streams (Stoneman and Jones, 2000). The habitat requirements of brown trout are essentially the same as brook trout but it can remain active and thriving in slightly higher temperatures; the upper range of which has been reported as 24°C (Brynildson et al 1963) or 25°C (Hasnain et al. 2010). Elliot and Elliot (2010) produced a growth model to assess the impacts of climate change and resulting changes to water temperature on Brown Trout. They found that water temperatures would have to increase by 4ºC in winter and spring or 3ºC in summer and fall before they had a marked negative impact on growth.

Given the conservative mass balance model predictions of a maximum downstream Willow Creek temperature increase from 19.35°C to 19.43°C, the temperature impacts from the WWTP would not be expected to push downstream temperatures above the upper tolerance for Brown Trout or effect growth rates.

*g) Measures must be put in place to guard against the release of high volumes of waters into Willow Creek at times of spring flooding and summer storms.*

The stringent conditions that have been imposed on the Stormwater associated with the developments within the Midhurst Secondary Plan will protect the downstream watercourses from additional spring flooding. In particular, through the NVCA's Minutes of Settlement and Draft Plan Conditions associated with each development, the stormwater management system(s) must, among many other things, have:

- The ability to hold back the first 25 mm of storm runoff for a period of 48 hours.
- The ability to infiltrate back into the ground, close to the source, aiming for the first 25 mm of rainfall while also ensuring a healthy hydrologic cycle.

**6. Stan Kirsch – representing Frankcom Estate (based on YouTube presentation and written submission)**

*a) Mayor stressed that Phasing of Development is not a concern of the Class EA process and that Mr. Kirsch was not to mention Phasing in his presentation*

No comment necessary.

b) *Mr. Kirsch noted that wastewater servicing is part of the Class EA review and that the Frankcom estate lands have been included in the sizing of the wastewater system.*

As previously noted to Mr Kirish, the Frankcom Estates lands are included within the Midhurst Class EA.

c) *Mr. Kirsch stated that Alliance has agreed to handle the Frankcom Estate stormwater discharge.*

As previously noted to Mr Kirish, the Frankcom Estates lands are included within the Midhurst Class EA.

d) *Mr. Kirsch noted that it is just good engineering to consider the Frankcom Estate lands in the design of the Midhurst Developments since Frankcom is situated immediately adjacent to the existing community (no leapfrogging) - cited County Phasing Policy which is not being followed but Mayor reiterated that Phasing was not to be discussed as part of the Class EA.*

This is a Planning matter and outside the scope of the Class EA.

e) *Mr. Kirsch noted that there is a proposed road link through the Frankcom lands that will benefit Doran Road North – therefore include Frankcom lands in phase 1 – stage 1.*

This is a Planning matter and outside the scope of the Class EA.

f) *Service the Frankcom lands at the same time as Phase 1, Stage 1 to improve traffic flow.*

This is a Planning matter and outside the scope of the Class EA.

g) *Wants more consultation with interested parties;*

There has been extensive consultation throughout the Class EA process.

h) *Wants questions addressed in a timely manner;*

Questions from Mr. Kirsch have been responded in conjunction with response to all other questions received throughout the Class EA process.

i) *Wants Class EA process to be updated "to accommodate Additional information…in respect to the Estate's lands."*

The Class EA is using the latest information as provided by the Township Planning Department.

j) *Wants Frankcom lands to "…go forward in Phase 1 Stage 1 of development in Midhurst".*

This is a Planning matter and outside the scope of the Class EA.

k) *Wants Phasing and Staging Table to be modified to include Frankcom lands*

This is a Planning matter and outside the scope of the Class EA.

**7. Michael Thorn – 1146 St. Vincent Street (based on written presentation only – did not attend meeting)**

a) *Concern that extraction of ground water will reduce flow in Creeks.*

Groundwater baseflow reductions within the Willow Creek watershed were evaluated and described in Section 6.3 of Appendix M of the Hydrogeological Study. It was found that post-development baseflow loss was minor throughout the year with a maximum reduction of less than 10%. Golder also predicts that groundwater taking for the Midhurst Secondary Plan Area will lead to a maximum baseflow reduction in Willow Creek of 8.7% in the late summer. Ministry of Environment & Climate Change (MOECC) / Ministry of Natural Resources and Forestry (MNRF) threshold is 20% in a cold water stream. The predicted baseflow loss is well below the 20% maximum allowed. In addition, the Department of Fisheries (DFO) requirement is that a cumulative flow alteration of less than 10% of the instantaneous flow will "…have a low probability of detectable impacts to ecosystems that support commercial, recreational of Aboriginal fisheries." Therefore, the predicted reduction of 8.7% is undetectable and therefore, not a concern.

In addition, the base flow reduction calculations, do not take into consideration the 140L/s of treated effluent that will be discharged back into Willow Creek, nor the extensive use of Low Impact Development measures through the Midhurst Secondary Plan that will promote groundwater recharge.

*b)* *Notes opinion that a "…small relative change in a low base flow stream can have a negative impact on the ecological functioning of the system equivalent to a larger change in a system with higher base flows. The base flows in sections of Willow Creek within and above Midhurst are very low in the summer (below 1$m^3$/s) and any reductions in the base flow/ground water discharge could have several major ecological consequences."*

See response to item a) above.

*c)* *Notes opinion that "The interruption of water flow in Willow Creek due to low flow conditions and drought would clearly disrupt the ecological functioning of the system." "…providing less useable habitat to aquatic organisms." "Willow Creek has low base flows and further reduction of the base flow could have detrimental impacts on the streams carrying capacity (e.g. number of fish it can support) and functioning (e.g. ability to move sediment or break down organic matter.)"*

See response to item a) above.

*d)* *"Reduced ground water inputs will decrease of destroy thermal refugia for coldwater fish…" and "…areas that were previously considered moderate coldwater habitats may be reduced in quality and no longer habitable for coldwater species."*

See response to item a) above.

*e)* *Reduces "…buffer against solar radiation and the water temperature of the creek will warm." "..lead to temperature increase downstream."*

Effluent discharge will have a minimal effect on water temperatures in the creek. A mass balance model was built using predicted effluent temperatures (validated by comparison with effluent temperature data from existing Wastewater Treatment Plants in southern Ontario) and monthly average and 75$^{th}$ percentile temperatures in Willow Creek near the proposed discharge point. At average water temperatures, the maximum temperature increase in Willow Creek was 1.05°C (at Full Build Out and minimum creek flows), which was predicted for January. Through the summer (June 1 to August 31), the maximum temperature increase was 0.85°C, equating to a final downstream temperature of 18.6°C. At 75$^{th}$ percentile Willow Creek water temperatures, Full Build out and minimum creek flows, the maximum fully mixed downstream temperature was 19.43°C (experienced in July), which was a 0.08°C increase over upstream Willow Creek

upstream temperatures of 19.35°C. These are conservative downstream temperature estimates since the effluent will be cooled as it travels along the 4.5km buried forcemain from the WWTP on Snow Valley Road to the discharge point at Willow Creek and will exchange heat with the atmosphere after discharge.

The PWQO for water temperature is, "The natural thermal regime of any body of water shall not be altered so as to impair the quality of the natural environment. In particular, the diversity, distribution and abundance of plant and animal life shall not be significantly changed." (MOE 1994). We reviewed the thermal tolerances of resident trout species as representative coldwater organisms. We have captured Brown Trout within Willow Creek and Ministry of Natural Resources and Forestry (MNRF) have indicated that others have collected them in Willow Creek as well. Although Brook Trout have a lower thermal tolerance than Brown Trout and were included in fish species lists of Willow Creek provided by NVCA and MNRF, we have not captured Brook Trout in field surveys within Willow Creek and Scientific Collection results provided by MNRF indicate Brook Trout only in tributaries to Willow Creek.

Water temperature appears to be the most important factor separating trout streams from non-trout streams (Stoneman and Jones, 2000). The habitat requirements of brown trout are essentially the same as brook trout but it can remain active and thriving in slightly higher temperatures; the upper range of which has been reported as 24°C (Brynildson et al 1963) or 25°C (Hasnain et al. 2010). Elliot and Elliot (2010) produced a growth model to assess the impacts of climate change and resulting changes to water temperature on Brown Trout. They found that water temperatures would have to increase by 4ºC in winter and spring or 3ºC in summer and fall before they had a marked negative impact on growth.

Given the conservative mass balance model predictions of a maximum downstream Willow Creek temperature increase from 19.35°C to 19.43°C, the temperature impacts from the WWTP would not be expected to push downstream temperatures above the upper tolerance for Brown Trout or effect growth rates.

*f)* *Coldwater species require upwelling for spawning and any reduction could have negative impact on the spawning success of Brook Trout. How much will the development decrease the strength of groundwater upwelling in areas of Brook Trout Spawning?*

See the attached Memo from Hutchinson Environmental dated March 30, 2017.

*g)* *Will the wastewater treatment facility be permitted to bypass the treatment process?*

No. In addition, see the attached Memo from Hutchinson Environmental dated March 30, 2017.

*h)* *Phosphorus budget is likely a conservative estimation – Phosphorus will be higher in an already eutrophic creek. Take precautionary approach and implement program similar to the one established in Tottenham.*

See the attached Memo from Hutchinson Environmental dated March 30, 2017.

*i)* *Why was there essentially no mention of aquatic communities in any of the environmental assessments available online?*

See the attached Memo from Hutchinson Environmental dated March 30, 2017.

**8. Ross Abate? – Represents property owner at 2212 Russell Rd. (based on YouTube review only)**

a) *Wants route 2B for Craig Rd. – northern route*

Noted.

b) *Why was AECOM route for Craig Rd not considered?*

The alternative identified by AECOM was considered and included as one of the long list of Alternatives that was presented at the Public Information Centre.

c) *Lands have development potential. Therefore, please consider similar to Frankcom Estates situation.*

This is a Planning matter and outside the scope of the Class EA.

**9. Bill Haight – 2117 George Johnston Rd.**

a) *Township must consider the Drainage Act and address siltation of Willow Creek – now and before any development occurs to prevent flooding.*

See previous response letter, dated March 3, 2017 to Mr. Haight.

b) *Consider establishing a Municipal Drain as per Mr. Parker's presentation.*

The request to turn Willow Creek and Matheson Creek into Municipal Drains is outside the scope of the Midhurst Class EA.

**10. Joseph Cinanni – 28 Willow Landing Rd. (based on YouTube review only)**

a) *Phosphorus prediction is based on a study that is 11 years old – update to include recent TP loadings from Tottenham and Beeton new development.*

The phosphorus Budget that has been completed for the Midhurst Secondary Plan is current 2015/16 data.

b) *Include 2016 Willow Creek low flow data in the analysis.*

The Willow Creek Assimilative Capacity Study dated May 2016 utilizes the 10 years worth of stream flow data available at that time. Since the completion of this report, we have reviewed the 2016 flow data and determined the impact on 7Q20 value would be minimal.

c) *Discharge of effluent will create a blockage where no growth can occur – fish will not be able to pass by this spot.*

Based upon the information from Hutchinson Environmental the proposed discharge of highly treated effluent will not impact fish migration in any way.

d) *Any future ramifications to the environment will fall on the Township and the County to address.*

Noted

**11. Connie Spek – 47 Doran Rd. (based on YouTube presentation only)**

a) *Her property has riparian rights – back onto Creek.*

Noted

b) *Proposed wells will impact Minesing wetlands due to loss of water.*

It has been estimated that the maximum loss of baseflow/groundwater discharge will be 8.7% in the late summer (August) baseflow to Willow Creek in the area of Midhurst as a result of operation of the proposed wells at full buildout. Our analysis meets the requirement of MOECC for this stage of the assessment and has determined that no such significant losses are expected and thus the cold water habitat status is protected in Willow Creek. The MOECC maximum limit for baseflow reduction is 20% and the DFO maximum limit is 10%. Therefore, the predicted reduction of 8.7% in baseflow is undetectable and therefore, not a concern.

c) *Groundwater recharge to wetlands is colder – therefore development will impact water temperature in Creek.*

Effluent discharge will have a minimal effect on water temperatures in the creek. A mass balance model was built using predicted effluent temperatures (validated by comparison with effluent temperature data from existing Wastewater Treatment Plants in southern Ontario) and monthly average and 75$^{th}$ percentile temperatures in Willow Creek near the proposed discharge point. At average water temperatures, the maximum temperature increase in Willow Creek was 1.05°C (at Full Build Out and minimum creek flows), which was predicted for January. Through the summer (June 1 to August 31), the maximum temperature increase was 0.85°C, equating to a final downstream temperature of 18.6°C. At 75$^{th}$ percentile Willow Creek water temperatures, Full Build out and minimum creek flows, the maximum fully mixed downstream temperature was 19.43°C (experienced in July), which was a 0.08°C increase over upstream Willow Creek upstream temperatures of 19.35°C. These are conservative downstream temperature estimates since the effluent will be cooled as it travels along the 4.5km buried forcemain from the WWTP on Snow Valley Road to the discharge point at Willow Creek and will exchange heat with the atmosphere after discharge.

The PWQO for water temperature is, “The natural thermal regime of any body of water shall not be altered so as to impair the quality of the natural environment. In particular, the diversity, distribution and abundance of plant and animal life shall not be significantly changed.” (MOE 1994). We reviewed the thermal tolerances of resident trout species as representative coldwater organisms. We have captured Brown Trout within Willow Creek and Ministry of Natural Resources and Forestry (MNRF) have indicated that others have collected them in Willow Creek as well. Although Brook Trout have a lower thermal tolerance than Brown Trout and were included in fish species lists of Willow Creek provided by NVCA and MNRF, we have not captured Brook Trout in field surveys within Willow Creek and Scientific Collection results provided by MNRF indicate Brook Trout only in tributaries to Willow Creek.

Water temperature appears to be the most important factor separating trout streams from non-trout streams (Stoneman and Jones, 2000). The habitat requirements of brown trout are essentially the same as brook trout but it can remain active and thriving in slightly higher temperatures; the upper range of which has been reported as 24°C (Brynildson et al 1963) or 25°C (Hasnain et al. 2010). Elliot and Elliot (2010) produced a growth model to assess the impacts of climate change and resulting changes to water temperature on Brown Trout. They found that water temperatures would have to increase by 4ºC in winter and spring or 3ºC in summer and fall before they had a marked negative impact on growth.

Given the conservative mass balance model predictions of a maximum downstream Willow Creek temperature increase from 19.35°C to 19.43°C, the temperature impacts from the WWTP would not be expected to push downstream temperatures above the upper tolerance for Brown Trout or effect growth rates.

Also See Fact Sheet #2.

*d) Protect the downstream environment – provide shade along Creek for fish habitat.*

Not required. Temperature of the water in the Creek will not be impacted.

e) *Well pump testing was too short a duration – 3 days. Suggests simultaneous one year pumping test of all future proposed wells to assess any impact to existing wells. Township should direct Developers to undertake such testing.*

The 3 day pumping tests, such as those conducted in the Study, are a typical and reliable method of estimating well yield and aquifer properties. In addition extending the length of these tests would not provide more accurate/useful results. It is the first day of pumping data that are important in analysis of aquifer transmissivity and storage. Also long-term groundwater impacts were predicted using a calibrated groundwater model that simulated all proposed operational wells using full build-out pumping rates. The model considers a 10-year simulation, which is significantly longer than the 30-day test proposed by Mr. Lotimer and can provide better data than the approach suggested by Lotimer. Finally, the groundwater flow model was calibrated based on the results of the pumping tests. These included the interference among the aquifers that was noted at TW21. The drawdown predicted in the shallow wells is representative of the results of the pumping tests."

f) *Use precautionary process with respect to water taking.*

Agreed.

Regards

J. A. Mullan, P.Eng.
President & CEO

*S:\113027 Midhurst\Correspondence\Memos\Memo - Twp Special Council Mtg Responses (Apr 21 2017).docx*

# MEMORANDUM

**TO** Joe Mullan, Ainley Group **DATE** April 21, 2017

**CC**

**FROM** John Easton / Devin Hannan **PROJECT No.** 13-1170-0040

**RESPONSE TO LOTIMER AND ASSOCIATES PRESENTATION "MIDHURST SECONDARY PLAN DEVELOPMENT PROPOSAL"**

Dear Sir,

Golder Associates Ltd. (Golder) is pleased to provide this response to the Lotimer Associates Inc. (Lotimer) presentation entitled "*Midhurst Secondary Plan Development*" dated March 8, 2017. Lotimer provides a critique of Golder's report entitled "*Hydrogeological Study, Midhurst Water Supply Exploration Program, Township of Springwater, Ontario* [the Study] (Golder, June 2016), and offers their opinion on the potential for future impacts to groundwater users as a result of the proposed Carson and Doran Neighbourhood water supply well pumping. The purpose of this detailed memorandum is to respond to Lotimer's comments and conclusions as presented to the Township of Springwater Council regarding the Study and potential impacts of the proposed pumping to the hydrogeological system. The Lotimer presentation slides are contained in Appendix A.

**Pumping Tests and Predicted Impacts**

***Slide 6***; Impacts to Private Water Supply Wells: *"To assess the impacts to these wells, it would be necessary to measure the normal pumping level in each of the wells and compare this to the predicted interference from pumping of the new wells."*

*"Complete a door-to-door survey of private wells and their operating characteristics to allow this assessment can not be found in the Golder (2016) report."*

Lotimer contends that measuring the *"normal pumping level in each of the wells"* and *"their operating characteristics"* is required, or in other words 'conducting a pumping test should have been done at every well within the drawdown cone'. An investigation to this level of detail, at any point, in a municipal water supply development project is simply unheard of. This has not been done nor is it required by the MOECC even at the Permits to Take Water (PTTW) stage that Golder prepared for the Township of Springwater at Anten Mills, Minesing, or Del Trend for dozens of other PTTWs for other municipalities in Simcoe County. Furthermore, neither the Township of Springwater, the City of Barrie nor any other municipality in Simcoe have ever done this for any of their municipal water systems. An investigation to this level of detail is totally unnecessary.

A domestic water well survey (door-to-door) would not reveal materially more information than we currently have on the water supply use in the Midhurst area The water well database that is maintained by the Ministry of the Environment and Climate Change is a very useful tool for assessing the water supply characteristics for an area. The water well record database contains a log of the geological materials, well depth, static water level, rate of taking in pumping test, recommended pumping rate and these parameters are typically not available from well owners. The water well record database contains the only water level and testing information available for most wells. Therefore, compared to a door-to-door survey an examination of the impacts through an examination of the water well records results in more actual usable data that can be used to evaluate the available water resources of an area. Thus, in our opinion, door to door surveys are not the most reliable way to measure impact.

In order to gather water level data, the Study included drilling and construction of monitoring wells in all of the aquifers that are present including those used by private wells in the study area. In this way it was possible to measure drawdown during pumping tests in all of the aquifers, including those that contain private wells. These monitoring wells were all equipped with data loggers that recorded water levels prior to, during, and after all of the pumping tests.

Finally, Slide 6 is misleading because it gives the impression that a large number of wells may experience significant drawdown. Slide 6 shows the drawdown cone for Aquifer 3, however, almost all of the private wells in the area are completed within shallower Aquifer A1 or Aquifer A2, which is hydraulically separated from direct drawdown from wells operating in Aquifer A3 or A4.

***Slide 7***; Impacts to Private Water Supply Wells: *"it is known that the MOECC water well record data base is often missing wells."*

The water well database also contains many wells in Midhurst and in Barrie which are no longer in service because the homes and businesses are serviced with the Midhurst municipal water supply. The MOECC database contains the original water well records that show the location of the well on a map. The database when used by an experienced hydrogeologist provides a clear picture of the groundwater resources of an area, and the precise location of every well is not required. A statistical evaluation of water wells constructed in an aquifer provides all required and reliable information to assess water supply impacts.

**Slide 8;** Impacts to Land Owners: *"The WHPA's show the areas where limitations may be placed on property use, in accordance with the Source Protection Plan. There are many farms and private rural dwellings within Springwater Township and adjacent Oro-Medonte Township that may be affected by these limitations."*

Lotimer suggests that an eventual Source Protection Plan for the proposed wells may affect land use on farms and private rural dwellings. However, to use a current example, the recently approved Source Protection Plan for Midhurst, Del Trend and Snow Valley, all of which draw from deep Aquifer A3, indicates the only area of high aquifer vulnerability is within a 100 m radius around the supply wells themselves ("WHPA-A") (Approved Assessment Report: Nottawasaga Valley Source Protection Area - South Georgian Bay-Lake Simcoe Source Protection Committee, 2015). Outside of the WHPA-A no land use restrictions on farming and domestic land use practices were recommended as part of the Source Water Protection plans.

The 100-m WHPA-A for the proposed wells is **within** the proposed development area for houses. This is a common circumstance throughout Simcoe County and Barrie where municipal wells are often constructed within built-up areas containing homes with the WHPA-A. Homes within a WHPA-A do not face land use restrictions that affect normal domestic use.

**Slide 8;** Impacts to Land Owners: *"it is also important to note that some of the new wells will capture water that currently flows to the existing Midhurst municipal wells, causing an impact to the existing wells."*

The slight overlap in the 10 to 25 year time of travel capture zone for the Greenpine and Idlewood wells with TW21 and TW24 in no way affects the ability of the existing wells to continue to provide water. The groundwater flow model accounts for all of the municipal water taking in Midhurst, not just the new wells.

***Slide 9***; Impacts of the Water Taking: *"When considering impacts the cumulative taking of all of the municipal water supplies within the Willow Creek Sub-watershed must be considered."*

The cumulative impact of the taking within the Willow Creek Subwatershed was considered and addressed within the Study. The cumulative impact is well below the MNR and DFO thresholds for significant baseflow loss and will have no detectable impact. The Study illustrates that no drawdown is expected to occur at the Minesing Wetland (see Figure 10 of Appendix M) and groundwater baseflow loss directly upstream of Minesing Wetland is minor (between 2% to 6% reduction as per 02ED032 results in Figure 11 of Appendix M in the Study).

***Slide 10***; Impact of Proposed New Water Supply: *"The water taking from the municipal wells within the watershed is considered to be a consumptive taking." "This results in a reduction of groundwater flow to the existing receptors connected to the pumping aquifer (other groundwater users, streams and wetlands) that approximately equals the amount of water pumped."*

Virtually all municipal groundwater taking in Simcoe County and Barrie is a consumptive water use. Defining a water taking as consumptive does not mean that the water taking is not sustainable. The aquifer testing and groundwater flow model both indicate that the groundwater supply for existing Midhurst, the future Midhurst development, including the groundwater use in Barrie, is sustainable.

Lotimer is incorrect to claim that a withdrawal of groundwater from Aquifer A3 or A4 results in an equivalent water loss to Willow Creek. In the Midhurst area, water in Aquifer A3 is entrained in the regional groundwater flow system that discharges to Georgian Bay. The Study illustrates that no drawdown is expected to occur at the Minesing Wetland (see Figure 10 of Appendix M) and groundwater baseflow loss directly upstream of Minesing Wetland is minor (between 2% to 6% reduction as per 02ED032 results in Figure 11 of Appendix M in the Study). Clearly, the cumulative impact is addressed and is well below the MNR and DFO thresholds for unacceptable impacts. For further discussion on this topic see the memorandum prepared by Hutchinson Environmental Services Ltd. for the Ainley Group dated March 30, 2017.

***Slides 11, 12, 13, and 14***; Wetland Impacts: *"the slide on the left is from the NVCA. It shows the area of the Minesing swamp that is very dependent on groundwater discharge. The conceptual drawing on the right shows the hydrogeological setting that results in this groundwater discharge area shown by the Nottawasaga Conservation Authority. The layers are from the Ontario Geological Survey mapping for the Snow Valley Area."*

These slides show a farrago of unrelated data. This use of unrelated drawings renders the whole discussion of recharge into the upland area and discharge to the proximal lowland areas entirely incorrectly, as expanded upon below.

Lotimer is inferring that the cross section represents the hydrostratigraphy of the Sunnidale upland and the Minesing lowland to the west of George Johnson Road. In reality the cross section taken from the Ontario Geological Survey report GRS 11 (Slide 22) is a generalized North-South cross section through the Oro Moraine and the Horseshoe Valley. In the Oro Moraine–Horseshoe Valley area the deep Regional A3/A4 Aquifer is thinner than in the Midhurst area and the Valley Fill deposits (shown in yellow, green, and light blue) are different than in the Minesing basin making the reference to this cross-section to describing groundwater flow under natural and pumping conditions inappropriate for the Midhurst area.

The entire Minesing basin is covered by a thick varved clay deposited from Lake Algonquin and the highly publicized blow-outs of flowing wells in the Township of Springwater at Gill Road in 2015, on Horseshoe Valley Road west of Anten Mills in 2006, and on George Johnson Road in 2003 are direct examples that the deep aquifers are confined and do not allow direct discharge to the wetland from below. Slides 12, 13, 14, and 22 of Lotimer are inaccurate and misleading. The geological model prepared by Golder and used by the South Georgian Bay Lake

Simcoe Source Protection Region for modelling the Barrie and Springwater groundwater flow model is appropriate for the Midhurst area.

The groundwater flow lines shown on drawing (Slide 11) neglect to recognize the regional groundwater movement, which includes flow under the Minesing Wetland with ultimate discharge to Georgian Bay, and the thick confining layer (Lake Algonquin varves) over the aquifers in the Minesing Wetland basin. The conceptual stratigraphy shown in Slide 11 shows channel fill deposits rather than the more appropriate geological model which includes aquifer units and confining layers extending from the Snow Valley upland toward Wasaga Beach. This hydrogeological concept of a regional scale confining layer between Aquifer A2 and Aquifer A3 was also used by Beckers and Frind (University of Waterloo) in their 2001 hydrostratigraphic model of the Oro Moraine aquifer (which included the Minesing Wetland).

***Slide 16*;** Lotimer Conclusions: *"The predicted impacts are based on short term pumping of individual wells" "not all wells are constructed" "combined pumping of all of the new wells at the required volume to meet the needs of the proposed development has not been done"*

We wish to emphasize four aspects of the Study approach in response:

- Firstly, 3-day pumping tests, such as those conducted in the Study, are a typical and reliable method of estimating well yield and aquifer properties.
- Secondly, extending the length of these tests would not provide more accurate/useful results. It is the first day of pumping data that are important in analysis of aquifer transmissivity and storage.
- Thirdly, long-term groundwater impacts were predicted using a calibrated groundwater model that simulated all proposed operational wells using full build-out pumping rates. In our opinion this approach negates the need for a combined, longer term pumping test. The model considers a 10-year simulation, which is significantly longer than the 30-day test proposed by Lotimer and can provide better data than the approach suggested by Lotimer.
- Finally, the groundwater flow model was calibrated based on the results of the pumping tests. These included the interference among the aquifers that was noted at TW21. The drawdown predicted in the shallow wells is representative of the results of the pumping tests.

***Slide 17***; Lotimer Conclusions: *"The hydrogeological study does not include a complete survey of private well use and the potential impacts to these private wells"*

Lotimer is proposing that a pumping test is required at every well within the drawdown cone. An investigation to this level of detail, at any point, in a municipal water supply development project is simply unheard of.

In support of this conclusion, Lotimer superimposes private wells from the Ministry of Environment and Climate Change (MOECC) water well information system database onto an image of predicted drawdown in deep Aquifer A3 (Slide 6, which uses simulated A3 drawdown extents as adapted from Figure 10, Appendix M of the Study).

In our opinion, as noted above, this illustration is misleading because it gives the impression that a large number of wells may experience significant drawdown. Slide 6 shows the drawdown cone for Aquifer 3, however, almost all of the private wells in the area are completed within shallower Aquifer A1 or Aquifer A2 which is hydraulically separated from direct drawdown from wells operating in Aquifer A3 or A4.

For example, within Lotimer's image extents, there are approximately 589 domestic wells listed in the MOECC WWIS of which completion depth can be ascertained. Of these 589 wells, 573 (over 95%) are completed above Aquifer A3 based on regional aquifer mapping. Predicted drawdown within Aquifer A1 or Aquifer A2 is significantly less than that in Aquifer A3 (see Figure 10, Appendix M of the Study) and is not expected to adversely affect domestic wells within these aquifers.

We have summarized the information presented in the Hydrogeological and Modelling reports to address the well interference issue raised by Lotimer below:

The drawdown at the nearest wells constructed inside the two metre drawdown zone were evaluated to test Lotimer's hypothesis of widespread interference with private water supply wells. Logic dictates that if nearby wells can accommodate two metres of drawdown then more distant wells would be able to accommodate less interference. It must be understood that some drawdown water level at a well does not mean that there will be interference with the well's ability to provide an adequate water supply.

There are no wells located within the 2-metre drawdown cone for any of the proposed wells in Aquifer A1. There are 11 wells located within the 1.5-metre drawdown cone, which have a water column above the well screen of between 6 and 14 m. None of these wells are expected to be vulnerable to a loss of water as a result of the proposed water taking.

There are 16 wells within the 2-metre drawdown cone for Aquifer A2 and they have a water column above the well screen of between 10 and 34 m. None of these wells are expected to be vulnerable to a loss of water supply as a result of the proposed water taking.

There are three wells within the 2-metre drawdown cone for Aquifer A3 and these wells have a water column above the well screen of between 46 and 71 m. It is not expected that these wells will be vulnerable to a loss of water supply as a result of the proposed water taking.

There are three wells within the 2-metre drawdown cone for Aquifer A4 and one well constructed in the bedrock aquifer. These wells have a water column above the well screen of between 69 and 112 m. It is not expected that these wells will be vulnerable to a loss of water supply as a result of the proposed water taking.

The preceding indicates that impact to private water supply wells is not expected. There will be further well construction and aquifer performance testing prior to submitting an application for a Permit to Take Water. Part of the Permit to Take Water application process involves public consultation and posting the proposed application for comment on the Environmental Registry of the Ontario Ministry of the Environment and Climate Change.

***Slide 17***; Lotimer Conclusions: *"An assessment of the possible limitations to land use within the new Well Head Protection Areas has not be completed"*

As noted above, the WHPA-A for the proposed wells is within the proposed development area for houses. This is a common circumstance throughout Simcoe County and Barrie where municipal wells are within built-up areas and homes are located within the WHPA-A. Homes within a WHPA-A do not face land use restrictions that affect normal domestic use. Outside of the WHPA-A no land use restrictions on farming and domestic land use practices were recommended as part of the Source Water Protection plans, therefore we do not anticipate that there will be significant restrictions proposed as a result of future Source Protection Plans.

***Slide 15, 17***; Lotimer Conclusions: *"The hydrogeological study does not include an assessment of stream flow reductions along reaches of Willow and Matheson creek" "the hydrogeological study does not include an assessment of the impact to the Minesing wetland complex"*

Groundwater baseflow reductions within the Willow Creek watershed *were* evaluated and described in Section 6.3 of Appendix M of the Study. In summary:

- Pre- and post-development monthly baseflows were simulated at the three Water Survey of Canada flow gauges along Willow Creek, namely: 02ED009 (upstream of proposed development near Little Lake), 02ED010 (at Midhurst) and 02ED032 (downstream of Matheson Creek and just upstream of Minesing Wetland). It was found that post-development baseflow loss was minor throughout the year with a maximum reduction of less than 10% occurring at 02ED010.

For context, the *Water Budget and Water Quantity Risk Assessment* Guide published by the Ministry of Natural Resources and Ministry of Environment defines an unacceptable impact to cold water streams as a circumstance where groundwater discharge is reduced by more than 20% as compared to the average monthly baseflow of the watercourse. Further as noted above, it is also below MNR and DFO thresholds. For further discussion on this topic see the memorandum prepared by Hutchinson Environmental Services Ltd. for the Ainley Group dated March 30, 2017.

***Slide 20***; Proposed New Water Supply – Assessing the Impact: *"Predictions of impacts from the proposed water taking have been determined using a mathematical groundwater model. Does this work?" "can Council rely on the work to date?"*

The Township is already relying on the Mathematical Model and the model has benefitted greatly from work conducted during the Study. The groundwater flow model that was used during the Study to prepare well capture zones and make predictions of drawdown is the same model that was used to prepare the WHPA areas in the southern part of the Township by the South Georgian Bay Lake Simcoe Source Protection Region. The Study provided a valuable update with the many deep boreholes, water levels, and aquifer characteristics obtained from borehole drilling and aquifer testing during the water supply exploration program. A statistical evaluation of water wells constructed in an aquifer provides all required and reliable information to assess water supply impacts.

Lotimer notes that the use of groundwater flow models is common, and we agree it is standard practice that is usual in the industry.

***Slide 21***; Geologic Model + Drilling Program: *"when we compare the test well results to the mathematical model, it appears that the field program contradicts the model."*

Lotimer suggests that the hydrostratigraphic model used in the Study may be in conflict with the Study drilling program data. In support of this argument, Lotimer superimposes three drill logs (TW34, TW22, and TW21) over the example hydrostratigraphic model section presented in Figure 4, Appendix M of the Study (Slide 21). We infer that the intent of this image is to show a potential conflict between the geologic materials in the drill logs and the modelled hydrostratigraphic layering. However, we note the following:

- **TW34**: The thicknesses of each major aquifer/aquitard unit in the model are reasonably close to those in the well log (generally within 5 m). There is a slight offset in unit elevations in this particular area owing to a

discrepancy between the originally estimated GPS hole elevation (used to update the model surface) being lower than the final estimated ground elevation.

- **TW22:** The correct location of the log is slightly west of that shown by Lotimer and should be approximately coincident with the Black Creek label (which we acknowledge is incorrectly positioned on our original figure) – thus the ground elevation of TW22 should be approximately 232 masl. When the location revision is applied the aquifer and aquitard materials in the log align reasonably well with those in the model (generally within 5 m). Note that the till materials described in this log are generally associated with aquitard units.
- **TW21:** The model hydrostratigraphy in this immediate area was developed using logs at TW21 and TW24. Whereas the presence of mostly permeable material down to C2 is confirmed in the logs, the thickness of C2 is variable between TW21 and TW24. In model a C2 thickness approximating that of TW24 (20 m) is used. The bottom of Aquifer A3 is within 5 m of the well logs.

These small changes do not affect our conclusions contained in the Study.

***Slides 22 and 23***; comparison of Geologic Models: *"The Ontario Geological Survey has studied the Midhurst Area"*

The Ontario Geological Survey (OGS) has been conducting surficial mapping and subsurface drilling in Simcoe County for almost 20 years. Golder has been a partner with the OGS sharing data and experience. Slides 22 and 23 attribute OGS work to Midhurst, where it is actually across the Oro moraine between Lake Simcoe and Horseshoe Valley and does not represent the stratigraphy between the Oro moraine and the Minesing Wetland. Again we reiterate that the geological model and numerical groundwater flow models reflect an accurate assessment of the current understanding of the stratigraphic composition of Midhurst area and the Lotimer interpretation does not.

***Slide 24***; Proposed New Water Supply – Water Quality Treatment: *"What is the water quality like?"*

All water quality data is contained in Chapter 4 and related appendices of the Study. The water is similar to the water elsewhere in Midhurst and Snow Valley with respect to aesthetic parameters such as hardness, manganese, and iron. Existing conditions for Nitrate at TW22 is within the standards set by the MOECC, however it is elevated. Treatment of the water to lower the nitrate to approximately 50% of the ODWS standard is proposed for this site. Most of the capture zone for TW19 and TW22 is in the development lands, which are currently in agricultural production and that will cease with the establishment of housing. The source of nitrate is inferred to be agricultural fertilizer and that source will be removed from the capture zone going forward.

**Permit to Take Water Obligations: "***You'll be asked by the Ministry of the Environment to go out and confirm the characteristics of those wells that you believe are within the ZOI of pumping: "The ministry requires you to identify the areas where you think wells will be impacted and to go out and test those and ensure that there isn't an adverse impact to those wells. The law is very clear on how that works. It's very, very clear and very straightforward"*

Further to Mr. Lotimer's statements, every Permit to Take Water issued by the Ministry of the Environment and Climate Change contains a condition that existing users of water are protected from a loss of water supply and it is the responsibility of the owner of the PTTW to restore the affected water supply.

As per the Study, there are no unacceptable impacts predicted for existing users of water, however, further groundwater monitoring could be proposed as a part of the Monitoring and Contingency Plan in the Permit to Take Water application. Monitoring dedicated observation wells is far superior to monitoring private wells or conducting door-to-door surveys. Long-term water level monitoring is conducted by many municipalities including the City of Orillia, City of Guelph, Town of Erin, and the Regions of Durham, York, and Waterloo. The monitoring program could be incorporated into either the existing Township of Springwater system or into the PGMN system to track water levels and verify long term changes in groundwater levels. The Nottawasaga Valley Conservation Authority also installs groundwater monitoring equipment and maintains water level databases for groundwater monitoring wells throughout Simcoe County for the MOECC as part of a provincial groundwater monitoring network (PGMN).

## CLOSURE

We trust this meets your current requirements. Should you have any questions please do not hesitate to contact the authors.

**GOLDER ASSOCIATES LTD.**

John Easton, M.Sc., P.Geo.

JAE/DH/plc

Appendix A: Midhurst Secondary Plan Development Proposal

N:\Active\2013\13-1170-0040 Midhurst Doran Hydrog Well\Report\Lotimer Reply\Golder Midhurst Response April 21_2017.docx

| Modelled Predicted Drawdown (m) | MOE_CODE MOE# | CON # | LOT # | DATE Well Was Constructed | EAST_83 UTM-17 | NORTH_83 UTM-17 | Water Column m | DEPTH mbgl | Aquifer |
|---|---|---|---|---|---|---|---|---|---|
| There Are No Wells in Aquifer A1 with 2 m Drawdown | | | | | | | | | |
| 1.5 | 5723277 | 2 | 19 | Mar-1988 | 603957 | 4923389 | 6 | 53.3 | A1 |
| 1.5 | 5704587 | 2 | 21 | Nov-1964 | 603719 | 4923275 | 6 | 53.6 | A1 |
| 1.5 | 5714409 | 2 | 22 | Jun-1977 | 603612 | 4923621 | 8 | 53.3 | A1 |
| 1.5 | 5707450 | 2 | 21 | Aug-1970 | 603632 | 4923371 | 8 | 51.8 | A1 |
| 1.5 | 5713342 | 3 | 14 | Jun-1976 | 602722 | 4922981 | 8 | 44.8 | A1 |
| 1.5 | 5711575 | 2 | 19 | Nov-1974 | 604112 | 4922571 | 9 | 62.8 | A1 |
| 1.5 | 5706050 | 3 | 14 | May-1968 | 602732 | 4922896 | 9 | 48.8 | A1 |
| 1.5 | 5736080 | 1 | 21 | May-2001 | 603956 | 4923346 | 11 | 55.5 | A1 |
| 1.5 | 5715526 | 2 | 20 | Jul-1978 | 603935 | 4923131 | 11 | 55.2 | A1 |
| 1.5 | 5706541 | 1 | 19 | May-1969 | 604312 | 4922741 | 14 | 54.9 | A1 |
| 1.5 | 5709944 | 2 | 21 | Jun-1973 | 602907 | 4922956 | 14 | 54.9 | A1 |
| | | | | | | | | | |
| Wells in Aquifer A2 with 2 m Drawdown | | | | | | | | | |
| 2 | 5704590 | 2 | 27 | Jul-1959 | 601617 | 4924951 | 10 | 50.3 | A2 |
| 2 | 5708342 | 3 | 10 | Oct-1971 | 601381 | 4925121 | 11 | 52.7 | A2 |
| 2 | 5735436 | 6 | 14 | Jul-2000 | 598666 | 4919887 | 11 | 25.0 | A2 |
| 2 | 5737231 | | 14 | Sep-2002 | 598564 | 4919871 | 14 | 31.1 | A2 |
| 2 | 5738455 | 6 | 14 | Dec-2003 | 598714 | 4919899 | 14 | 36.0 | A2 |
| 2 | 5737495 | 6 | 14 | Dec-2002 | 598542 | 4919846 | 17 | 31.1 | A2 |
| 2 | 5711192 | 6 | 14 | Apr-1974 | 598656 | 4919677 | 19 | 27.4 | A2 |
| 2 | 5718866 | 6 | 14 | Sep-1983 | 599012 | 4920171 | 20 | 36.0 | A2 |
| 2 | 5727803 | 6 | 14 | Jun-1989 | 598736 | 4919910 | 20 | 39.3 | A2 |
| 2 | 5716112 | 7 | 13 | Jun-1979 | 598421 | 4919822 | 21 | 29.3 | A2 |
| 2 | 5713102 | 7 | 13 | May-1975 | 598271 | 4920091 | 22 | 26.8 | A2 |
| 2 | 5708828 | 6 | 13 | Apr-1972 | 598431 | 4920005 | 22 | 29.0 | A2 |
| 2 | 5739023 | 6 | 14 | Aug-2004 | 598727 | 4919962 | 23 | 40.5 | A2 |
| 2 | 5709252 | 6 | 13 | Aug-1972 | 598393 | 4920021 | 24 | 29.3 | A2 |
| 2 | 5730289 | 6 | 15 | Sep-1993 | 598832 | 4920041 | 27 | 46.6 | A2 |
| 2 | 5708225 | 2 | 27 | Sep-1971 | 601611 | 4924941 | 34 | 81.4 | A2 |
| | | | | | | | | | |
| Wells in Aquifer A3 with 2 m drawdown | | | | | | | | | |
| 2 | 7054010 | 3 | 11 | Dec-2007 | 600897 | 4923544 | 46 | 96.0 | A3 |
| 2 | 7111735 | 3 | 10 | Aug-2008 | 601830 | 4924191 | 65 | 126.8 | A3 |
| 2 | 7227319 | 2 | 20 | Aug-2014 | 603819 | 4922773 | 71 | 152.4 | A3 |
| | | | | | | | | | |
| There Are No Wells in Aquifer A4 with 2 m Drawdown | | | | | | | | | |
| 1 | 7220692 | 6 | 13 | Apr-2014 | 598682 | 4921070 | 69 | 95.1 | A4 |
| 1 | 5726202 | 1 | 16 | Dec-1989 | 606527 | 4923073 | 96 | 116.4 | A4 |
| 1 | 5734761 | 1 | 16 | Oct-1999 | 606671 | 4922984 | 100 | 116.1 | A4 |
| 1 | 5703504 | 1 | 16 | Sep-1959 | 606942 | 4922860 | 112 | 129.8 | BEDROCK |

# APPENDIX A

# Midhurst Secondary Plan Development Proposal

2017-03-08

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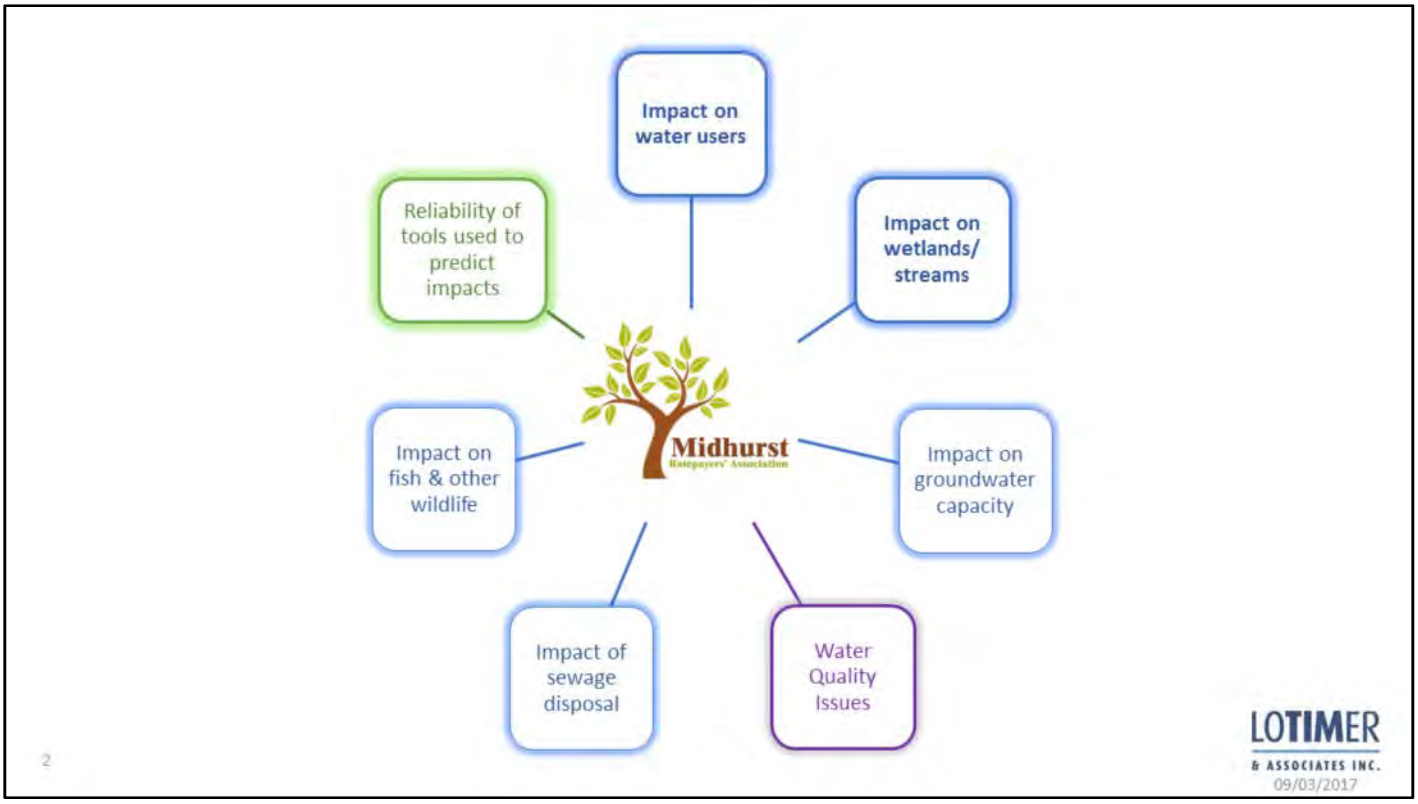
& ASSOCIATES INC.

Good evening your Worship and Members of Springwater Council.

My name is Tim Lotimer. I am a professional geoscientist with 40 years of experience primarily working on municipal groundwater supplies. Some recent Class EA water supply projects I have been involved with were for the Regions of Halton and Waterloo, the Municipality of Chatham-Kent and the County of Brant.



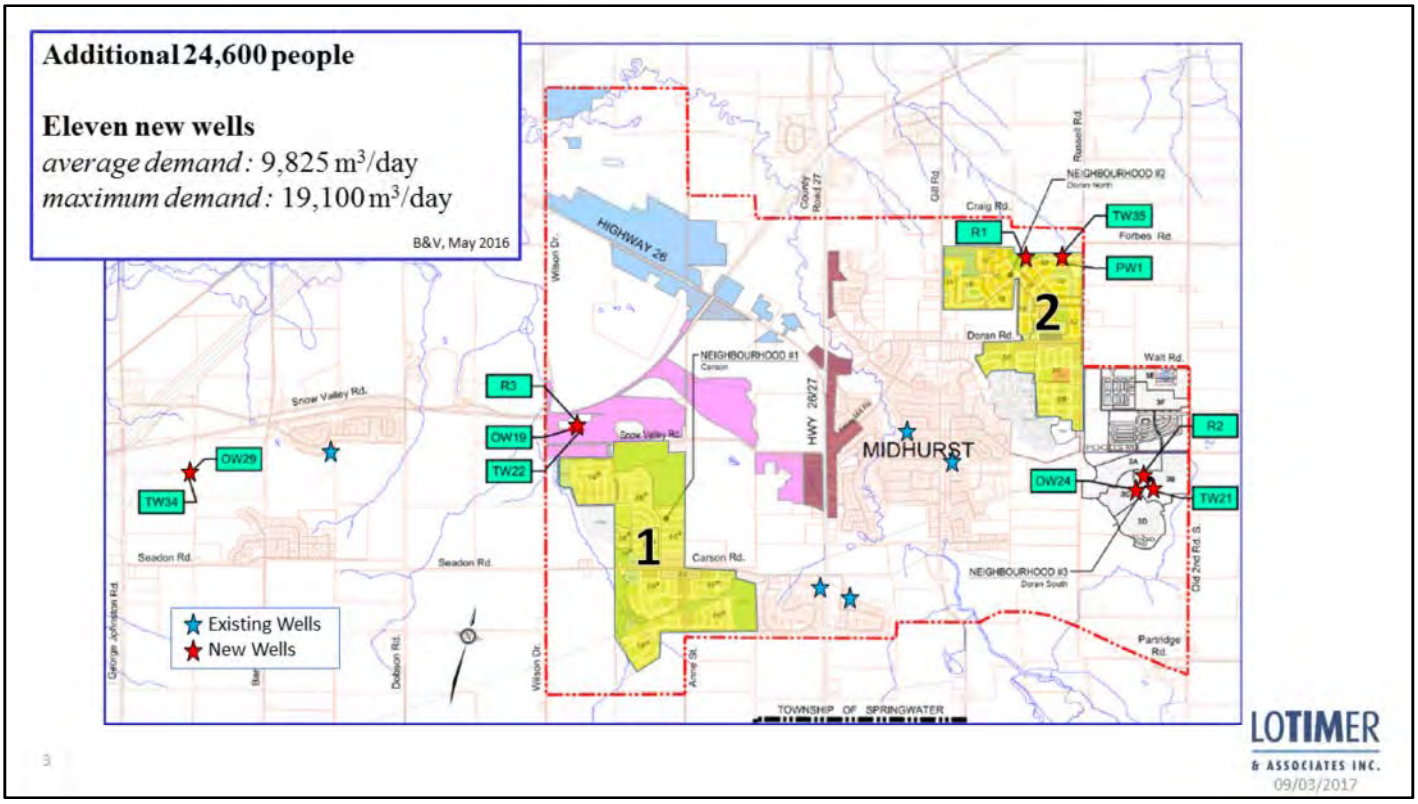

I have been retained as an independent expert, by the Midhurst Ratepayers Association (MRA), to see if the available Class EA documents address the questions that the MRA submitted to the Township during the public commenting period that closed December 1, 2016.

These questions are summarized on this slide and the focus of my presentation will be on the impact of the proposed taking on water users, wetlands and streams.

I have reviewed reports that are available on the Township of Springwater's web site related to the proposed water supply.

A key report is the Draft hydrogeological study report prepared by Golder Associates in June 2016 on the Midhurst Water Supply Exploration Program. Note that this report is DRAFT and a final copy of the report has not been made available to me.

I have also reviewed other publically available reports that provide information on the Midhurst area, its geology, hydrogeology and existing water takings and ecological characteristics.




A municipal class EA is being conducted for proposed development in the Midhurst area. The Class EA is in Phase 4 of the process, and has now reached the point of selection of the preferred design.

The water source will be new wells. Sewage will be treated and discharged to Willow Creek.

People and flow rates from B&V, May 2016
Existing wells – blue stars – approximate location
Red stars – approximate location of proposed new wells – some have multiple wells at 1 location (i.e. snow valley – 3 wells)

## Municipal Class EA

Phase 4: Selection of the preferred design

Must include a detailed discussion of:

- Identification of the *potential impacts on the environment*
- Description of *mitigation measures to minimize environmental effects*

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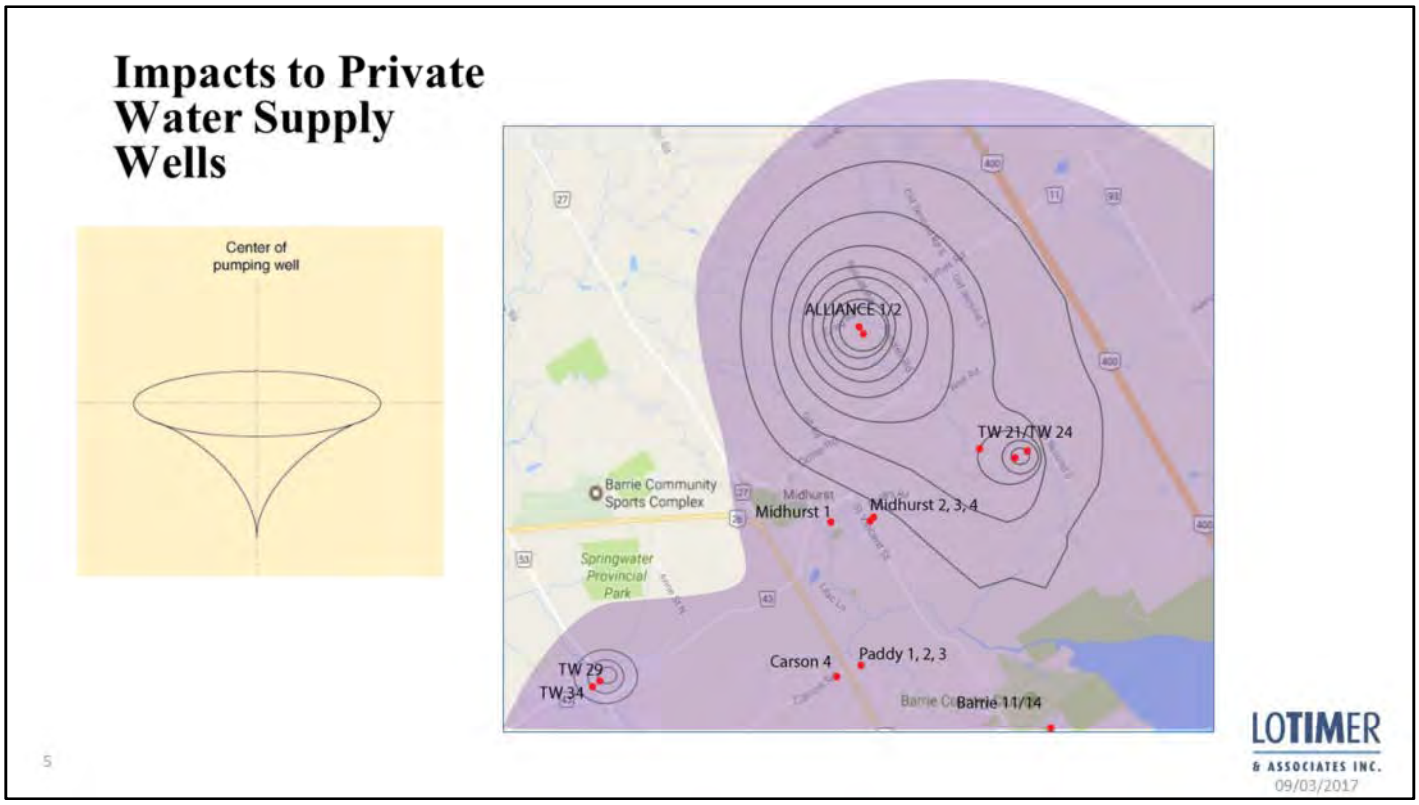
The Class EA Environmental Study Report (ESR) is required to provide a discussion of the potential impacts on the environment and the proposed mitigation measures to minimize environmental effects.

The ESR is not available yet, but we expect that the hydrogeological component of the ESR will be mostly obtained from Golder's report when it is finalized.

I will discuss the potential impacts of the water taking in more detail, starting with the potential impact to private wells in Springwater Township.

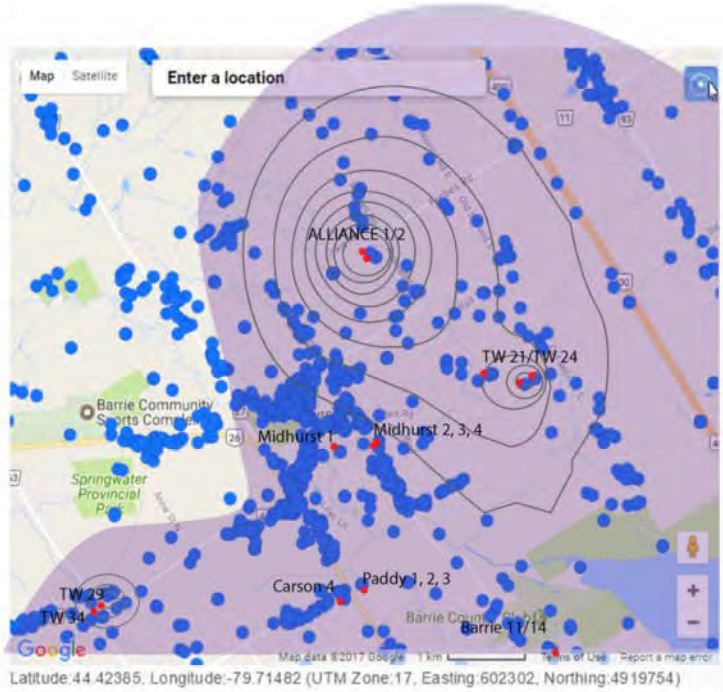



This figure shows contour lines of the drawdown that results from the pumping from the deep aquifer at three of the four proposed sites.

As illustrated by the slide on the left, the drawdown is greatest near the wells and decreases as you go farther away.

The purple colour is the zone-of-influence (the area where more than a metre of drawdown can be expected) that results from the pumping of these wells.

## Impacts to Private Water Supply Wells

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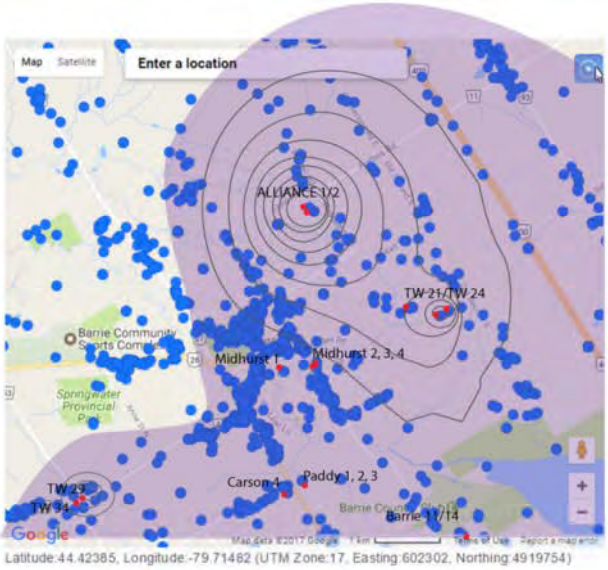
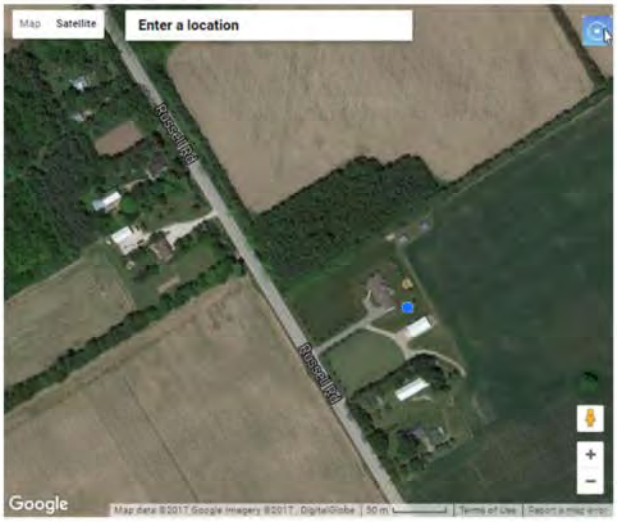
On this slide we have added blue dots, that show the location of private wells in the MOECC water well record data base.

To assess impacts to these wells, it would be necessary to measure the normal pumping level in each of the wells and compare this to the predicted interference from pumping of the new wells.

A complete door-to-door survey of private wells and their operating characteristics to allow this assessment can not be found in the Golder (2016) report.

# Impacts to Private Water Supply Wells

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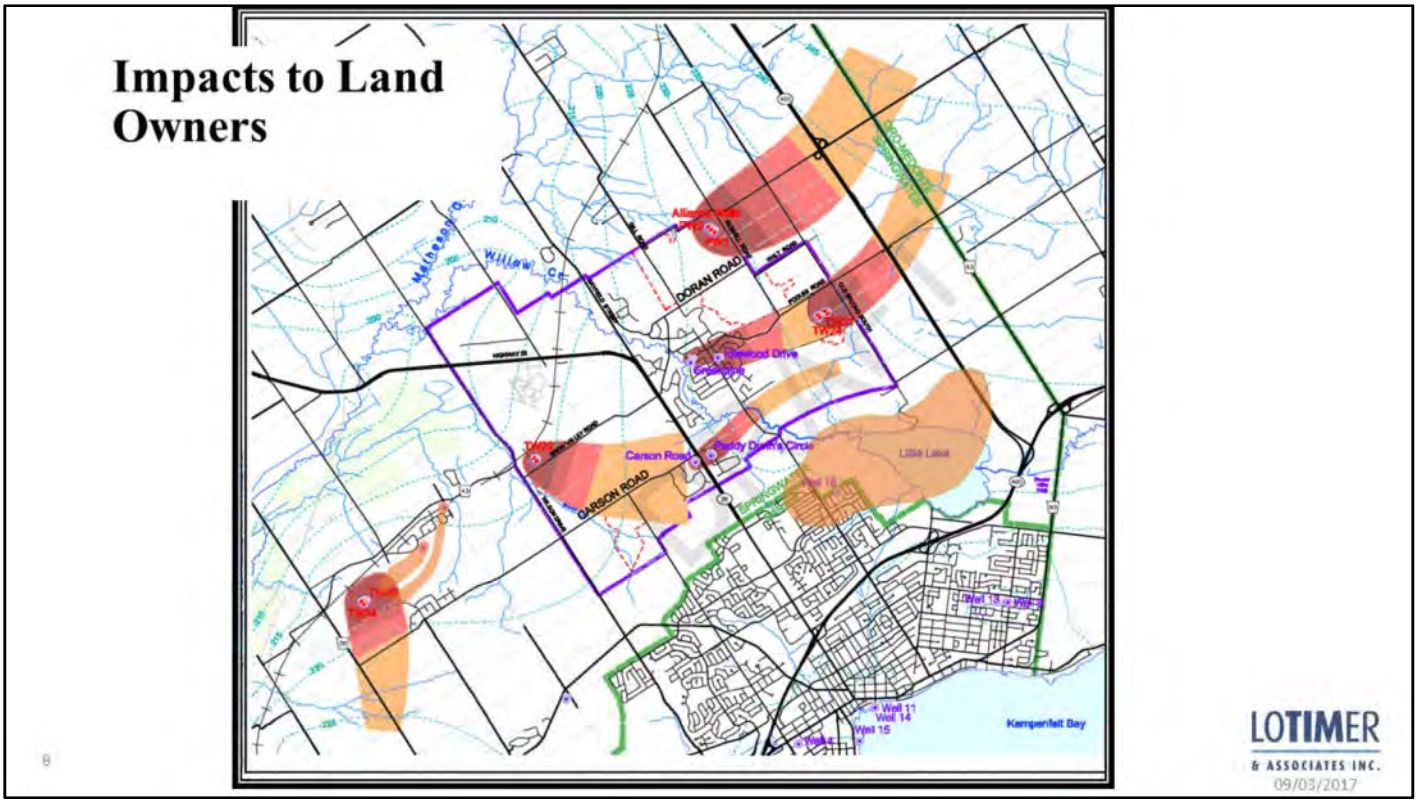
It is known that the MOECC water well record data base is often missing wells.

In this slide an area is shown where there are several homes but only one well identified.

Our review of the MOECC water well record data base shows that there are wells within both the deep and shallower aquifers, within the zone-of-influence of pumping.

The aquifer testing program shows that in some areas, pumping from the deep aquifer also causes drawdown in the shallower aquifers




The colourful shapes are the interpreted Well Head Protection Areas (WHPA's) for the existing Midhurst and Snow Valley wells, and the Barrie municipal wells all located within the Willow Creek subwatershed.

The WHPA's also provide an indication of the capture zone of the wells – where the water is coming from within the groundwater flow system.

The WHPA's show the areas where limitations may be placed on property use, in accordance with the Source Protection Plan. There are many farms and private rural dwellings within Springwater Township and adjacent Oro-Medonte Township that may be affected by these limitations.

It is also important to note that some of the new wells will capture water that currently flows to the existing Midhurst municipal wells, causing an impact to the existing wells.

(Note that Barrie has a water system that uses wells to supply water in the north end of the City and uses Lake Simcoe for servicing in the south end. The systems do not mix water and so the areas serviced by the wells shown will continue to serve the City of Barrie.)

Sources:

Golder (2016) Study and the source protection MOECC Approved Assessment Reports for

the City of Barrie and the Midhurst municipal drinking water systems.

## Impacts of the Water Taking

- Current and proposed *average day* and *maximum day* demand of municipal takings within the Willow Creek subwatershed

| | Average Day | Maximum Day |
|---|---|---|
| Existing Midhurst Wells | 1,450 $m^3$/day | 4,095 $m^3$/day |
| Existing Barrie Wells* | 20,966 $m^3$/day? | 20,966 $m^3$/day? |
| Proposed New Wells | 9,825 $m^3$/day | 19,014 $m^3$/day |
| **TOTAL** | **32,241 $m^3$/day** | **44,075 $m^3$/day** |

* Operating capacity of wells within the Willow Creek subwatershed

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When considering impacts the cumulative taking of all of the municipal water supplies within the Willow Creek Sub-watershed must be considered.

The average day taking from the proposed new wells is a third of the total average day municipal taking within the sub-watershed

Sources:
Barrie total taking in 2010 (groundwater base case) was 40,280 $m^3$/day (Tier 3 Study). Of that amount, 17,800 $m^3$/day is modelled groundwater inflow from the Willow Creek subwatershed. Midhurst takings from the SWP Assessment Report based on 2014 data. Proposed taking from B&V 2016.

T3 Figure 1.2 shows Barrie Wells 9, 13 and 16 within the NVCA Willow Creek Subwatershed.
T3 Table 3.1 shows PTTW Well 9 - 6,552 $m^3$/day; Well 13 - 6,552 $m^3$/day; Well 16 - 7,862 $m^3$/day

## Impact of Proposed New Water Supply

- The water taking from the municipal wells within the watershed is considered to be a ***consumptive taking***
  - ➢ *A consumptive groundwater taking occurs when the water is pumped from an aquifer but not returned to the aquifer from which the water is taken*
- This results in a **reduction of groundwater flow** to the existing receptors connected to the pumped aquifer (other groundwater users, streams and wetlands) **that approximately equals the amount of water pumped**



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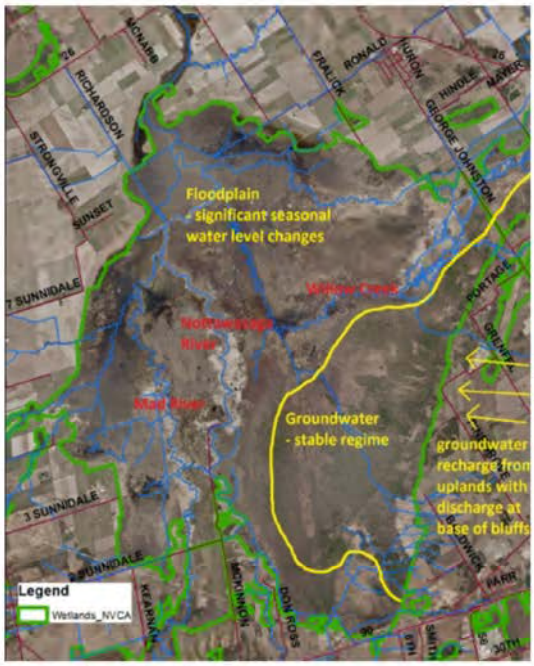
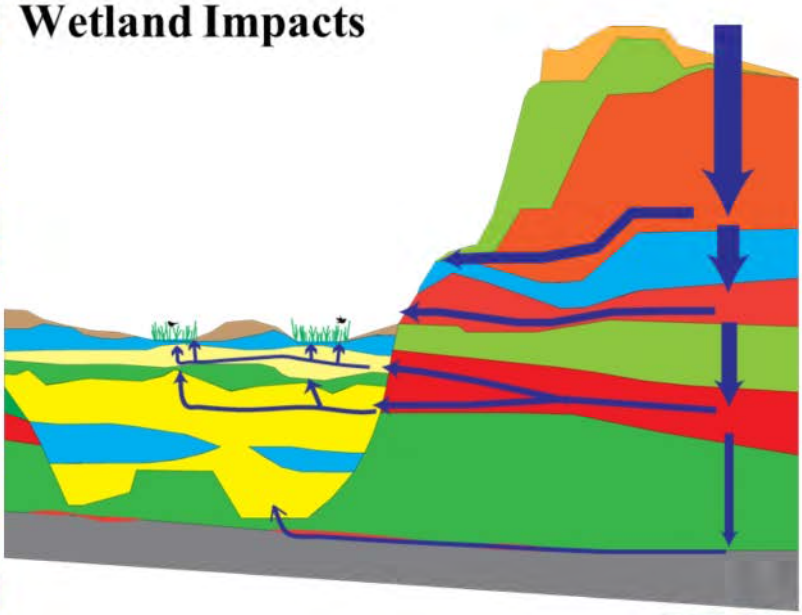
This concept is illustrated in the next few slides.




Map from NVCA, 2015

## Wetland Impacts



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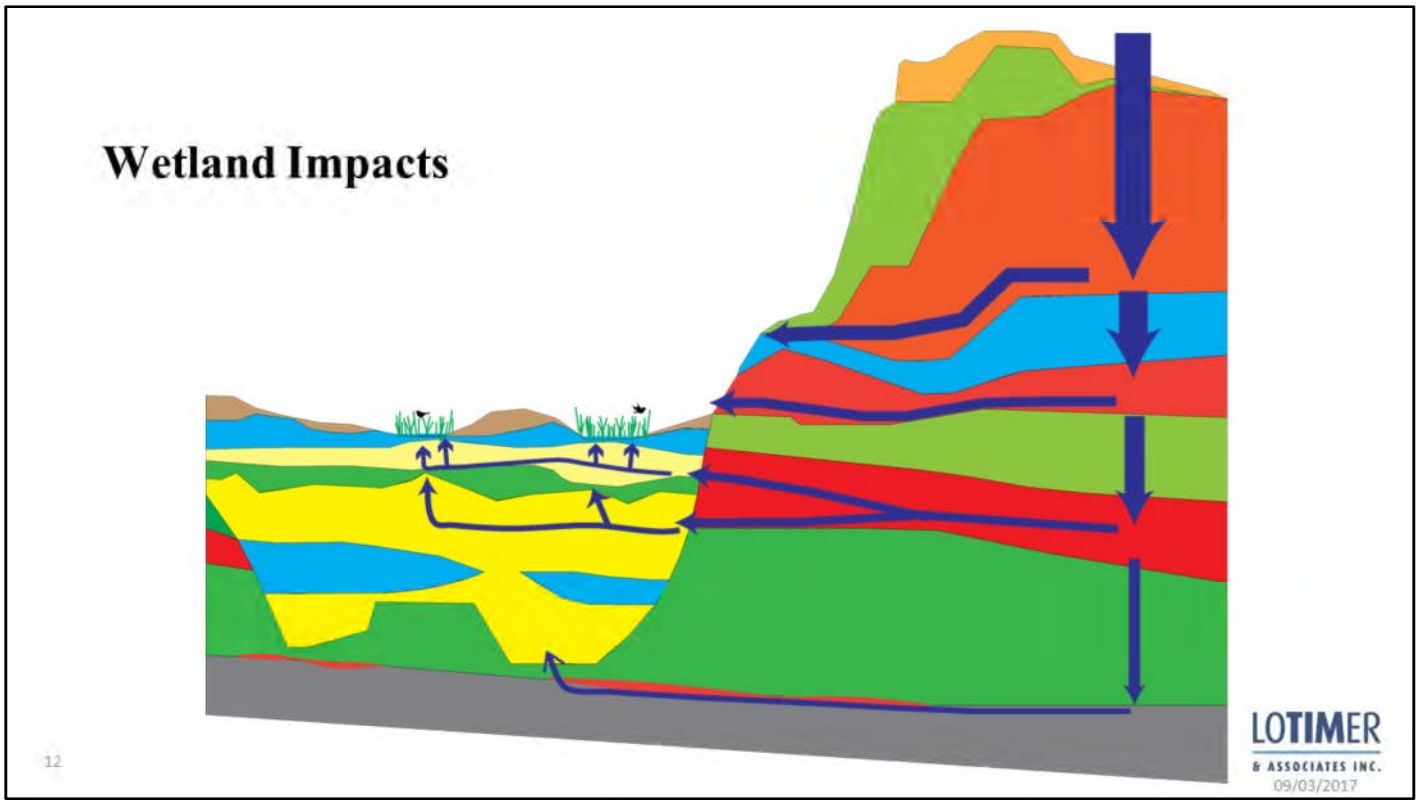
The slide on the left is from the NVCA. It shows the area of the Minesing swamp that is very dependent on groundwater discharge.

The conceptual drawing on the right shows the hydrogeological setting that results in this groundwater discharge shown by the Nottawasaga Conservation Authority.

The geologic layers are from the Ontario Geological Survey mapping for the Snow Valley Area.

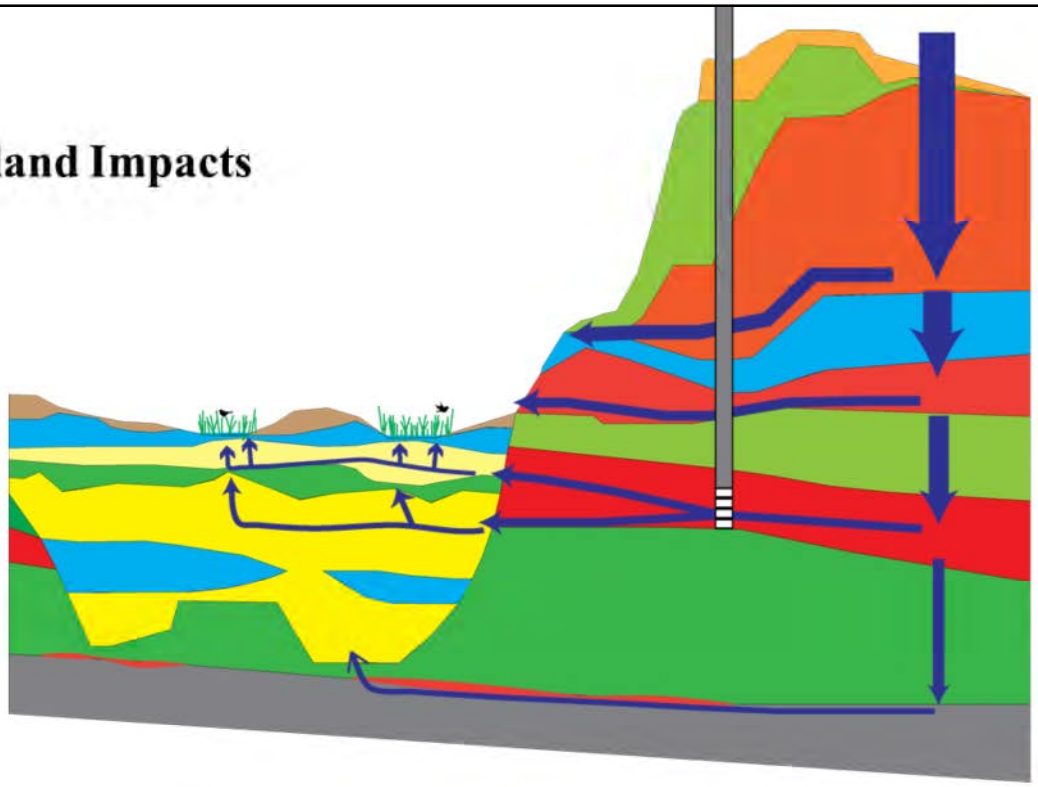
The blue arrows are a conceptual representation of groundwater flow. The thickness of the arrows are for illustrative purposes only and have been drawn to show a gradual reduction in groundwater flow downward, as groundwater moves through the geologic layers.

The Golder (2016) report does not contain the water budget information necessary to allow estimates of the volumes of water that move between the various hydrogeological units.




In the next series of slides, I show how the pumping of a well can reduce the groundwater discharge to a wetland.

## Wetland Impacts



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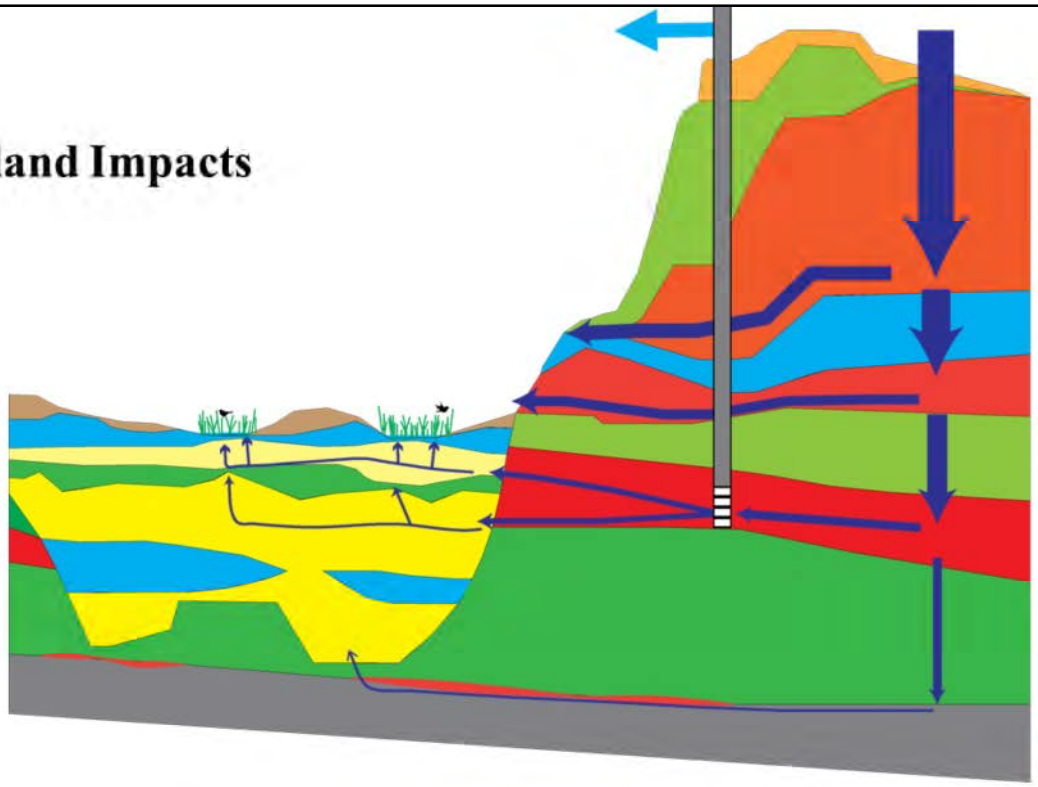
## Wetland Impacts



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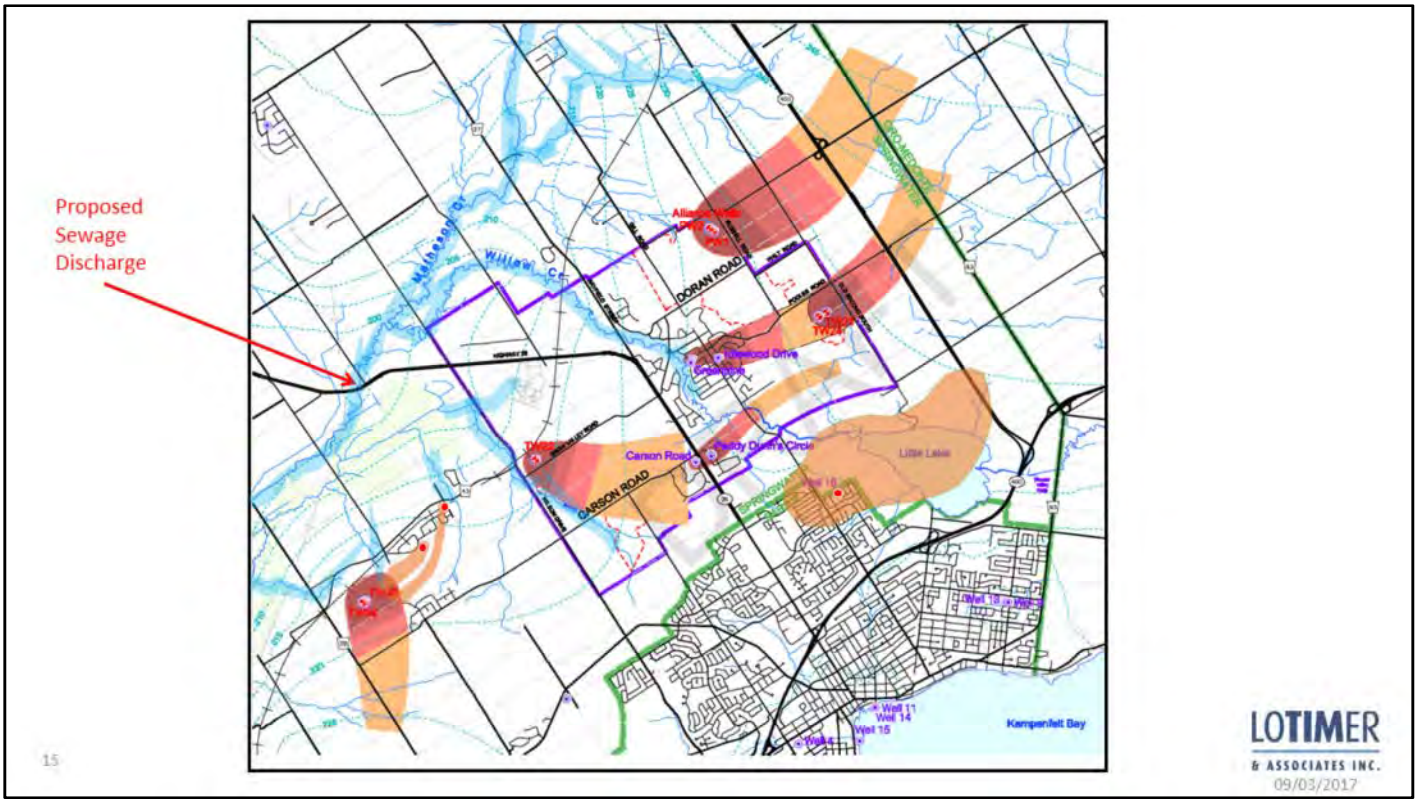


A similar process happens with streams, where pumping from a well can reduce the groundwater discharge to a stream.

The colourful shapes show the capture zones for the new wells and from these I can determine where stream flow reductions can be expected to occur.

The groundwater discharging to streams is considered “warm” in the winter, and protects trout eggs from freezing, and “cold” in the summer, that prevents heat stress to fish.

The location of the sewage discharge does not replace the water that will be removed from the streams “upstream” of the sewage discharge that will occur as a result of pumping.

Sources:

Golder (2016)
Black and Veatch (2016)
Well 16 capture zone: Map from Lake Simcoe SPA Approved Assessment Report F9-1

## Conclusions

- The predicted impacts are based on short term pumping of individual wells
- Not all of the wells have yet been constructed
- Combined pumping of all of the new wells at the required volume to meet the needs of the proposed development has not been done

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Most of the aquifer tests described in the Golder (2016) study were for 3 days. It is not uncommon to conduct 30 day or longer tests to determine the nature of impacts in a multi-aquifer system such as observed in the Midhurst area

## Conclusions

- The hydrogeological study does not include a complete survey of private well use and the potential for impacts to these private wells
- An assessment of the possible limitations to land use within the new Well Head Protection Areas has not been completed
- The hydrogeological study does not include an assessment of stream flow reductions along reaches of Willow and Matheson creek
- The hydrogeological study does not include an assessment of the impact to the Minesing wetland complex



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## Questions?

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We have been able to comment on some of the issues, and there is more information in the Appendix on the issues that I was not able to discuss.

# APPENDIX



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## Proposed New Water Supply – Assessing the Impact

- All of the new wells have not been constructed
- The new wells have not been pumped together at the required demand to observe the impacts of the taking
- *Predictions of impacts from the proposed taking have been determined using a mathematical groundwater model*

***Does this work?***



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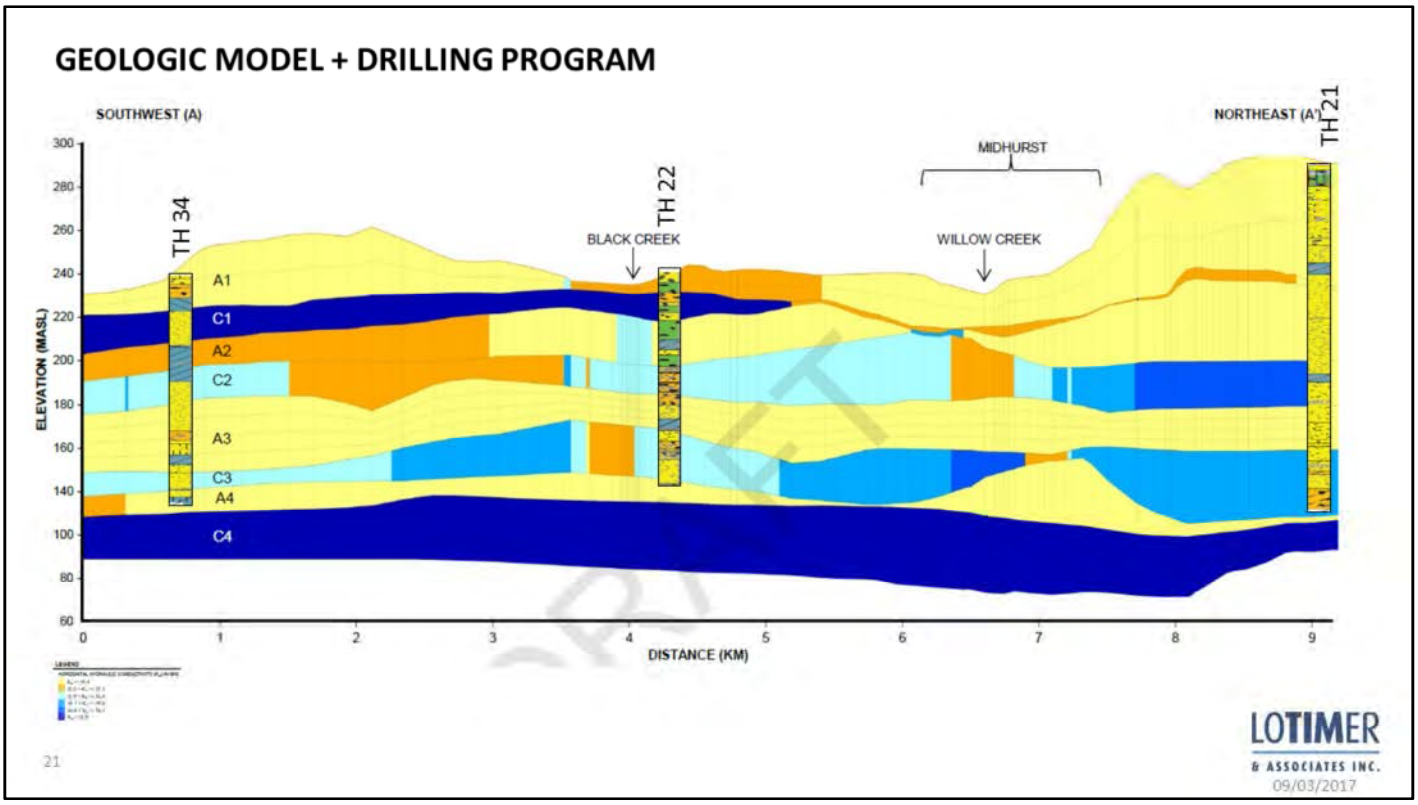
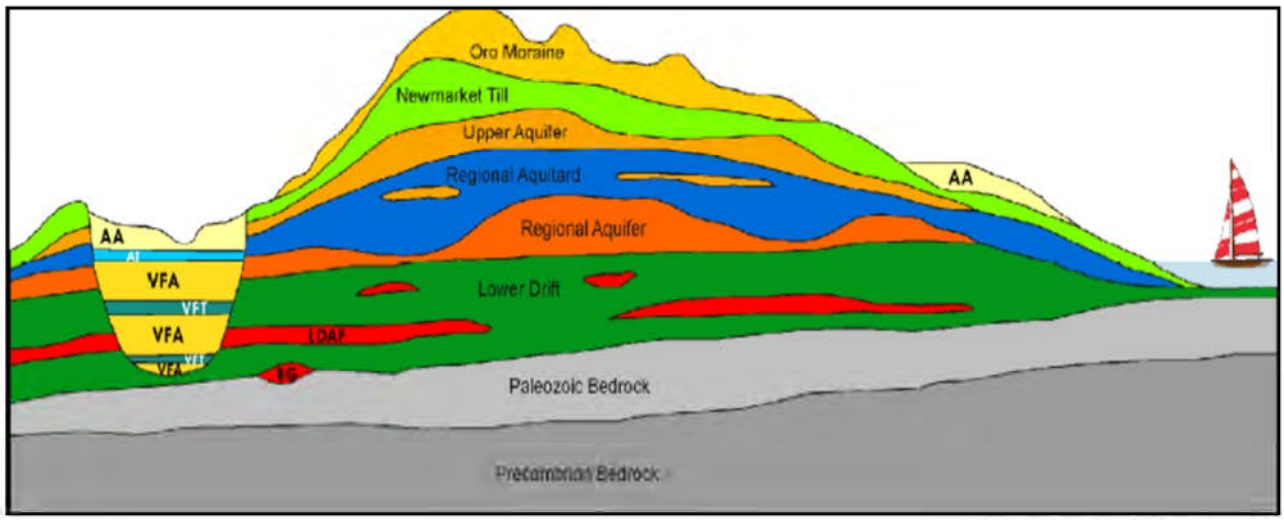
Start to introduce some issues related to the work done to date. The key point is: can Council rely on the work to date?




In this slide, we superimpose the geological information obtained from drilling at three of the four proposed water supply locations.

When we compare the test well results to the mathematical model, it appears that the field program contradicts the model




Ontario Geological Survey, 2011

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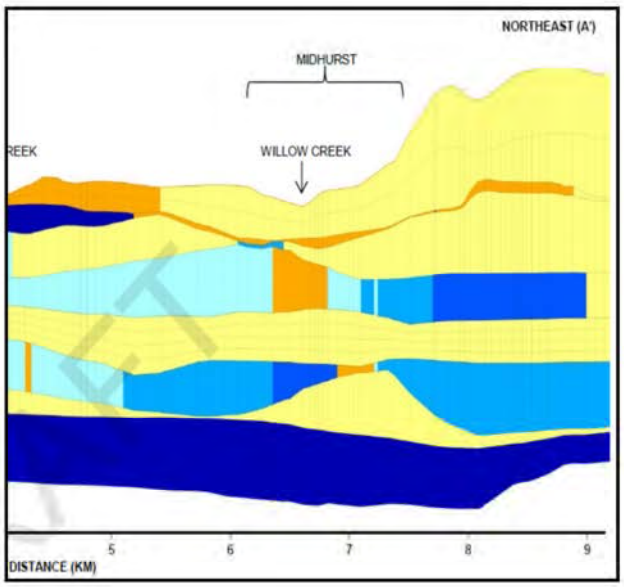
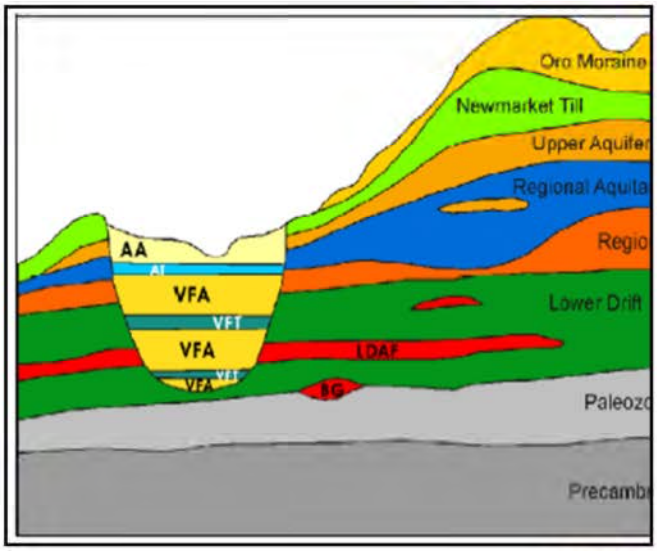
The Ontario Geological Survey has studied the Midhurst area.

This drawing shows that the area has various layers that can be divided into aquifers and aquitards.

An interesting finding of the work of the Geological Survey was that the sediments within the low lying areas reflect newer deposits, where the deposits shown in the upland areas are essentially missing. The aquifers and aquitards of the upland areas may or may not be connected to the sediments within the valley fill areas (VFA) associated with the streams and wetlands.

## Comparison of Geologic Models

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This slide compares the Golder (2016) model cross section to the Ontario Geological Survey conceptual geologic cross section.

The major difference is how the model represents the valley fill areas (VFA) where sensitive surface water features are present.

The Ontario Geological Survey layers do not extend through the valley fill areas, as they are interpreted to have been eroded away during more recent geological events.

# Proposed New Water Supply – Water Quality Treatment

| WELL SITE | WELL # | HIGHLIGHTS OF WATER QUALITY TEST RESULTS |
|---|---|---|
| Carson: Sand and Gravel Site | OW19 / TW22 | Low iron and manganese concentrations and elevated nitrate concentration |
| Carson: West Snow Valley Site | OW29 / TW34 | High iron and manganese concentrations with observed bubbles of gas and a slight sulphurous odour |
| Doran: Road Alliance Site | TW35 / PW1 | High manganese concentration and slightly elevated iron concentrations |
| Doran: Old Second Road Site | TW21 / OW24 | No detectable issue |

Bubbles of gas = methane gas



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What is the water quality like?

B&V, May 2016

# Proposed New Water Supply – Water Quality Treatment

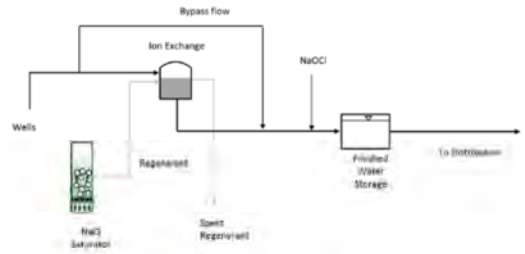


Figure 5 - Sand and Gravel Site Well Water Treatment System

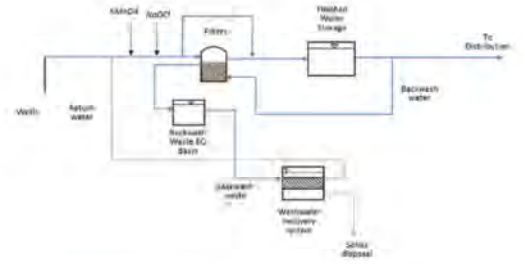


Figure 8 - Treatment at the Alliance Site

- Disinfection
- Green sand filtration to lower iron and manganese
- Ion exchange to lower elevated nitrate
- Air stripping to remove volatile organic compounds

- Note: current Midhurst wells are disinfected and then sodium silicate added to keep iron in solution

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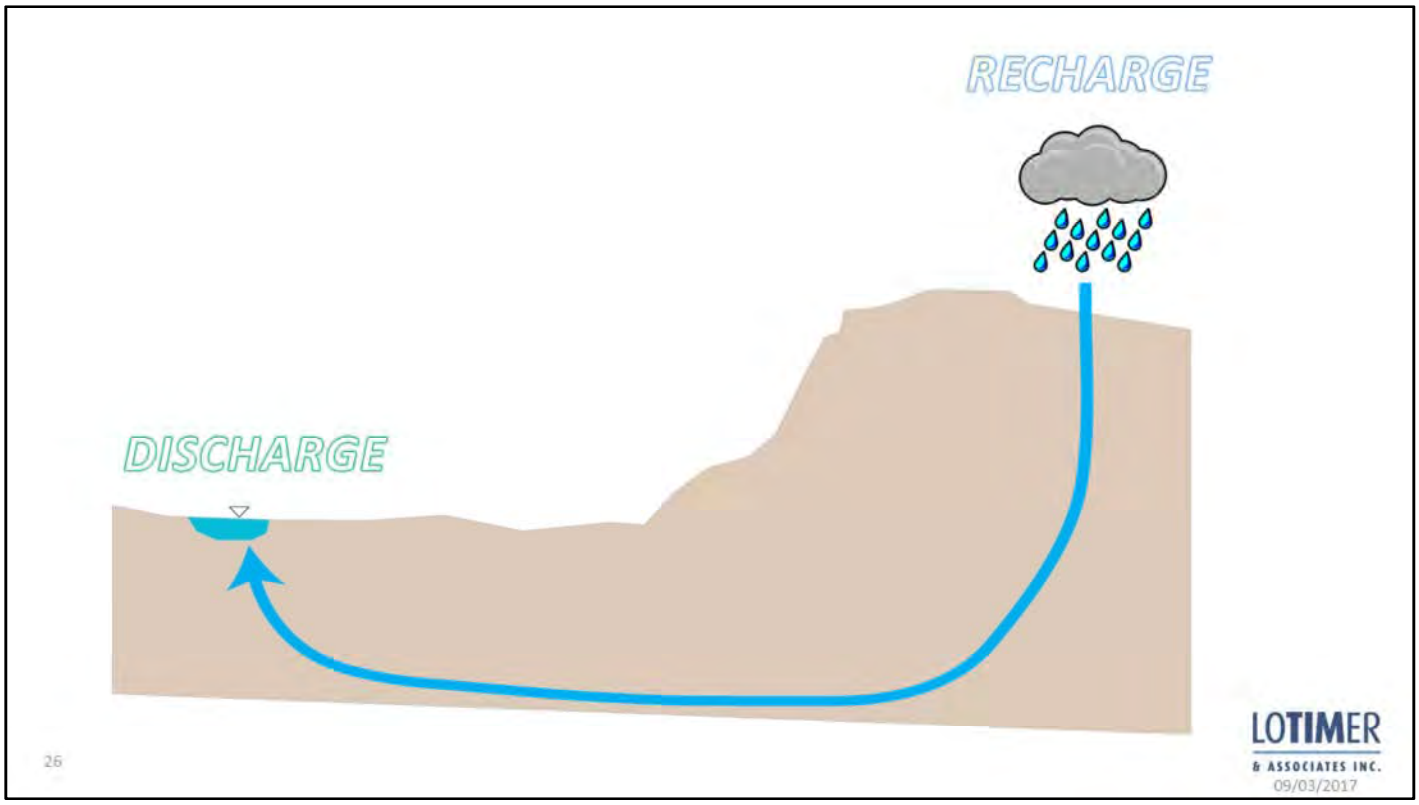
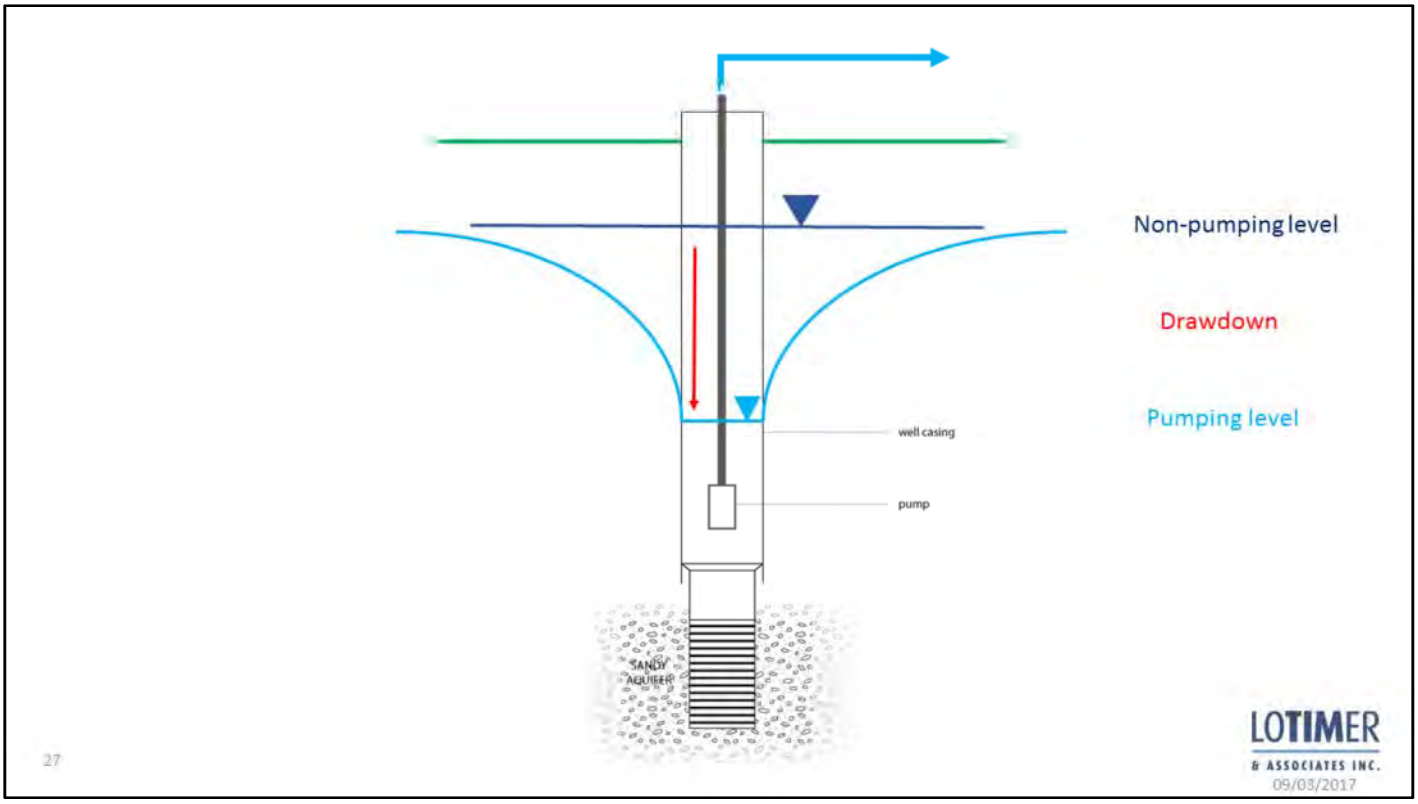
B&V, May 2016




Groundwater flow is from areas of recharge (typically the higher ground, such as the Oro Moraine ) to areas of discharge (typically streams and wetlands).

Groundwater moves through the pore spaces in the geological materials found below the surface.

The movement is in response to gravity, with groundwater moving from areas of higher hydraulic potential to lower hydraulic potential.




Many residents of Springwater Township rely on wells for their private water supply.

When a well is pumped the pumping level in the well drops. This is called drawdown.

Not only is there drawdown in the well, but there is also drawdown in the aquifer. This is called the zone-of-influence of pumping.

Hutchinson
Environmental Sciences Ltd.

1-5 Chancery Lane, Bracebridge, ON P1L 2E3 | 705-645-0021
www.environmentalsciences.ca

# Memorandum

**Date:** **March 30, 2017**

**To:** **Joe Mullan - Ainley Group**

**From:** **Neil Hutchinson**

**Re:** Response to Midhurst EA Submission from Michael Thorn.

---

I am pleased to provide this response to the comments submitted by Mr. Michael Thorn to Midhurst Council regarding his concerns (letter: March 7, 2017. "Comments on the Midhurst Environmental Assessment").

Mr. Thorn bases his concerns on the draft Assimilative Capacity Study prepared by Hutchinson Environmental Sciences Ltd. and downloaded from the Springwater Twp. web site. (HESL, May 2016. "Willow Creek Assimilative Capacity Study - Draft"). His comments also reference the modelling of groundwater baseflows in Willow Creek, as provided in Golder (June 2016, "Hydrogeological Study, Midhurst Water Supply Exploration Program [Appendix M]").

Mr. Thorn's concerns relate to the potential that pumping water to supply the Midhurst Secondary Plan Area will: reduce water levels in Willow Creek and impact fish communities, that sewage bypasses from the proposed WWTP may threaten water quality in Willow Creek, and a "General Comment" relating to the absence of a discussion on fisheries in the creeks.

**General Comment**

Mr. Thorn ends his letter with an overall comment that *"Finally, why was there essentially no mention of aquatic communities in any of the environmental assessments available online?"*

It is important to address this comment first as an understanding of the process to be followed will clarify that specific assessments of the fisheries and the aquatic environment in the creek are not required by MOE (1994a)[1] for purposes of an Assimilative Capacity Study. They are considered unnecessary for purposes of this assessment as effluent limits to maintain water quality in Willow Creek are required to protect **all forms of aquatic life** and **all aspects of the aquatic life cycles**. The clear intention is to protect all life stages during indefinite exposure to the water.

Our Draft Assimilative Capacity Study (HESL 2016) was prepared in connection with the class EA process to meet the requirements outlined in MOE (1994a). Section 2.5 states that:

[1] Ontario Ministry of Environment and Energy. 1994. Deriving Receiving Water-Based, Point Source Effluent Requirements for Ontario Waters. Procedure B-1-5. PIBS#3302. July, 1994. 53pp.

*"In establishing effluent requirements for discharges to surface waters, the process outlined below should be followed:*

1) *Appropriate site-specific receiving water assessments will be conducted to determine the effluent requirements based on the waste assimilative capacity of the receiver.*
2) *The site-specific effluent requirements, so derived, will be compared, where they exist, to the federal or provincial regulations or guidelines for effluent discharges and the most stringent requirement will be applied.*
3) *The effluent requirements derived from the above procedures, expressed as both waste loadings and/or concentrations, will be incorporated into a Certificate of Approval.*
4) *For existing discharges in areas with water quality worse than the Provincial Water Quality Objectives, the Ministry may develop a pollution control program with each discharger that would meet the effluent requirement determined from the above procedures.*

*Through the incorporation of receiving-water quality based limits into legally enforceable control documents like a Certificate of Approval, the guidelines for water quality management become enforced."*

Therefore, the intent of the Assimilative Capacity Study was to develop effluent limits for the proposed WWTP based on the specific receiving water requirements of Willow Creek. These are presented in HESL (2016). The site specific effluent requirements were developed within the MOE Policy Framework for protection of Surface Water Quality (MOE 1994a, 1994b[2]) which states:

> "Receiving-water based Effluent Requirements are developed within the following policy framework:
>
> > *"The surface waters of Ontario are put to many uses, and each use has specific water quality requirements. As a general management principle, water quality must be protected, preserved or restored to permit the greatest number of uses, based on the best interests of the people of Ontario"* (Water Management, 1994).
>
> To this end, the goal of the Ministry of Environment and Energy is:
>
> > *"to ensure that the surface waters of the province are of a quality which is satisfactory for aquatic life and recreation"* (ibid).
>
> To support this goal, the Ministry's policy further states that:
>
> > *"... the PWQO are set at a level of water quality which is protective of all forms of aquatic life and all aspects of the aquatic life cycles. The clear intention is to protect all life stages during indefinite exposure to the water"* "

Therefore, the Assimilative Capacity Study (ACS) has followed the requirements of MOE Policy to recommend effluent limits sufficient to maintain water quality in Willow Creek within the Provincial Water Quality Objectives (PWQO) to protect: "…*all forms of aquatic life and all aspects of the aquatic life cycles. The clear intention is to protect all life stages during indefinite exposure to the water".*

[2] Ontario Ministry of the Environment. Water Management Policies Guidelines and Water Quality Objectives of the Ministry of Environment and Energy, July 1994. ISBN 0-7778-8473-9 rev.67pp.

Accordingly, the ACS is focussed on setting effluent limits to maintain the receiving water quality at a level to support and sustain all forms and life stages of aquatic life.

**Explicit assessment of aquatic communities is unnecessary as maintaining water quality within the PWQO assures no adverse effect of the discharge on aquatic life.**

Our Draft Assimilative Capacity Study (HESL 2016) also meets the requirements for water quantity management outlined in MOE (1994a):

> ***"1.2.3 Other Water Management Policies***
> *The MOEE policy document Water Management (MOEE. 1994) also contains a number of policies, guidelines and implementation procedures related to the management of groundwater quality and the management of surface and ground water quantity. It is imperative to understand the inter-relationships of surface and ground water quality management and the important linkages between water quality and water quantity management. Management decisions related to any one of these aspects of water management can have serious implications on the others.*

…

> *Surface and Ground Water Quantity Management*
> *The protection and control of water quantity is a key component of Ontario's water management strategy. Water quantity and quality are closely related, inasmuch as the amount of water available and its physical characteristics are an important aspect of water quality. Ground water quantity management is essential for the added reason that ground water is often an important component of streamflow. Recognizing the many and varied uses of water, the MOEE policy for the management of surface and ground water quantity is:*
>
> ***To ensure the fair sharing, conservation and sustainable development of the surface and ground waters of the province.***
>
> *This general water quantity management policy is supported by a series of guidelines enunciated in Water Management (1994[b])"*

which states:

> *"Water takings will be controlled to prevent interference with other uses of water wherever possible and to resolve such problems if they do occur.*

The analysis provided below shows that the water takings associated with the Midhurst Secondary Plan will *"prevent interference with other uses of water"* (fish habitat) and thus meet the MOECC policy requirement "***To ensure the fair sharing, conservation and sustainable development of the surface and ground waters of the province"***

**Explicit assessment of aquatic communities is not necessary to meet the MOECC policy requirements of the Class EA process as these are met by setting effluent limits to protect all forms of aquatic life and ensuring that the ground water takings do not interfere with other water uses.**

**Ground Water Extraction and the Ecological Functioning of Willow Creek**

Mr. Thorn has raised concerns that *"any reductions in the base flow/ground water discharge could have several major ecological consequences"* in reference to the Golder (2016) prediction that groundwater taking for the Midhurst Secondary Plan Area may lead to maximum losses of 8.7% in the late summer (August) baseflow to Willow Creek in the area of Midhurst, and that assessment of risk on the basis of a proportional reduction in baseflow may not be protective of cold water fisheries.

We support the need to protect the cold water habitat status of Willow Creek and agree that significant losses of flow or base flow are potentially detrimental and must be considered. Our analysis, however, meets the requirements of MOECC for this stage of the assessment, has determined that no such significant losses are expected and thus the cold water habitat status is protected.

Our analysis determined that the small losses of baseflow predicted by Golder (2016) fall far short of a significant loss. The potential for deleterious impact that Mr. Thorn infers, without substantiation, will not occur as a result of the small reduction in baseflow predicted by Golder.

Mr. Thorn states that "*Reduced ground water discharge to Willow Creek will make it more vulnerable to drought and increase its risk of drying up in sections. The interruption of water flow in Willow Creek due to low flow conditions and drought would clearly disrupt the ecological functioning of the system"*

Mr. Thorn provides no evidence that flows in Willow Creek are low enough that a maximum predicted loss of 8.7% of base flow would disrupt its ecological functioning. Over dozens of visits over the past 8 years, HESL scientists have not witnessed anything close to drying up in the creek or its tributaries at the proposed project sites. We would advise that MOECC Policy (MOE 1994b) requires that, "When water is taken from streams which cease to flow seasonally due to natural causes, downstream flow must be maintained whenever there is an inflow" That is, MOECC recognize that some natural systems may "dry up" naturally but that this does not impose an extra requirement on water takings.

Mr. Thorn also states that Willow Creek *"has low base flows and further reduction of the base flow could have detrimental impacts on the streams carrying capacity (e.g. number of fish it can support) and functioning (e.g. ability to move sediment or break down organic matter)."*

- The ability of the stream to move sediment is not threatened by reductions of 8.7% in baseflow in any way - sediment is moved at high flows which will not be altered by the water takings.

- Carrying capacity of a stream for fish will, all else being equal, be related to the area of habitat available for fish and, in this case, how much habitat might be affected by a reduction in baseflow. Golder (2016) cites 20% as the threshold of baseflow loss at which ecological effects become unacceptable in a cold water stream. This is a provincial government (MOECC/MNRF) threshold.[3]
- The maximum predicted loss of 8.7% of baseflow is well below this MNRF/MOECC 20%. threshold of unacceptable impact. It is also lower than the more conservative estimate of DFO (2013[4]) which `states that cumulative flow alterations <10% of the instantaneous flow *"…have a*

[3] *Water Budget and Water Quality Risk Assessment Guide (MNRF and MOE, 2011) http://waterbudget.ca/waterbudgetguide*

[4] *Fisheries and Oceans Canada. 2013. Framework for Assessing the Ecological Flow Requirements to Support Fisheries in Canada. Canadian Science Advisory Secretariat. Science Advisory Report 2013/017. 16pp.*

*low probability of detectable impacts to ecosystems that support commercial, recreational or Aboriginal fisheries."*

While Mr. Thorn has criticized the use of the 20% threshold and has speculated on potential impacts, he provides no empirical evidence to suggest that the threshold is inadequate and should be reconsidered.

**We conclude that the predicted reduction of 8.7% is undetectable in accordance with DFO standards and therefore not a concern, and is well below the 20% loss which is considered unacceptable by MOECC/MNRF.**

Mr. Thorn speaks of the implications of the loss of cold water habitat and groundwater upwellings to cold water species such as brook trout. Willow Creek is a groundwater fed system during baseflow periods and will remain so. Although brook trout are reported in Willow Creek watershed they are present only in the tributaries of Black Creek and Matheson Creek. Analyses of the model by Golder (D. Hannan, pers. comm. March 21 2017) predict maximum potential baseflow losses of 8.7% in Black Creek in September and of 4.9% in Matheson Creek in October at full build out. Again, this maximum predicted loss of baseflow (groundwater) is below the DFO threshold of 10% for detectable impacts to fisheries. The groundwater model, therefore indicates no potential for detectable impacts to brook trout in Willow Creek, Matheson Creek or Black Creek.

Mr. Thorn concludes his submission by asking *"As such, how much will the development decrease the strength of ground water upwelling in areas of brook trout spawning?"*

- The analysis provided by Golder and our interpretation conclude that the predicted reductions from the water supply wells will not represent a significant loss of base flow as they are below provincial and federal thresholds of effect and will have no detectable impact.,
- I would clarify that the Golder analysis is highly conservative as the predicted loss of 8.7% does not account for any infiltration of stormwater to the shallow aquifers of the development areas. The Stormwater Management Plan for the Midhurst Secondary Plan area provides for infiltration of the first 23mm of all storm events to shallow groundwater (A1 aquifer) in the developed areas. This will effectively supplement the base flow in the developed areas and reduce the losses to base flow from those predicted by the Golder model.
- The Monitoring and Adaptive Management Plan being prepared for the Midhurst Secondary Plan includes detailed monitoring of groundwater, surface water and aquatic biota during pre-development conditions which can be compared to the post development response. This represents an unprecedented opportunity to monitor the effectiveness of the LID and BMP techniques proposed for the Midhurst Secondary Plan in protecting surface and ground water.

**Phosphorus and Willow Creek**

Mr. Thorn expressed his concern that *"…a common occurrence during spring melt for a waste water treatment facility is to bypass the treatment process, because of high water volumes, by dumping untreated waste into the creek. Will the waste water treatment facility for the Midhurst development be permitted to bypass the treatment process?"*

The WWTP will not by-pass the treatment process. The WWTP will be located 5 km from Willow Creek. Black & Veatch are the project engineers designing the WWTP and have advised as follows:

- MOECC does not permit a wastewater treatment plant by-pass unless the plant is connected to an old combined (sanitary+ stormwater) sewer system. In those cases, stormwater infiltrates old sanitary sewers and overwhelms the plant capacity. The sewerage system in Midhurst will be a new tight separate system (sanitary effluent only) so there will be no stormwater or groundwater infiltration into the wastewater collection system. Stormwater discharge will have no interaction with the sanitary sewer system.
- The wastewater treatment plant will not have any provision to by-pass the treatment as it is not permitted. The treated discharge from the wastewater treatment plant will be pumped to Willow Creek with dedicated pumps; there will be no direct connection between raw sewage and the effluent water pumping system. Therefore, no accidental event can occur.

**There is not, therefore, any reason to be concerned that wastewater treatment plant bypasses will impair any aspect of water quality in Willow Creek or its tributaries.**

Mr., Thorn also expressed an opinion that:"*Given that the phosphorus budget is likely a conservative estimation and phosphorus will be higher in an already eutrophic creek, the developers and consultants should take a precautionary approach and implement a program similar to what was set up by the Developers group in the Tottenham (i.e. creek restoration to reduce phosphorus; Fact Sheet #2). At the very least, this would be a good faith measure by the developer".*

The phosphorus budget for Willow Creek is presented in HESL (2016 Midhurst Phosphorus Budget Draft, May 2016). It demonstrates how state of the art stormwater management will reduce phosphorus from the developed areas of the Midhurst Secondary Plan levels compared to current levels, how a state of the art WWTP will discharge effluent with phosphorus concentrations at the PWQO for surface water (0.03 mg/L) and below the current 75$^{th}$ percentile concentration in Willow Creek and how the net effect, at full build out is only a 66 kg increase (3%) of current loads to the creek. The phosphorus budget also shows that high phosphorus concentrations in Willow Creek are associated with high concentrations of Total Suspended Solids (TSS) which are a result of runoff and erosion into the creek associated with existing land uses. We conclude that a full offset program for total phosphorus is not warranted in light of the extraordinary measures being taken to reduce phosphorus from the WWTP and storm water but we do recommend that some watershed management measures be implemented to reduce the concentration of TSS and associated TP associated with existing land uses in Willow Creek. These could include, among other opportunities, investigation of target sites and opportunities to implement:

- Fencing livestock out of stream channels,
- Increased use of vegetative buffers along stream corridors that traverse agricultural lands, and
- a program of riparian plantings to stabilize stream banks.

The Midhurst Development Group is committed to developing and implementing any required offsetting or watershed management measures with the NVCA or the MOECC.

# MEMORANDUM

**TO** Joe Mullan, Ainley Group **DATE** April 21, 2017

**CC**

**FROM** John Easton **DOCUMENT No.** 13-1170-0040

**RESPONSE TO APRIL 19, 2017 E-MAIL FROM JOHN HARRIS TO DON ALLEN**

Dear Sir

Golder Associates Ltd. (Golder) is pleased to provide this response with respect to a well examination conducted by Mr. Harris on the well of Mr. Allen. For ease of reference, the original text of the e-mail is in *italics* and our responses are added below in bold normal text. The purpose of this memorandum is to respond to Mr. Harris' written comments to the Township of Springwater. A copy of the e-mail from Mr. Harris to Mr. Allen is attached in Appendix A, we have also attached a copy of Water Well Record (WWR) #5718061.

*"Don,*

*Please find attached (legal size paper) copies of the two Ontario Water Well records for the 1981, 5 inch diameter drilled wells at/near your address.*

*As you can see the location sketches are not accurately drawn to be able to determine which exact property they are on.*

*Based on the well depth we measured on March 15, 2017, (51.5m or 169 ft) I would think that your well is #5718061*

*It is described as having a 3 ft screen from 166 to 169 ft."*

**The water well record is attached, for reference. We note that the subject well is approximately 1.6 km from the nearest proposed water supply wells.**

*"We measured a static water level of 42.97m (141ft). This is compared to the SWL in September 1981 was 145 ft*

*The difference may be related to seasonal fluctuations.*

*The WWR indicates that the well was tested for 1.5 hours at a rate of 7 gpm."*

**Pumping for 90 minutes at 32 L/min results in a water taking of 2880 L, which is almost three times the typical daily domestic water use. Typically, daily water use is divided up over three distinct periods and is separated by at least a few hours during which time water levels recover.**

*"The pumping water level dropped by 10 ft to 155 ft in 15 minutes and stayed at that level throughout the test.*

*(The top of the screen is recorded at 166 ft)*

*From the geologic sections, your well would be described as being located within the A2 aquifer unit."*

**We have assigned this well to Aquifer A1 based on typical elevation ranges for Aquifer A1. The absence of a confining layer over the aquifer, as indicated in the well record, contributes to this aquifer assignment.**

*"The Golder model simulations predict that your well will be impacted. It is within the 1.0 + to 1.5m drawdown area."*

**In accordance with the model simulations, the subject well is located just inside the projected 1-metre drawdown line. This drawdown is predicted to occur after 10 years of water taking after full build-out of the Secondary Plan area.**

*"Thus depending on seasonal aquifer level fluctuations, your well may be left with approx. 1.5 to 2m (5 to 6 ft) of water above the screen.*

*This may be satisfactory but it would not be considered a large safety factor."*

**Based on the information reported above, the water level in WWR#5718061 is 4' above the 1981 static water level, thus resulting in 25' of water above the screen. With the reported 10' of drawdown which occurred in the 2,880 L pumping test the resulting water level would be 15' above the screen. With the anticipated 1m drawdown modelled to steady state, this will result in a remaining 12' of water (or 3.6m) above the screen.**

**We do not expect that drawdown associated with the Midhurst water supply would result in any noticeable impact at the Allen well.**

*"I have had a quick look at the WWRs which are with 1000m radius of the Poole/Old Secord well site.*

*I expect that there will be others nearby that will be similarly affected."*

**We have reviewed the referenced wells as well as all other wells within the drawdown radius and have concluded that impacts resulting in a loss of water supply among distant shallow wells will not be an issue.**

*"Depending on actual water levels and depths some wells will need to have pumps deepened (if possible) or wells redrilled to a deeper depth".*

**We agree that there are many options to restore water supplies, however we do not expect that it will be necessary with respect to the Midhurst water supply.**

*"I am also going to look at the other well sites and the WWRs which are within about 1000m radius of each.*

*Regards,*

*John A. Harris"*

## CLOSURE

We trust this meets your current requirements. Should you have any questions please do not hesitate to contact the author.

**GOLDER ASSOCIATES LTD.**

John Easton, M.Sc. P.Geo.

WWR#5718061

Appendix A: E-mail string between Mr. Harris and Deputy Mayor Allen.

N:\Active\2013\13-1170-0040 Midhurst Doran Hydrog Well\Report\Allen Reply\Golder Midhurst Response to Allen April 21_2017.docx

MINISTRY OF THE ENVIRONMENT

The Ontario Water Resources Act

# WATER WELL RECORD

3105

Ontario

1 PRINT ONLY IN SPACES PROVIDED
2 CHECK ☒ CORRECT BOX WHERE APPLICABLE

(11) 5718061 MUNICIP 57016 CO PR W 01

COUNTY OR DISTRICT: Simcoe
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Vespra
CON., BLOCK, TRACT, SURVEY, ETC.: 2 PRW part
LOT: 016
[redacted] 7 Cedar creek Rd Barrie
DATE COMPLETED: DAY 14 MO 09 81
UTM: 921400 RC 5 ELEVATION 0925 RC 5 BASIN CODE 22

## LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

| GENERAL COLOUR | MOST COMMON MATERIAL | OTHER MATERIALS | GENERAL DESCRIPTION | DEPTH - FEET FROM | DEPTH - FEET TO |
|---|---|---|---|---|---|
| Black | Topsoil | | | 0 | 1 |
| Brown | Sand | | Dry | 1 | 145 |
| 11 | 11 | | Wet | 145 | 169 |

(31) 0001802 01456868 01691628

(32)

## (41) WATER RECORD

| WATER FOUND AT - FEET | KIND OF WATER |
|---|---|
| 145 | 1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL |
| | 1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL |
| | 1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL |
| | 1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL |
| | 1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL |

## (51) CASING & OPEN HOLE RECORD

| INSIDE DIAM INCHES | MATERIAL | WALL THICKNESS INCHES | DEPTH - FEET FROM | DEPTH - FEET TO |
|---|---|---|---|---|
| 05 | 1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE | 188 | 0 | 166 |
| | 1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE | | | |
| | 1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE | | | |

## SCREEN

SIZE(S) OF OPENING (SLOT NO.): 012
DIAMETER: 05000 INCHES
LENGTH: 03 FEET
MATERIAL AND TYPE: Johnson SS
DEPTH TO TOP OF SCREEN: 0166 FEET

## (61) PLUGGING & SEALING RECORD

| DEPTH SET AT - FEET FROM | DEPTH SET AT - FEET TO | MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.) |
|---|---|---|
| 10-13 | 14-17 13 | Packer |
| 18-21 | 22-25 | |
| 26-29 | 30-33 | |

## (71) PUMPING TEST

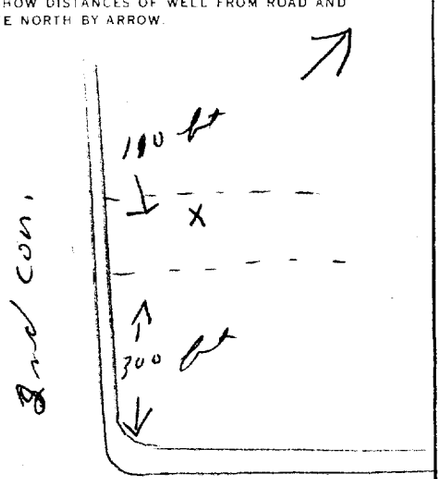
PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER
PUMPING RATE: 0007 GPM
DURATION OF PUMPING: 01 HOURS 30 MINS
STATIC LEVEL: 145 FEET
WATER LEVEL END OF PUMPING: 155 FEET
WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY

| 15 MINUTES | 30 MINUTES | 45 MINUTES | 60 MINUTES |
|---|---|---|---|
| 155 FEET | 155 FEET | 155 FEET | 155 FEET |

IF FLOWING GIVE RATE: GPM
PUMP INTAKE SET AT: FEET
WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING: 160 FEET
RECOMMENDED PUMPING RATE: 0007 GPM
GPM./FT. SPECIFIC CAPACITY

## LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.




DRILLERS REMARKS: 1 10302

**FINAL STATUS OF WELL** (54): 1 ☒ WATER SUPPLY; 2 ☐ OBSERVATION WELL; 3 ☐ TEST HOLE; 4 ☐ RECHARGE WELL; 5 ☐ ABANDONED, INSUFFICIENT SUPPLY; 6 ☐ ABANDONED, POOR QUALITY; 7 ☐ UNFINISHED

**WATER USE** (55-56) 01: 1 ☒ DOMESTIC; 2 ☐ STOCK; 3 ☐ IRRIGATION; 4 ☐ INDUSTRIAL; 5 ☐ COMMERCIAL; 6 ☐ MUNICIPAL; 7 ☐ PUBLIC SUPPLY; 8 ☐ COOLING OR AIR CONDITIONING; ☐ OTHER; 9 ☐ NOT USED

**METHOD OF DRILLING** (57) 1: 1 ☒ CABLE TOOL; 2 ☐ ROTARY (CONVENTIONAL); 3 ☐ ROTARY (REVERSE); 4 ☐ ROTARY (AIR); 5 ☐ AIR PERCUSSION; 6 ☐ BORING; 7 ☐ DIAMOND; 8 ☐ JETTING; 9 ☐ DRIVING

## CONTRACTOR

NAME OF WELL CONTRACTOR: Kent Well Drilling — LICENCE NUMBER: 3135
ADDRESS: RR #1 Barrie Ont
NAME OF DRILLER OR BORER: Ted Westra — LICENCE NUMBER:
SIGNATURE OF CONTRACTOR: [signature] — SUBMISSION DATE: DAY ____ MO. ____ YR. ____

## OFFICE USE ONLY

DATA SOURCE (58): 1
CONTRACTOR (59-62): 3135
DATE RECEIVED (63-68): 11 06 82
DATE OF INSPECTION:
INSPECTOR:
REMARKS:
P 9
CSS.ESWI

MINISTRY OF THE ENVIRONMENT COPY

FORM 7 MOE 07-091

# APPENDIX A

## Easton, John

**From:** Don Allen <don@allentrustee.ca>
**Sent:** Wednesday, April 19, 2017 3:54 PM
**To:** Joe Mullan
**Subject:** Don re John Harris

Don,

Please find attached (legal size paper) copies of the two Ontario Water Well records for the 1981, 5 inch diameter drilled wells at/near your address.

As you can see the location sketches are not accurately drawn to be able to determine which exact property they are on.

Based on the well depth we measured on March 15, 2017, (51.5m or 169 ft) I would think that your well is #5718061

It is described as having a 3 ft screen from 166 to 169 ft.
We measured a static water level of 42.97m (141ft). This is compared to the SWL in September 1981 was 145 ft
The difference may be related to seasonal fluctuations.

The WWR indicates that the well was tested for 1.5 hours at a rate of 7 gpm.
The pumping water level dropped by 10 ft to 155 ft in 15 minutes and stayed at that level throughout the test.
(The top of the screen is recorded at 166 ft)

From the geologic sections, your well would be described as being located within the A2 aquifer unit.
The Golder model simulations predict that your well will be impacted. It is within the 1.0 + to 1.5m drawdown area.

Thus depending on seasonal aquifer level fluctuations, your well may be left with approx. 1.5 to 2m (5 to 6 ft) of water above the screen.
This may be satisfactory but it would not be considered a large safety factor.

I have had a quick look at the WWRs which are with 1000m radius of the Poole/Old Secord well site.
I expect that there will be others nearby that will be similarly affected.
Depending on actual water levels and depths some wells will need to have pumps deepened (if possible) or wells redrilled to a deeper depth.

I am also going to look at the other well sites and the WWRs which are within about 1000m radius of each.

Regards,

John A. Harris

Kind Regards, **Don Allen** CPA CA CIRP
Licensed Insolvency Trustee

Don Allen & Associates
217-60 Collier Street,
Barrie, ON L4M 1G8
705-733-1511
866-223-0405 (fax)

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# MEMORANDUM

**TO** Joe Mullan, Ainley Group **DATE** April 21, 2017

**CC**

**FROM** John Easton, M.Sc., P.Geo. **PROJECT No.** 13-1170-0040

**RESPONSE TO MR. HARRIS WRITTEN COMMENTS TO DEPUTY MAYOR ALLEN "MIDHURST SECONDARY PLAN, CLASS ENVIRONMENTAL ASSESSMENT PHASE 3 AND 4, HYDROGEOLOGICAL STUDY COMMENTS"**

Dear Sir,

Golder Associates Ltd. (Golder) is pleased to provide this response to Mr. Harris' comments. For ease of reference, our responses are added in blue below into the body of Mr. Harris' emails in italics. The purpose of this memorandum is to respond to Mr. Harris' written comments to the Township of Springwater. A copy of the e-mail string between Mr. Harris and Deputy Mayor Allen is attached in Appendix A.

**From:** John Harris [mailto:j.a.harris@sympatico.ca]
**Sent:** April 18, 2017 8:15 PM
**To:** 'Don Allen' <don@allentrustee.ca>
**Subject:** RE: Don question
**Importance:** High

*"Population size has nothing to do with an aquifer's ability to sustain well production.*

*In most of southern Ontario over burden sediment aquifer materials have been laid out over 10s of thousands of years by advancing and receding glacial activity.*

*Some areas have very good aquifer conditions with good quality water, other areas have poor aquifer conditions and water quality.*

*Barrie, and KW 's groundwater supply evolved over decades. They both started in the early 1930's with 1 or 2 wells and added well supply as population increased.*

*The same can be said for York Region municipalities. The smaller communities of Marham, Richmond hill, Aurora and Newmarket were all totally on groundwater supplies developed over decades as the population increased. Then, sometime ago Toronto water was introduced into Vaughn, Markham and Richmondhill. As the population further increased Aurora began to receive surface water and recently Newmarket as well. An additional pipeline has also been recently added bringing surface water from Peel Region into Kleinberg, King City and connecting with supplement Aurora/Newmarket.*

*KW added the Grand River surface water supply in early 1990's to allow increased development once the apparent sustainable groundwater supply was maximized.*

*There were also several groundwater contaminant issues.*

*Barrie groundwater studies in the 1980's indicated a maximum sustainable groundwater supply for a population of up to about 135,000. The Kempenfelt Bay surface water supply was added in/around 2008 to permit increased growth once the sustainable groundwater supply was maximized. Unfortunately with the economic decline leading up to 2008, the industrial/manufacturing demand ceased and the population growth also slowed.*

*Presently, Barrie has a surface water supply and plant they paid $140,000,000 for and it is currently not needed. With hindsight, the plant construction could have delayed by 10 years or more.*

*Barrie, Newmarket and Aurora aquifers are deep, coarse grained sands and gravel deposits and highly productive wells. Many of the wells supply 75 L/s (1000 IGM). Kitchener Waterloo area also has conditions permitting high capacity wells. These conditions are very different from that found in the Midhurst, Springwater area."*

The aquifers proposed for use for servicing the Midhurst developments are known in Simcoe County as Aquifer A3 and A4 (aquifer designations derived in South Simcoe County Groundwater Study, Golder, 2004). They are, and continue to be, the primary water supply aquifers for almost all large municipal water takings in Simcoe County, Barrie, and the Regions of Peel, York, and Durham. These aquifers are part of a geological unit known as the Thorncliffe Formation (Thorncliffe Fm.). The Thorncliffe Fm. was deposited during a very long interglacial period prior to the last glaciation. It extends over a broad area of southern Ontario east of the Niagara Escarpment from Simcoe County to Lake Ontario.

Coarse grained aquifers, such as those described by Mr. Harris above, are not the only viable way of providing adequate water supplies for municipal use. In Springwater existing wells at Midhurst, Anten Mills, Snow Valley and Minesing are constructed in Aquifers A3 and A4 which are composed of fine to medium grained sand. The combination of great thickness and large areal extent of the aquifers makes construction of municipal grade wells possible, appropriate, and viable sources of water supply.

The comparison of Midhurst (future population 25,000) with Barrie (population 141,000), Markham (population 342,000), Richmond Hill (population 195,000), Aurora (population 55,000) or Newmarket (population 98,000) or Kitchener-Waterloo (population 523,000) is not appropriate. These other municipalities were serviced by groundwater until populations were far greater than the potential Midhurst population.

It is also noted that the population of Barrie was 38,423 in 1981 and it increased to 128,430 by 2006. This is a population increase of 90,000 over 25 years.

It is also noted that in the 25 years between 1981 and 2016 the population of Barrie increased from 38,423 to 128,430 (Census Canada). Municipal groundwater was used to service this increased population of 90,000. This growth is more than four times greater than the proposed growth of Midhurst Secondary Plan over the next 25 years.

**From:** Don Allen [mailto:don@allentrustee.ca]
**Sent:** April-18-17 5:25 PM
**To:** John Harris <j.a.harris@sympatico.ca>
**Subject:** Don question

John –

The following point has been made as to your comment about nothing of this scale having been done before. Interested in your comments.

The City of Barrie at a population of approximately 130,000 in 2008/09 was entirely on well water. They did not start using lake water until after this time.

Kitchener and Waterloo collectively at significantly more population than Barrie (at least 200,000 population) were entirely on well water until the 90's.

Regards, Don

**From:** John Harris [mailto:j.a.harris@sympatico.ca]
**Sent:** April 18, 2017 2:39 PM
**To:** don.allen@springwater.ca
**Cc:** John Harris <j.a.harris@sympatico.ca>
**Subject:** Midhurst Secondary Plan, Class Environmental Assessment Phase 3 and 4, Hydrogeological Study comments

*"Don Allen, Deputy Mayor, Township of Springwater*

*Reference; Midhurst Secondary Plan, Class Environmental Assessment Phase 3 and 4, Hydrogeological Study Comments*

*I am writing this letter as a resident of the Village of Midhurst, a taxpayer in the Township of Springwater.*

*I have concerns about this development on several levels ranging from its scope and size, and the issues related to the creation of what becomes a city surrounding the existing rural environment in and around the Village of Midhurst, increased traffic volume issues, treated volumes of waste water discharges into Willow creek up gradient of the Minesing Wetlands, local employment prospects for the new residents, and the development of a significant groundwater supply and the associated infrastructure, its impacts and potential required mitigation measures for the existing groundwater users (domestic residential and municipal supplies) and the long term maintenance costs of the two new proposed water systems.*

*I believe this development is unprecedented.*

*I do not think that there has been a development of this size that I can recall that has ever been developed on groundwater."*

The further email of April 18, 2017 8:15 PM, contradicts this position and illustrates a number of municipalities, which are much larger than Midhurst have been developed on groundwater.

*" Historically, groundwater development has been undertaken in relatively modest steps, with the addition of one or two wells developed or added to existing supplies.*

*The MOECC would issue a Permit to Take Water based on testing conducted on the newly constructed wells.*

*A Drinking Water License is then giving to operate the wells into a drinking water system.*

*The existing groundwater supplies would then be monitored for their impacts and performance before potential additional supplies are developed.*

*Permits would normally not be approved for new wells (for the two new water supplies) without testing at their final design capacities.*

*To date only four separate tests up to a combined capacity of 129 L/s have been completed while the future requirements are 221 L/s.*

*There will be impacts from the development of the new water supplies on the existing users, both residential and municipal. Mitigation measures may be required."*

This development application, unlike the municipal examples stated above, has looked at the water supply development for the whole development before it happens. Well testing supports the groundwater flow modelling that has been conducted based on the maximum taking at full development. In the past, Barrie, Newmarket, Richmond Hill, Kitchener-Waterloo, Peel, etc. have all added wells when needed without first assessing the potential of the aquifer to provide the required ultimate future supply.

The proposed development has considered the well supply, storage, and treatment for the full build-out of the development. This is a more appropriate way of determining the groundwater resources than expanding the water system to accommodate growth on an ad-hoc basis. However, Midhurst development will also be phased, with well construction and permitting completed as development proceeds, thus phasing in the usage consistent with the experience of other municipalities.

*"Most domestic residential wells are constructed within the relatively shallow depths of the A1 and A2 aquifer units.*

*The three municipal supplies (Midhurst 2,3,4,5 Deltrend 1,2,3 and Snow Valley 1,2,3,4 supplying Snow Valley and Centre Vespra) are all generally constructed in the deeper A3 aquifer unit.*

*The Vespra Hills Golf Club wells constructed within the A3 aquifer are a significant seasonal use of groundwater.*

*The Golder Hydrogeological Study and Groundwater Model predict impacts in all aquifer units.*

*The predicted drawdowns in areas at moderate distance from the new wells appear to be in the order of 1.0 to 1.5 - 2.0 m in A1 and A2 units and 1.0 to 1.5 m in the A3 aquifer.*

*The existing municipal supply wells should be capable of tolerating these impacts. Ongoing monitoring will be required to confirm impacts on the existing well supplies.*

*There are many domestic residential wells that may be significantly impacted by the development of the new water supplies.*

*These well would likely be within 1000 to 1500 m radius of the new supply wells.*
*A Permit to Take Water general condition is that the permit taker cannot negatively impact existing users.*

*Required mitigation measures would range from pump lowering where possible, to new deeper wells constructed, or connection to the new municipal supply.*

*From the MOECC Water Well Record database there appears to be approximately 57 (known) wells within a 1000m radius of the four identified new well sites.*

*All domestic residential wells will need to be surveyed, door to door to identify known and unknown wells, and to check their operating conditions to identify if they potentially are at risk of impacts and to mitigate as and when required. The costs for this mitigation should be born on the new development and not the general Springwater taxpayer."*

These issues have been addressed in our response to the Lotimer comments, attached (Appendix B).

*" The identified new high capacity well supply sites, with the exception of TW22 (coarse sand and gravel), have fine grained aquifer material, generally fine to medium sands requiring well screen openings of 0.006" to up to 0.020" slot utilizing a uniform gravel pack surrounding the screen. With the identified water quality at these sites consisting of elevated mineral content (iron, manganese) it is likely that well screen zone plugging will occur and that frequent well maintenance rehabilitation efforts will be required to recover lost well performance and capacity.*

*The costs for this ongoing maintenance should be born on the new development and not the other existing municipal supply users or the general Springwater taxpayer."*

The majority of the existing wells in Springwater, including the existing Midhurst wells, are constructed with well screens with well screen openings of 0.010" to 0.020", which is very similar to what is proposed for future Midhurst wells. There is nothing unusual in the proposed wells to suggest that there would be greater maintenance rehabilitation requirements with the proposed wells than there is with existing wells in Springwater.

*"Due to the water quality identified the new water supplies are to be treated by the removal of iron, manganese, nitrate (health related water quality parameter) and methane gas.*
*The existing municipal supplies require little treatment other than disinfection and sequestration of moderately elevated iron and manganese which are aesthetic water quality parameters.*
*Elevated Nitrate removal will be required at the TW22 area site as it is close to the health limit of 10 mg/L.*
*Its removal will likely be ongoing for many years as recent studies, some by University of Waterloo, have shown that levels remain in the soil for many years after fertilizer application by farming practices has ceased.*
*The treatments and associated infrastructure for the new well supplies are costly to build, operate and to maintain.*
*The costs for this infrastructure, operating costs and maintenance should be born on the new development and not the other existing municipal supply users or the general Springwater taxpayer."*

As water treatment strategies have evolved, treatment engineers are now able to employ reliable technologies to permanently remove metals (like iron and manganese) from drinking water. This permanent removal has been mandated by the Township. Some municipalities continue to add of chemicals to the water like sodium

silicate or sodium hexametaphosphate in order to temporarily hold iron and manganese in solution. The addition of chemicals is not proposed.

The removal of land from agricultural production and the associated application of fertilizer in well head protection areas and applying Best Management Practises to farmland shows that nitrate in groundwater decreases with time. It is expected that nitrate will decrease with time in the development lands with the removal of the feed lot and farm lands.

I hope you and members of Springwater Council will ensure that the above concerns and those raised by other residents are given close full and close deliberation.

**CLOSURE**

We trust this meets your current requirements. Should you have any questions please do not hesitate to contact the author.

**GOLDER ASSOCIATES LTD.**

John Easton, M.Sc., P.Geo.

Appendix A: e-mail string between Mr. Harris and Deputy Mayor Allen.

Appendix B: Response to Lotimer and Associates Presentation “Midhurst Secondary Plan Development Proposal”

N:\Active\2013\13-1170-0040 Midhurst Doran Hydrog Well\Report\Harris reply\Golder Midhurst Response to Harris April 21_2017.docx

# APPENDIX A

## Easton, John

**From:** Info @ Don Allen <info@donallen.ca>
**Sent:** Tuesday, April 18, 2017 8:18 PM
**To:** 'Barnet Kussner'; 'Bill French'; 'Robert Brindley'; 'Sandy McConkey'; 'Perry Ritchie'; 'Katy Austin'; 'Jennifer Coughlin'; Joe Mullan
**Cc:** 'Don Allen L9X 1P5'
**Subject:** John Harris further comments

**Importance:** High

See further comments and background. Don

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**From:** John Harris [mailto:j.a.harris@sympatico.ca]
**Sent:** April 18, 2017 8:15 PM
**To:** 'Don Allen' <don@allentrustee.ca>
**Subject:** RE: Don question
**Importance:** High

Population size has nothing to do with an aquifer's ability to sustain well production.

In most of southern Ontario over burden sediment aquifer materials have been laid out over 10s of thousands of years by advancing and receding glacial activity.
Some areas have very good aquifer conditions with good quality water, other areas have poor aquifer conditions and water quality.

Barrie, and KW 's groundwater supply evolved over decades. They both started in the early 1930's with 1 or 2 wells and added well supply as population increased.

The same can be said for York Region municipalities. The smaller communities of Marham, Richmondhill, Aurora and Newmarket were all totally on groundwater supplies developed over decades as the population increased. Then, sometime ago Toronto water was introduced into Vaughn, Markham and Richmondhill. As the population further increased Aurora began to receive surface water and recently Newmarket as well. An additional pipeline has also been recently added bringing surface water from Peel Region into Kleinberg, King City and connecting with supplement Aurora/Newmarket.

KW added the Grand River surface water supply in early 1990's to allow increased development once the apparent sustainable groundwater supply was maximized.
There were also several groundwater contaminant issues.

Barrie groundwater studies in the 1980's indicated a maximum sustainable groundwater supply for a population of up to about 135,000. The Kempenfelt Bay surface water supply was added in/around 2008 to permit increased growth once the sustainable groundwater supply was maximized. Unfortunately with the economic decline leading up to 2008, the industrial/manufacturing demand ceased and the population growth also slowed.
Presently, Barrie has a surface water supply and plant they paid $140,000,000 for and it is currently not needed. With hindsight, the plant construction could have delayed by 10 years or more.

Barrie, Newmarket and Aurora aquifers are deep, coarse grained sands and gravel deposits and highly productive wells. Many of the wells supply 75 L/s (1000 IGM). Kitchener Waterloo area also has conditions permitting high capacity wells. These conditions are very different from that found in the Midhurst, Springwater area.

**From:** Don Allen [mailto:don@allentrustee.ca]
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**Subject:** Don question

John –
The following point has been made as to your comment about nothing of this scale having been done before. Interested in your comments.

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**Subject:** Midhurst Secondary Plan, Class Environmental Assessment Phase 3 and 4, Hydrogeological Study comments

Don Allen, Deputy Mayor

Township of Springwater

Reference; Midhurst Secondary Plan, Class Environmental Assessment Phase 3 and 4, Hydrogeological Study Comments

I am writing this letter as a resident of the Village of Midhurst, a taxpayer in the Township of Springwater.

I have concerns about this development on several levels ranging from its scope and size, and the issues related to the creation of what becomes a city surrounding the existing rural environment in and around the Village of Midhurst, increased traffic volume issues, treated volumes of waste water discharges into Willow creek up gradient of the Minesing Wetlands, local employment prospects for the new residents, and the development of a significant groundwater supply and the associated infrastructure, its impacts and potential required mitigation measures for the existing groundwater users (domestic residential and municipal supplies) and the long term maintenance costs of the two new proposed water systems.

I believe this development is unprecedented.

I do not think that there has been a development of this size that I can recall that has ever been developed on groundwater.

Historically, groundwater development has been undertaken in relatively modest steps, with the addition of one or two wells developed or added to existing supplies.

The MOECC would issue a Permit to Take Water based on testing conducted on the newly constructed wells.

A Drinking Water License is then giving to operate the wells into a drinking water system.

The existing groundwater supplies would then be monitored for their impacts and performance before potential additional supplies are developed.

Permits would normally not be approved for new wells (for the two new water supplies) without testing at their final design capacities.

To date only four separate tests up to a combined capacity of 129 L/s have been completed while the future requirements are 221 L/s.

There will be impacts from the development of the new water supplies on the existing users, both residential and municipal. Mitigation measures may be required.

Most domestic residential wells are constructed within the relatively shallow depths of the A1 and A2 aquifer units.

The three municipal supplies (Midhurst 2,3,4,5  Deltrend 1,2,3 and Snow Valley 1,2,3,4 supplying Snow Valley and Centre Vespra) are all generally constructed in the deeper A3 aquifer unit.

The Vespra Hills Golf Club wells constructed within the A3 aquifer are a significant seasonal use of groundwater.

The Golder Hydrogeological  Study and Groundwater Model predict impacts in all aquifer units.

The predicted drawdowns in areas at moderate distance from the new wells appear to be in the order of 1.0 to 1.5 - 2.0 m in A1 and A2 units and 1.0 to 1.5 m in the A3 aquifer.

The existing municipal supply wells should be capable of tolerating these impacts. Ongoing monitoring will be required to confirm impacts on the existing well supplies.

There are many domestic residential wells that may be significantly impacted by the development of the new water supplies.

These well would likely be within 1000 to 1500 m radius of the new supply wells.
A Permit to Take Water general condition is that the permit taker cannot negatively impact existing users.

Required mitigation measures would range from pump lowering where possible, to new deeper wells constructed, or connection to the new municipal supply.

From the MOECC Water Well Record database there appears to be approximately 57 (known) wells within a 1000m radius of the four identified new well sites.

All domestic residential wells will need to be surveyed, door to door to identify known and unknown wells, and to check their operating conditions to identify if they potentially are at risk of impacts and to mitigate as and when required. The costs for this mitigation should be born on the new development and not the general Springwater taxpayer.

The identified new high capacity well supply sites, with the exception of TW22 (coarse sand and gravel), have fine grained aquifer material, generally fine to medium sands requiring well screen openings of 0.006" to up to 0.020" slot utilizing a uniform gravel pack surrounding the screen. With the identified water quality at these sites consisting of elevated mineral content (iron, manganese) it is likely that well screen zone plugging will occur and that frequent well maintenance rehabilitation efforts will be required to recover lost well performance and capacity.

The costs for this ongoing maintenance should be born on the new development and not the other existing municipal supply users or the general Springwater taxpayer.

Due to the water quality identified the new water supplies are to be treated by the removal of iron, manganese, nitrate (health related water quality parameter) and methane gas.
The existing municipal supplies require little treatment other than disinfection and sequestration of moderately elevated iron and manganese which are aesthetic water quality parameters .
Elevated Nitrate removal will be required at the TW22 area site as it is close to the health limit of 10 mg/L.
Its removal will likely be ongoing for many years as recent studies, some by University of Waterloo, have shown that levels remain in the soil for many years after fertilizer application by farming practices has ceased.
The treatments and associated infrastructure for the new well supplies are costly to build, operate and to maintain.
The costs for this infrastructure, operating costs and maintenance should be born on the new development and not the other existing municipal supply users or the general Springwater taxpayer.

I hope you and members of Springwater Council will ensure that the above concerns and those raised by other residents are given close full and close deliberation.

Sincerely,

John A. Harris

7 Golden Oak Drive

Midhurst, Ontaio, L9X 0M4

j.a.harris@sympatico.ca

# APPENDIX B

# MEMORANDUM

**TO** Joe Mullan, Ainley Group **DATE** April 21, 2017

**CC**

**FROM** John Easton / Devin Hannan **PROJECT No.** 13-1170-0040

**RESPONSE TO LOTIMER AND ASSOCIATES PRESENTATION "MIDHURST SECONDARY PLAN DEVELOPMENT PROPOSAL"**

Dear Sir,

Golder Associates Ltd. (Golder) is pleased to provide this response to the Lotimer Associates Inc. (Lotimer) presentation entitled "*Midhurst Secondary Plan Development*" dated March 8, 2017. Lotimer provides a critique of Golder's report entitled "*Hydrogeological Study, Midhurst Water Supply Exploration Program, Township of Springwater, Ontario* [the Study] (Golder, June 2016), and offers their opinion on the potential for future impacts to groundwater users as a result of the proposed Carson and Doran Neighbourhood water supply well pumping. The purpose of this detailed memorandum is to respond to Lotimer's comments and conclusions as presented to the Township of Springwater Council regarding the Study and potential impacts of the proposed pumping to the hydrogeological system. The Lotimer presentation slides are contained in Appendix A.

**Pumping Tests and Predicted Impacts**

***Slide 6***; Impacts to Private Water Supply Wells: *"To assess the impacts to these wells, it would be necessary to measure the normal pumping level in each of the wells and compare this to the predicted interference from pumping of the new wells."*

*"Complete a door-to-door survey of private wells and their operating characteristics to allow this assessment can not be found in the Golder (2016) report."*

Lotimer contends that measuring the *"normal pumping level in each of the wells"* and *"their operating characteristics"* is required, or in other words 'conducting a pumping test should have been done at every well within the drawdown cone'. An investigation to this level of detail, at any point, in a municipal water supply development project is simply unheard of. This has not been done nor is it required by the MOECC even at the Permits to Take Water (PTTW) stage that Golder prepared for the Township of Springwater at Anten Mills, Minesing, or Del Trend for dozens of other PTTWs for other municipalities in Simcoe County. Furthermore, neither the Township of Springwater, the City of Barrie nor any other municipality in Simcoe have ever done this for any of their municipal water systems. An investigation to this level of detail is totally unnecessary.

A domestic water well survey (door-to-door) would not reveal materially more information than we currently have on the water supply use in the Midhurst area The water well database that is maintained by the Ministry of the Environment and Climate Change is a very useful tool for assessing the water supply characteristics for an area. The water well record database contains a log of the geological materials, well depth, static water level, rate of taking in pumping test, recommended pumping rate and these parameters are typically not available from well owners. The water well record database contains the only water level and testing information available for most wells. Therefore, compared to a door-to-door survey an examination of the impacts through an examination of the water well records results in more actual usable data that can be used to evaluate the available water resources of an area. Thus, in our opinion, door to door surveys are not the most reliable way to measure impact.

In order to gather water level data, the Study included drilling and construction of monitoring wells in all of the aquifers that are present including those used by private wells in the study area. In this way it was possible to measure drawdown during pumping tests in all of the aquifers, including those that contain private wells. These monitoring wells were all equipped with data loggers that recorded water levels prior to, during, and after all of the pumping tests.

Finally, Slide 6 is misleading because it gives the impression that a large number of wells may experience significant drawdown. Slide 6 shows the drawdown cone for Aquifer 3, however, almost all of the private wells in the area are completed within shallower Aquifer A1 or Aquifer A2, which is hydraulically separated from direct drawdown from wells operating in Aquifer A3 or A4.

***Slide 7***; Impacts to Private Water Supply Wells: *"it is known that the MOECC water well record data base is often missing wells."*

The water well database also contains many wells in Midhurst and in Barrie which are no longer in service because the homes and businesses are serviced with the Midhurst municipal water supply. The MOECC database contains the original water well records that show the location of the well on a map. The database when used by an experienced hydrogeologist provides a clear picture of the groundwater resources of an area, and the precise location of every well is not required. A statistical evaluation of water wells constructed in an aquifer provides all required and reliable information to assess water supply impacts.

**Slide 8;** Impacts to Land Owners: *"The WHPA's show the areas where limitations may be placed on property use, in accordance with the Source Protection Plan. There are many farms and private rural dwellings within Springwater Township and adjacent Oro-Medonte Township that may be affected by these limitations."*

Lotimer suggests that an eventual Source Protection Plan for the proposed wells may affect land use on farms and private rural dwellings. However, to use a current example, the recently approved Source Protection Plan for Midhurst, Del Trend and Snow Valley, all of which draw from deep Aquifer A3, indicates the only area of high aquifer vulnerability is within a 100 m radius around the supply wells themselves ("WHPA-A") (Approved Assessment Report: Nottawasaga Valley Source Protection Area - South Georgian Bay-Lake Simcoe Source Protection Committee, 2015). Outside of the WHPA-A no land use restrictions on farming and domestic land use practices were recommended as part of the Source Water Protection plans.

The 100-m WHPA-A for the proposed wells is **within** the proposed development area for houses. This is a common circumstance throughout Simcoe County and Barrie where municipal wells are often constructed within built-up areas containing homes with the WHPA-A. Homes within a WHPA-A do not face land use restrictions that affect normal domestic use.

**Slide 8;** Impacts to Land Owners: *"it is also important to note that some of the new wells will capture water that currently flows to the existing Midhurst municipal wells, causing an impact to the existing wells."*

The slight overlap in the 10 to 25 year time of travel capture zone for the Greenpine and Idlewood wells with TW21 and TW24 in no way affects the ability of the existing wells to continue to provide water. The groundwater flow model accounts for all of the municipal water taking in Midhurst, not just the new wells.

***Slide 9***; Impacts of the Water Taking: *"When considering impacts the cumulative taking of all of the municipal water supplies within the Willow Creek Sub-watershed must be considered."*

The cumulative impact of the taking within the Willow Creek Subwatershed was considered and addressed within the Study. The cumulative impact is well below the MNR and DFO thresholds for significant baseflow loss and will have no detectable impact. The Study illustrates that no drawdown is expected to occur at the Minesing Wetland (see Figure 10 of Appendix M) and groundwater baseflow loss directly upstream of Minesing Wetland is minor (between 2% to 6% reduction as per 02ED032 results in Figure 11 of Appendix M in the Study).

***Slide 10***; Impact of Proposed New Water Supply: *"The water taking from the municipal wells within the watershed is considered to be a consumptive taking." "This results in a reduction of groundwater flow to the existing receptors connected to the pumping aquifer (other groundwater users, streams and wetlands) that approximately equals the amount of water pumped."*

Virtually all municipal groundwater taking in Simcoe County and Barrie is a consumptive water use. Defining a water taking as consumptive does not mean that the water taking is not sustainable. The aquifer testing and groundwater flow model both indicate that the groundwater supply for existing Midhurst, the future Midhurst development, including the groundwater use in Barrie, is sustainable.

Lotimer is incorrect to claim that a withdrawal of groundwater from Aquifer A3 or A4 results in an equivalent water loss to Willow Creek. In the Midhurst area, water in Aquifer A3 is entrained in the regional groundwater flow system that discharges to Georgian Bay. The Study illustrates that no drawdown is expected to occur at the Minesing Wetland (see Figure 10 of Appendix M) and groundwater baseflow loss directly upstream of Minesing Wetland is minor (between 2% to 6% reduction as per 02ED032 results in Figure 11 of Appendix M in the Study). Clearly, the cumulative impact is addressed and is well below the MNR and DFO thresholds for unacceptable impacts. For further discussion on this topic see the memorandum prepared by Hutchinson Environmental Services Ltd. for the Ainley Group dated March 30, 2017.

***Slides 11, 12, 13, and 14***; Wetland Impacts: *"the slide on the left is from the NVCA. It shows the area of the Minesing swamp that is very dependent on groundwater discharge. The conceptual drawing on the right shows the hydrogeological setting that results in this groundwater discharge area shown by the Nottawasaga Conservation Authority. The layers are from the Ontario Geological Survey mapping for the Snow Valley Area."*

These slides show a farrago of unrelated data. This use of unrelated drawings renders the whole discussion of recharge into the upland area and discharge to the proximal lowland areas entirely incorrectly, as expanded upon below.

Lotimer is inferring that the cross section represents the hydrostratigraphy of the Sunnidale upland and the Minesing lowland to the west of George Johnson Road. In reality the cross section taken from the Ontario Geological Survey report GRS 11 (Slide 22) is a generalized North-South cross section through the Oro Moraine and the Horseshoe Valley. In the Oro Moraine–Horseshoe Valley area the deep Regional A3/A4 Aquifer is thinner than in the Midhurst area and the Valley Fill deposits (shown in yellow, green, and light blue) are different than in the Minesing basin making the reference to this cross-section to describing groundwater flow under natural and pumping conditions inappropriate for the Midhurst area.

The entire Minesing basin is covered by a thick varved clay deposited from Lake Algonquin and the highly publicized blow-outs of flowing wells in the Township of Springwater at Gill Road in 2015, on Horseshoe Valley Road west of Anten Mills in 2006, and on George Johnson Road in 2003 are direct examples that the deep aquifers are confined and do not allow direct discharge to the wetland from below. Slides 12, 13, 14, and 22 of Lotimer are inaccurate and misleading. The geological model prepared by Golder and used by the South Georgian Bay Lake

Simcoe Source Protection Region for modelling the Barrie and Springwater groundwater flow model is appropriate for the Midhurst area.

The groundwater flow lines shown on drawing (Slide 11) neglect to recognize the regional groundwater movement, which includes flow under the Minesing Wetland with ultimate discharge to Georgian Bay, and the thick confining layer (Lake Algonquin varves) over the aquifers in the Minesing Wetland basin. The conceptual stratigraphy shown in Slide 11 shows channel fill deposits rather than the more appropriate geological model which includes aquifer units and confining layers extending from the Snow Valley upland toward Wasaga Beach. This hydrogeological concept of a regional scale confining layer between Aquifer A2 and Aquifer A3 was also used by Beckers and Frind (University of Waterloo) in their 2001 hydrostratigraphic model of the Oro Moraine aquifer (which included the Minesing Wetland).

***Slide 16*;** Lotimer Conclusions: *"The predicted impacts are based on short term pumping of individual wells" "not all wells are constructed" "combined pumping of all of the new wells at the required volume to meet the needs of the proposed development has not been done"*

We wish to emphasize four aspects of the Study approach in response:

- Firstly, 3-day pumping tests, such as those conducted in the Study, are a typical and reliable method of estimating well yield and aquifer properties.
- Secondly, extending the length of these tests would not provide more accurate/useful results. It is the first day of pumping data that are important in analysis of aquifer transmissivity and storage.
- Thirdly, long-term groundwater impacts were predicted using a calibrated groundwater model that simulated all proposed operational wells using full build-out pumping rates. In our opinion this approach negates the need for a combined, longer term pumping test. The model considers a 10-year simulation, which is significantly longer than the 30-day test proposed by Lotimer and can provide better data than the approach suggested by Lotimer.
- Finally, the groundwater flow model was calibrated based on the results of the pumping tests. These included the interference among the aquifers that was noted at TW21. The drawdown predicted in the shallow wells is representative of the results of the pumping tests.

***Slide 17***; Lotimer Conclusions: *"The hydrogeological study does not include a complete survey of private well use and the potential impacts to these private wells"*

Lotimer is proposing that a pumping test is required at every well within the drawdown cone. An investigation to this level of detail, at any point, in a municipal water supply development project is simply unheard of.

In support of this conclusion, Lotimer superimposes private wells from the Ministry of Environment and Climate Change (MOECC) water well information system database onto an image of predicted drawdown in deep Aquifer A3 (Slide 6, which uses simulated A3 drawdown extents as adapted from Figure 10, Appendix M of the Study).

In our opinion, as noted above, this illustration is misleading because it gives the impression that a large number of wells may experience significant drawdown. Slide 6 shows the drawdown cone for Aquifer 3, however, almost all of the private wells in the area are completed within shallower Aquifer A1 or Aquifer A2 which is hydraulically separated from direct drawdown from wells operating in Aquifer A3 or A4.

For example, within Lotimer's image extents, there are approximately 589 domestic wells listed in the MOECC WWIS of which completion depth can be ascertained. Of these 589 wells, 573 (over 95%) are completed above Aquifer A3 based on regional aquifer mapping. Predicted drawdown within Aquifer A1 or Aquifer A2 is significantly less than that in Aquifer A3 (see Figure 10, Appendix M of the Study) and is not expected to adversely affect domestic wells within these aquifers.

We have summarized the information presented in the Hydrogeological and Modelling reports to address the well interference issue raised by Lotimer below:

The drawdown at the nearest wells constructed inside the two metre drawdown zone were evaluated to test Lotimer's hypothesis of widespread interference with private water supply wells. Logic dictates that if nearby wells can accommodate two metres of drawdown then more distant wells would be able to accommodate less interference. It must be understood that some drawdown water level at a well does not mean that there will be interference with the well's ability to provide an adequate water supply.

There are no wells located within the 2-metre drawdown cone for any of the proposed wells in Aquifer A1. There are 11 wells located within the 1.5-metre drawdown cone, which have a water column above the well screen of between 6 and 14 m. None of these wells are expected to be vulnerable to a loss of water as a result of the proposed water taking.

There are 16 wells within the 2-metre drawdown cone for Aquifer A2 and they have a water column above the well screen of between 10 and 34 m. None of these wells are expected to be vulnerable to a loss of water supply as a result of the proposed water taking.

There are three wells within the 2-metre drawdown cone for Aquifer A3 and these wells have a water column above the well screen of between 46 and 71 m. It is not expected that these wells will be vulnerable to a loss of water supply as a result of the proposed water taking.

There are three wells within the 2-metre drawdown cone for Aquifer A4 and one well constructed in the bedrock aquifer. These wells have a water column above the well screen of between 69 and 112 m. It is not expected that these wells will be vulnerable to a loss of water supply as a result of the proposed water taking.

The preceding indicates that impact to private water supply wells is not expected. There will be further well construction and aquifer performance testing prior to submitting an application for a Permit to Take Water. Part of the Permit to Take Water application process involves public consultation and posting the proposed application for comment on the Environmental Registry of the Ontario Ministry of the Environment and Climate Change.

***Slide 17***; Lotimer Conclusions: *"An assessment of the possible limitations to land use within the new Well Head Protection Areas has not be completed"*

As noted above, the WHPA-A for the proposed wells is within the proposed development area for houses. This is a common circumstance throughout Simcoe County and Barrie where municipal wells are within built-up areas and homes are located within the WHPA-A. Homes within a WHPA-A do not face land use restrictions that affect normal domestic use. Outside of the WHPA-A no land use restrictions on farming and domestic land use practices were recommended as part of the Source Water Protection plans, therefore we do not anticipate that there will be significant restrictions proposed as a result of future Source Protection Plans.

***Slide 15, 17***; Lotimer Conclusions: *"The hydrogeological study does not include an assessment of stream flow reductions along reaches of Willow and Matheson creek" "the hydrogeological study does not include an assessment of the impact to the Minesing wetland complex"*

Groundwater baseflow reductions within the Willow Creek watershed *were* evaluated and described in Section 6.3 of Appendix M of the Study. In summary:

- Pre- and post-development monthly baseflows were simulated at the three Water Survey of Canada flow gauges along Willow Creek, namely: 02ED009 (upstream of proposed development near Little Lake), 02ED010 (at Midhurst) and 02ED032 (downstream of Matheson Creek and just upstream of Minesing Wetland). It was found that post-development baseflow loss was minor throughout the year with a maximum reduction of less than 10% occurring at 02ED010.

For context, the *Water Budget and Water Quantity Risk Assessment* Guide published by the Ministry of Natural Resources and Ministry of Environment defines an unacceptable impact to cold water streams as a circumstance where groundwater discharge is reduced by more than 20% as compared to the average monthly baseflow of the watercourse. Further as noted above, it is also below MNR and DFO thresholds. For further discussion on this topic see the memorandum prepared by Hutchinson Environmental Services Ltd. for the Ainley Group dated March 30, 2017.

***Slide 20***; Proposed New Water Supply – Assessing the Impact: *"Predictions of impacts from the proposed water taking have been determined using a mathematical groundwater model. Does this work?" "can Council rely on the work to date?"*

The Township is already relying on the Mathematical Model and the model has benefitted greatly from work conducted during the Study. The groundwater flow model that was used during the Study to prepare well capture zones and make predictions of drawdown is the same model that was used to prepare the WHPA areas in the southern part of the Township by the South Georgian Bay Lake Simcoe Source Protection Region. The Study provided a valuable update with the many deep boreholes, water levels, and aquifer characteristics obtained from borehole drilling and aquifer testing during the water supply exploration program. A statistical evaluation of water wells constructed in an aquifer provides all required and reliable information to assess water supply impacts.

Lotimer notes that the use of groundwater flow models is common, and we agree it is standard practice that is usual in the industry.

***Slide 21***; Geologic Model + Drilling Program: *"when we compare the test well results to the mathematical model, it appears that the field program contradicts the model."*

Lotimer suggests that the hydrostratigraphic model used in the Study may be in conflict with the Study drilling program data. In support of this argument, Lotimer superimposes three drill logs (TW34, TW22, and TW21) over the example hydrostratigraphic model section presented in Figure 4, Appendix M of the Study (Slide 21). We infer that the intent of this image is to show a potential conflict between the geologic materials in the drill logs and the modelled hydrostratigraphic layering. However, we note the following:

- **TW34**: The thicknesses of each major aquifer/aquitard unit in the model are reasonably close to those in the well log (generally within 5 m). There is a slight offset in unit elevations in this particular area owing to a

discrepancy between the originally estimated GPS hole elevation (used to update the model surface) being lower than the final estimated ground elevation.

- **TW22:** The correct location of the log is slightly west of that shown by Lotimer and should be approximately coincident with the Black Creek label (which we acknowledge is incorrectly positioned on our original figure) – thus the ground elevation of TW22 should be approximately 232 masl. When the location revision is applied the aquifer and aquitard materials in the log align reasonably well with those in the model (generally within 5 m). Note that the till materials described in this log are generally associated with aquitard units.
- **TW21:** The model hydrostratigraphy in this immediate area was developed using logs at TW21 and TW24. Whereas the presence of mostly permeable material down to C2 is confirmed in the logs, the thickness of C2 is variable between TW21 and TW24. In model a C2 thickness approximating that of TW24 (20 m) is used. The bottom of Aquifer A3 is within 5 m of the well logs.

These small changes do not affect our conclusions contained in the Study.

***Slides 22 and 23***; comparison of Geologic Models: *"The Ontario Geological Survey has studied the Midhurst Area"*

The Ontario Geological Survey (OGS) has been conducting surficial mapping and subsurface drilling in Simcoe County for almost 20 years. Golder has been a partner with the OGS sharing data and experience. Slides 22 and 23 attribute OGS work to Midhurst, where it is actually across the Oro moraine between Lake Simcoe and Horseshoe Valley and does not represent the stratigraphy between the Oro moraine and the Minesing Wetland. Again we reiterate that the geological model and numerical groundwater flow models reflect an accurate assessment of the current understanding of the stratigraphic composition of Midhurst area and the Lotimer interpretation does not.

***Slide 24***; Proposed New Water Supply – Water Quality Treatment: *"What is the water quality like?"*

All water quality data is contained in Chapter 4 and related appendices of the Study. The water is similar to the water elsewhere in Midhurst and Snow Valley with respect to aesthetic parameters such as hardness, manganese, and iron. Existing conditions for Nitrate at TW22 is within the standards set by the MOECC, however it is elevated. Treatment of the water to lower the nitrate to approximately 50% of the ODWS standard is proposed for this site. Most of the capture zone for TW19 and TW22 is in the development lands, which are currently in agricultural production and that will cease with the establishment of housing. The source of nitrate is inferred to be agricultural fertilizer and that source will be removed from the capture zone going forward.

**Permit to Take Water Obligations: "***You'll be asked by the Ministry of the Environment to go out and confirm the characteristics of those wells that you believe are within the ZOI of pumping: "The ministry requires you to identify the areas where you think wells will be impacted and to go out and test those and ensure that there isn't an adverse impact to those wells. The law is very clear on how that works. It's very, very clear and very straightforward"*

Further to Mr. Lotimer's statements, every Permit to Take Water issued by the Ministry of the Environment and Climate Change contains a condition that existing users of water are protected from a loss of water supply and it is the responsibility of the owner of the PTTW to restore the affected water supply.

As per the Study, there are no unacceptable impacts predicted for existing users of water, however, further groundwater monitoring could be proposed as a part of the Monitoring and Contingency Plan in the Permit to Take Water application. Monitoring dedicated observation wells is far superior to monitoring private wells or conducting door-to-door surveys. Long-term water level monitoring is conducted by many municipalities including the City of Orillia, City of Guelph, Town of Erin, and the Regions of Durham, York, and Waterloo. The monitoring program could be incorporated into either the existing Township of Springwater system or into the PGMN system to track water levels and verify long term changes in groundwater levels. The Nottawasaga Valley Conservation Authority also installs groundwater monitoring equipment and maintains water level databases for groundwater monitoring wells throughout Simcoe County for the MOECC as part of a provincial groundwater monitoring network (PGMN).

## CLOSURE

We trust this meets your current requirements. Should you have any questions please do not hesitate to contact the authors.

**GOLDER ASSOCIATES LTD.**

John Easton, M.Sc., P.Geo.

JAE/DH/plc

Appendix A: Midhurst Secondary Plan Development Proposal

N:\Active\2013\13-1170-0040 Midhurst Doran Hydrog Well\Report\Lotimer Reply\Golder Midhurst Response April 21_2017.docx

| Modelled Predicted Drawdown (m) | MOE_CODE MOE# | CON # | LOT # | DATE Well Was Constructed | EAST_83 UTM-17 | NORTH_83 UTM-17 | Water Column m | DEPTH mbgl | Aquifer |
|---|---|---|---|---|---|---|---|---|---|
| There Are No Wells in Aquifer A1 with 2 m Drawdown | | | | | | | | | |
| 1.5 | 5723277 | 2 | 19 | Mar-1988 | 603957 | 4923389 | 6 | 53.3 | A1 |
| 1.5 | 5704587 | 2 | 21 | Nov-1964 | 603719 | 4923275 | 6 | 53.6 | A1 |
| 1.5 | 5714409 | 2 | 22 | Jun-1977 | 603612 | 4923621 | 8 | 53.3 | A1 |
| 1.5 | 5707450 | 2 | 21 | Aug-1970 | 603632 | 4923371 | 8 | 51.8 | A1 |
| 1.5 | 5713342 | 3 | 14 | Jun-1976 | 602722 | 4922981 | 8 | 44.8 | A1 |
| 1.5 | 5711575 | 2 | 19 | Nov-1974 | 604112 | 4922571 | 9 | 62.8 | A1 |
| 1.5 | 5706050 | 3 | 14 | May-1968 | 602732 | 4922896 | 9 | 48.8 | A1 |
| 1.5 | 5736080 | 1 | 21 | May-2001 | 603956 | 4923346 | 11 | 55.5 | A1 |
| 1.5 | 5715526 | 2 | 20 | Jul-1978 | 603935 | 4923131 | 11 | 55.2 | A1 |
| 1.5 | 5706541 | 1 | 19 | May-1969 | 604312 | 4922741 | 14 | 54.9 | A1 |
| 1.5 | 5709944 | 2 | 21 | Jun-1973 | 602907 | 4922956 | 14 | 54.9 | A1 |
| | | | | | | | | | |
| Wells in Aquifer A2 with 2 m Drawdown | | | | | | | | | |
| 2 | 5704590 | 2 | 27 | Jul-1959 | 601617 | 4924951 | 10 | 50.3 | A2 |
| 2 | 5708342 | 3 | 10 | Oct-1971 | 601381 | 4925121 | 11 | 52.7 | A2 |
| 2 | 5735436 | 6 | 14 | Jul-2000 | 598666 | 4919887 | 11 | 25.0 | A2 |
| 2 | 5737231 | | 14 | Sep-2002 | 598564 | 4919871 | 14 | 31.1 | A2 |
| 2 | 5738455 | 6 | 14 | Dec-2003 | 598714 | 4919899 | 14 | 36.0 | A2 |
| 2 | 5737495 | 6 | 14 | Dec-2002 | 598542 | 4919846 | 17 | 31.1 | A2 |
| 2 | 5711192 | 6 | 14 | Apr-1974 | 598656 | 4919677 | 19 | 27.4 | A2 |
| 2 | 5718866 | 6 | 14 | Sep-1983 | 599012 | 4920171 | 20 | 36.0 | A2 |
| 2 | 5727803 | 6 | 14 | Jun-1989 | 598736 | 4919910 | 20 | 39.3 | A2 |
| 2 | 5716112 | 7 | 13 | Jun-1979 | 598421 | 4919822 | 21 | 29.3 | A2 |
| 2 | 5713102 | 7 | 13 | May-1975 | 598271 | 4920091 | 22 | 26.8 | A2 |
| 2 | 5708828 | 6 | 13 | Apr-1972 | 598431 | 4920005 | 22 | 29.0 | A2 |
| 2 | 5739023 | 6 | 14 | Aug-2004 | 598727 | 4919962 | 23 | 40.5 | A2 |
| 2 | 5709252 | 6 | 13 | Aug-1972 | 598393 | 4920021 | 24 | 29.3 | A2 |
| 2 | 5730289 | 6 | 15 | Sep-1993 | 598832 | 4920041 | 27 | 46.6 | A2 |
| 2 | 5708225 | 2 | 27 | Sep-1971 | 601611 | 4924941 | 34 | 81.4 | A2 |
| | | | | | | | | | |
| Wells in Aquifer A3 with 2 m drawdown | | | | | | | | | |
| 2 | 7054010 | 3 | 11 | Dec-2007 | 600897 | 4923544 | 46 | 96.0 | A3 |
| 2 | 7111735 | 3 | 10 | Aug-2008 | 601830 | 4924191 | 65 | 126.8 | A3 |
| 2 | 7227319 | 2 | 20 | Aug-2014 | 603819 | 4922773 | 71 | 152.4 | A3 |
| | | | | | | | | | |
| There Are No Wells in Aquifer A4 with 2 m Drawdown | | | | | | | | | |
| 1 | 7220692 | 6 | 13 | Apr-2014 | 598682 | 4921070 | 69 | 95.1 | A4 |
| 1 | 5726202 | 1 | 16 | Dec-1989 | 606527 | 4923073 | 96 | 116.4 | A4 |
| 1 | 5734761 | 1 | 16 | Oct-1999 | 606671 | 4922984 | 100 | 116.1 | A4 |
| 1 | 5703504 | 1 | 16 | Sep-1959 | 606942 | 4922860 | 112 | 129.8 | BEDROCK |

# APPENDIX A

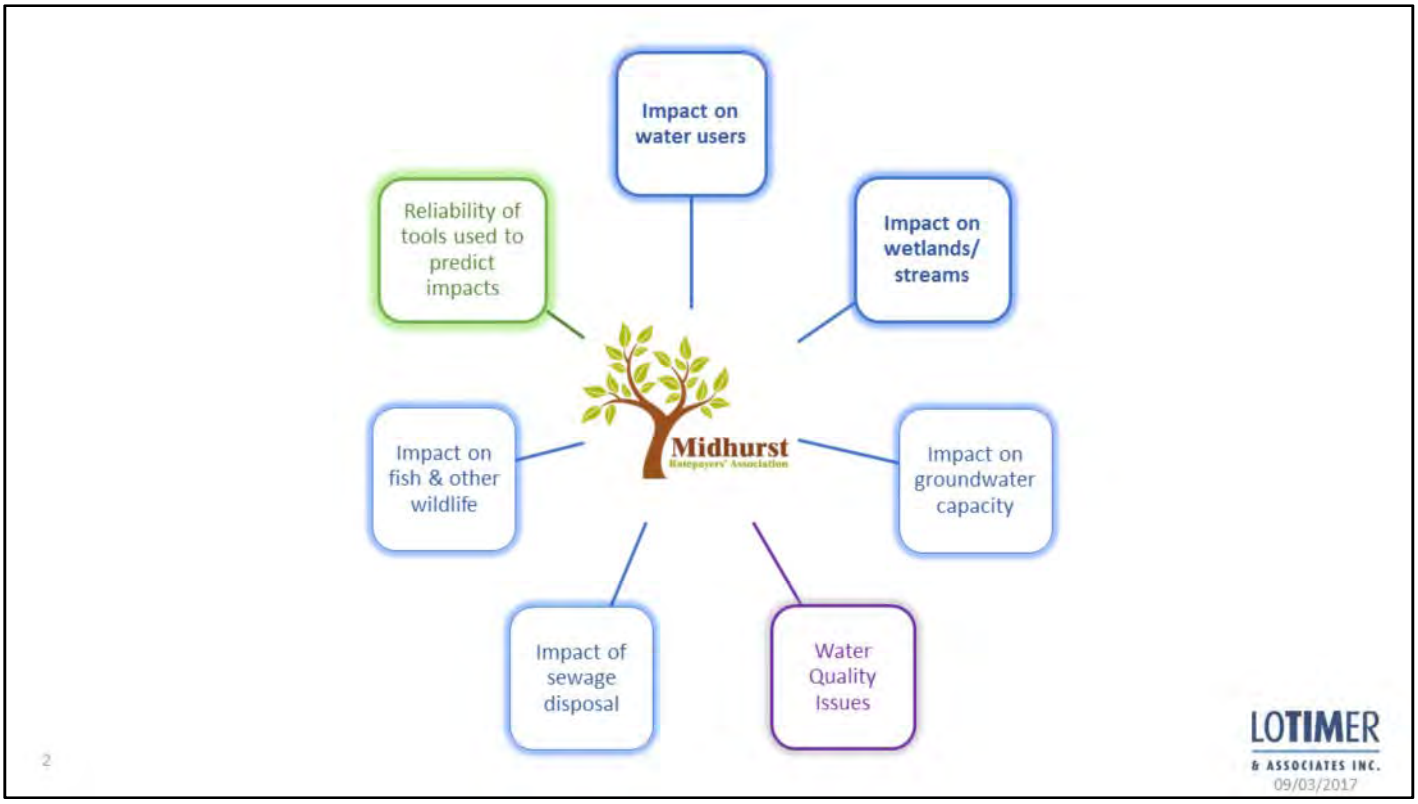
# Midhurst Secondary Plan Development Proposal

2017-03-08

LOTIMER
& ASSOCIATES INC.

Good evening your Worship and Members of Springwater Council.

My name is Tim Lotimer. I am a professional geoscientist with 40 years of experience primarily working on municipal groundwater supplies. Some recent Class EA water supply projects I have been involved with were for the Regions of Halton and Waterloo, the Municipality of Chatham-Kent and the County of Brant.



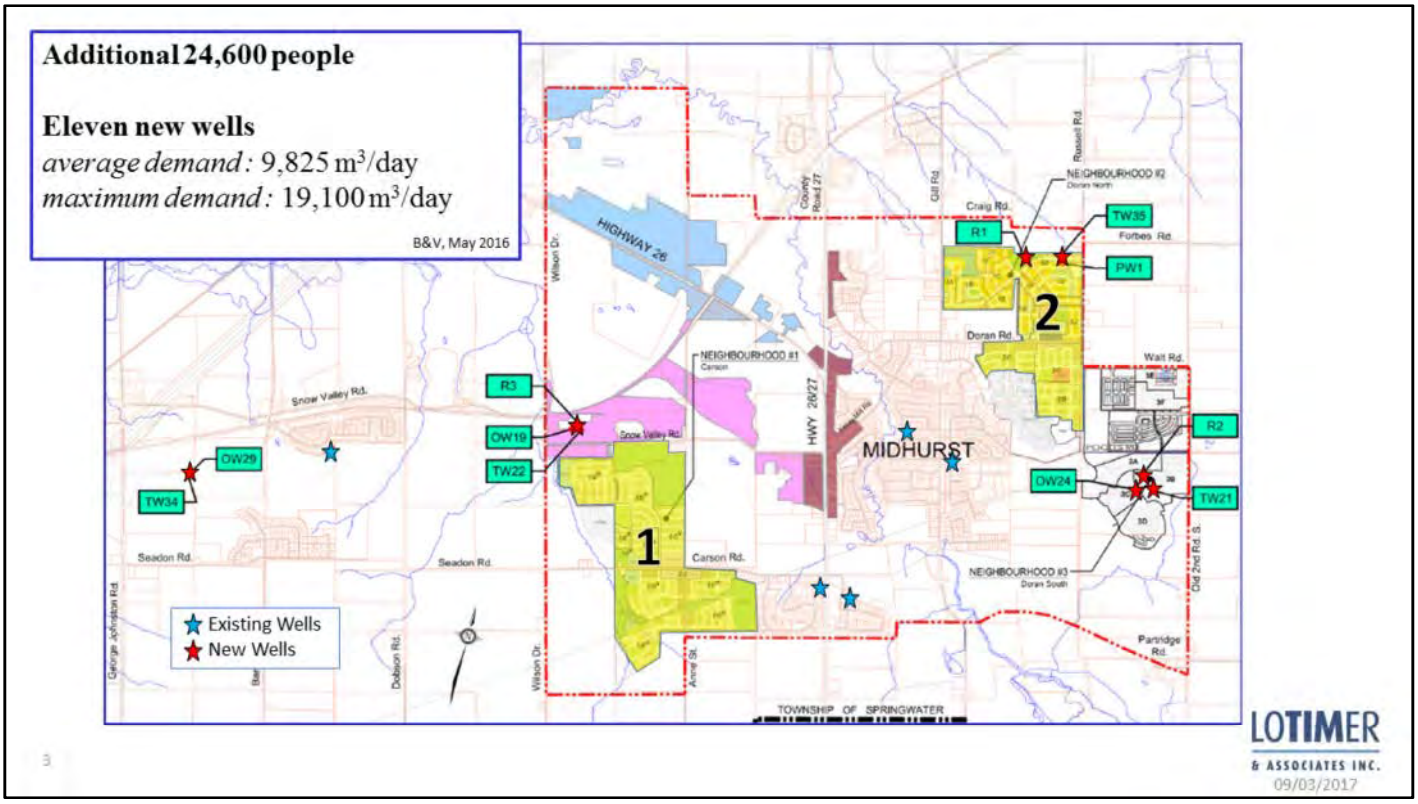

I have been retained as an independent expert, by the Midhurst Ratepayers Association (MRA), to see if the available Class EA documents address the questions that the MRA submitted to the Township during the public commenting period that closed December 1, 2016.

These questions are summarized on this slide and the focus of my presentation will be on the impact of the proposed taking on water users, wetlands and streams.

I have reviewed reports that are available on the Township of Springwater's web site related to the proposed water supply.

A key report is the Draft hydrogeological study report prepared by Golder Associates in June 2016 on the Midhurst Water Supply Exploration Program. Note that this report is DRAFT and a final copy of the report has not been made available to me.

I have also reviewed other publically available reports that provide information on the Midhurst area, its geology, hydrogeology and existing water takings and ecological characteristics.




A municipal class EA is being conducted for proposed development in the Midhurst area. The Class EA is in Phase 4 of the process, and has now reached the point of selection of the preferred design.

The water source will be new wells. Sewage will be treated and discharged to Willow Creek.

People and flow rates from B&V, May 2016
Existing wells – blue stars – approximate location
Red stars – approximate location of proposed new wells – some have multiple wells at 1 location (i.e. snow valley – 3 wells)

## Municipal Class EA

Phase 4: Selection of the preferred design

Must include a detailed discussion of:

- Identification of the *potential impacts on the environment*
- Description of *mitigation measures to minimize environmental effects*

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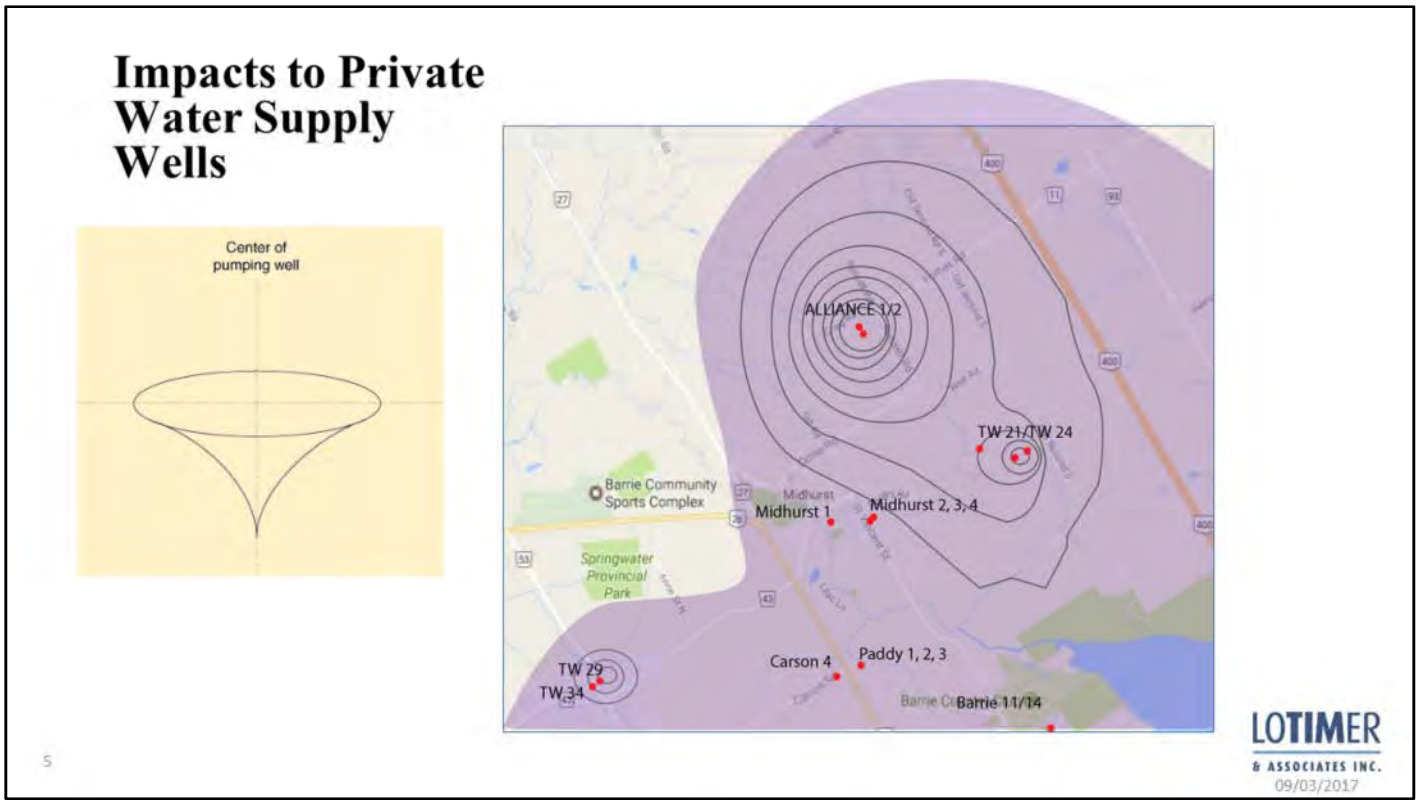
The Class EA Environmental Study Report (ESR) is required to provide a discussion of the potential impacts on the environment and the proposed mitigation measures to minimize environmental effects.

The ESR is not available yet, but we expect that the hydrogeological component of the ESR will be mostly obtained from Golder's report when it is finalized.

I will discuss the potential impacts of the water taking in more detail, starting with the potential impact to private wells in Springwater Township.

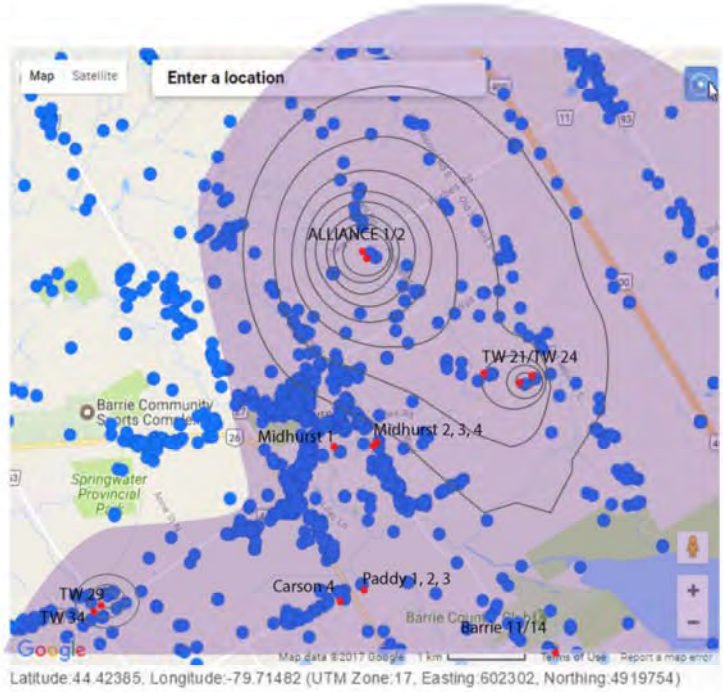



This figure shows contour lines of the drawdown that results from the pumping from the deep aquifer at three of the four proposed sites.

As illustrated by the slide on the left, the drawdown is greatest near the wells and decreases as you go farther away.

The purple colour is the zone-of-influence (the area where more than a metre of drawdown can be expected) that results from the pumping of these wells.

## Impacts to Private Water Supply Wells

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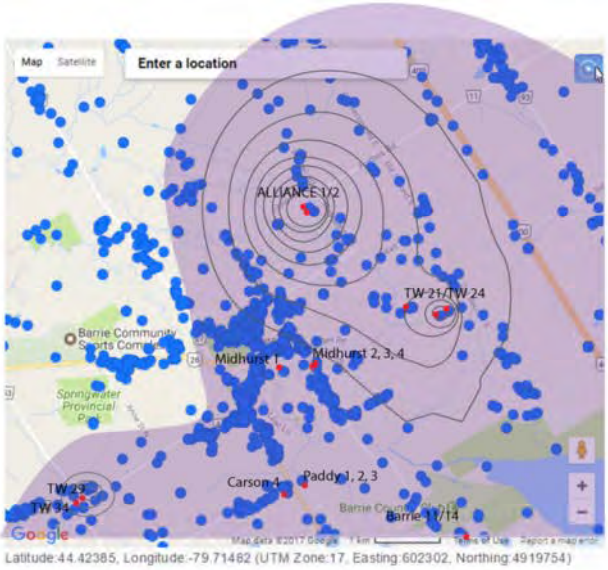
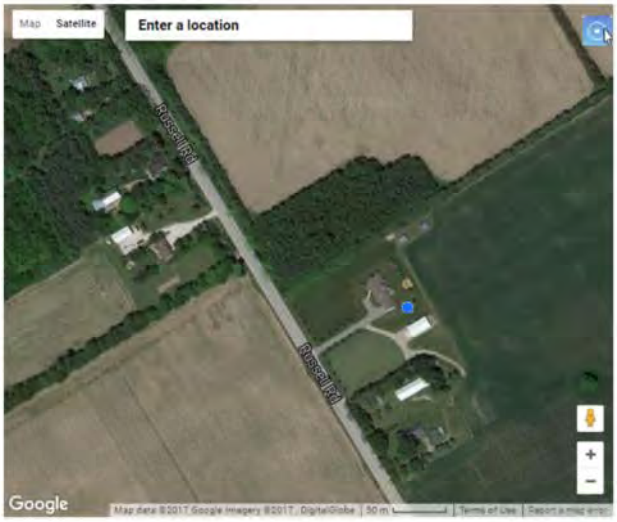
On this slide we have added blue dots, that show the location of private wells in the MOECC water well record data base.

To assess impacts to these wells, it would be necessary to measure the normal pumping level in each of the wells and compare this to the predicted interference from pumping of the new wells.

A complete door-to-door survey of private wells and their operating characteristics to allow this assessment can not be found in the Golder (2016) report.

# Impacts to Private Water Supply Wells

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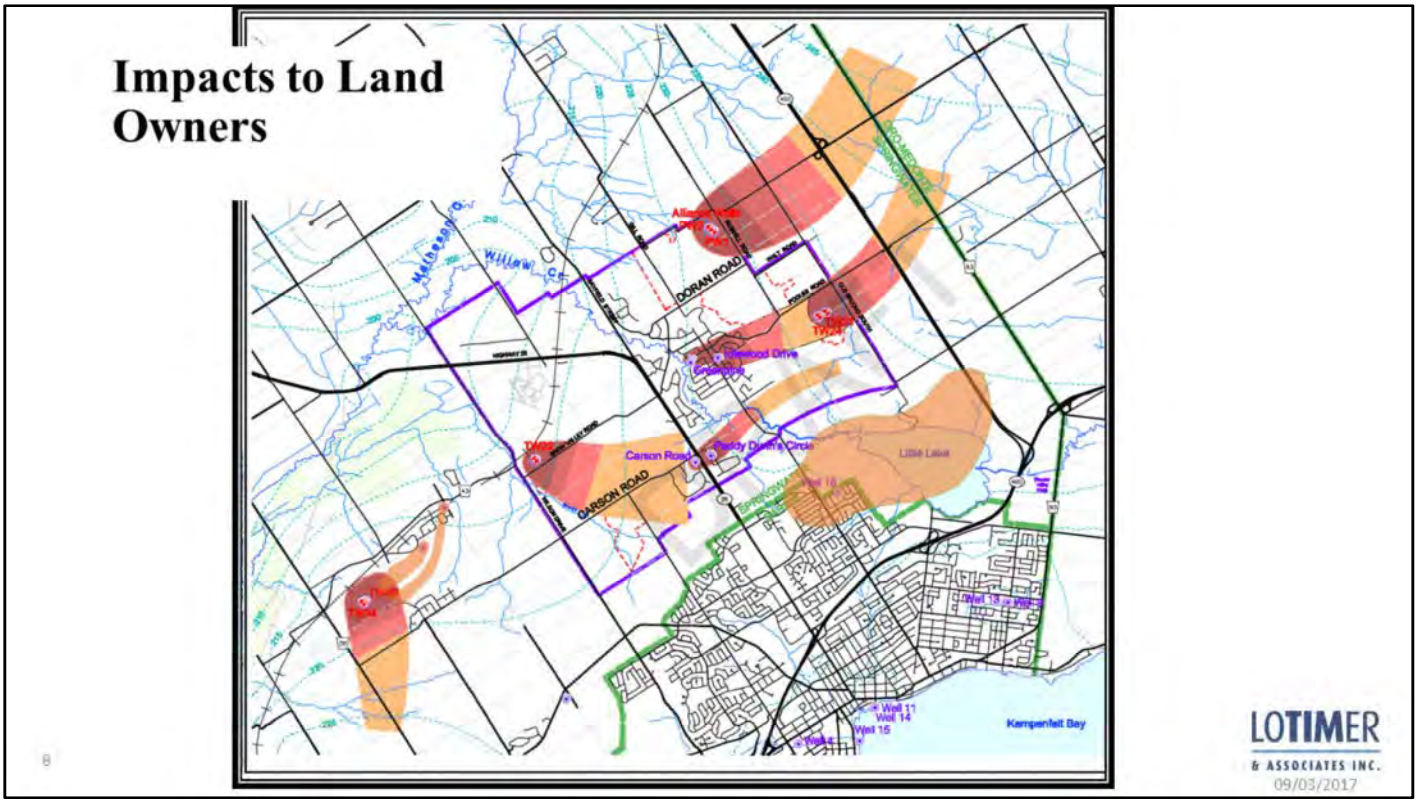
It is known that the MOECC water well record data base is often missing wells.

In this slide an area is shown where there are several homes but only one well identified.

Our review of the MOECC water well record data base shows that there are wells within both the deep and shallower aquifers, within the zone-of-influence of pumping.

The aquifer testing program shows that in some areas, pumping from the deep aquifer also causes drawdown in the shallower aquifers




The colourful shapes are the interpreted Well Head Protection Areas (WHPA's) for the existing Midhurst and Snow Valley wells, and the Barrie municipal wells all located within the Willow Creek subwatershed.

The WHPA's also provide an indication of the capture zone of the wells – where the water is coming from within the groundwater flow system.

The WHPA's show the areas where limitations may be placed on property use, in accordance with the Source Protection Plan. There are many farms and private rural dwellings within Springwater Township and adjacent Oro-Medonte Township that may be affected by these limitations.

It is also important to note that some of the new wells will capture water that currently flows to the existing Midhurst municipal wells, causing an impact to the existing wells.

(Note that Barrie has a water system that uses wells to supply water in the north end of the City and uses Lake Simcoe for servicing in the south end. The systems do not mix water and so the areas serviced by the wells shown will continue to serve the City of Barrie.)

Sources:

Golder (2016) Study and the source protection MOECC Approved Assessment Reports for

the City of Barrie and the Midhurst municipal drinking water systems.

## Impacts of the Water Taking

- Current and proposed *average day* and *maximum day* demand of municipal takings within the Willow Creek subwatershed

| | Average Day | Maximum Day |
|---|---|---|
| Existing Midhurst Wells | 1,450 $m^3$/day | 4,095 $m^3$/day |
| Existing Barrie Wells* | 20,966 $m^3$/day? | 20,966 $m^3$/day? |
| Proposed New Wells | 9,825 $m^3$/day | 19,014 $m^3$/day |
| **TOTAL** | **32,241 $m^3$/day** | **44,075 $m^3$/day** |

* Operating capacity of wells within the Willow Creek subwatershed

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When considering impacts the cumulative taking of all of the municipal water supplies within the Willow Creek Sub-watershed must be considered.

The average day taking from the proposed new wells is a third of the total average day municipal taking within the sub-watershed

Sources:
Barrie total taking in 2010 (groundwater base case) was 40,280 $m^3$/day (Tier 3 Study). Of that amount, 17,800 $m^3$/day is modelled groundwater inflow from the Willow Creek subwatershed. Midhurst takings from the SWP Assessment Report based on 2014 data. Proposed taking from B&V 2016.

T3 Figure 1.2 shows Barrie Wells 9, 13 and 16 within the NVCA Willow Creek Subwatershed.
T3 Table 3.1 shows PTTW Well 9 - 6,552 $m^3$/day; Well 13 - 6,552 $m^3$/day; Well 16 - 7,862 $m^3$/day

## Impact of Proposed New Water Supply

- The water taking from the municipal wells within the watershed is considered to be a ***consumptive taking***
  - ➢ *A consumptive groundwater taking occurs when the water is pumped from an aquifer but not returned to the aquifer from which the water is taken*
- This results in a **reduction of groundwater flow** to the existing receptors connected to the pumped aquifer (other groundwater users, streams and wetlands) **that approximately equals the amount of water pumped**



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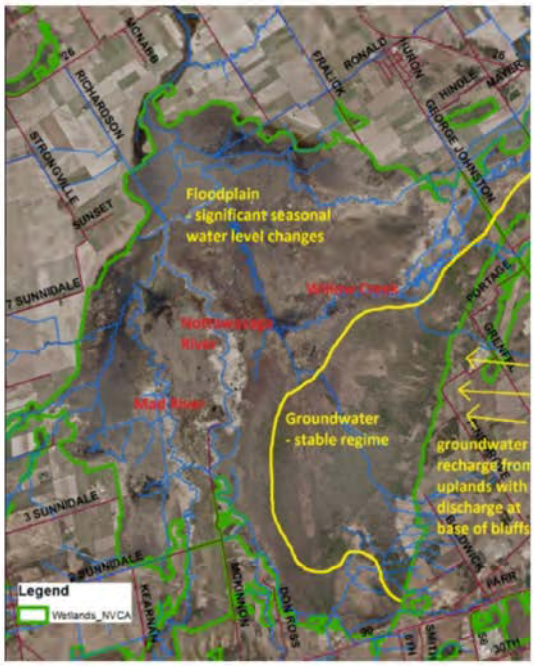
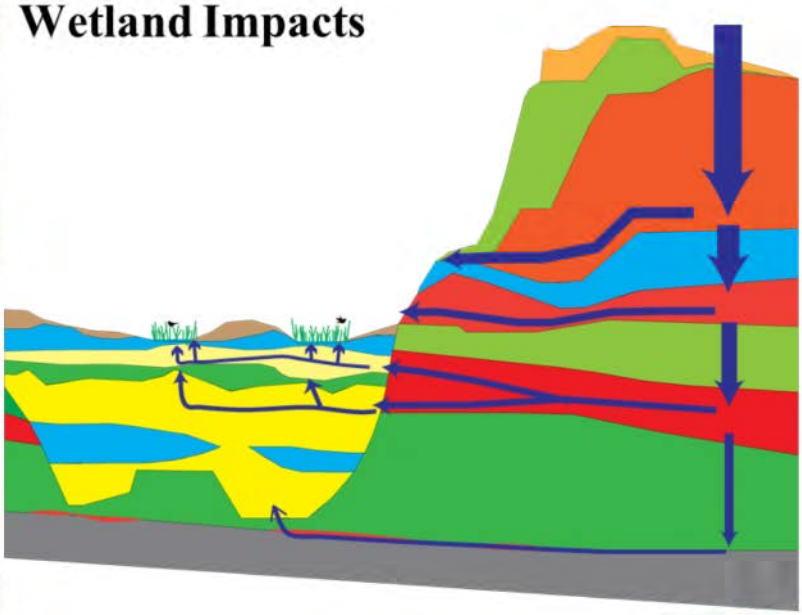
This concept is illustrated in the next few slides.




Map from NVCA, 2015

## Wetland Impacts



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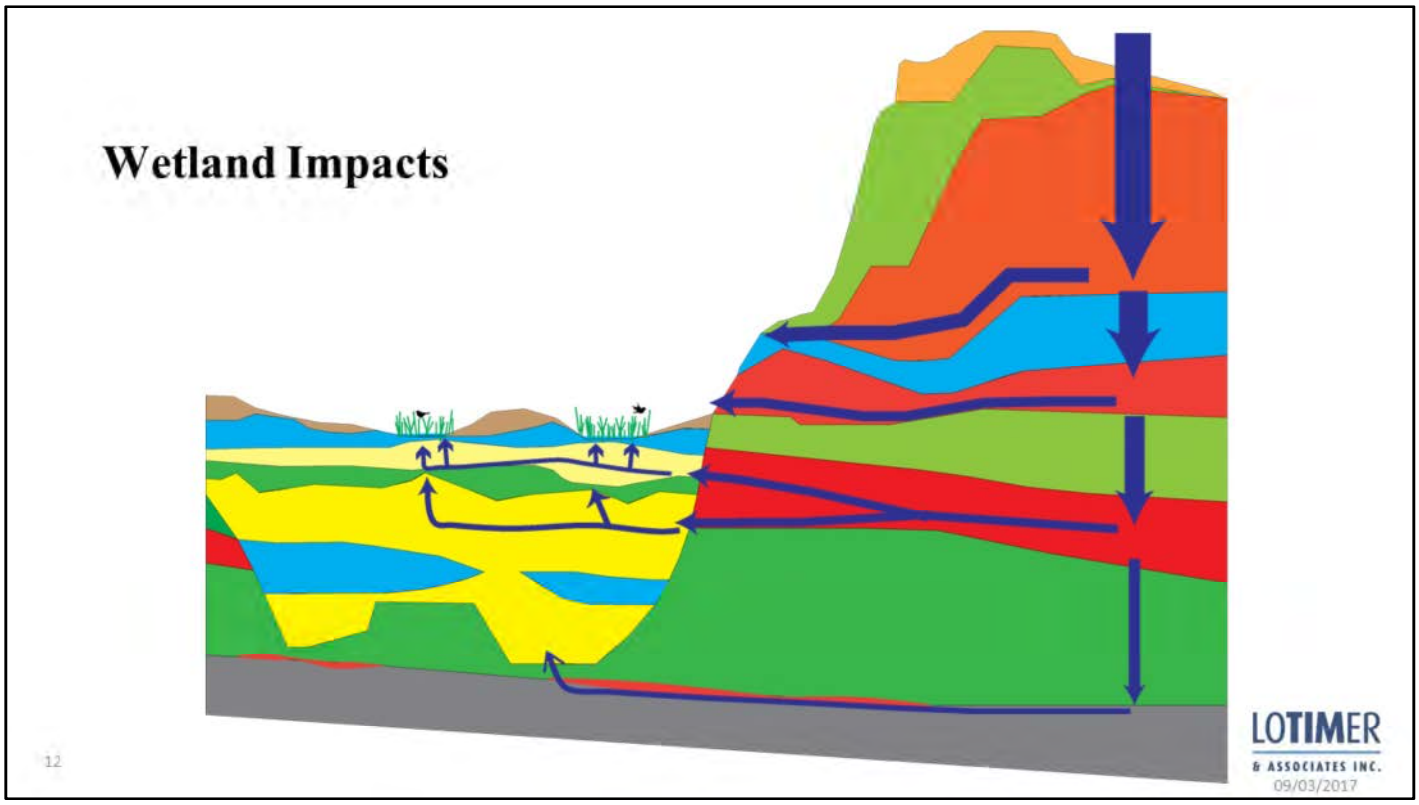
The slide on the left is from the NVCA. It shows the area of the Minesing swamp that is very dependent on groundwater discharge.

The conceptual drawing on the right shows the hydrogeological setting that results in this groundwater discharge shown by the Nottawasaga Conservation Authority.

The geologic layers are from the Ontario Geological Survey mapping for the Snow Valley Area.

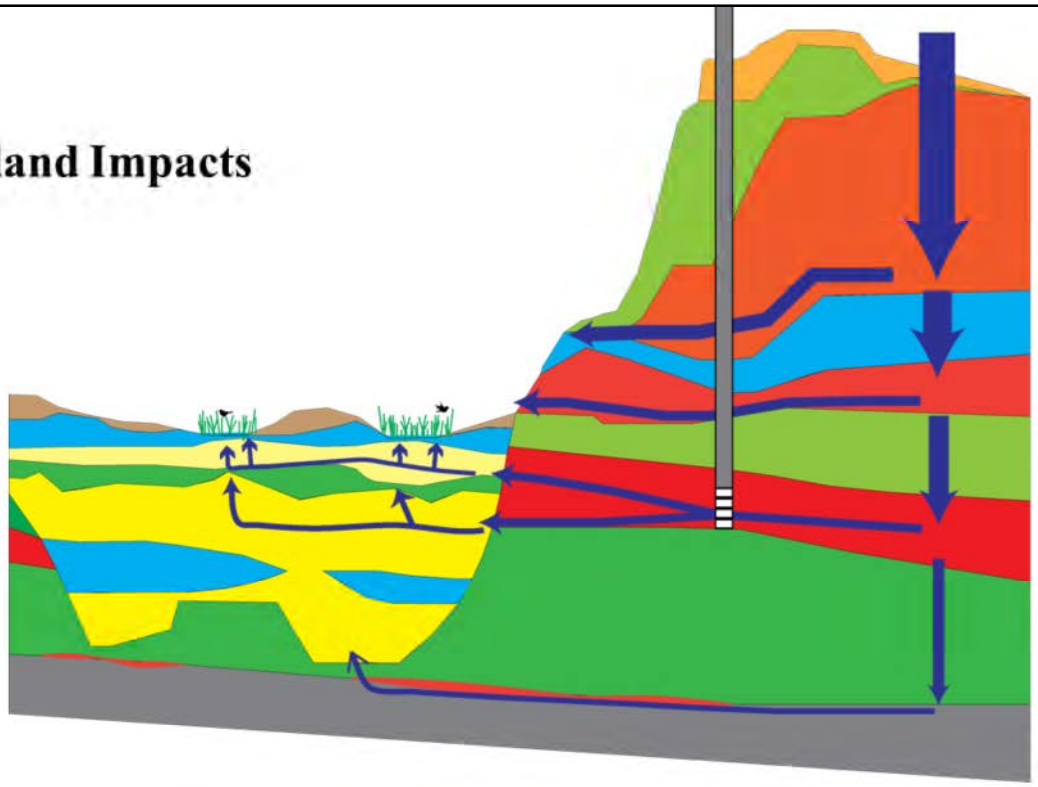
The blue arrows are a conceptual representation of groundwater flow. The thickness of the arrows are for illustrative purposes only and have been drawn to show a gradual reduction in groundwater flow downward, as groundwater moves through the geologic layers.

The Golder (2016) report does not contain the water budget information necessary to allow estimates of the volumes of water that move between the various hydrogeological units.




In the next series of slides, I show how the pumping of a well can reduce the groundwater discharge to a wetland.

## Wetland Impacts



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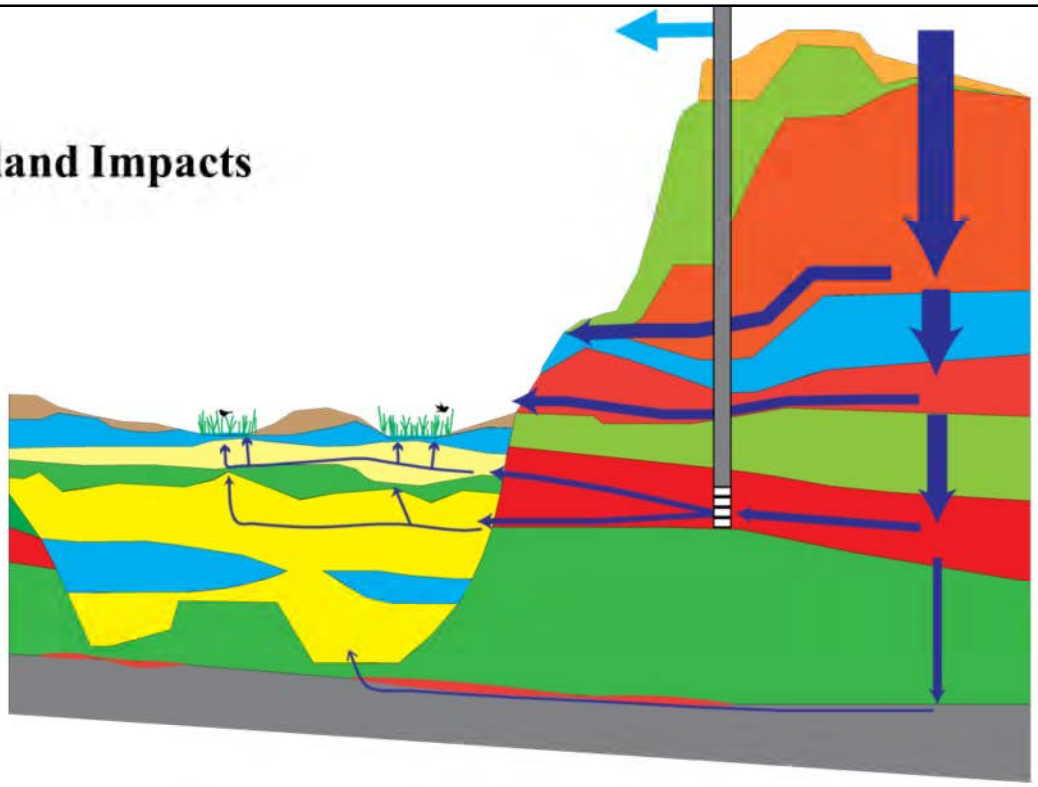
## Wetland Impacts



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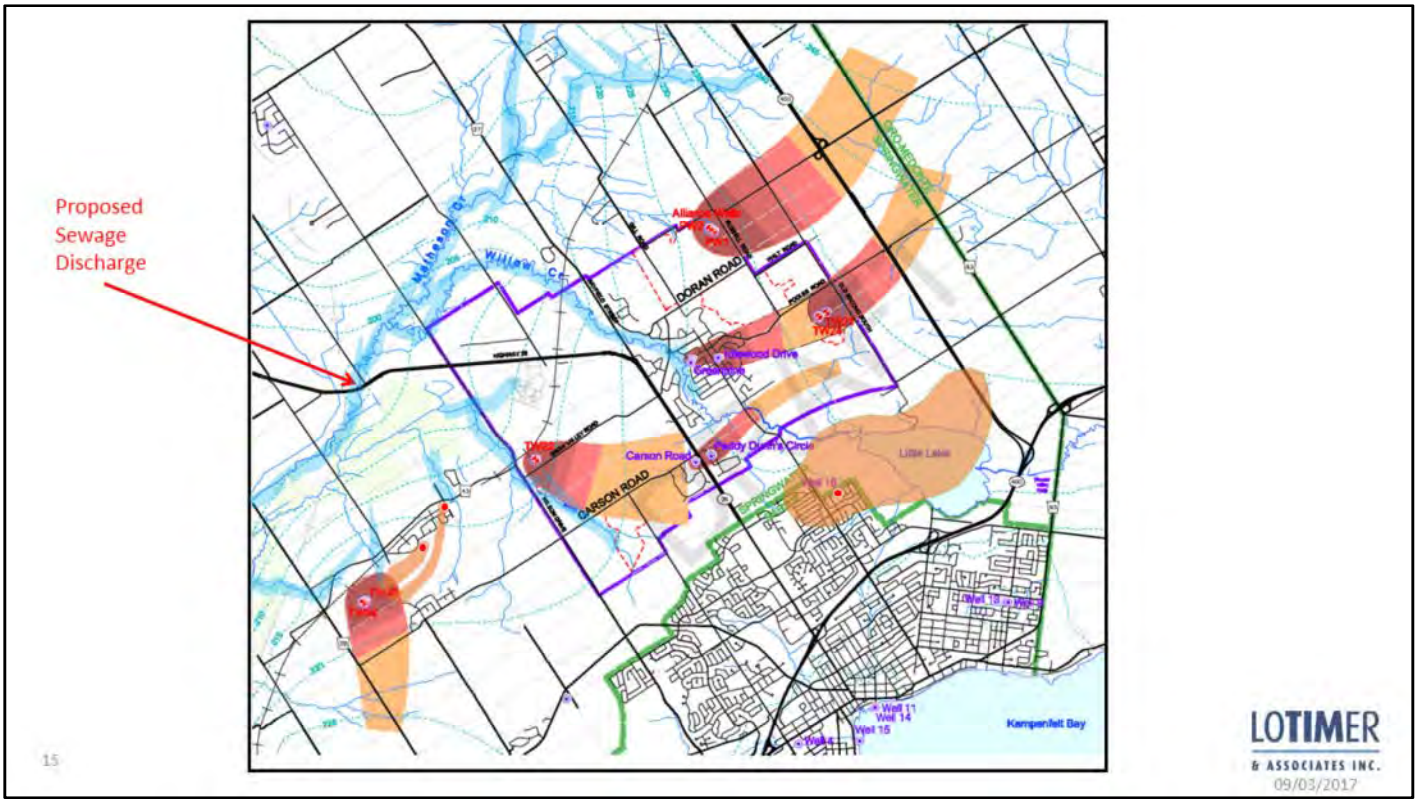


A similar process happens with streams, where pumping from a well can reduce the groundwater discharge to a stream.

The colourful shapes show the capture zones for the new wells and from these I can determine where stream flow reductions can be expected to occur.

The groundwater discharging to streams is considered “warm” in the winter, and protects trout eggs from freezing, and “cold” in the summer, that prevents heat stress to fish.

The location of the sewage discharge does not replace the water that will be removed from the streams “upstream” of the sewage discharge that will occur as a result of pumping.

Sources:

Golder (2016)
Black and Veatch (2016)
Well 16 capture zone: Map from Lake Simcoe SPA Approved Assessment Report F9-1

## Conclusions

- The predicted impacts are based on short term pumping of individual wells
- Not all of the wells have yet been constructed
- Combined pumping of all of the new wells at the required volume to meet the needs of the proposed development has not been done

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Most of the aquifer tests described in the Golder (2016) study were for 3 days. It is not uncommon to conduct 30 day or longer tests to determine the nature of impacts in a multi-aquifer system such as observed in the Midhurst area

## Conclusions

- The hydrogeological study does not include a complete survey of private well use and the potential for impacts to these private wells
- An assessment of the possible limitations to land use within the new Well Head Protection Areas has not been completed
- The hydrogeological study does not include an assessment of stream flow reductions along reaches of Willow and Matheson creek
- The hydrogeological study does not include an assessment of the impact to the Minesing wetland complex



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## Questions?

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We have been able to comment on some of the issues, and there is more information in the Appendix on the issues that I was not able to discuss.

# APPENDIX



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09/03/2017

## Proposed New Water Supply – Assessing the Impact

- All of the new wells have not been constructed
- The new wells have not been pumped together at the required demand to observe the impacts of the taking
- *Predictions of impacts from the proposed taking have been determined using a mathematical groundwater model*

***Does this work?***



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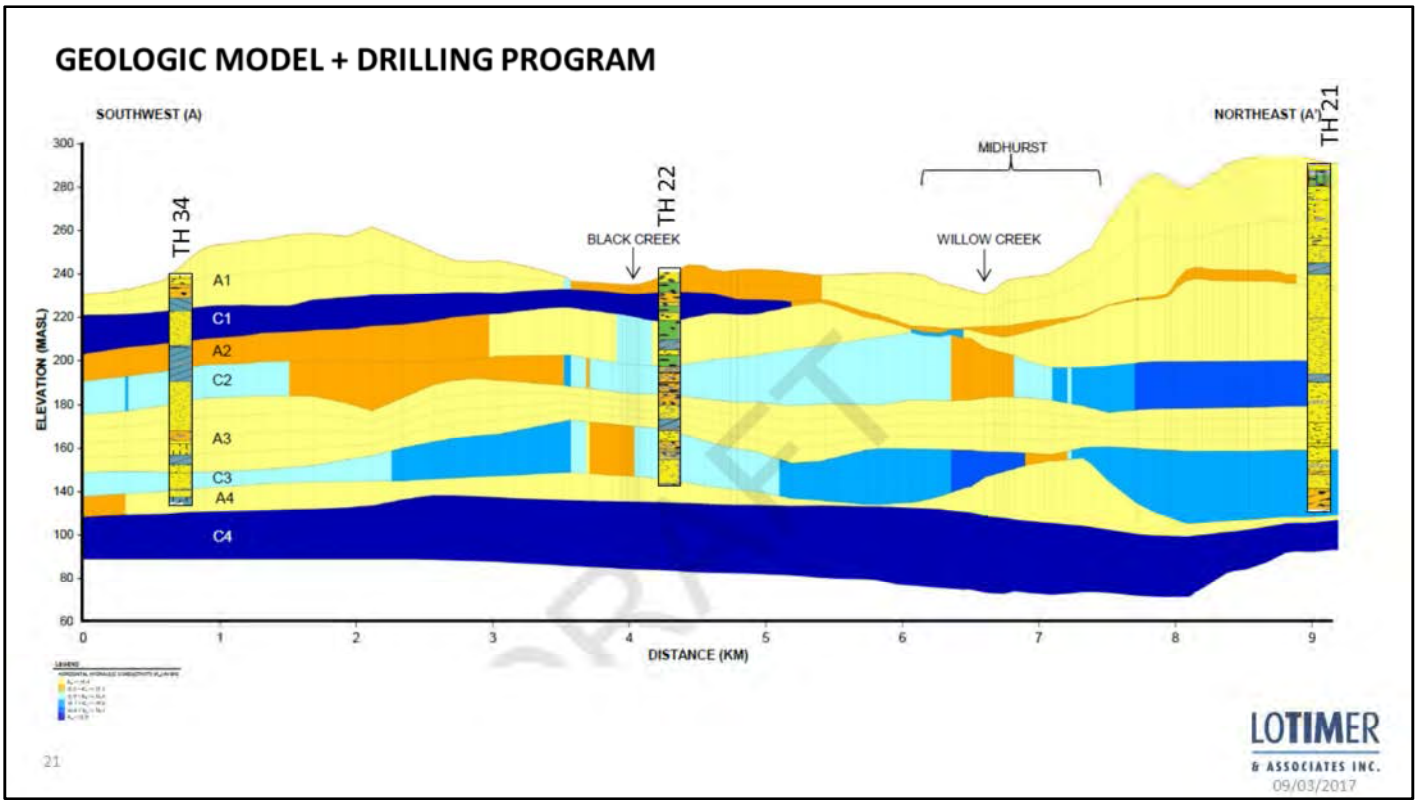
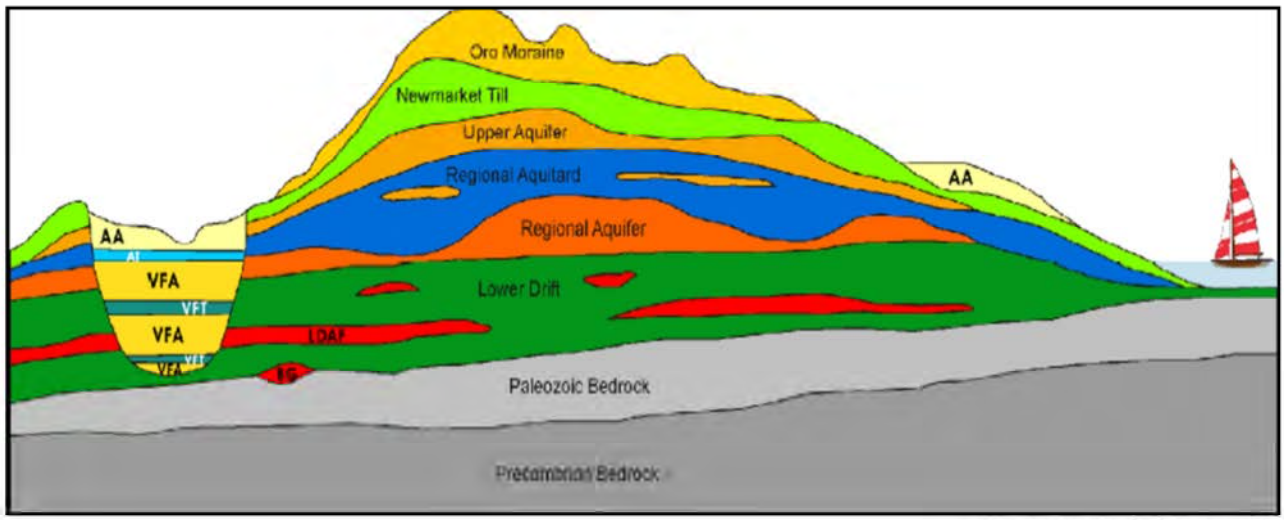
Start to introduce some issues related to the work done to date. The key point is: can Council rely on the work to date?




In this slide, we superimpose the geological information obtained from drilling at three of the four proposed water supply locations.

When we compare the test well results to the mathematical model, it appears that the field program contradicts the model




Ontario Geological Survey, 2011

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09/03/2017

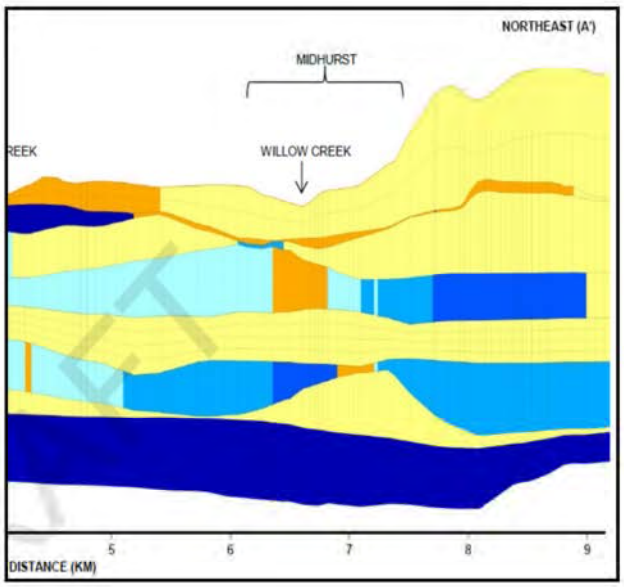
22

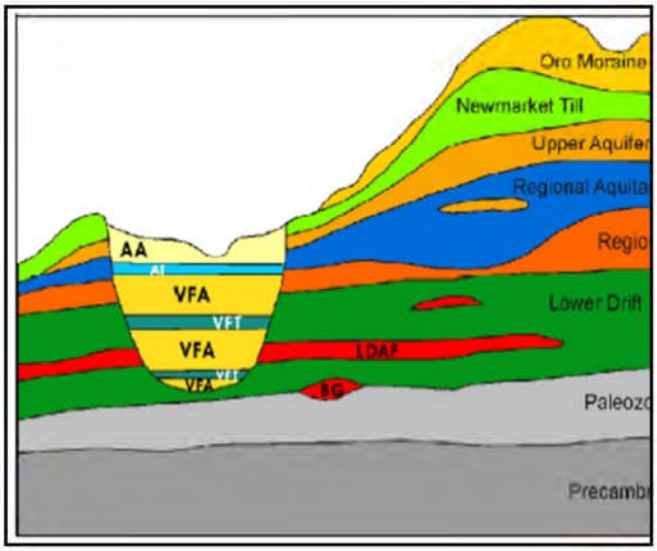
The Ontario Geological Survey has studied the Midhurst area.

This drawing shows that the area has various layers that can be divided into aquifers and aquitards.

An interesting finding of the work of the Geological Survey was that the sediments within the low lying areas reflect newer deposits, where the deposits shown in the upland areas are essentially missing. The aquifers and aquitards of the upland areas may or may not be connected to the sediments within the valley fill areas (VFA) associated with the streams and wetlands.

## Comparison of Geologic Models

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09/03/2017

This slide compares the Golder (2016) model cross section to the Ontario Geological Survey conceptual geologic cross section.

The major difference is how the model represents the valley fill areas (VFA) where sensitive surface water features are present.

The Ontario Geological Survey layers do not extend through the valley fill areas, as they are interpreted to have been eroded away during more recent geological events.

# Proposed New Water Supply – Water Quality Treatment

| WELL SITE | WELL # | HIGHLIGHTS OF WATER QUALITY TEST RESULTS |
|---|---|---|
| Carson: Sand and Gravel Site | OW19 / TW22 | Low iron and manganese concentrations and elevated nitrate concentration |
| Carson: West Snow Valley Site | OW29 / TW34 | High iron and manganese concentrations with observed bubbles of gas and a slight sulphurous odour |
| Doran: Road Alliance Site | TW35 / PW1 | High manganese concentration and slightly elevated iron concentrations |
| Doran: Old Second Road Site | TW21 / OW24 | No detectable issue |

Bubbles of gas = methane gas



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09/03/2017

What is the water quality like?

B&V, May 2016

# Proposed New Water Supply – Water Quality Treatment

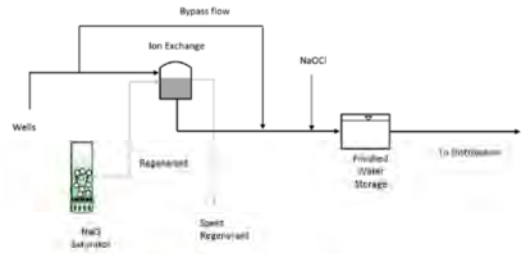


Figure 5 - Sand and Gravel Site Well Water Treatment System

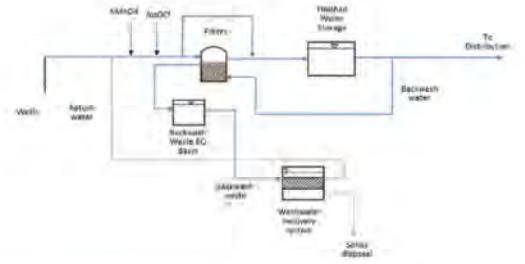


Figure 8 - Treatment at the Alliance Site

- Disinfection
- Green sand filtration to lower iron and manganese
- Ion exchange to lower elevated nitrate
- Air stripping to remove volatile organic compounds

- Note: current Midhurst wells are disinfected and then sodium silicate added to keep iron in solution

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09/03/2017

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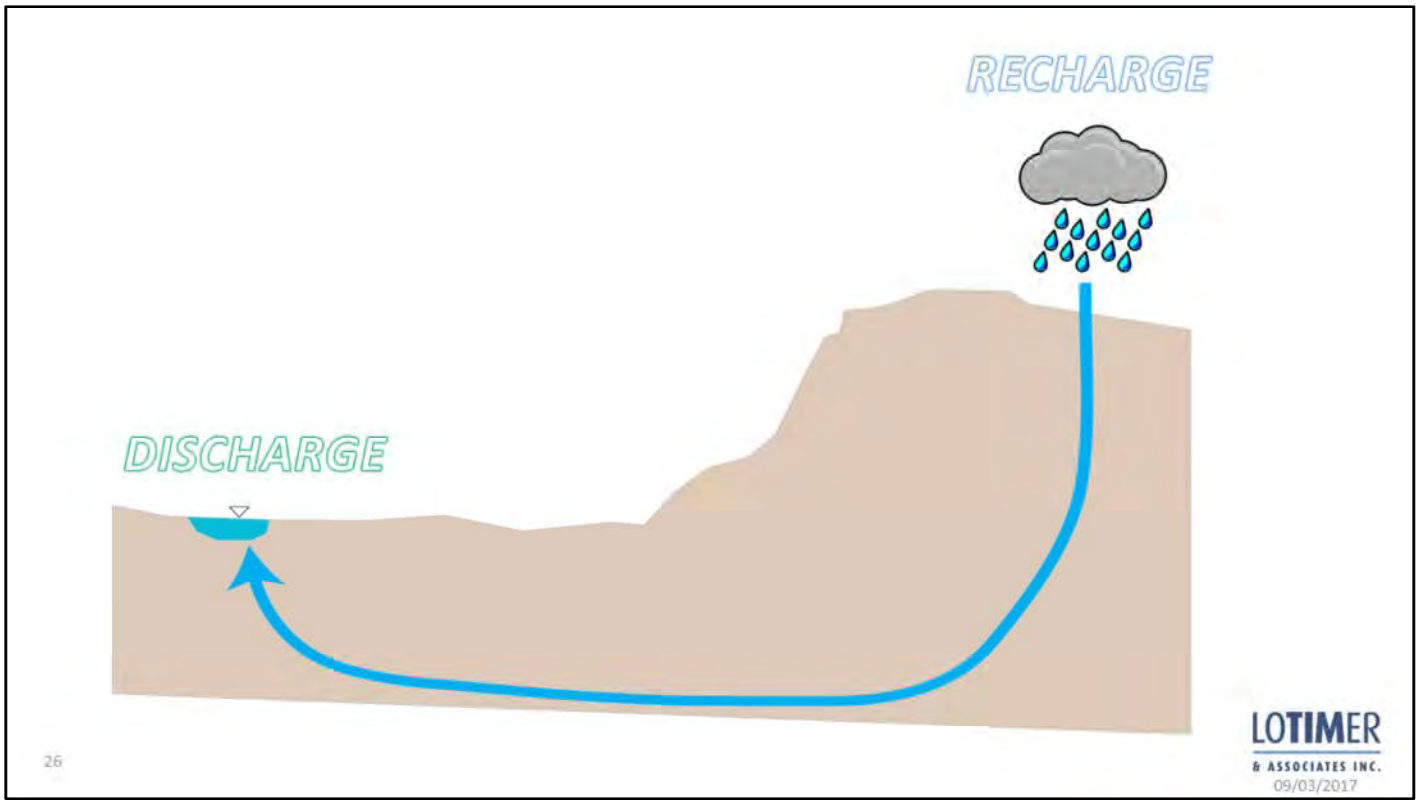
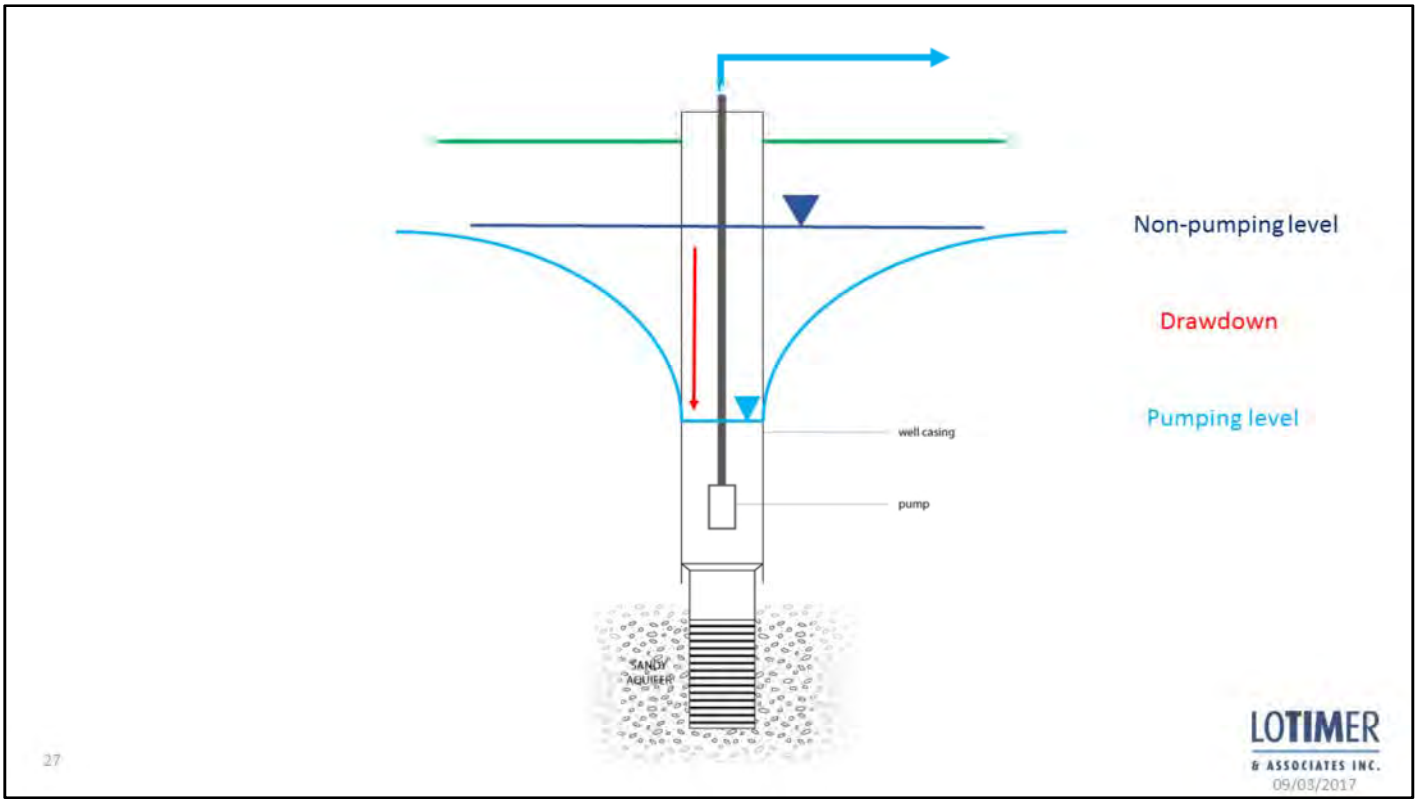
B&V, May 2016




Groundwater flow is from areas of recharge (typically the higher ground, such as the Oro Moraine ) to areas of discharge (typically streams and wetlands).

Groundwater moves through the pore spaces in the geological materials found below the surface.

The movement is in response to gravity, with groundwater moving from areas of higher hydraulic potential to lower hydraulic potential.




Many residents of Springwater Township rely on wells for their private water supply.

When a well is pumped the pumping level in the well drops. This is called drawdown.

Not only is there drawdown in the well, but there is also drawdown in the aquifer. This is called the zone-of-influence of pumping.

# APPENDIX 'BB'

# COMMENTS AFTER SUBMISSION OF DRAFT ESR

Township of Springwater

www.springwater.ca

2231 Nursery Road
Minesing, Ontario
L9X 1A8 Canada

April 25, 2017

Ministry of the Environment and Climate Change
Air, Pesticides and Environmental Planning
5775 Yonge Street, 9th Floor
Toronto, ON M2M 4J1

**Attention: Chunmei Liu**
**Environmental Resource Planner & EA Coordinator**

Dear Ms. Liu:

**Re: Township of Springwater - Class Environmental Assessment Study for Midhurst Water, Wastewater and Transportation Servicing Phases 3 and 4 - Draft Environmental Study Report (ESR)**

The Township of Springwater (the "**Township**") has directed the Ainley Group, consultant to the Township on the above-noted Class Environmental Assessment Study ("**Class EA**"), to submit this draft ESR to the Ministry of the Environment and Climate Change ("MOECC") for its technical review and comment. We understand that such a review by the MOECC is a standard and expected component of the Class EA process.

As an accompaniment to the draft ESR, Township Council has authorized me to send this letter on its behalf.

The purposes of this letter are: (a) to bring to the attention of the MOECC a number of issues and concerns that have been raised by interested stakeholders, particularly in light of the magnitude and scope of the Midhurst Class EA study; and (b) to request that the Ministry pay particular attention to those issues in the course of undertaking its technical review of the draft ESR, so that the Township and all other concerned stakeholders can be satisfied that due attention was given to these issues as part of the MOECC review process.

The specific issues and concerns are contained in Appendix "BB" to the draft ESR and can be briefly summarized as follows:

1. **Water Supply**

Concerns have been raised by Mr. Tim Lotimer, a hydrogeologist retained by the Midhurst Ratepayers' Association, about certain aspects of the methodology for determining the availability of suitable Municipal Water Supply, which relied primarily on computer

modelling and testing using the newly drilled wells and monitoring wells. It is Mr. Lotimer's position that it is common in such testing to have some degree of surveying of a representative number of surrounding wells to measure them and test actual well depths, rather than relying exclusively on historical well records and computer modelling.

Concerns have also been raised by Mr. Lotimer about the fact that there are many domestic residential wells that may be significantly impacted by the development of the proposed new water supplies, and there has been some suggestion that the testing methodology ought to be expanded for that reason.

## 2. Well Quality and Maintenance

Concerns have been raised by Mr. John Harris, a hydrogeologist who resides in the community, noting that the new high capacity well supply sites (with the exception of TW22 - coarse sand and gravel) have fine grained aquifer material and that with the identified water quality at these sites consisting of elevated mineral content, there is a heightened potential that well screen zone plugging will occur and that frequent well maintenance rehabilitation efforts will be required to recover lost well performance and capacity.

## 3. Water Flow Testing

Concerns have been raised that to date, only four separate tests up to a combined capacity of 129 L/s have been completed while the future requirements are estimated to be 221 L/s, and about the reliability of computer models after only 72 hours of testing.

In addition to the documentation associated with each of these items being contained in Appendix BB, response Memoranda from Golder Associates (sub-consultant to the Ainley Group) are also included within Appendix BB.

## 4. Protecting Our Watercourses and Wetlands

In 2013 correspondence from the Nottawasaga Valley Conservation Authority (NVCA), concern was raised about phosphorus loading and impact on the Willow Creek and Minesing Wetland. A limit of .03 mg/L has been set by the Province, yet NVCA studies note that anything above .02 mg/L could have a negative impact on the watercourse. Council shares the concerns of the NVCA and requests that the impact of phosphorus and targets provided by the NVCA be reviewed by the MOECC.

Township of Springwater

www.springwater.ca

2231 Nursery Road
Minesing, Ontario
L9X 1A8 Canada

**5. Transportation**

Concern has been raised about the sufficiency of the road network to accommodate the proposed growth within the Midhurst settlement area from approximately 3,500 to 30,000 people. The Ministry is therefore asked to review the adequacy of the models used to predict traffic growth and road design (adequate upgrades, arterial roads, etc.). Transportation background studies are outlined in Appendices E, F, G, H and I.

As the Ministry can appreciate, these are matters of significant importance to current and future residents of the Township. Accordingly, we look forward to the Ministry's consideration and review of these issues, as well as the balance of the draft ESR in its entirety, in due course.

Thank you in advance for the Ministry's careful attention to these matters.

Yours truly,

Mayor Bill French
Township of Springwater

c: Township of Springwater Council
c: J. Mullan, Ainley Group

Phone: 705-728-4784
Ext. 2040

Mayor's Office

Fax: 705-728-6957

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, ON, L9Y 4J5
Tel: (705) 445-3451 ▪ Fax: (705) 445-0968
E-mail collingwood@ainleygroup.com

April 27, 2017 113027

"By Email"

Ministry of Environment & Climate Change
Air, Pesticides and Environmental Planning
5775 Yonge Street, 9th Floor
Toronto, ON
M2M 4J1

Attn: **Ms. Chunmei Liu**
**Environmental Resource Planner & EA Coordinator**

Ref: **Township of Springwater**
**Class Environmental Assessment (Phase 3 and 4)**
**Draft Environmental Study Report**

Dear Chunmei:

On behalf of the Steering Committee for the Midhurst Class Environmental Assessment, we have been asked to provide the following clarification with regard to the Phosphorus loading from the Midhurst Secondary Plan.

Within the Minutes of Settlement between the Nottawasaga Valley Conservation Authority (NVCA) and the Midhurst Developers Group and within the Township's Draft Plan conditions associated with the various Plans of Subdivision in the Midhurst Secondary Plan, one of the key conditions stipulates that there shall be a net zero increase in phosphorus loading after the development of the Midhurst Secondary Plan. Therefore, one of the key components of the Midhurst Class EA process has been the completion of an overall Phosphorus Budget for the Midhurst Secondary Plan. This study was completed Hutchinson Environmental Services Ltd and given the importance of this component of the Class EA, we retained XCG Consulting Ltd to complete an independent Peer Review of the overall Phosphorus Budget, on behalf of the Ainley Group, the Township and the NVCA.

The Phosphorus Budget concludes that the net cumulative change in Phosphorus after the development of the Midhurst Secondary Plan will be an additional 66kg/yr of phosphorus discharged into the Willow Creek and Minesing Wetlands. The Phosphorus Budget also notes that a Phosphorus Offsetting program will not be required, given that additional load represents approximately 0.2% of the annual phosphorus load going through the Minesing Wetlands.

However; the Class EA Steering Committee wants to reaffirm that the Midhurst Secondary Plan must achieve a net zero increase in phosphorus.

Therefore, sections of the Draft ESR, where it currently states that a net zero increase in phosphorus, will be achieved, if deemed by MOECC, or in areas where it is noted that a phosphorus offsetting program will not be required, will be revised, prior to going to the 30-day Public Review, to note that a net zero increase in phosphorus must be achieved. In addition, wording will also be added to the ESR noting that a Phosphorus Offsetting program will have to be developed, to ensure that the net zero requirement is meet, prior to an Environmental Compliance Approval (ECA) being

issued by MOECC for the proposed Midhurst Wastewater Treatment Plant or Development approvals being granted by the Township of Springwater.

Should you have any questions regarding this please, do not hesitate to contact the undersigned.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P.Eng.
President & CEO

Ainley GROUP CONSULTING ENGINEERS PLANNERS

# TRANSMITTAL

**Ainley & Associates Limited**
280 Pretty River Parkway, Collingwood, ON L9Y 4J5
Tel: (705) 445-3451 • Fax: (705) 445-0968
Email: collingwood@ainleygroup.com

| | | | |
|---|---|---|---|
| To: | Chunmei Lui, Environmental Resource Planner/EA Coordinator | Company: | Ministry of Environment and Climate Change, Place Nouveau<br>9th Floor, 5775 Yonge St.<br>Toronto, ON M2M4J1 |
| From: | Reid Mitchell for J. Mullan | Date: | April 27, 2017 |
| Ref: | Township of Springwater<br>Midhurst Class EA – Phase 3 and 4<br>Draft ESR | File: | 113027 |

Please find enclosed the material listed below:

☐ Prints ☐ Specifications ☐ Shop Drawings ☐ **Tech Studies as requested**

**Delivery Method**

☐ Mail ☐ Courier ☐ Hand Delivery ☐ Pick-up

| No. of Copies | Document Number | Rev. No. | Description |
|---|---|---|---|
| 1 | | | Appendices D to H inclusive, J to Z inclusive, AA and BB as well as T1 to T8 inclusive |
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**Submitted for your:**

☐ Information/Records ☐ Action

☐ Review/Approval

**STATUS:**

☐ Preliminary ☐ For Tender

☐ For Construction ☐ Record Drawings

☐ Reviewed as Noted

REMARKS:

**Please note that Appendix I will be deleted. That subject is covered in Section 7 of the ESR.**

cc:

## Reid Mitchell

**From:** Joe Mullan <mullan@ainleygroup.com>
**Sent:** April-28-17 4:01 PM
**To:** Chunmei Liu
**Cc:** Paul Martin
**Subject:** RE: Midhurst Class EA - DRAFT Environmental Study Report
**Attachments:** Twp Letter - MOECC re Midhurst EA Study Dated April 25, 2017.pdf; Ainley Ltr to MOECC RE Draft ESR (Apr 27 2017).pdf

**Hi Chunmei:**

Further to the digital submission of the Draft Environmental Study Report (ESR) associated with the Midhurst Class Environmental Assessment earlier this week, we wish to provide the follow-up documentation listed below:

1. A letter from the Township of Springwater Council, dated April 25, 2017, requesting the MOECC review a few items within the Draft ESR of significant importance to current and future residents of the Township, before proceeding forward with the completion of the ESR;
2. A letter from Ainley Group on behalf of the Steering Committee for the Midhurst Class EA, with regard to the Phosphorus loading from the Midhurst Secondary Plan;
3. As per your request, we have sent a hard copy of key components of the ESR to you, via courier.

If you have any questions, please do not hesitate to contact me.

Regards,

J. A. Mullan, P.Eng.
President & CEO

Ainley

www.ainleygroup.com
Tel: (705) 445-3451 Ext. 126
Cell: (705) 718-7230

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**From:** Joe Mullan
**Sent:** Tuesday, April 25, 2017 10:08 AM
**To:** Chunmei Liu <Chunmei.Liu@ontario.ca>
**Cc:** Paul Martin <paul.d.martin@ontario.ca>
**Subject:** Midhurst Class EA - DRAFT Environmental Study Report

**Hi Chunmei:**

Further to our recent communication, we have uploaded the DRAFT Environmental Study Report (ESR) associated with the Midhurst Class Environmental Assessment, to Dropbox and it can be accessed using the following link:

https://www.dropbox.com/sh/x33ce3zaunf3z9l/AAANqjzDFMgMnq09-1SZgH1wa?dl=0

Also, please note that we will be forwarding a letter from the Township of Springwater Council, within the next 1 to 2 days, requesting the MOECC review a few items within the Draft ESR of significant importance to current and future residents of the Township, before proceeding forward with the completion of the ESR.

Subsequent, to the Ministry's review of the document, we would respectfully request the opportunity to meet with the Ministry staff, to discuss your comments on the Draft document. It is acknowledged that Ministry Staff are busy, but is hoped that such a meeting could take place towards the end of May (at your office in Toronto), as we would like to move forward with the formal 30-day review period and Public Open House, in June before the start of the summer holidays.

If you have any questions, please do not hesitate to contact me.

Regards,

J. A. Mullan, P.Eng.
President & CEO

Ainley

www.ainleygroup.com
Tel: (705) 445-3451 Ext. 126
Cell: (705) 718-7230

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**Ministry of the Environment and Climate Change**

Central Region
Technical Support Section

5775 Yonge Street, 8th Floor
North York, OntarioM2M 4J1

Tel.: (416) 326-6700
Fax: (416) 325-6347

**Ministère de l'Environnment et de l'Action en Matière de Changement Climatique**

Région du Centre
Section d'appui technique

5775, rue Yonge, 8ième étage
North York, Ontario M2M 4J1

Tél. : (416) 326-6700
Téléc. : (416) 325-6347

Ontario

July 5, 2017

File No.: EA 01-06-11

Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Ltd.
280 Pretty River Parkway
Collingwood, ON L9Y 4J5

RE: Midhurst Water, Wastewater and Transportation
Township of Springwater
Municipal Class Environmental Assessment Phases 3 and 4
Draft Environmental Study Report

Dear Mr. Mullan,

We have reviewed the draft Environmental Study Report (dESR) for the above-noted project and provide the following comments for consideration:

**Air Quality**

General Comments

1. As recommended in the ministry's letter dated May 13, 2013, an air quality impact assessment should have been conducted by the Township of Springwater for the proposed undertaking during the EA Stage. Based on the information provided in Appendix B of the dESR, a meeting was held June 10, 2013 with representatives from the Township, Developer & Ainley Group. This meeting committed to address the ministry's requirements with respect to odour impacts during the Class EA process. However, this assessment was not included in the dESR.

   The air quality impact assessment (AQA) as stipulated in the May 2013 ministry's letter should include emission estimation and dispersion modelling to assess potential future impacts in the community. Including a discussion how the proposed undertaking will comply with the O. Reg. 419 air standards, such as Schedule 3, 10-minute odour standards.

2. Furthermore, impacts from any potential odour source such as sewers, pumping stations, wastewater treatment facilities at the nearest sensitive receptors and future sensitive receptors should also be considered at the EA stage.

   The proposed biological reactor tanks and or sludge storage tanks are typically considered potential odour and other pollutants sources for these types of facilities. The AQA should assess impacts from these sources (including screening and degritting, step feed biological nitrogen removal (BNR) with chemical addition for phosphorus removal, tertiary membrane filtration, ultraviolet disinfection, effluent discharge to Willow Creek), but not limited to the list above.

   Please ensure the supporting documentation follows the requirements stipulated under *Emission Summary Dispersion Modelling* (ESDM) *Guideline*.

3. In addition, the dESR is proposing transportation improvements to support the development of the Midhurst Area. Therefore, the AQA should also consider impacts from the proposed transportation improvements such as the widening of Wilson Road to 4 lanes from Snow Valley Road to Barrie City limits and the proposed new roads.

4. The dESR has indicated that the public has concerns about air quality impacts for the proposed undertaking. Please clarify how these concerns will be addressed in the ESR.

Recommendations

- The ESR should address air quality impacts from the proposed wastewater treatment infrastructure network and transportation improvements in support to the Midhurst Development Area. The AQA should not only evaluate the impacts for the proposed full build out scenario but also how these compare with the current scenario.

- During the EA stage the AQA should follow the ministry's guidance documentation which includes O. Reg. 419/05 dispersion modelling and compliance with O.Reg. 419/05 standards.

- The AQA should also assess odour impacts at the nearest sensitive receptors (current and future) and discuss how to mitigate odours and what to be included in the contingency plan if complaints are received in the future.

- With respect to the proposed transportation improvements, such as road widening and new roads, the ESR should also consider dust mitigation measures during the construction to minimize of-site dust impacts at sensitive receptors.

We will provide additional comments when our groundwater and surface water specialists complete their review.

Thank you for the opportunity to comment on this project. Should your team have any questions regarding the above, please contact Chunmei Liu, Environmental Resource Planner and EA Coordinator at our office directly at 416-326-4886.

Yours sincerely,

Paul Martin, Supervisor
Air, Pesticides and Environmental Planning

c. H. Coleman, Director of Public Works, Township of Springwater
S. Dudding, Senior Vice President, GERANIUM
A. Evers, Supervisor, Environmental Approvals Branch, MOECC
C. Hood, Manager, Barrie District Office, MOECC
Central Region EA File
A & P File

**Reid Mitchell**

| | |
|---|---|
| **From:** | Martin, Paul (MOECC) <Paul.D.Martin@ontario.ca> |
| **Sent:** | August-11-17 11:05 AM |
| **To:** | mullan@ainleygroup.com; Alain.Carriere@rwdi.com |
| **Cc:** | edwardsb@bv.com; KocO@bv.com; mitchell@ainleygroup.com; Antunes, Marinha (MOECC); Liu, Chunmei (MOECC) |
| **Subject:** | Follow-Up Action Items: Clarification on requirements for transportation AQIA - Midhurst |

Good morning

Further to our teleconference yesterday, it appears that the road widening from 2 to 4 lanes will be approximately 2-3 km in length with a forecasted population around 2000 people in a mostly rural area. One of the action items from the meeting was for the ministry to circulate the *draft transportation air quality impact assessment protocol* to members of the group. As the protocol is still in draft form and is currently being peer-reviewed, we have decided not to circulate the draft until it has been formalized. However, based on the information contained within the protocol, the ministry recommends a **qualitative assessment** for this particular project.

The qualitative assessment described by RWDI during the teleconference will outline the contaminants of concern from vehicular traffic, how close the sensitive receptors are to the proposed undertaking, and any queuing or idling concerns. The qualitative assessment should also discuss proposed mitigation measures such as dust impacts at the most impacted sensitive receptor during construction. Lastly, mitigation measures from dust impacts during operation of any new roads or widened roads should be discussed (such as planting coniferous species to act as a barrier to minimize dust impacts at the sensitive receptors etc).

If you have any questions, please feel free to contact me directly
Thanks

**Paul Martin, GISP** | Supervisor – Air, Pesticides & Environmental Planning | Technical Support Section, Central Region
Ontario Ministry of the Environment and Climate Change | 5775 Yonge St. 9th Floor | Toronto, ON | M2M 4J1 | T: 416-326-3477 F: 416-325-6347

**Ministry of the Environment and Climate Change**

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Technical Support Section

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**Ministère de l'Environnment et de l'Action en Matière de Changement Climatique**

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April 30, 2018 File No.: EA 01-06-11

Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Ltd.
280 Pretty River Parkway
Collingwood, ON L9Y 4J5

RE: Midhurst Water, Wastewater and Transportation
Township of Springwater
Municipal Class Environmental Assessment Phases 3 and 4
Draft Environmental Study Report

Dear Mr. Mullan,

Further to our comments dated July 5, 2017, the following comments on the draft Environmental Study Report (dESR) for groundwater, surface water and air quality are provided for your consideration:

# 1.0 Groundwater

## 1.1 Introduction

**Documents Reviewed:**

The Environmental Assessment (EA) findings are provided in a draft *Environmental Study Report (ESR), April 2017.* The ESR includes numerous reports attached as appendices. The following report was reviewed:

Ainley. 2017. Township of Springwater Class Environmental Assessment study for Midhurst Water, Wastewater and Transportation Servicing Phase 3 and 4 Environmental Study Report, Ainley Group, consulting Engineers and Planners
File: 113027, April 2017.

The following reports were included as Appendix J in Volume 3 or 4 of Ainley (2017):

Golder. 2016. Hydrogeological Study, Midhurst Water Supply Exploration Program – Golder Associates Ltd, DRAFT by John Easton, M.Sc., P.Geo. June 2016, Report No: 13-1170-0040

Golder. 2014. Midhurst Developments Water Balance for Draft Plan Subdivision Application Numbers: SP-T-1001, SP-T-1004, SP-T-1005, SP-T-1006, SP-T-1007, SP-T-0702, SP-T-0505 and SP-T-0904. Golder Associates Ltd, DRAFT signed by Adriana Parada P.Eng. and Kevi McKenzie, P. Eng., May 2, 2014, Project number 13-1170-0040

Golder. 2017. Report on Carson and Doran Neighbourhoods Water Supply – Midhurst Secondary Plan: Supplementary Hydrologic Modelling – Golder Associates Ltd., January 2017

### 1.1 Hydrogeological Assessment

The Golder (2016 and 2017) report documented the water supply exploration program that occurred on ten sites in the Doran Road, Pooles Road, Garson road and Highway 28 areas in December 2013 and October 2014. The well drilling was completed to determine the presence and characteristics of the two main water supply aquifers in Simcoe County described as Regional Aquifers A3 and A4. Observation wells were screened within aquifers A1, A2, A3 and A4 where encountered. Numerical modeling was conducted to evaluate the sustainability of and potential impacts from the long term operation of wells at these test sites. The model used was an update of the existing 3D Kempenfeldt Fay FEFLOW numerical model.

The study (Golder, 2016) revealed that there was limited connection between the lower aquifers and the upper aquifers. It did not evaluate the effect of pumping on surface water features. The latter impact was determined using the FEFLOW groundwater model that included the Willow Creek watershed. Pre and Post Development pumping conditions were simulated and compared for Willow Creek and the Minesing Wetland. Pre- and Post-development scenarios were compared. The effect on Willow Creek, Minesing Wetland and surface water level changes in Minesing Wetland and nearby Snow Valley Road was determined to be minor.

The effect of dewatering for road and sewage treatment plant construction was not addressed in these studies. This effect will need to be addressed in the Permit To Take Water (PTTW) application stage.

A PTTW will be required for the new municipal water wells. The hydrogeological studies completed are a good base from which to complete a Hydrogeological Assessment as required by the “Technical Guidance Document for Hydrogeological Studies In Support of Category 3 Applications for Permit to Take Water”.

A Hydrogeological Assessment will be required if construction dewatering is required for road reconstruction and the construction of the wastewater treatment plant. This Hydrogeological Assessment can build on the assessments already completed but will be required to address temporary impacts on local water features and on domestic water wells in the area.

## 2.0 Surface Water

### 2.1 Introduction

**Documents Reviewed:**

The Environmental Assessment (EA) findings are provided in a draft *Environmental Study Report (ESR), April 2017.* The ESR includes numerous reports attached as appendices. The Ministry of the Environment and Climate Change (the ministry) has also received a letter from the Township of Springwater Council, dated April 25, 2017, requesting the ministry’s review focus on several items within the draft ESR (issues related: to potential effect of the water supply wells; phosphorus loading and transportation needs).

The ministry received a letter from Ainley Group (consultant to the Township), dated April 27, 2017, which indicates the following:

- The Class EA Steering Committee reaffirms that the Midhurst Secondary Plan must achieve a net zero increase in phosphorus (identified as a condition within the Minutes of Settlement between the Nottawasaga Valley Conservation Authority (NVCA) and the Midhurst Developers Group, as well as within the Township’s Draft Plan conditions associated with the various Plans of Subdivision in the Midhurst Secondary Plan);

- Sections of the Draft ESR which state that a net zero increase in phosphorus will be achieved if deemed necessary by MOECC as well as sections of the ESR where it is noted that a phosphorus offsetting program will not be required will be revised to indicate that a net zero increase in phosphorus must be achieved; and
- Wording will be added to the ESR noting that a phosphorus offsetting program will have to be developed, to ensure that the net zero requirement is met, prior to an Environmental Compliance Approval (ECA) being issued by the MOECC for the proposed Midhurst Wastewater Treatment Plant.

**Previous Involvement & Scope of Current Review** :
In 2009, the Town of Springwater completed a Master Plan study that identified the servicing solutions for the proposed development within the Midhurst Secondary Plan (MSP), also referred to as OPA 38. The findings of the master plan study were presented in the report: "*Midhurst Master Servicing Plan – Phase 1 & 2 – Water, Wastewater & Transportation, dated July 2009*". The ministry provided surface water related comments on the master plan report, focusing on the wastewater servicing proposal. In particular, the ministry reviewed in detail Appendix H of the master plan: "*Interim Assimilation Analysis: Discharge of Treated Sewage Effluent from the Proposed Midhurst WWTP to Willow Creek, June 2009"* (by AECOM). Following our initial review, MOECC continued to provide input to the proponent, mostly by providing feedback on documents prepared to address the low flow estimation for Willow Creek.

The current surface water review is a continuation of the input provided previously. It covers wastewater servicing as well as the potential surface water related effects of the water supply and transportation projects covered by the EA. In the EA, the sewage plant proposal is linked to the cumulative phosphorus loading from the Midhurst development (i.e. from treated sewage plus from urban stormwater). Our review attempts to address this issue. However, this review is not intended to address storm water management (SWM) for the proposed development areas.

It should be noted that these comments are based on the information available in the draft ESR and its appendices. Additional questions or concerns may be identified during the formal review period of the final ESR. Also, note that many of the issues raised at this stage may also be revisited and evaluated in greater detail during subsequent ministry approval stages (Permits to Take Water (PTTW) and Environmental Compliance Approvals (ECA)).

## 2.2. Transportation

The transportation improvements covered by this EA include adding a new east west road (Craig Road) and widening several existing roads ( section 7.6 of the report). Section 7.7 of the ESR and Appendix T-7 document how the alignment for the new (Craig) Road was selected.

The potential surface water related issues associated with the new and widened roads include: the type of stormwater management (SWM) and if construction of the road works requires water taking/dewatering (temporary or long term).

The EA does not contain details regarding SWM for the new/expanded road works or the water taking needs (short term and long term). We acknowledge that section 7.9 and Appendix T-8 discuss the list of potential environmental impacts and suggested mitigation measures for the proposed transportation works. However, this contains only a two page, high level identification of likely requirements/Best Management Plans (BMPs) to address issues or concerns related to the roadway improvement works. While it may be too early to develop detailed drainage and SWM plans for the road works at this stage, it is our opinion that the EA should clearly stipulate the kind of SWM that should apply for the new/expanded roads and what criteria should be used (as a minimum, achieving enhanced level of water quality control;

addressing the need for peak flow control; would road works also be required to meet the 25 mm infiltration target discussed in the phosphorus budget work? etc.);

Construction related water taking (dewatering) that may be required to facilitate construction of road works may require approvals through the Permit to Take Water (PTTW) process or the Environmental Activity and Sector Registry (EASRs). The ministry notes that Appendix T-8 acknowledges that EASRs may apply for "consumptive" uses during the road construction works and the contractor may be required to obtain the EASR. Note that construction related groundwater and/or stormwater takings may require a PTTW if the daily amount is >400,000 litres. Any such water takings that require a PTTW will be evaluated in much greater detail as part of the future PTTW applications.

## 2.3 Water Supply

The proposed water supply system includes multiple wells that will be developed in phases as development proceeds. The bulk of the evaluation of the potential environmental effects of the proposed groundwater taking is provided in Appendix J of the ESR. Appendix J includes two reports:

- A hydrogeological study by Golder (*Midhurst Water Supply Exploration Program, June 2016*). This report details the well exploration program and pumping tests undertaken to determine available capacity. The report also includes the findings of a numerical groundwater flow model that was completed in 2015. The purpose of this modeling was to determine the potential long term groundwater impacts from water taking at the projected full build-out phase. The results of the groundwater flow modeling exercise are presented in a separate report entitled: "*Draft Report on… Groundwater Modeling, Golder, March 2015*", and attached as Appendix M to the June 2016 hydrogeological report;

- A second study by Golder: "*Supplementary Hydrologic Modeling, January 2017…*". The purpose of this report is stated to be the determination of potential impacts from the taking on surface waters. The modeling undertaken for this purpose reportedly builds upon the previous modeling work mentioned above and attempts to determine the effects of the proposed taking on surface waters (in particular, Willow Creek and the Minesing wetland). The HydroGeoShpere (HGS) computer program is used for this purpose while FEFLOW was used in the previous (2015) groundwater flow modeling work.

Other relevant documents with respect to the potential environmental effects of the proposed well based water supply system are the April 25, 2017 letter the ministry received from Springwater Council, asking the MOECC to focus its review of the ESR on several issues (including water supply) as well as Appendix BB of the EA: "*Special Council Meeting, March 8, 2017, Public Comments & Responses*". This document contains details of the concerns raised by various parties during Springwater's Special Council meeting of March 8, 2017 in relation to the Midhurst EA. Of particular relevance here are some of the concerns/comments raised by Lotimer & Associates (independent peer reviewer for the Midhurst Ratepayers Association) as well as others. Responses to the concerns were provided in several memos, and are also included in Appendix BB (*Response to Lotimer, by Golder, April 21, 2017; Response to Michael Thorn, by Hutchinson, March 30, 2017; and Response to John Harris, Golder, April 21, 2017)*.

The assessment of surface water impacts from groundwater taking includes attempts to quantify and characterize where, when and how much effect a proposed groundwater taking may have on surface waters (these are done through hydrological and hydrogeological studies). The assessment also requires evaluating the ecological significance of the observed/predicted effects of the taking. Addressing surface water concerns may require developing a monitoring plan and planning for implementation of mitigation

measures, if required (e.g. placing wells farther away from affected/sensitive stream reaches; reducing rates of takings during certain periods etc.). The ministry's review focuses on these aspects.

i. The potential environmental effects of this water taking will be evaluated in greater detail during the review of the PTTW review process. While the technical reports provided within this EA (described above) contain significant information regarding the water supply proposal and the impact evaluation undertaken to date, significantly more detailed information will be required during the PTTW stage. As such, the comments provided here are preliminary. There could be additional questions and comments during the PTTW review stage;

ii. The hydrogeological study report (June 2016) indicates that, generally, the potential for significant effects on area surface waters (Willow Creek and its tributaries and the Minesing wetland) from the proposed groundwater taking is low. This is because the target aquifers are regionally extensive deep aquifers that are separated from the upper aquifers by low permeability materials and whose hydraulic interconnection to the subject surficial features (streams, wetlands) is likely limited. The target regional aquifers are believed to discharge directly into the Nottawasaga Bay (e.g. see section 3.3 of the June 2016 report in Appendix J). Cross sections and well logs are used to support this geologic model. The short term (72 hr) pumping tests conducted in four of the test wells (see sections 4.1.2; 4.2.2; 4.3.2; 4.4.2) are also interpreted to support the conclusion that the deep aquifers are hydraulically separated from the shallow formations (i.e. lack of response in shallow observation wells suggested hydraulic separation between the deep and shallow systems). The ministry is aware of instances where pumping from formations (even at considerable depth) has resulted in measurable effects in shallow groundwater and surficial features such as wetlands and streams. However, these were instances where the deep and shallow systems were not hydraulically separated by low permeability formations. In the current case, the report points out (with supporting evidence) that the target aquifers are separated. The review has not identified any argument/evidence to contradict this conclusion. So, given the depth of the wells, the presented geologic model and results of the short term pumping tests, the ministry does not see major issues with the above interpretation. The ministry expects that the PTTW applications for each well or groups of wells will include further verification that there are no reaches of surface waters where there is significant interconnection between shallow and deep systems within the zone of influence;

iii. The groundwater modeling work (March 2015) attached to the hydrogeological study report and the subsequent hydrological modeling work (January 2017) imply some impact to stream baseflows under full build out scenarios. In these reports, the evaluation of potential effects on surface waters is largely based on model predictions which indicated that the long term, cumulative effect of the taking on baseflow in Willow Creek would be no more than 10%. The reports suggest that this amount of baseflow loss would be insignificant. The ministry does not agree that a 10% loss in baseflow would be insignificant. The modeling results and how they should be interpreted may need to be revisited. Experience has shown that predictions of streamflow losses in specific reaches based on these kinds of large scale modeling may be inaccurate. The uncertainties are often larger than the predicted effects and prediction results could change significantly by altering model input parameters (many of which also have very large uncertainties). Therefore, while the modeling may be useful in developing an understanding of general trends in groundwater level that may develop over extended use, results should not be relied upon to provide quantitative estimates of potential baseflow reductions and should not be used as the basis to determine if the proposed water taking is acceptable or not (from a surface water perspective). The ministry also strongly disagrees with the comments in the various documents that up to 20% reduction in the amount of groundwater contribution to a cold water stream would be considered acceptable. This is variously reported as an MNRF and/or Fisheries and Oceans Canada (DFO) threshold, but the sources for this are not provided. It is recommended that the discussions on modeling results be revised.

- It is the ministry's view that, given the geologic setting presented, any effect of takings on the surface waters found locally would likely be negligible. Effects, if any, will be localized/ concentrated in areas where significant hydraulic connection between the source aquifers and surface systems may exist (although the current understanding of the area's hydrogeologic setting does not suggest this to be the case). As part of the future PTTW applications, it is recommended to take a closer look at the geology/hydrogeology (particularly within the predicted zones of influence of the pumping wells) to determine if areas of more enhanced hydraulic connectivity exist;
- It would also be helpful to have an understanding of the spatial and temporal scales at which we can expect to see effects, if any, and the magnitude of these effects. Much of the discussion to date is focused on the potential volumetric reductions of stream flow as a result of the takings. It is important to note that, at the watershed scale, the taking would be effectively offset by the discharge of treated effluent back into the same watershed. In fact, the discharge may result in greater dry weather flows in Willow Creek than present conditions (by taking from deep aquifers that do not appear to discharge into the same system and releasing the water into the stream). As discussed above, if there are effects of takings, they are likely to be subtle. Rather than percent reduction in flows, it may be more appropriate to see if effects of takings could manifest in more subtle but still important ways. For example, losses of specific groundwater input areas and loss of groundwater upwelling features, could be ecologically significant. Where are the areas of significant groundwater discharge? Are effects likely here? Do pumping tests show reversal of gradients? Is it necessary to have monitoring in these areas to identify effects over time?
- The opinions of a qualified aquatic ecologist(s) would also be very useful in characterizing the various reaches of the surface water system and its sensitivity to changes. Efforts to characterize and quantify potential effects should also be supplemented with ecological evaluation to assess the significance of predicted effects.

iv. The EA also includes information related to the selection and evaluation of many other aspects of the water supply systems, including the water treatment alternatives and the distribution and storage system (e.g. see section 5 of the main report; Appendix K to the ESR which is a draft report by Black & Veach, May 2016). These are beyond the scope of this review. However, similar to the transportation projects, if construction of the water supply system components requires water taking/dewatering (e.g. during installation of water mains, during building treatment plant structures), this dewatering/taking may require PTTWs and will be evaluated in much greater detail as part of the future PTTW applications.

### 2.4. Wastewater Servicing

Willow Creek is the initial receiver of the treated effluent, and as such the evaluation of impacts (as well as our review of the ESR) is focused on Willow Creek. The assessment of proposed wastewater discharges however may expand beyond the immediate receiver and consider aquatic systems downstream. In this case, the downstream systems that may also be affected include: the Minesing Wetland (into which Willow Creek flows about 4 km downstream of the proposed discharge), the Nottawasaga River (Willow Creek joins the River within the Minesing Wetland) and the Nottawasaga Bay into which the Nottawasaga River empties. The concerns raised regarding these downstream waterbodies (and discussed in the EA documents) are mostly related to nutrient enrichment (phosphorus loading), and to a lesser degree potential changes in hydrology of the wetland.

Another issue that is linked to the wastewater servicing proposal in this EA is the requirement by the Nottawasaga Valley Conservation Authority (NVCA) to limit the cumulative future phosphorus loading to the environment from sewage and stormwater to no more than current loads. That is, the phosphorus load from the discharge of treated sewage and the phosphorus contribution from runoff from developed areas should remain below the phosphorus load under existing conditions ("no net increase" requirement).

### 2.4.1 Addressing Potential Impacts on Willow Creek

The bulk of the relevant information on the evaluation of the potential environmental impacts of the proposed wastewater servicing on Willow Creek is provided in the report: "*Willow Creek Assimilative Capacity Study (ACS), May 2016".* The report (prepared by Hutchinson Environmental Services Limited, HESL) is included as Appendix M to the ESR. The ACS also contains its own appendices, which include Appendix A ("*7Q20 Flow Assessment Update Willow Creek, HESL, May 2016"*) and Appendix C ("*Fluvial Geomorphological Assessment of Willow Creek, Palmer Environmental Consulting, April 2014"*). Additional documents and references are cited in the review comments below, as appropriate.

Low Flows in Willow Creek (7Q20 flow):
One of the issues raised during the ministry's review of the master plan was the estimation of low flows in Willow Creek. The proponent has now updated the assessment using data collected since 2009 (see Appendix A to the current ACS).

HESL has now addressed this issue satisfactorily. The ministry has no objections to using a 7Q20 value of 430 L/sec, as proposed. For winter (November to May) conditions, the report uses a minimum streamflow of 900 L/sec. We find this winter low flow estimate to be reasonable and appropriate, based on the minimum daily flows observed at the gauge (02ED032) during the relevant months.

Water Quality Status of Willow Creek:
The water quality conditions in the receiver (Willow Creek) were largely determined based on data collected at the Provincial Water Quality Monitoring Network (PWQMN) station 03005703002, located on Willow Creek, approximately 3.2 km downstream of the proposed discharge location.

The ministry has no concerns regarding the analysis undertaken to determine the water quality status of the Creek.

Proposed Effluent Quality Targets:

Effluent targets (limits, objectives and averaging periods) are discussed in Section 6 of the main ESR report and in Appendix S to the ESR. The ACS is focused on demonstrating the proposed targets are acceptable.

In the following sections, the proposed effluent quality targets are reviewed:

i. Total Suspended Solids (TSS): the ACS does not contain discussion on how the proposed TSS targets are adequate to avoid adverse impacts (a monthly average limit of 15 mg/L and a design objective of 10 mg/L for both phases of development). The ministry has undertaken a preliminary level calculation to estimate TSS concentrations in Willow Creek if the effluent in fact contains 15 mg/L of TSS, as proposed. The worst case condition would be when the receiver (Willow Creek) is under a long dry spell (clear flow condition) in summer with flows approaching the 7Q20 statistic and effluent flows are close to the full buildout design flow of 143 L/sec. The Canadian Water Quality Guideline (CWQG) for TSS for long term sustained discharges (longer than 24 hours) is that the discharge not cause the TSS concentration in the receiver to increase by more than 5 mg/L (during clear flow conditions). The ministry estimated the ambient TSS concentration in Willow Creek during such conditions to be between 5 and 10 mg/L (see data for the PWQMN station provided in the ACS report). Even under such overly conservative assumptions, TSS in the receiver will not be above the guideline. Therefore, we have no objection to the proposed values. It is also our view that actual TSS levels in

the effluent are likely to be much better than the proposed limit, given that the total phosphorus (TP) targets being considered for the plant are very low (which effectively means TSS also has to be very low. Subject to the engineering review during the ECA stage, the TSS targets to be incorporated into the ECA may be lowered to ensure the values are consistent with the low TP targets).

ii. E.Coli: Disinfection is proposed to be done using ultraviolet light. The EA proposes a monthly limit of 200/100 ml with a design objective of 100/100 ml (the PWQO is 100/100 ml). Please justify using 200/100 ml.

iii. Total Ammonia Nitrogen (TAN): For phase 1, the proposed TAN limits are: 1.5 mg/L (June to October) and 3 mg/L (November to May). For the full buildout scenario, the proposed limits are: 1 mg/L (June to October) and 2 mg/L (November to May).

a) Issues Considered: The ACS appropriately considers whether the levels of un-ionized ammonia in the effluent remain below the value considered to be acutely toxic and whether the levels in the mixed water (beyond a reasonably small mixing zone) remain below the PWQO (0.02 mg/L). Please note however that we consider un-ionized ammonia levels in effluent above 0.2 mg/L as being acutely toxic – not 0.24 mg/L as noted in the ACS report (also see comments of September 2009, during the master plan stage).

b) Acute Toxicity (see section 4.1 of the ACS): The maximum concentration of TAN that could be present in the effluent such that the concentration of un-ionized ammonia remains below 0.2 mg/L would be 4.3 mg/L (calculated using an effluent pH of 8 and temperature of 20 degrees, as was done in the ACS report). Therefore, the proposed TAN limits meet the requirement that undiluted effluent be non-acutely lethal at the point of discharge;

c) Chronic Toxicity: When evaluating whether the PWQO will be met after mixing, one simple approach (especially for discharges into small waterbodies) is to assume complete and instantaneous mixing of the effluent with the ambient water and calculate resultant ammonia concentrations. In this approach, effluent containing TAN at the proposed summer and winter limits is assumed to completely mix with river during low flows (430/900 L/sec in summer/winter) containing 0.025 mg/L of TAN (the reported 75$^{th}$ percentile ambient TAN value). To determine the fraction of un-ionized ammonia, a conservative assumption could be taken and the resultant water temperature and pH is expected to be similar to that of the ambient: i.e. a temperature of 18.5/4 degrees (summer/winter) and pH of 8.4 (note that pH in 2013 and 2014 never exceeded 8.25. Even the 90$^{th}$ percentile value for the 2013-2014 data is a pH of 8.2). The results are summarized in the table below:

| | Phase 1 (75 L/sec) | | Phase 2 (143 L/sec) | |
|---|---|---|---|---|
| | **Summer** | **Winter** | **Summer** | **Winter** |
| **TAN (mg/L)** | 0.24 | 0.25 | 0.27 | 0.29 |
| **pH** | 8.4 | 8.4 | 8.4 | 8.4 |
| **Temp** | 18.5 | 4 | 18.5 | 4 |
| **$NH_3$ (mg/l)** | **0.024** | 0.009 | **0.027** | 0.01 |

The analysis suggests un-ionized ammonia levels in the mixed water could be marginally above the PWQO of 0.02 mg/L during summer. However, the analysis is very conservative and does not

factor in any downstream assimilation and additional dilution processes.

The ACS instead relies on a more sophisticated assessment approach to evaluate this issue. In the ACS, a plume dispersion model (CORMIX) is used first to evaluate the size and shape of the mixing zone. The analysis shows complete mixing of the effluent is achieved some 300-360 m downstream of the point of discharge. Although we have not undertaken a detailed review of the CORMIX analysis, the inputs applied and the assumptions made are reasonable. CORMIX was also used to predict un-ionized ammonia concentrations within the plume (ammonia modeled as a non-conservative substance for summer). This analysis shows that PWQO for ammonia will be achieved well before the point of complete mixing in all scenarios. The ACS also uses another model QUAL2K (a water quality modeling tool) to better evaluate how ammonia (among other parameters) is assimilated by instream processes. This model also assumes complete mixing, but can evaluate how concentrations change downstream of the discharge as a result of instream processes. The analysis using QUAL2K further demonstrates how assimilation in the stream progresses and satisfactorily demonstrates that, at the proposed effluent limits, levels of un-ionized ammonia in the stream will remain below the PWQO.

iv. Biochemical Oxygen Demand (BOD) and Dissolved Oxygen (DO): The ESR proposed a carbonaceous biochemical oxygen (cBOD) limit of 15 mg/L and a design objective of 10 mg/L for all seasons and all phases. These values are similar to what is routinely used in many approvals for wastewater discharges. More importantly, considerable effort has been spent in the QUAL2K modeling exercise to demonstrate that the levels of total BOD will not significantly affect DO levels in the receiver or lower it below acceptable levels. Therefore, the ministry has no objections to the proposed cBOD targets.

v. Nitrate: It is not common for the ministry to include targets related to nitrate levels in approvals for sewage plants that discharge to surface water, however the Midhurst proposal has always included such targets. The 2009 Masterplan proposed an effluent nitrate-N limit of 9.8 mg/L (see Appendix H of the 2009 mater plan and the report: “Interim Assimilation Analysis…, AECOM, June 2009”). Using a simple mass balance approach, the Interim Assimilation report showed that this target would ensure the nitrate-N concentration in the mixed water remains below 4.7 mg/L. There was no PWQO for nitrate in 2009 (this is still the case), but it was noted that a nitrate-N target of 4.7 mg/L was proposed under the Ideal Performance Standards (IPS), developed by Environment Canada in 2008 under the National Agri-Environmental Standards Initiative (NAESI). Although there was an interim Canadian Water Quality Guideline (CWQG) of 2.93 mg/L for nitrate-N at that time (developed 2003), the Interim Assimilation report preferred to use the IPS since it was deemed to be more defensible. In 2009, as part of our review of the master plan, we offered the following regarding the proposed nitrate limit: “Considering that there is an extensive wetland environment downstream (amphibians reported to be more susceptible to nitrate pollution) the proposal to include a nitrate limit is supportable. However, since there is no PWQO for nitrate, it will be at least premature for the MOE to bind the proponent to the proposed value at this time. …Before committing to these values, I recommend a more detailed evaluation…”

The current ESR proposes a limit of 17 mg/L for Total Inorganic Nitrogen (TIN) and an objective of 15 mg/L, to apply for all phases. The latest TIN targets in the ESR are developed using the same approach as was done in the 2009 Interim Assimilation report. The reason for the latest values being different is that the low flow (7Q20) estimate for Willow Creek has now been revised from 232 L/sec to 430 L/sec. Also, the effluent flow for the full buildout (worst case) scenario is lowered from 172 L/sec

(used in the 2009 assessment) to 143 L/sec (used in the latest reports).

Note that the latest targets are for TIN (not for nitrate-N as was the case in 2009). The ministry concurs that if effluent targets are to be included in the approval for purposes of limiting nitrate levels in the receiver, those targets should be expressed as TIN instead of nitrate-N.

The ministry supports the plan to lower TIN in the effluent, noting that it is not a common practice to include nitrate or TIN targets in approvals for sewage treatment plants that discharge to surface waters. Further discussions are anticipated to occur at the ECA stage of the approval on whether effluent targets will need to be incorporated, and if so, how the targets should be derived. At this point, the following comments are provided to help scope the future discussions regarding nitrate.

A conservative approach would be if nitrate related targets are developed following the same approach as the one used in developing targets for ammonia which has an applicable PWQO. For this purpose, the CWQG targets for nitrate are used as surrogates for PWQOs. Note also that the CWQG for nitrate was revised and finalized in 2012. The current CWQG for nitrate is a chronic target of 3 mg/L as N and an acute target of 124 mg/L as N. Following the approach applied for ammonia, the reasons for establishing nitrate targets would be: (a) ensuring nitrate levels in the effluent remain below the value considered acutely lethal (the CWQG criterion for acute lethality for nitrate is 550 mg/L or 124 mg/L expressed as N); and (b) ensuring levels in the mixed water, beyond a reasonably small mixing zone, remain below the CWQG chronic target of 13 mg/L (or 3 mg/L expressed as N):

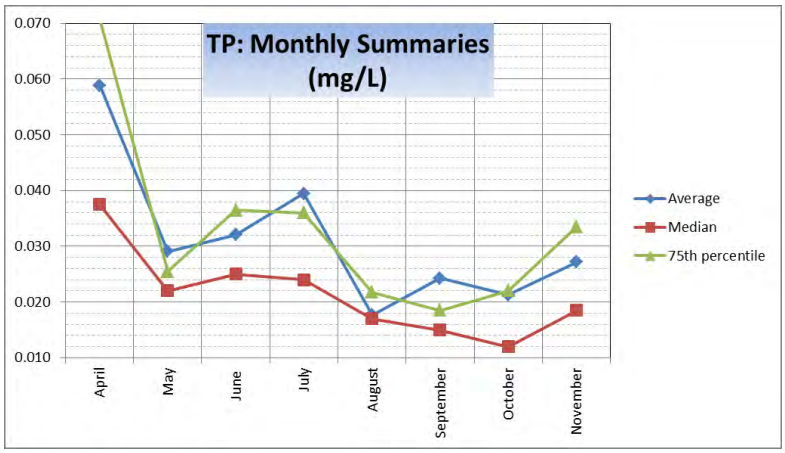
a) There is little risk that nitrate in the effluent will exceed the acute toxicity target even if all forms of nitrogen in the sewage are converted into nitrate-N (literature suggests the total nitrogen in raw sewage is around 40 mg/L);

b) For a screening level assessment of whether the chronic target will be met or not, we have used a simple mass balance approach as was done in the ACS. The ACS indicates that the 75$^{th}$ percentile nitrate-N concentration in the receiver is 0.85 mg/L. The critical low stream flow is 430 L/sec. Effluent flow is 75 L/sec (phase 1) and 143 L/sec (phase 2). This would mean that, to keep nitrate-N levels in the mixed water below 3 mg/L, the nitrate-N in the effluent will need to remain below 15.4 mg/L for phase 1 and 9.5 mg/L for phase 2. We also agree with the approach in the ACS that nitrate related targets should be expressed at TIN and not as nitrate-N. The screening level calculation above suggests that the TIN target of 17 mg/L value proposed in the latest ACS would be unsupportable. Following the above approach the TIN targets (limits) should be 15.4 mg/L for phase 1 and 9.5 mg/L for full buildout. However, as noted above, the mass balance calculation is a preliminary level screening and very conservative in that it does not account for any additional dilution or assimilation/uptake that may occur downstream of the discharge. We recommend the consultant to have a closer look at this before finalizing the target values for nitrate/TIN.

vi. Total Phosphorus (TP): In this section, discussion is mostly focused on determining if the proposed TP targets are suitable for discharge into Willow Creek. Consideration of potential TP related issues in receivers beyond Willow Creek and the implications of the “no net increase” requirement by the NVCA are addressed separately.

a) Baseline (background) TP Conditions: The 75$^{th}$ percentile value of available TP data for Willow Creek (2002- 2014 data collected at the PWQMN station No.03005703002) is 0.031 mg/L, which suggests the Creek is Policy 2 with respect to TP. However, information presented in the EA

also suggests that TP concentrations in the Creek are often below 0.03 mg/L (and often below 0.01 mg/L) during low flows and that the higher levels of TP are associated with high TSS levels (which also appear to be related to higher flows). The high TSS & TP levels are believed to be caused by significant input of soils into the stream due to erosion from both natural processes as well as due to poor land use practices. For detailed discussion on the causes of high TP/TSS levels as well as further in-depth analysis on monthly/seasonal distribution of TP, see sections 6 & 7 of Appendix N: Phosphorus Budget Update, HESL, May 2016. Appendix M of the ESR also contains a memo dated October 13, 2016 (update to the P Budget work) that presents monthly TP concentrations in Willow Creek. The chart below also shows all of the available TP data summarized for the months of April – November (75$^{th}$ percentile, median and average monthly values shown). Note that even the 75$^{th}$ percentile values for August, September and October are well below the PWQO:




In conclusion, the ministry concurs with the suggestion in the ESR that Willow Creek meets Policy 1 for TP for significant periods of the year, including portions of the summer growing season.

b) Proposed Effluent TP Targets: The 2009 Interim Assimilation report recommended a TP target of 0.03 mg/L for all phases. This was done to ensure that the Policy 1 status of Willow Creek is not altered as a result of the discharge. If effluent meets this target all the time, it would mean that mixed water concentrations would never be driven above the PWQO by the discharge of the effluent (consistent with Policy 1). And, during the times that upstream concentrations are above the PWQO, the resultant mixed water concentrations would be slightly better than background levels (consistent with Policy 2).

The proposed effluent quality targets for TP in the latest ACS/ESR however are slightly different. While a design objective of 0.03 mg/L is still proposed for all phases, a monthly compliance limit of 0.05 mg/L is proposed for phase 1. The proposed limit for the full buildout case is the same as the design objective (0.03 mg/L).

To assess the acceptability of the proposed limit for phase 1, mass balance predictions are used (by using 7Q20 flow condition and 75$^{th}$ percentile value for TP). The calculation suggests the proposed limit for phase 1 could be problematic. As shown in section 5 of the ACS, the effect of such effluent (i.e. containing 0.05 mg/L of TP) would be to elevate in-stream concentrations to 0.034 mg/L during the summer low flow conditions (in contradiction to Policy 2). The effect during the winter low flow periods would be to marginally increase concentrations in the mixed water to

0.032 mg/L.

The following table is also provided to help further assess the effects on mixed water concentrations if effluent with a TP concentration of 0.05 mg/L is discharged during periods when TP in the Creek is at or below (i.e. better than) the PWQO. The table suggests that if the Creek is at or close to the PWQO, the discharge may cause mixed water concentrations to exceed the PWQO marginally (i.e. from Policy 1 water to a Policy 2 water):

| Ambient Conditions | | Effluent | | Mixed Water | |
|---|---|---|---|---|---|
| Flow (L/sec) | TP (mg/L) | Flow (L/sec) | TP (mg/L) | Flow (L/sec) | TP (mg/L) |
| 430 | 0.02 | 75 | 0.05 | 505 | 0.024 |
| | 0.025 | | | | 0.029 |
| | 0.028 | | | | **0.031** |
| | 0.03 | | | | **0.033** |

Although the above analyses suggest that exceedances above the PWQO of 0.03 mg/L may result from the discharge, the assessment in our opinion is very conservative and the predicted exceedances marginal. It is also our opinion that the likelihood for effluent flows to be at the maximum design flow when stream flows are under extreme low flow conditions is low. The assessment also does not account for the fact that the design objective is still 0.03 mg/L – the plant would be expected to meet this target reliably. The October 2016 memo includes a more realistic monthly mass balance prediction for TP (using average monthly TP concentrations for the Creek and monthly minimum flows). This analysis shows that the effect of the discharge on downstream TP levels will be insignificant (still using the design flow of 75 L/sec and the limit of 0.05 mg/L). The analysis provided in this memo is more appropriate and more realistic, and adequate to demonstrate that the discharge is unlikely to violate Policy 1 or Policy 2 requirements. Therefore, the ministry has no objections to the proposed effluent TP targets (limits and objectives). As an additional precautionary measure, the feasibility of adding a monthly loading limit of about 6 kg TP per month (based on the proposed design flow of 75 L/sec and the proposed design objective of 0.03 mg/L objective over 31 days) could be considered for phase 1 during the ECA approval stage. This would ensure that the plant still achieves the design objectives for much of the time in any given month.

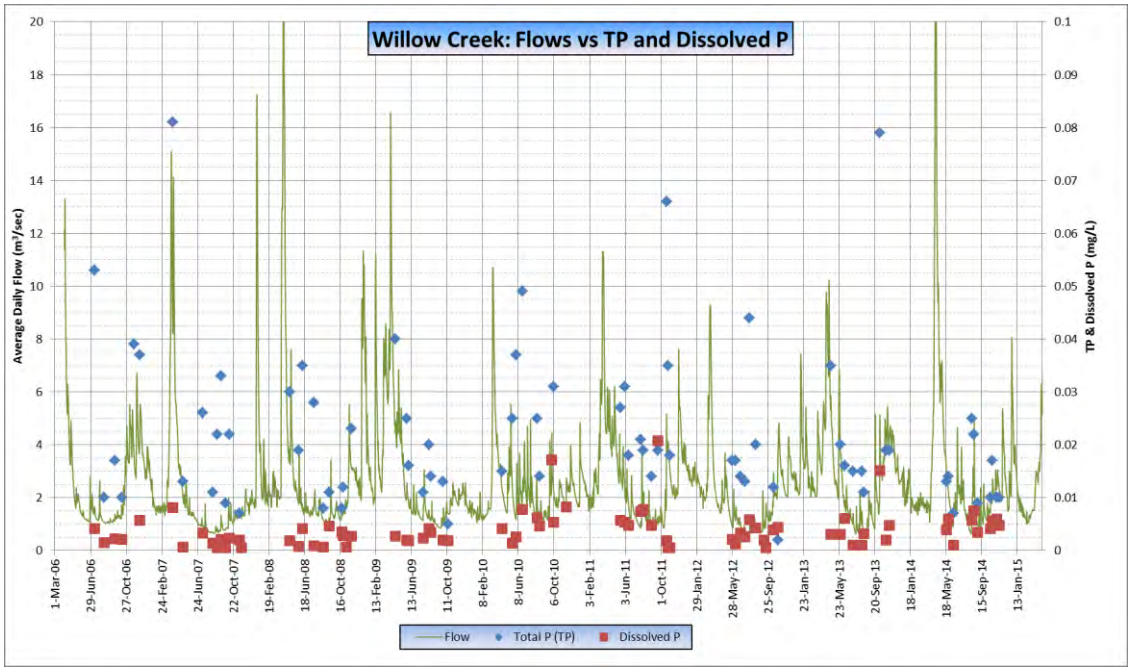
c) Feasibility of Proposed TP Targets: The ministry recommends that the proponents hold early pre-consultation with the ministry's approvals branch regarding the acceptability of the selected treatment technology to reliably achieve the TP targets (which are quite low) and exactly how effluent limits and objectives should be established (note that the proposed effluent limit for the full build-out case is the same as the proposed objective).

d) Bioavailability of P: Another question that has come up is how the proposal may affect bioavailability of phosphorus post development. The issue is that while a significant proportion of the total phosphorus measured in the Creek at present is attached to particulate matter (hence unlikely to be bioavailable), some of the phosphorus in the effluent will be in the form of dissolved (hence, more readily bioavailable phosphorus.

The consultant has offered opinions on bioavailability in section 7.5 of the May 2016 Phosphorus Budget Update report, attached as Appendix N to the ESR. While noting lack of data on current concentrations of bioavailable P in Willow Creek, this report suggests that the discharge is unlikely to significantly increase bioavailability of P post development. It also offers to undertake further

monitoring in Willow Creek in the future for bioavailable P. The ministry's review is focused on TP given that the PWQO is for TP – not for bioavailable P. Further, as noted above, the evaluation undertaken for TP relies on conservative assumptions and ensures that the proposed discharge will not elevate TP concentrations in the stream above PWQO/ background levels. Therefore, it is our opinion that our review of the ESR need not consider this issue further.

If the proponent wishes to follow up on the proposal to undertake more studies regarding bioavailability (as proposed in the May 2016 P Budget update report), the PWQMN dataset should be reviewed, which includes results for both TP (i.e. unfiltered samples) as well as for field filtered samples which represent the "dissolved phosphorus" fraction. The usefulness of the filtered sample results in assessing bioavailability should be considered first before undertaking further investigations. The chart below shows daily flows in Willow Creek with the TP and dissolved P data from the PWQMN station:




Other Potential Impacts on Willow Creek: In this section, potential effects on the Creek that cannot be addressed though effluent quality targets are discussed (such as thermal impacts and geomorphic impacts).

i. Thermal impacts: the ESR shows the 75$^{th}$ percentile summer temperature in Willow Creek to be about 18 degrees while the maximum effluent temperature estimated around 20 degrees (see section 4 of the ACS). A much more detailed evaluation of potential thermal effects is provided in Appendix Y to the ESR (this Appendix is a compilation of Notices and presentations at Public Information Sessions and a summary of comments received and responses provided). In particular, see Item No. 39 & 48 in the Table in Appendix Y entitled: "Brief Summary of Comments Received and Responses…, March 3, 2017". Here, a thorough and satisfactory analysis is provided demonstrating there will be no thermal impacts. Given this, it is our opinion that the discharge is unlikely to result in measurable thermal effects;

ii. Hydrologic & geomorphic impacts: various documents of the ESR adequately demonstrate that the additional flow from the sewage treatment plant (STP) (max of 143 L/sec after full buildout) is small compared to the natural flows experienced in Willow Creek, and unlikely to result in meaningful changes in the Creek's hydrologic and hydraulic properties (low and high flows, flow velocities and water depth will remain unaffected). These discussions are also repeated in several places in the Table in Appendix Y, mentioned above. The ministry agrees with the conclusions in the ESR that changes in the hydrologic and hydraulic characteristics of Willow Creek resulting from the discharge will be insignificant.

The ACS (Appendix M to the ESR) also includes a report that specifically addresses potential geomorphic effects of the discharge on Willow Creek (Fluvial Geomorphological Assessment of Willow Creek…, Palmer Environmental Consulting Group (PECG), April 2014). The PECG report indicates that the effects of the discharge on erosion would be insignificant/not measurable.

### 2.4.2 Addressing Potential Impacts on Downstream Waterbodies

The ministry agrees with the conclusion of the EA that by protecting water quality in Willow Creek, downstream water bodies including the Nottawasaga River, Georgian Bay and the Minesing Wetland, will also be protected.

### 2.4.3 "No Net Increase" in Phosphorus Loading Requirement & STP Approval

Master Drainage Plan/SWM: The Midhurst development proposal includes a commitment that the cumulative input of phosphorus into Willow Creek/ Minesing wetland from stormwater from developed areas and from treated sewage should not be more than the input under existing conditions ("no net increase"). Our understanding is that this requirement is from the NVCA and it is now part of the approvals for the development under the Planning Act. To address this requirement, the developers group committed to prepare and implement a "Master Drainage Plan"/ comprehensive SWM plan which is to be developed in consultation with the NVCA. The commitments stipulate that the SWM that would be implemented would at a minimum, meet MOECC's current guidelines and would also include requirements to implement low impact development (LIDs) to achieve minimum infiltration targets of up to 25 mm.

This process (agreement between developers and NVCA and the development of SWM for the lands) is independent of the EA process, and this review is not intended to look into the SWM proposal for the developable lands. In any case, documents submitted as part of the EA do not include details of the Master Drainage Plan (it is not clear if this plan is complete or currently being prepared).

Phosphorus Budget Assessment: To determine how the improved SWM affects phosphorus loads and to determine if the "no net increase" requirement is met or not, the proponents have prepared a phosphorus budget analysis report entitled: "*Phosphorus Budget Update, Hutchinson Environmental Sciences Ltd. May 2016*". This report is included in the EA as Appendix N to the ESR. In this report, phosphorus (P) budgets for phase 1 and full build-out scenarios are presented that are developed based on several assumptions/considerations. These include:

- The sewage plant will achieve a TP target of 0.05 mg/L during phase 1, resulting in a maximum load of 118 kg/year from all of the phase 1 development. The plant will achieve 0.03 mg/L once development beyond phase 1 starts , resulting in a maximum total load of 134 kg/year after all development is connected (full build-out); and

- SWM for developed areas will go beyond the minimum enhanced level of treatment and will include LIDs to infiltrate the first 20 mm - 25 mm of rain.

Section 2 and Section 5 of the report explains the methodology used to determine the phosphorus budgets for pre and post development scenarios. Based on these, the report concluded that:

- The contribution of P from runoff under existing conditions from phase 1 (about 298 ha in size) is 46 kg/year (see Table 7). Post development, the amount of P that can be exported from the same area would be 575.7 kg/year. If only conventional SWM measures with enhanced level of treatment (i.e. 80% TSS removal) are implemented (wet ponds expected to remove 63% of the P load in stormwater) the export from the area would be 213 kg/year (i.e. 37% of the potential load of 575.7 kg/year). If LIDs for infiltrating 20 - 25 mm of rain are also implemented, then significant further reduction will be achieved. LIDs that can infiltrate the runoff from 20-25 mm storms are expected to infiltrate 90 – 95% of the predicted annual runoff volume and 100% of the P load from this volume of infiltrated water would be discounted. Hence, the P load from the un-infiltrated portion of runoff would only be 10 to 5% of the total potential load of 575.7 kg/year (i.e. 57.6 kg/year to 28.8 kg/year). Further, the approach used also assumes that the un-infiltrated water will also be treated using wet ponds which will achieve a further 63% reduction (i.e. only 37% of the 57.6 kg/year = 21.3 kg/year will be exported. If 25 mm could be infiltrated the load will be 11 kg/year only) – see Table 8.

- For phase 2, a similar analysis shows that the additional P load under pre-developed (existing) conditions from the additional lands outside of phase 1 (about 597 ha) is 88 kg/year. So, the cumulative total loading from all lands (phase 1 and phase 2) under existing conditions would be 134 kg/year (46 + 88). Post development, the P contribution from the phase 2 additional area (i.e. the 597 ha) without any SWM control would be 1,216 kg/year. With conventional SWM (wet ponds) only, the load would be 450 kg/year (i.e. the total post development P load, if only conventional SWM measures excluding infiltration are implemented, would be 213 + 450 = 663 kg/year). If LIDs for infiltrating 20 - 25 mm of rain are also implemented flowed by wet ponds for the un-infiltrated water (as was done for phase 1), the post development load from stormwater runoff from the phase 2 additional area would be reduced to 45 – 22.5 kg/year only. So, under the full build-out scenario (i.e. all phases developed) the cumulative load after implementing all SWM measures (wet ponds with LIDs to infiltrate 20 – 25 mm of rain) would be 66 – 33.5 kg/year. So, the total post development contribution from urban runoff would be much lower than the contribution under existing conditions (134 kg/year) by 68 – 100.5 kg/year (see Tables 11 and 12);

- The purpose of the P budget exercise is to evaluate the net increase from runoff as well as sewage disposal. As noted above, the STP will be discharging a total of 118 kg/year at the full phase 1 flows and a total of 134 kg/year at the full build-out flows. So, although the post development contribution from runoff (assuming infiltration of 20- 25 mm of rain) is predicted to be lower than the contribution from runoff at present, the net total amount from runoff and sewage will increase under both phase 1 and full build-out scenarios. The net increase from existing conditions during phase 1 will be 93 kg/year (based on infiltration of 20 mm only). If infiltration can achieve the 25 mm target, then the net increase will be to 83 kg/year only. The net increase after full build-out will be 66 (if only 20 mm is infiltrated). It will be 33 kg/year, if 25 mm could be infiltrated.

The May 2016 P Budget report was peer reviewed by XCG in June 2016 (memo dated June 22, 2016 – not available in the ESR documents). The main comment by XCG was that in calculating the amount of infiltration that the LIDs would provide, consideration should be given to the amount of time needed to recover infiltration capacity between events. HESL agreed and recalculated the amount of infiltration that LIDs designed to infiltrate 20- 25 mm of rain can achieve, with consideration for recovery time (see HESL's memo dated March 7, 2017 provided in Appendix M). The result is that measures designed to infiltrate 20 mm of rain can only capture about 87% of the runoff volume (as opposed to the previously calculated

90%). Measures designed to infiltrate 25 mm of rain would only capture 92% (as opposed to previous estimate of 95%). The implication to the P budget analysis was: under the revised calculations, the net P export amount with measures to infiltrate 20 mm of rain for phase 1 would be 100 kg/year (vs the previous calculation of 93 kg/year). At full build-out, the total load would be 86 kg/year (vs 66 kg/year previously calculated). If LIDs to infiltrate 25 mm are implemented, the revised load during phase 1 will be 89 kg/year (vs previously calculated value of 83 kg/year). Under the full build-out scenario, the total load would be 53 kg/year (vs previous estimate of 33 kg/year).

The conclusion of the May 2016 P budget report was that the estimated net increase in P load is small and would not be significantly different from existing conditions. Potential effects of the STP discharge are shown to be acceptable (see previous section in this memo). Contribution from runoff is estimated to be lower than existing conditions. Although total loads to the downstream wetland would increase, the P load assessment for the wetland shows that the additional amount is very small compared to the total loading to the wetland. On this basis, the recommendation in the May 2016 report was that there would be no need to implement additional P offset measures. The changes to the P budget calculation resulting from XCG's peer review were also minor.

On this basis, the conclusion in the April 2017 ESR (draft) was that there would be no significant increases in P loading. However, in a letter dated April 27, 2017, Ainley clarified that the "no net increase" requirement would still need to be met and sections of the ESR that suggest that no further action would be required would be revised during the commenting period. The letter also indicated that a P offsetting program would be developed and implemented to achieve the "no net increase" requirement prior to issuance of the ECA for the sewage plant.

General Comments:
The proposal as discussed in the EA ties approval conditions for the sewage treatment plant to the estimated phosphorus loading from stormwater as well. To address this, the ministry is offering limited input on SWM and how the two sources of P loading are evaluated in the P budget assessment. As noted from the outset, this is not a review of SWM for the development. It is also not intended to be a detailed review of the P budget assessment. It is our understanding that the analysis presented on P budget and how the proposal satisfies the "no net increase" requirement will be reviewed by the agency (agencies) that required it.

Comments on SWM:

- The ministry notes that the proponent has indicated that SWM plans for the development will meet MOECC's current guidelines (enhanced level of water quality protection) and would also include requirements to implement LIDs and minimum infiltration targets of up to 25 mm. These criteria are consistent with current ministry guidelines, but this is not an exhaustive review by the ministry of the SWM plans for the development. The ministry expects that SWM plans will be prepared for each development phase and would be submitted to the ministry for review, either as part of the SWM ECA process (ECAs are required for the structural controls that make up the SWM) or as part of the approval of the SWM strategies during the various stages of the development approval process.

- While the proposal to infiltrate up to 25 mm of rain is supportable, the feasibility of achieving this target is yet to be proven. The P budget analysis relies on the ability to infiltrate this much water throughout the entire development area.

- We understand that SWM will include LIDs to infiltrate up to 25 mm of rain AND wet ponds. We note that one advantage of LIDs would be to minimize the need and reliance on wet ponds. We'd

recommend that the proponent consider whether wet ponds will indeed be constructed in addition to the LIDs and if not, the need to revise the P budget assessment.

Comments on the P Budget Assessment:

- The export coefficients used to determine pre & post development P loads from various land uses are values previously reviewed and accepted by the ministry. We are also aware that the P Budget report was peer reviewed by an independent consultant.

- As indicated above, the "no net increase" is a requirement of the NVCA. Nevertheless, it would be prudent for the ministry to consider the potential environmental effects of the cumulative loading of phosphorus from all sources – especially when information on the relative contribution from the various sources is available. The ministry has looked at the P budget assessment in this context, with the specific focus on what additional approval conditions would be warranted for the sewage treatment plant. The P budget assessment concludes that, with implementation of LIDs, the post development P load from runoff would be significantly lower than existing conditions. As noted above, we have not identified significant issues with this assessment. However, for our purposes here, let us assume that post development P load from stormwater estimated through the P budget exercise is optimistic. As a conservative measure, let us instead assume that the P load from storm water post development would be as high P load from runoff under pre development conditions (i.e. it could be as high as 134 kg/year even with LIDs). This would mean that there are no load reductions from runoff to be realized to offset some of the new load from treated sewage. This also means that the sewage plant discharge can be looked at without the need to consider P load contributions or reductions from SWM, as was done in the evaluation of proposed effluent TP targets (presented under the previous section of this review memo). As presented above, the ministry finds that the proposed TP effluent concentration targets are acceptable to protect Willow Creek. It is also our opinion that the TP load discharged from the plant (which could be up to a maximum of 134 kg/year) would be a very small fraction of the total load that is annually released into the downstream systems (Minesing Wetland) and unlikely to be of any concern.

- Given the above, provided the STP is designed and operated as proposed in the EA, it is our opinion at this time that it will not be necessary to include the P offsetting requirements as part of the ECA for the STP. The proponents should continue to work directly with the NVCA regarding the "no net increase" requirement and the kind of additional P control that may need to be implemented.

## 3. Air Quality

In July 2017, Central Region reviewed the draft ESR with respect to air quality impacts from the proposed WWTP, WTP facilities and transportation improvements. The ministry's review requested an air quality impact assessment be conducted to address air quality impacts from odour and other contaminants of concern that may be emitted from the proposed WWTP, WTP facilities and transportation improvements (MOECC letter, July 5, 2017).

In response to the ministry's request, the proponent submitted an AQIA for review on February 13, 2018.

### 3.1 Background

The following is a list of potential air emission sources from the proposed undertaking:

- The wastewater treatment plant (WWTP), which is to be located within an abandoned sand and gravel pit north of Snow Valley Road and east of Wilson Drive. The maximum daily flow for the full build out is proposed to treat 12314 $m^3$/day of effluent.

  The preliminary preferred liquid treatment solution for the WWTP includes:
  - Screening and degritting
  - Step feed biological nitrogen removal (BNR) with chemical addition for phosphorus removal
  - Tertiary membrane filtration
  - Ultraviolet disinfection
  - Effluent discharge to Willow Creek

  The preliminary preferred biosolids management solution is:
  - Biological stabilized liquid sludge to beneficial re-use with mechanical thickening and Autothermal Thermophilic Aerobic Digestion (ATAD) with 240 day storage

- Supporting infrastructure including sewers, pumping stations, and transportation improvements

**3.2 AQIA Technical Comments**

1. As outlined in the ministry's letter dated July 5, 2017, the ministry recommends addressing potential fugitive odours not only from the WWTP but also from sources such as sewers and pumping stations.

   The AQIA did not discuss the potential fugitive odour emissions from the trucking of biosolids off-site, exhaust from pumping stations, and other potential sources of fugitive emissions such as sewer manholes, shafts and air handing facilities. Furthermore, the AQIA did not address how the proponent will mitigate odours from the sewage pumping station.

   Please clarify the potential odour impacts from the above noted sources and how the proponent will mitigate such odours during operating conditions.

2. In addition, further clarification is required with respect to the potential fugitive odour emissions for the final biosolid products while stored onsite for 240 days.

3. The dispersion modelling done for the AQIA (December 15, 2017) used the regulatory AERMOD version that was current at that time. However, a new regulatory AERMOD version (16216r) was posted by the ministry for compliance with O.Reg419/05 on April 4, 2018. Please note that the new version of AERMOD must be used in the ECA submission. It may also be helpful to clarify at this time the maximum point of impingement for all contaminants of concern and whether or not the maximum POI concentrations will be below the O.Reg. 419/05 standards if the newer version of AERMOD were to be used.

4. The dispersion modelling assessment using AERMOD to determine compliance with O.Reg. 419/05 standards followed the ministry's guidance documentation as stipulated in the *Air Dispersion Modelling Guideline in Ontario* (ADMGO guideline) and the *Technical Bulletin – Methodology for modelling assessments of contaminants with 10-minute average standards and guidelines for Odour under O.Reg.419/05* (MOECC, 2016).

   However, please clarify why the urban dispersion coefficient was applied in the air quality impact assessment for the proposed WWTP. Typically, the rural dispersion coefficient is more

conservative than the urban dispersion coefficient, except during night conditions, due to the urban heat island effect.

Since the definition of urban in the ADMGO guideline refers to more than 50% urban land use surrounding 3 km of the facility, this definition does not apply to the current land use conditions at the proposed Midhurst WWTP facility. Please clarify what the land use surrounding the facility will be in the future. In addition, please explain how the maximum point of impingement for all contaminants of concern would be affected if the WWTP were modelled using the rural dispersion coefficient. If the future land use surrounding the facility is considered to be rural based on the ADMGO guidelines, the model is required to use the rural dispersion coefficient at the ECA stage.

5. The AQIA does not discuss how the proposed facilities will comply with the current D series guidelines with respect to land use compatibility. Currently, the proponent considered a buffer of 150 metres from the property line of the WWTP to the existing sensitive receptors (R10, R11 and R12). However, it is not clear if the proponent considered a buffer around the proposed pumping stations for future sensitive receptors.

6. The exhaust temperature for the aeration tanks noted on the Source Summary Table for the Sand and Gravel Site (Table 3) appears to be high. Although, this parameter will not have an impact on the emissions or the dispersion modelling results, it is recommended to revisit the exhaust temperature for the aeration tanks (35 degrees Celsius). Typically when aeration tanks are open the exhaust temperatures are closer to ambient conditions.

7. For the WTP facilities and the sewage pumping station there are 4 emergency diesel generators proposed. In addition to $NO_x$ emissions, the proponent should consider assessing $SO_2$ impacts from the proposed Sand and Gravel facility together with the proposed Midhurst WWTP facility at the ECA stage.

   Typically, air quality impact assessments for WWTP Class EAs are recommended to assess only the contaminants of concern, including but not limited to odour, TRS, $H_2S$, $NO_x$ and ammonia. The ministry notes that there are 4 emergency diesel generators proposed. In addition to $NO_x$ emissions, the proponent should consider assessing $SO_2$ impacts due to the change in $SO_2$ standards prior to the ECA stage.

   In the time since the August 10, 2017 teleconference with the proponent, the ministry has adopted more stringent $SO_2$ standards for which facilities have a 5-year phase in period before being assessed for compliance against these standards. The proposed WWTP facility will most likely be comprised of combustion sources such as boilers and other equipment which may emit $SO_2$. It is recommended to assess O.Reg. 419/05 compliance with the new $SO_2$ standards for the proposed WWTP and WTP facilities prior to the design stage.

8. The proponent should consider modelling all NOx sources from the WWTP and the nearby pumping station at the Sand and Gravel site to determine the combined maximum Point of Impingement concentration. These sites appear to meet the definition of adjacent properties under section 4 of O. Reg. 419/05. Although only required for the ECA package submission, this assessment is recommended prior to the design stage to identify any potential exceedance and the expected mitigation measures.

9. The draft ESR proposed transportation improvements to support the development of the Midhurst Area. The AQIA assessed this aspect of the project by conducting a qualitative assessment. However, this qualitative assessment lacks details that the ministry typically requests for an air quality impact assessment under the Class EA process. For example, background conditions are

typically summarized based on representative MOECC and Environment Canada stations for criteria air contaminants and selective transportation related toxics emissions, including benzene and benzo(a)pyrene.

Since the proposed undertaking will be shipping the biosolids off-site, the AQIA should clarify the additional number of trucks that will be travelling on the new and widened roads in the Midhurst Development Area.

In addition, this assessment failed to discuss the possible mitigation measures to minimize transportation related impacts on the most impacted sensitive receptors during the construction and operation of the proposed new and widened roads.

Section 5.3 "*Vehicle Emissions*" should be expanded to include the above noted recommendations.

10. During construction, further to the mitigation measures discussed, it is recommended to apply best management practices to mitigate any air quality impacts caused by construction dust. Please note that the ministry recommends that non-chloride dust suppressants be applied.

    For a comprehensive list of fugitive dust prevention and control measures, please refer to *Cheminfo Services Inc. Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities.* Report prepared for Environment Canada. March 2005.

    http://www.bieapfremp.org/Toolbox%20pdfs/EC%20- %20Final%20Code%20of%20Practice%20-%20Construction%20%20Demolition.pdf

    Section 5.4 "*Construction Emissions*" should be expanded to include the above noted recommendations.

11. The AQIA did not include particulate matter in the assessed contaminants of concern. Particulate emissions are common at WWTP facilities and at a minimum a Best Management Practice plan for particulate matter should be developed and included in the ECA submission.

12. The development of an odour mitigation and management plan is expected for the WWTP facility and should be included in the ECA submission. This plan should include how the proponent will mitigate other fugitive sources such as the trucking of biosolids off-site, a procedure for recording and responding to complaints and a protocol for managing process upsets and equipment malfunctions.

13. The proponent is planning to use 2 biofilters to control odours at the proposed Midhurst WWTP facility, and assumes a control efficiency of 80% for TRS species and odour. The ministry expects the manufacturer's recommendations for proper operation and maintenance of the biofilter to be followed such that the biofilter is able to achieve the assumed control efficiency.

    Please explain how ammonia emissions will be reduced by 70%, as presented in the emission estimates.

Although the AQIA demonstrates that the maximum predicted off-site odour concentrations will exceed 1 odour unit, the frequency of these exceedances proposed is less than 1% which follows the ministry's guidelines. It is however the ministry's experience that WWTP facilities can cause higher off-site odour impacts which often result in complaints. For this reason, the ministry recommends that the comments and recommendations outlined in this letter be considered during the design and operation of the proposed

WWTP facilities and be included as part of the ECA submission package.

Thank you for the opportunity to comment on this project. Should your team have any questions regarding the above, please contact Chunmei Liu, Environmental Resource Planner and EA Coordinator at our office directly at 416-326-4886.

Yours sincerely,

Paul Martin, Supervisor
Air, Pesticides and Environmental Planning

c. M. Archer, Director of Public Works, Township of Springwater
A. Evers, Supervisor, Environmental Approvals Branch, MOECC
C. Hood, Manager, Barrie District Office, MOECC
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June 5, 2018 113027

"By Email"

Ministry of the Environment and Climate Change
Central Region Technical Support Section
5775 Yonge Street, 8th Floor
North York, Ontario
M2M 4J1

**Attn: Paul Martin, Supervisor**
**Air, Pesticides and Environmental Planning**

**Ref: Township of Springwater**
**Midhurst Class EA (Water Wastewater & Transportation)**
**Response to MOECC Comments dated April 30, 2017**

**Dear Mr. Martin:**

We are pleased to respond to the comments received from the MOECC on April 30, 2018, regarding the draft Environmental Study Report (dESR) associated with the Midhurst Class EA. For your convenience, we have reprinted the MOECC's comments followed by our responses in red italics.

## *1.* Groundwater

### 1.1 Introduction

Documents Reviewed:

The Environmental Assessment (EA) findings are provided in a draft Environmental Study Report (ESR), April 2017. The ESR includes numerous reports attached as appendices. The following report was reviewed:

Ainley. 2017. Township of Springwater Class Environmental Assessment study for Midhurst Water, Wastewater and Transportation Servicing Phase 3 and 4 Environmental Study Report, Ainley Group, consulting Engineers and Planners File: 113027, April 2017.

The following reports were included as Appendix J in Volume 3 or 4 of Ainley (2017):
Golder. 2016. Hydrogeological Study, Midhurst Water Supply Exploration Program – Golder Associates Ltd, DRAFT by John Easton, M.Sc., P.Geo. June 2016, Report No: 13-1170-0040

Golder. 2014. Midhurst Developments Water Balance for Draft Plan Subdivision Application Numbers: SP-T-1001, SP-T-1004, SP-T-1005, SP-T-1006, SP-T-1007, SP-T-0702, SP-T-0505 and SP-T-0904. Golder Associates Ltd, DRAFT signed by Adriana Parada P.Eng. and Kevi McKenzie, P. Eng., May 2, 2014, Project number 13-1170-0040

Golder. 2017. Report on Carson and Doran Neighbourhoods Water Supply – Midhurst Secondary Plan: Supplementary Hydrologic Modelling – Golder Associates Ltd., January 2017

### 1.1 Hydrogeological Assessment

The Golder (2016 and 2017) report documented the water supply exploration program that occurred on ten sites in the Doran Road, Pooles Road, Garson road and Highway 28 areas in December 2013 and October 2014. The well drilling was completed to determine the presence and characteristics of the two main water supply aquifers in Simcoe County described as Regional Aquifers A3 and A4. Observation wells were screened within aquifers A1, A2, A3 and A4 where encountered. Numerical modeling was conducted to evaluate the sustainability of and potential impacts from the long term operation of wells at these test sites. The model used was an update of the existing 3D Kempenfelt Bay FEFLOW numerical model.

The study (Golder, 2016) revealed that there was limited connection between the lower aquifers and the upper aquifers. It did not evaluate the effect of pumping on surface water features. The latter impact was determined using the FEFLOW groundwater model that included the Willow Creek watershed. Pre and Post Development pumping conditions were simulated and compared for Willow Creek and the Minesing Wetland. Pre- and Post-development scenarios were compared. The effect on Willow Creek, Minesing Wetland and surface water level changes in Minesing Wetland and nearby Snow Valley Road was determined to be minor.

The effect of dewatering for road and sewage treatment plant construction was not addressed in these studies. This effect will need to be addressed in the Permit To Take Water (PTTW) application stage.

A PTTW will be required for the new municipal water wells. The hydrogeological studies completed are a good base from which to complete a Hydrogeological Assessment as required by the “Technical Guidance Document for Hydrogeological Studies In Support of Category 3 Applications for Permit to Take Water”.

A Hydrogeological Assessment will be required if construction dewatering is required for road reconstruction and the construction of the wastewater treatment plant. This Hydrogeological Assessment can build on the assessments already completed but will be required to address temporary impacts on local water features and on domestic water wells in the area.

***Response:*** *We agree with this summary and, that the potential effects of temporary construction dewatering should be addressed during the PTTW application stage. Also, we are pleased to note that the MOECC describes our work as a “good base” for future permitting actions.*

## 2.0 Surface Water

### 2.1 Introduction

Documents Reviewed:

The Environmental Assessment (EA) findings are provided in a draft Environmental Study Report (ESR), April 2017. The ESR includes numerous reports attached as appendices. The Ministry of the Environment and Climate Change (the ministry) has also received a letter from the Township of Springwater Council, dated April 25, 2017, requesting the ministry’s review focus on several items within the draft ESR (issues related: to potential effect of the water supply wells; phosphorus loading and transportation needs).

The ministry received a letter from Ainley Group (consultant to the Township), dated April 27, 2017, which indicates the following:

- The Class EA Steering Committee reaffirms that the Midhurst Secondary Plan must achieve a net zero increase in phosphorus (identified as a condition within the Minutes of Settlement between the Nottawasaga Valley Conservation Authority (NVCA) and the Midhurst Developers Group, as well as within the Township's Draft Plan conditions associated with the various Plans of Subdivision in the Midhurst Secondary Plan);

- Sections of the Draft ESR which state that a net zero increase in phosphorus will be achieved if deemed necessary by MOECC as well as sections of the ESR where it is noted that a phosphorus offsetting program will not be required will be revised to indicate that a net zero increase in phosphorus must be achieved; and

- Wording will be added to the ESR noting that a phosphorus offsetting program will have to be developed, to ensure that the net zero requirement is met, prior to an Environmental Compliance Approval (ECA) being issued by the MOECC for the proposed Midhurst Wastewater Treatment Plant.

**Previous Involvement & Scope of Current Review:**

In 2009, the Town of Springwater completed a Master Plan study that identified the servicing solutions for the proposed development within the Midhurst Secondary Plan (MSP), also referred to as OPA 38. The findings of the master plan study were presented in the report: "Midhurst Master Servicing Plan – Phase 1 & 2 – Water, Wastewater & Transportation, dated July 2009". The ministry provided surface water related comments on the master plan report, focusing on the wastewater servicing proposal. In particular, the ministry reviewed in detail Appendix H of the master plan: "Interim Assimilation Analysis: Discharge of Treated Sewage Effluent from the Proposed Midhurst WWTP to Willow Creek, June 2009" (by AECOM). Following our initial review, MOECC continued to provide input to the proponent, mostly by providing feedback on documents prepared to address the low flow estimation for Willow Creek.

The current surface water review is a continuation of the input provided previously. It covers wastewater servicing as well as the potential surface water related effects of the water supply and transportation projects covered by the EA. In the EA, the sewage plant proposal is linked to the cumulative phosphorus loading from the Midhurst development (i.e. from treated sewage plus from urban stormwater). Our review attempts to address this issue. However, this review is not intended to address storm water management (SWM) for the proposed development areas.

***Response:*** *Acknowledged and we hereby confirm that all Storm Water Management infrastructure associated with the Midhurst Secondary Plan will be required to obtain ECA's from the MOECC prior to construction.*

It should be noted that these comments are based on the information available in the draft ESR and its appendices. Additional questions or concerns may be identified during the formal review period of the final ESR. Also, note that many of the issues raised at this stage may also be revisited and evaluated in greater detail during subsequent ministry approval stages (Permits to Take Water (PTTW) and Environmental Compliance Approvals (ECA)).

***Response:*** *Acknowledged.*

## 2.2. Transportation

The transportation improvements covered by this EA include adding a new east west road (Craig Road) and widening several existing roads (section 7.6 of the report). Section 7.7 of the ESR and Appendix T-7 document how the alignment for the new (Craig) Road was selected.

The potential surface water related issues associated with the new and widened roads include: the type of stormwater management (SWM) and if construction of the road works requires water taking/dewatering (temporary or long term).

The EA does not contain details regarding SWM for the new/expanded road works or the water taking needs (short term and long term). We acknowledge that section 7.9 and Appendix T-8 discuss the list of potential environmental impacts and suggested mitigation measures for the proposed transportation works. However, this contains only a two page, high level identification of likely requirements/Best Management Plans (BMPs) to address issues or concerns related to the roadway improvement works. While it may be too early to develop detailed drainage and SWM plans for the road works at this stage, it is our opinion that the EA should clearly stipulate the kind of SWM that should apply for the new/expanded roads and what criteria should be used (as a minimum, achieving enhanced level of water quality control; addressing the need for peak flow control; would road works also be required to meet the 25 mm infiltration target discussed in the phosphorus budget work? etc.);

***Response:*** *The NVCA's requirement for a net zero increase in phosphorous loading is specifically related to the new development lands (approx. 756 ha) within the Midhurst Secondary Plan (MSP). Therefore, the Phosphorous Budget that has been developed, only accessed the Pre & Post conditions for the proposed development lands. As the transportation improvements associated with this Class EA are external to the new developments (they are within the existing community) they are not bound by the requirements by the NVCA's conditions and in particular the Phosphorous Budget.*

*However, we are conscious of those requirements and therefore, during the detailed design stages associated with the transportation improvements identified in the Class EA, we are committed to including Low Impact Development (LID) measures, where possible, in to the road reconstructions.*

*Therefore, ESR has been updated to include the specific kinds of Low Impact Development (LID) measures that will be implemented on the various road reconstruction and/or new construction projects.*

Construction related water taking (dewatering) that may be required to facilitate construction of road works may require approvals through the Permit to Take Water (PTTW) process or the Environmental Activity and Sector Registry (EASRs). The ministry notes that Appendix T-8 acknowledges that EASRs may apply for "consumptive" uses during the road construction works and the contractor may be required to obtain the EASR. Note that construction related groundwater and/or stormwater takings may require a PTTW if the daily amount is >400,000 litres. Any such water takings that require a PTTW will be evaluated in much greater detail as part of the future PTTW applications.

***Response:*** *Acknowledged and we hereby confirm that during detailed design, geotechnical investigations will be completed for all proposed road reconstructions and if determined necessary applications will be submitted to the MOECC for PTTW's.*

## 2.3 Water Supply

The proposed water supply system includes multiple wells that will be developed in phases as development proceeds. The bulk of the evaluation of the potential environmental effects of the proposed groundwater taking is provided in Appendix J of the ESR. Appendix J includes two reports:

- A hydrogeological study by Golder (*Midhurst Water Supply Exploration Program, June 2016*). This report details the well exploration program and pumping tests undertaken to determine available capacity. The report also includes the findings of a numerical groundwater flow model that was completed in 2015. The purpose of this modeling was to determine the potential long term groundwater impacts from water taking at the projected full build-out phase. The results of the groundwater flow modeling exercise are presented in a separate report entitled: "*Draft Report on… Groundwater Modeling, Golder, March 2015*", and attached as Appendix M to the June 2016 hydrogeological report;

- A second study by Golder: "*Supplementary Hydrologic Modeling, January 2017…*". The purpose of this report is stated to be the determination of potential impacts from the taking on surface waters. The modeling undertaken for this purpose reportedly builds upon the previous modeling work mentioned above and attempts to determine the effects of the proposed taking on surface waters (in particular, Willow Creek and the Minesing wetland). The HydroGeoShpere (HGS) computer program is used for this purpose while FEFLOW was used in the previous (2015) groundwater flow modeling work.

Other relevant documents with respect to the potential environmental effects of the proposed well based water supply system are the April 25, 2017 letter the ministry received from Springwater Council, asking the MOECC to focus its review of the ESR on several issues (including water supply) as well as Appendix BB of the EA: "*Special Council Meeting, March 8, 2017, Public Comments & Responses*". This document contains details of the concerns raised by various parties during Springwater's Special Council meeting of March 8, 2017 in relation to the Midhurst EA. Of particular relevance here are some of the concerns/comments raised by Lotimer & Associates (independent peer reviewer for the Midhurst Ratepayers Association) as well as others. Responses to the concerns were provided in several memos, and are also included in Appendix BB (*Response to Lotimer, by Golder, April 21, 2017; Response to Michael Thorn, by Hutchinson, March 30, 2017; and Response to John Harris, Golder, April 21, 2017)*.

The assessment of surface water impacts from groundwater taking includes attempts to quantify and characterize where, when and how much effect a proposed groundwater taking may have on surface waters (these are done through hydrological and hydrogeological studies). The assessment also requires evaluating the ecological significance of the observed/predicted effects of the taking. Addressing surface water concerns may require developing a monitoring plan and planning for implementation of mitigation measures, if required (e.g. placing wells farther away from affected/sensitive stream reaches; reducing rates of takings during certain periods etc.). The ministry's review focuses on these aspects.

***Response:*** *In parallel with the completion of this Class EA, an Adaptive Monitoring and Management Plan is being developed as part of the Midhurst Overall Drainage Plan. Baseline monitoring was initiated by Gartner Lee Limited in 2008 to characterize existing conditions in various watercourses that could be impacted by the development. Building on the data collected in 2008, Hutchinson (HESL) expanded the monitoring program and have collected baseline data since 2014. Baseline sampling is ongoing. Sampling includes collection and interpretation of water quality, flows, benthic invertebrates and fisheries at 16 sampling stations to identify any changes to surface water from*

*the proposed methods of stormwater management, wastewater management or groundwater drawdown, and provide guidance for the design and any necessary mitigation of the future developments.*

i. The potential environmental effects of this water taking will be evaluated in greater detail during the review of the PTTW review process. While the technical reports provided within this EA (described above) contain significant information regarding the water supply proposal and the impact evaluation undertaken to date, significantly more detailed information will be required during the PTTW stage. As such, the comments provided here are preliminary. There could be additional questions and comments during the PTTW review stage;

***Response:*** *Acknowledged.*

ii. The hydrogeological study report (June 2016) indicates that, generally, the potential for significant effects on area surface waters (Willow Creek and its tributaries and the Minesing wetland) from the proposed groundwater taking is low. This is because the target aquifers are regionally extensive deep aquifers that are separated from the upper aquifers by low permeability materials and whose hydraulic interconnection to the subject surficial features (streams, wetlands) is likely limited. The target regional aquifers are believed to discharge directly into the Nottawasaga Bay (e.g. see section 3.3 of the June 2016 report in Appendix J). Cross sections and well logs are used to support this geologic model. The short term (72 hr) pumping tests conducted in four of the test wells (see sections 4.1.2; 4.2.2; 4.3.2; 4.4.2) are also interpreted to support the conclusion that the deep aquifers are hydraulically separated from the shallow formations (i.e. lack of response in shallow observation wells suggested hydraulic separation between the deep and shallow systems). The ministry is aware of instances where pumping from formations (even at considerable depth) has resulted in measurable effects in shallow groundwater and surficial features such as wetlands and streams. However, these were instances where the deep and shallow systems were not hydraulically separated by low permeability formations. In the current case, the report points out (with supporting evidence) that the target aquifers are separated. The review has not identified any argument/evidence to contradict this conclusion. So, given the depth of the wells, the presented geologic model and results of the short term pumping tests, the ministry does not see major issues with the above interpretation. The ministry expects that the PTTW applications for each well or groups of wells will include further verification that there are no reaches of surface waters where there is significant interconnection between shallow and deep systems within the zone of influence;

***Response:*** *Acknowledged that the MOECC agrees with geologic interpretation and that the pumping tests did not reveal any connection to surface water features and that in conjunction with the PTTW's in the future, verification will be provided that there are no reaches of surface waters where there is significant interconnection between shallow and deep systems within the zone of influence.*

iii. The groundwater modeling work (March 2015) attached to the hydrogeological study report and the subsequent hydrological modeling work (January 2017) imply some impact to stream baseflows under full build out scenarios. In these reports, the evaluation of potential effects on surface waters is largely based on model predictions which indicated that the long term, cumulative effect of the taking on baseflow in Willow Creek would be no more than 10%. The reports suggest that this amount of baseflow loss would be insignificant. The ministry does not agree that a 10% loss in baseflow would be insignificant.

***Response:*** *Golder's modelling report does not specifically refer to a 10% baseflow loss as "insignificant." The qualification of "significant" versus "insignificant" is a natural environment question. The analysis, which is elaborated upon below, demonstrates that the existing habitat will not be impacted by the calculated baseflow loss.*

*A discussion of the potential effect of the predicted baseflow losses on natural environment receptors in the Willow Creek subwatershed is provided in the Hutchinson Environmental Sciences Report entitled 7Q20 Flow Assessment Update for Willow Creek at Highway 26 (Near Minesing) and Ecological Low Flow Assessment (HESL, 2018). In this document HESL concluded that "the predicted flow reductions in Willow Creek and its tributaries associated with the proposed water taking to supply the Midhurst Secondary Plan Area will have no adverse effects on habitat and water temperature in Matheson, Black and Willow Creeks."*

*HESL also stated that "Golder Associates modelled baseflow losses associated with projected groundwater pumping as part of the Class EA and we have assessed the ecological impact of modelled baseflow losses on various watercourses in Midhurst that are located within the modelled area of impact. Modelling completed by Golder established that monthly volumetric baseflow losses as a result of proposed Midhurst Secondary Plan Area pumping at full build out are estimated to range from 985 $m^3$/day in Willow Creek at Midhurst in August to 2,595 $m^3$/day in April, while percent losses range from 2.5% in Matheson Creek in February to 9.6% in Willow Creek at Midhurst in August (Golder 2016). Modelled baseflow losses are less than the maximum loss guidelines presented in peer-reviewed and regulator-based literature, indicating no threats to aquatic life related to the water takings.*

*Reductions in wetted stream width (a surrogate of aquatic habitat) were calculated to range from 0.0131 m in August to 0.0149 m in October using data collected from 2015-2017. It was not possible to calculate a breakpoint in accordance with Wetted Perimeter Method protocols but it is clear that predicted changes to the wetted perimeter are:*

*a) Minute,*
*b) Well within natural variation, and*
*c) Not anticipated to negatively affect ecosystem functions or features within Willow Creek." (HESL, 2018).*

*The intent at the Class EA level of assessment is to screen predictions of potential habitat change and to determine if they are likely to be significant or not.*

*A screening-level assessment commonly proceeds by modelling predicted changes using conservative assumptions and comparison of predicted changes against literature-based values, recognizing that neither direct observations of responses or experimental methods are feasible at the EA level. As such, HESL consulted the available literature that was specific for Ontario with the understanding that changes exceeding published thresholds could potentially be significant but that changes within these thresholds were not.*

*A variety of ecological flow guidelines have been developed for assessing potential flow alterations and any resulting impacts on aquatic features and functions. Guidelines have been developed for various parts of Canada based on general hydrological and ecological traits of watercourses prevalent in those areas. Most guidelines are focused on predicted changes in surface water flows because of direct surface water taking, while the MNR/MOEE (2011) guideline that we used (see below) does focus on predicted changes to streamflow resulting from losses of groundwater inflow to watercourses.*

*Groundwater is a sensitive habitat feature in the study area as coldwater thermal regimes and elevated dissolved oxygen concentrations support a variety of cold water fish species, and groundwater upwellings provide both overwintering habitat for a variety of fish and critical spawning habitat for Brook Trout (Salvelinus fontinalis) and Brown Trout (Salmo trutta).*

*Fisheries and Oceans Canada (DFO 2013[1]) clearly states that flow alterations <10% of the instantaneous flow "…have a low probability of detectable impacts to ecosystems that support commercial, recreational or Aboriginal fisheries based on "expert consensus" and recommend that site-specific studies should be completed where flows are subjected to >10% flow alteration.*

*The modelled baseflow losses are predicted on the basis of maximum permitted pumping rates during summer and are less than the 10% instantaneous flow guideline recommended by DFO and so there is a very low probability that the losses will result in a detectable impact.*

*Nevertheless, as part of an adaptive management and monitoring plan, being developed in conjunction with the Midhurst Overall Drainage Plan, we are committed to undertake ongoing site-specific studies as development proceeds to confirm that the DFO threshold is protective.*

*The Ontario Ministry of Natural Resources (MNR) and Ontario Ministry of Environment (MOE 2011[2]) compared consumptive water demand to water supply and developed thresholds which reflect Ontario's climate, including summer peak water demand. Surface water and groundwater stress levels were developed in accordance with monthly surface water level demands and both annual and monthly groundwater demands (Tables 1 and 2). They advise that additional assessment of threats to aquatic life is required if water demands exceed the thresholds.*

*Monthly surface water (Table 1) and ground water (Table 2) demands of <20% and <25% respectively represent a low stress level and so the maximum demands of 9.6% predicted for the proposed development represents a very low probability of stress to aquatic life according to this guidance. As previously mentioned, through the adaptive management and monitoring program, that is being developed in conjunction with the Midhurst Overall Drainage Plan we committed to undertake site specific studies to confirm that the MNRF/MOECC thresholds are met and that they are protective as the project proceeds.*

***Table 1. Surface Water Quantity Stress Threshold (MNR/MOE 2011)***

| Surface Water Quantity Stress Level Assignment | Maximum Monthly Percent Water Demand |
|---|---|
| Significant | >50% |
| Moderate | 20-50% |
| Low | <20% |

[1] DFO. 2013. Framework for Assessing the Ecological Flow Requirements to Support Fisheries in Canada. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/017.

[2] MNR and MOE. 2011. Water Budget and Water Quantity Risk Assessment Guide, Drinking Water Source Protection Program.

***Table 2. Groundwater Quantity Stress Threshold MNR/MOE 2011)***

| Groundwater Quantity Stress Level Assignment | Monthly Maximum Percent Water Demand |
|---|---|
| Significant | >50% |
| Moderate | 20-50% |
| Low | <20% |

*MNR/MOE (2011[2]) also developed more conservative stress thresholds for coldwater streams. An unacceptable impact is defined by a reduction in groundwater discharge of more than 20% of average monthly baseflow. Localized areas are assigned moderate risk if groundwater discharge is reduced between 10% - 20% of existing monthly baseflow. These thresholds are directly applicable to Midhurst as they represent the response of surface water to removal of groundwater, and not to direct surface water takings.*

*The modelled baseflow losses of 2.3-9.6% therefore represent a "Low" probability of stress for three watercourses evaluated in the study area (i.e. Black Creek, Matheson Creek and Willow Creek) and do not require additional assessment of water budget requirements. We would also emphasize that the modelled baseflow losses were derived assuming maximum pumping rates at full build out during summer and therefore represent a more conservative assessment than more realistic "actual use" rates which are typically significantly lower.*

*Modelling baseflow loss and assessment of these losses in accordance with published regulatory standards for Ontario is an appropriate approach to establish that the proposed water taking will not result in significant environmental effects to aquatic habitat or aquatic life. A substantial monitoring program was initiated in 2008 to characterize water quality, flows, benthic invertebrates and fisheries in various watercourses within the Midhurst Secondary Plan Area. Future monitoring will continue to characterize aquatic features but will also be focused on collecting data to inform the site-specific assessment of the groundwater environment and associated ecological low flow requirements which will be used when completing the Permit to Take Water process with MOECC. The monitoring results can inform the development of triggers for adaptive management in response to any threats to aquatic habitat.*

*We trust this information provides the information necessary to substantiate our conclusions that the water takings do not threaten aquatic life and provide the necessary commitment to additional monitoring and development of adaptive management measures to address any potential impacts to aquatic biota related to groundwater extraction.*

The modeling results and how they should be interpreted may need to be revisited. Experience has shown that predictions of streamflow losses in specific reaches based on these kinds of large scale modeling may be inaccurate. The uncertainties are often larger than the predicted effects and prediction results could change significantly by altering model input parameters (many of which also have very large uncertainties).

***Response:*** *The use of regional scale models such as the Kempenfelt Bay FEFLOW model to assess groundwater impacts is an industry-accepted and commonly used approach in large water resource studies in Ontario. The regional size of these models is required to fully capture the potential zone of influence of larger water takings and accurately assess impacts at the subwatershed scale.*

*Furthermore, groundwater models like the Kempenfelt Bay FEFLOW model are an identified Source Water Protection assessment tool in the Ministry of Environment and Climate Change (MOECC) Technical Rules under the Clean Water Act.*

*Lastly, the original Kempenfelt Bay model formed the hydrogeologic basis of the City of Barrie Tier 3 Water Budget and Local Area Risk Assessment (AquaResource, 2013). The model was used to estimate impacts (including flow losses) as a result of Barrie municipal well pumping and was a supporting tool for the MOECCs 2015 approval of the South Georgian Bay Lake Simcoe Source Protection Plan.*

*Therefore, in Golder's professional opinion, the Kempenfelt Bay Model, updated and refined for this specific Class EA, is an acceptable means to specifically and quantitatively predict baseflow losses at streams.*

Therefore, while the modeling may be useful in developing an understanding of general trends in groundwater level that may develop over extended use, results should not be relied upon to provide quantitative estimates of potential baseflow reductions and should not be used as the basis to determine if the proposed water taking is acceptable or not (from a surface water perspective).

***Response:*** *Through the calibration process the recharge rates, hydraulic properties of the geologic units and simulated flow patterns are found to be in satisfactory agreement with available field data. The Existing Conditions calibrated model input values are therefore considered to represent reasonable estimates for use in the assessment of Future Conditions. In particular, the calibrated model is sufficiently accurate for its purpose as an impact assessment tool given that:*

- *The focus of data collection and model updates, including the drilling and installation of 20 test wells and 13 observation well nests, performance of five aquifer tests, WSC flow station analysis and baseflow separation, a detailed review of the MOECC Water Well Information System Database well records, a surficial geology mapping assessment, and subsequent model mesh discretization, geologic layer adjustments and input parameter refinement occurs in the area with the most pumping and potential for impact (Midhurst);*
- *Baseflow is evaluated at three "real world" stream gauges broadly positioned along Willow Creek upstream, adjacent to, and downstream of the proposed pumping;*
- *A high-degree of correspondence is demonstrated between average measured monthly baseflows and simulated monthly baseflows at these stream gauges during transient calibration.*

The ministry also strongly disagrees with the comments in the various documents that up to 20% reduction in the amount of groundwater contribution to a cold water stream would be considered acceptable. This is variously reported as an MNRF and/or Fisheries and Oceans Canada (DFO) threshold, but the sources for this are not provided. It is recommended that the discussions on modeling results be revised.

***Response:*** *See our earlier comments in relation to baseflow losses.*

- It is the ministry's view that, given the geologic setting presented, any effect of takings on the surface waters found locally would likely be negligible. Effects, if any, will be localized/ concentrated in areas where significant hydraulic connection between the source aquifers and surface systems may exist (although the current understanding of the area's hydrogeologic setting does not suggest this to be the case).

***Response:*** *We agree that effects have the potential to be concentrated in areas where significant connection between deep and shallow systems exist. However, such connections have not been observed or modelled. Instead, the "concentration" of impact is broadly correlated to the location and magnitude of the pumping.*

- As part of the future PTTW applications, it is recommended to take a closer look at the geology/hydrogeology (particularly within the predicted zones of influence of the pumping wells) to determine if areas of more enhanced hydraulic connectivity exist;

  ***Response:*** *Acknowledged*

- It would also be helpful to have an understanding of the spatial and temporal scales at which we can expect to see effects, if any, and the magnitude of these effects.

  ***Response:*** *Baseflow impacts are evaluated at the subwatershed scale (namely between three Water Survey of Canada stream gauges located upstream, adjacent to, and downstream of Midhurst pumping) at a monthly temporal scale. The magnitude of these baseflow impacts are expressed in terms of total volumetric reduction and % reduction at each gauge on a monthly basis.*

- Much of the discussion to date is focused on the potential volumetric reductions of stream flow as a result of the takings. It is important to note that, at the watershed scale, the taking would be effectively offset by the discharge of treated effluent back into the same watershed. In fact, the discharge may result in greater dry weather flows in Willow Creek than present conditions (by taking from deep aquifers that do not appear to discharge into the same system and releasing the water into the stream).

  ***Response:*** *It is acknowledged that, at the watershed scale (effectively downstream of Willow Creek at Highway 26), there would be a large offset in potential baseflow losses at Willow Creek as a result of effluent discharge to the Creek. The modelling assessment was conservative in not considering this action within the groundwater model; however, we do acknowledge this offset qualitatively in our reporting in Golder, 2017.*

  As discussed above, if there are effects of takings, they are likely to be subtle. Rather than percent reduction in flows, it may be more appropriate to see if effects of takings could manifest in more subtle but still important ways. For example, losses of specific groundwater input areas and loss of groundwater upwelling features, could be ecologically significant. Where are the areas of significant groundwater discharge? Are effects likely here?

  ***Response****: An important feature of interest in the model is Willow Creek itself, which flows roughly centrally through the model domain from its source in the Oro uplands to its ultimate discharge location in the Minesing Swamp. The Creek demarcates topographic minima within the subwatershed and flows through granular soils for the majority of its length. As a result, Willow Creek is conceptualized and modelled as a major groundwater discharge zone for the majority of its reach (as opposed to discrete areas of upwelling). This conceptualization is supported by the NVCA in their Willow Creek 2013 Subwatershed Health Check where the following is stated:*

  *"Willow Creek arises on the rolling sand loams of the Simcoe Uplands near the hamlet of Edgar. It flows into Little Lake – one of the few natural lakes in the Nottawasaga River watershed – just north of Barrie. The creek then enters a deep, groundwater-rich valley as it flows westward through Midhurst."*

*As per the above, we consider Willow Creek as an area of significant groundwater discharge from Little Lake downstream. Baseflow losses as a result of the proposed pumping are simulated to occur from Little Lake downstream to Minesing Wetland – that is, effects are likely to be distributed along the broad reach of Willow Creek that receives groundwater as opposed to discrete localized areas.*

Do pumping tests show reversal of gradients? Is it necessary to have monitoring in these areas to identify effects over time?

***Response:*** *Aquifer testing did not reveal the potential for hydraulic connection between the pumping in deep Aquifers A3/A4 and surface water features. Water levels in Aquifer A1 did not decrease and gradients were not reversed as a result of the 72-hour pumping tests. This observation was considered when reviewing the modelled long-term impact of pumping at full build-out. Based on the field testing results, it was anticipated that any simulated potential impacts to surface water features from the deep pumping would take months or even years to propagate.*

*In parallel with the completion of this Class EA, an Adaptive Monitoring and Management Plan is being developed as part of the Midhurst Overall Drainage Plan. Baseline monitoring was initiated by Gartner Lee Limited in 2008 to characterize existing conditions in various watercourses that could be impacted by the development. Building on the data collected in 2008, Hutchinson (HESL) expanded the monitoring program and have collected baseline data since 2014. Baseline sampling is ongoing. Sampling includes collection and interpretation of water quality, flows, benthic invertebrates and fisheries at 16 sampling stations to identify any changes to surface water from the proposed methods of stormwater management, wastewater management or groundwater drawdown, and provide guidance for the design and any necessary mitigation of the future developments.*

- The opinions of a qualified aquatic ecologist(s) would also be very useful in characterizing the various reaches of the surface water system and its sensitivity to changes. Efforts to characterize and quantify potential effects should also be supplemented with ecological evaluation to assess the significance of predicted effects.

***Response:*** *Aquatic ecological conditions have been and continue to be characterized through baseline monitoring and interpretation by qualified aquatic ecologists at Hutchinson Environmental Sciences Ltd. This information will continue to be used to determine the sensitivity of specific watercourses in the study area and used to assess significance of predicted effects as described above.*

iv. The EA also includes information related to the selection and evaluation of many other aspects of the water supply systems, including the water treatment alternatives and the distribution and storage system (e.g. see section 5 of the main report; Appendix K to the ESR which is a draft report by Black & Veatch, May 2016). These are beyond the scope of this review. However, similar to the transportation projects, if construction of the water supply system components requires water taking/dewatering (e.g. during installation of water mains, during building treatment plant structures), this dewatering/taking may require PTTWs and will be evaluated in much greater detail as part of the future PTTW applications.

***Response:*** *Acknowledged.*

## 2.4 Wastewater Servicing

Willow Creek is the initial receiver of the treated effluent, and as such the evaluation of impacts (as well as our review of the ESR) is focused on Willow Creek. The assessment of proposed wastewater discharges however may expand beyond the immediate receiver and consider aquatic systems downstream. In this case, the downstream systems that may also be affected include: the Minesing Wetland (into which Willow Creek flows about 4 km downstream of the proposed discharge), the Nottawasaga River (Willow Creek joins the River within the Minesing Wetland) and the Nottawasaga Bay into which the Nottawasaga River empties. The concerns raised regarding these downstream waterbodies (and discussed in the EA documents) are mostly related to nutrient enrichment (phosphorus loading), and to a lesser degree potential changes in hydrology of the wetland.

Another issue that is linked to the wastewater servicing proposal in this EA is the requirement by the Nottawasaga Valley Conservation Authority (NVCA) to limit the cumulative future phosphorus loading to the environment from sewage and stormwater to no more than current loads. That is, the phosphorus load from the discharge of treated sewage and the phosphorus contribution from runoff from developed areas should remain below the phosphorus load under existing conditions ("no net increase" requirement).

### 2.4.1 Addressing Potential Impacts on Willow Creek

The bulk of the relevant information on the evaluation of the potential environmental impacts of the proposed wastewater servicing on Willow Creek is provided in the report: "*Willow Creek Assimilative Capacity Study (ACS), May 2016".* The report (prepared by Hutchinson Environmental Services Limited, HESL) is included as Appendix M to the ESR. The ACS also contains its own appendices, which include Appendix A ("*7Q20 Flow Assessment Update Willow Creek, HESL, May 2016"*) and Appendix C ("*Fluvial Geomorphological Assessment of Willow Creek, Palmer Environmental Consulting, April 2014"*). Additional documents and references are cited in the review comments below, as appropriate.

Low Flows in Willow Creek (7Q20 flow):
One of the issues raised during the ministry's review of the master plan was the estimation of low flows in Willow Creek. The proponent has now updated the assessment using data collected since 2009 (see *Appendix* A to the current ACS).

*HESL* has now addressed this issue satisfactorily. The ministry has no objections to using a 7Q20 value of 430 L/sec, as proposed. For winter (November to May) conditions, the report uses a minimum streamflow of 900 L/sec. We find this winter low flow estimate to be reasonable and appropriate, based on the minimum daily flows observed at the gauge (02ED032) during the relevant months.

Water Quality Status of Willow Creek:
The water quality conditions in the receiver (Willow Creek) were largely determined based on data collected at the Provincial Water Quality Monitoring Network (PWQMN) station 03005703002, located on Willow Creek, approximately 3.2 km downstream of the proposed discharge location.

The ministry has no concerns regarding the analysis undertaken to determine the water quality status of the Creek.

Proposed Effluent Quality Targets:
Effluent targets (limits, objectives and averaging periods) are discussed in Section 6 of the main ESR report and in Appendix S to the ESR. The ACS is focused on demonstrating the proposed targets are acceptable.

In the following sections, the proposed effluent quality targets are reviewed:

i. Total Suspended Solids (TSS): the ACS does not contain discussion on how the proposed TSS targets are adequate to avoid adverse impacts (a monthly average limit of 15 mg/L and a design objective of 10 mg/L for both phases of development). The ministry has undertaken a preliminary level calculation to estimate TSS concentrations in Willow Creek if the effluent in fact contains 15 mg/L of TSS, as proposed. The worst case condition would be when the receiver (Willow Creek) is under a long dry spell (clear flow condition) in summer with flows approaching the 7Q20 statistic and effluent flows are close to the full buildout design flow of 143 L/sec. The Canadian Water Quality Guideline (CWQG) for TSS for long term sustained discharges (longer than 24 hours) is that the discharge not cause the TSS concentration in the receiver to increase by more than 5 mg/L (during clear flow conditions). The ministry estimated the ambient TSS concentration in Willow Creek during such conditions to be between 5 and 10 mg/L (see data for the PWQMN station provided in the ACS report). Even under such overly conservative assumptions, TSS in the receiver will not be above the guideline. Therefore, we have no objection to the proposed values. It is also our view that actual TSS levels in the effluent are likely to be much better than the proposed limit, given that the total phosphorus (TP) targets being considered for the plant are very low (which effectively means TSS also has to be very low. Subject to the engineering review during the ECA stage, the TSS targets to be incorporated into the ECA may be lowered to ensure the values are consistent with the low TP targets).

***Response:*** *Acknowledged.*

ii. E.Coli: Disinfection is proposed to be done using ultraviolet light. The EA proposes a monthly limit of 200/100 ml with a design objective of 100/100 ml (the PWQO is 100/100 ml). Please justify using 200/100 ml.

***Response:*** *The ESR and associated background reports have been updated to have monthly limit of 100/100.*

iii. Total Ammonia Nitrogen (TAN): For phase 1, the proposed TAN limits are: 1.5 mg/L (June to October) and 3 mg/L (November to May). For the full buildout scenario, the proposed limits are: 1 mg/L (June to October) and 2 mg/L (November to May).

a) Issues Considered: The ACS appropriately considers whether the levels of un-ionized ammonia in the effluent remain below the value considered to be acutely toxic and whether the levels in the mixed water (beyond a reasonably small mixing zone) remain below the PWQO (0.02 mg/L). Please note however that we consider un-ionized ammonia levels in effluent above 0.2 mg/L as being acutely toxic – not 0.24 mg/L as noted in the ACS report (also see comments of September 2009, during the master plan stage).

***Response:*** *The Assimilative Capacity Study has been updated to note that un-ionized ammonia levels in effluent above 0.2 mg/L as being acutely toxic.*

b) Acute Toxicity (see section 4.1 of the ACS): The maximum concentration of TAN that could be present in the effluent such that the concentration of un-ionized ammonia remains below 0.2 mg/L would be 4.3 mg/L (calculated using an effluent pH of 8 and temperature of 20 degrees, as was done in the ACS report). Therefore, the proposed TAN limits meet the requirement that undiluted effluent be non-acutely lethal at the point of discharge;

c) Chronic Toxicity: When evaluating whether the PWQO will be met after mixing, one simple approach (especially for discharges into small waterbodies) is to assume complete and instantaneous mixing of the effluent with the ambient water and calculate resultant ammonia concentrations. In this approach, effluent containing TAN at the proposed summer and winter limits is assumed to completely mix with river during low flows (430/900 L/sec in summer/winter) containing 0.025 mg/L of TAN (the reported 75$^{th}$ percentile ambient TAN value). To determine the fraction of un-ionized ammonia, a conservative assumption could be taken and the resultant water temperature and pH is expected to be similar to that of the ambient: i.e. a temperature of 18.5/4 degrees (summer/winter) and pH of 8.4 (note that pH in 2013 and 2014 never exceeded 8.25. Even the 90$^{th}$ percentile value for the 2013-2014 data is a pH of 8.2). The results are summarized in the table below:

| | **Phase 1 (75 L/sec)** | | **Phase 2 (143 L/sec)** | |
|---|---|---|---|---|
| | **Summer** | **Winter** | **Summer** | **Winter** |
| **TAN (mg/L)** | 0.24 | 0.25 | 0.27 | 0.29 |
| **pH** | 8.4 | 8.4 | 8.4 | 8.4 |
| **Temp** | 18.5 | 4 | 18.5 | 4 |
| **$NH_3$ (mg/l)** | **0.024** | 0.009 | **0.027** | 0.01 |

The analysis suggests un-ionized ammonia levels in the mixed water could be marginally above the PWQO of 0.02 mg/L during summer. However, the analysis is very conservative and does not factor in any downstream assimilation and additional dilution processes.

The ACS instead relies on a more sophisticated assessment approach to evaluate this issue. In the ACS, a plume dispersion model (CORMIX) is used first to evaluate the size and shape of the mixing zone. The analysis shows complete mixing of the effluent is achieved some 300-360 m downstream of the point of discharge. Although we have not undertaken a detailed review of the CORMIX analysis, the inputs applied and the assumptions made are reasonable. CORMIX was also used to predict un-ionized ammonia concentrations within the plume (ammonia modeled as a non-conservative substance for summer). This analysis shows that PWQO for ammonia will be achieved well before the point of complete mixing in all scenarios. The ACS also uses another model QUAL2K (a water quality modeling tool) to better evaluate how ammonia (among other parameters) is assimilated by instream processes. This model also assumes complete mixing, but can evaluate how concentrations change downstream of the discharge as a result of instream processes. The analysis using QUAL2K further demonstrates how assimilation in the stream progresses and satisfactorily demonstrates that, at the proposed effluent limits, levels of un-ionized ammonia in the stream will remain below the PWQO.

iv. Biochemical Oxygen Demand (BOD) and Dissolved Oxygen (DO): The ESR proposed a carbonaceous biochemical oxygen (cBOD) limit of 15 mg/L and a design objective of 10 mg/L for

all seasons and all phases. These values are similar to what is routinely used in many approvals for wastewater discharges. More importantly, considerable effort has been spent in the QUAL2K modeling exercise to demonstrate that the levels of total BOD will not significantly affect DO levels in the receiver or lower it below acceptable levels. Therefore, the ministry has no objections to the proposed cBOD targets.

v. Nitrate: It is not common for the ministry to include targets related to nitrate levels in approvals for sewage plants that discharge to surface water, however the Midhurst proposal has always included such targets. The 2009 Masterplan proposed an effluent nitrate-N limit of 9.8 mg/L (see Appendix H of the 2009 mater plan and the report: "Interim Assimilation Analysis…, AECOM, June 2009"). Using a simple mass balance approach, the Interim Assimilation report showed that this target would ensure the nitrate-N concentration in the mixed water remains below 4.7 mg/L. There was no PWQO for nitrate in 2009 (this is still the case), but it was noted that a nitrate-N target of 4.7 mg/L was proposed under the Ideal Performance Standards (IPS), developed by Environment Canada in 2008 under the National Agri-Environmental Standards Initiative (NAESI). Although there was an interim Canadian Water Quality Guideline (CWQG) of 2.93 mg/L for nitrate-N at that time (developed 2003), the Interim Assimilation report preferred to use the IPS since it was deemed to be more defensible. In 2009, as part of our review of the master plan, we offered the following regarding the proposed nitrate limit: "Considering that there is an extensive wetland environment downstream (amphibians reported to be more susceptible to nitrate pollution) the proposal to include a nitrate limit is supportable. However, since there is no PWQO for nitrate, it will be at least premature for the MOE to bind the proponent to the proposed value at this time. …Before committing to these values, I recommend a more detailed evaluation…"

The current ESR proposes a limit of 17 mg/L for Total Inorganic Nitrogen (TIN) and an objective of 15 mg/L, to apply for all phases. The latest TIN targets in the ESR are developed using the same approach as was done in the 2009 Interim Assimilation report.

The reason for the latest values being different is that the low flow (7Q20) estimate for Willow Creek has now been revised from 232 L/sec to 430 L/sec. Also, the effluent flow for the full buildout (worst case) scenario is lowered from 172 L/sec (used in the 2009 assessment) to 143 L/sec (used in the latest reports).

Note that the latest targets are for TIN (not for nitrate-N as was the case in 2009). The ministry concurs that if effluent targets are to be included in the approval for purposes of limiting nitrate levels in the receiver, those targets should be expressed as TIN instead of nitrate-N.

The ministry supports the plan to lower TIN in the effluent, noting that it is not a common practice to include nitrate or TIN targets in approvals for sewage treatment plants that discharge to surface waters. Further discussions are anticipated to occur at the ECA stage of the approval on whether effluent targets will need to be incorporated, and if so, how the targets should be derived. At this point, the following comments are provided to help scope the future discussions regarding nitrate.

A conservative approach would be if nitrate related targets are developed following the same approach as the one used in developing targets for ammonia which has an applicable PWQO. For this purpose, the CWQG targets for nitrate are used as surrogates for PWQOs. Note also that the CWQG for nitrate was revised and finalized in 2012. The current CWQG for nitrate is a chronic target of 3 mg/L as N and an acute target of 124 mg/L as N. Following the approach applied for ammonia, the reasons for establishing nitrate targets would be: (a) ensuring nitrate

levels in the effluent remain below the value considered acutely lethal (the CWQG criterion for acute lethality for nitrate is 550 mg/L or 124 mg/L expressed as N); and (b) ensuring levels in the mixed water, beyond a reasonably small mixing zone, remain below the CWQG chronic target of 13 mg/L (or 3 mg/L expressed as N):

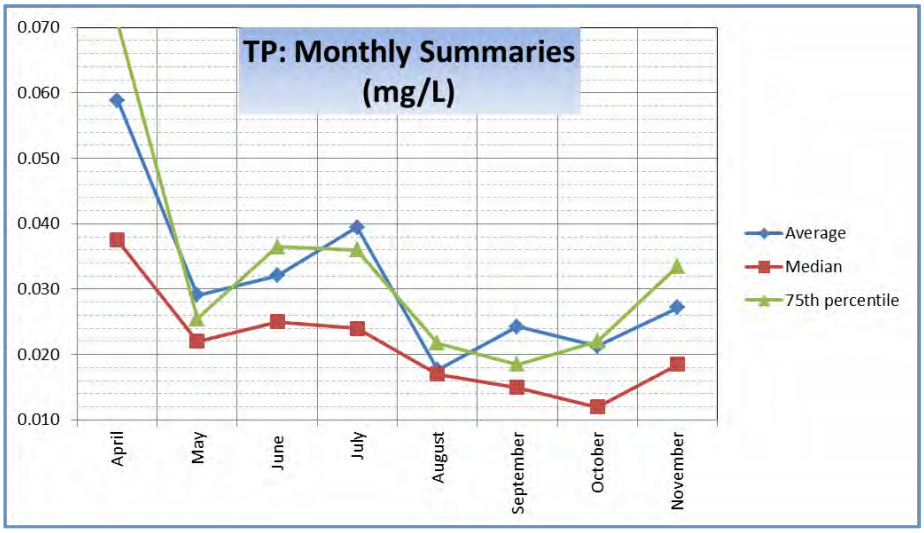
a) There is little risk that nitrate in the effluent will exceed the acute toxicity target even if all forms of nitrogen in the sewage are converted into nitrate-N (literature suggests the total nitrogen in raw sewage is around 40 mg/L);

b) For a screening level assessment of whether the chronic target will be met or not, we have used a simple mass balance approach as was done in the ACS. The ACS indicates that the 75th percentile nitrate-N concentration in the receiver is 0.85 mg/L. The critical low stream flow is 430 L/sec. Effluent flow is 75 L/sec (phase 1) and 143 L/sec (phase 2). This would mean that, to keep nitrate- N levels in the mixed water below 3 mg/L, the nitrate-N in the effluent will need to remain below 15.4 mg/L for phase 1 and 9.5 mg/L for phase 2. We also agree with the approach in the ACS that nitrate related targets should be expressed at TIN and not as nitrate-N. The screening level calculation above suggests that the TIN target of 17 mg/L value proposed in the latest ACS would be unsupportable. Following the above approach the TIN targets (limits) should be 15.4 mg/L for phase 1 and 9.5 mg/L for full buildout. However, as noted above, the mass balance calculation is a preliminary level screening and very conservative in that it does not account for any additional dilution or assimilation/uptake that may occur downstream of the discharge. We recommend the consultant to have a closer look at this before finalizing the target values for nitrate/TIN.

***Response:*** *Acknowledged and we would like to have further dialogue with the MOECC at the ECA stage, regarding the need for nitrate/TIN limits.*

vi. Total Phosphorus (TP): In this section, discussion is mostly focused on determining if the proposed TP targets are suitable for discharge into Willow Creek. Consideration of potential TP related issues in receivers beyond Willow Creek and the implications of the “no net increase” requirement by the NVCA are addressed separately

a) Baseline (background) TP Conditions: The 75$^{th}$ percentile value of available TP data for Willow Creek (2002- 2014 data collected at the PWQMN station No.03005703002) is 0.031 mg/L, which suggests the Creek is Policy 2 with respect to TP. However, information presented in the EA also suggests that TP concentrations in the Creek are often below 0.03 mg/L (and often below 0.01 mg/L) during low flows and that the higher levels of TP are associated with high TSS levels (which also appear to be related to higher flows). The high TSS & TP levels are believed to be caused by significant input of soils into the stream due to erosion from both natural processes as well as due to poor land use practices. For detailed discussion on the causes of high TP/TSS levels as well as further in-depth analysis on monthly/seasonal distribution of TP, see sections 6 & 7 of Appendix N: Phosphorus Budget Update, HESL, May 2016. Appendix M of the ESR also contains a memo dated October 13, 2016 (update to the P Budget work) that presents monthly TP concentrations in Willow Creek. The chart below also shows all of the available TP data summarized for the months of April – November (75$^{th}$ percentile, median and average monthly values shown). Note that even the 75$^{th}$ percentile values for August, September and October are well below the PWQO:




In conclusion, the ministry concurs with the suggestion in the ESR that Willow Creek meets Policy 1 for TP for significant periods of the year, including portions of the summer growing season.

b) Proposed Effluent TP Targets: The 2009 Interim Assimilation report recommended a TP target of 0.03 mg/L for all phases. This was done to ensure that the Policy 1 status of Willow Creek is not altered as a result of the discharge. If effluent meets this target all the time, it would mean that mixed water concentrations would never be driven above the PWQO by the discharge of the effluent (consistent with Policy 1). And, during the times that upstream concentrations are above the PWQO, the resultant mixed water concentrations would be slightly better than background levels (consistent with Policy 2).

The proposed effluent quality targets for TP in the latest ACS/ESR however are slightly different. While a design objective of 0.03 mg/L is still proposed for all phases, a monthly compliance limit of 0.05 mg/L is proposed for phase 1. The proposed limit for the full buildout case is the same as the design objective (0.03 mg/L).

To assess the acceptability of the proposed limit for phase 1, mass balance predictions are used (by using 7Q20 flow condition and 75th percentile value for TP). The calculation suggests the proposed limit for phase 1 could be problematic. As shown in section 5 of the ACS, the effect of such effluent (i.e. containing 0.05 mg/L of TP) would be to elevate in-stream concentrations to 0.034 mg/L during the summer low flow conditions (in contradiction to Policy 2). The effect during the winter low flow periods would be to marginally increase concentrations in the mixed water to 0.032 mg/L.

The following table is also provided to help further assess the effects on mixed water concentrations if effluent with a TP concentration of 0.05 mg/L is discharged during periods when TP in the Creek is at or below (i.e. better than) the PWQO. The table suggests that if the Creek is at or close to the PWQO, the discharge may cause mixed water concentrations to exceed the PWQO marginally (i.e. from Policy 1 water to a Policy 2 water):

| Ambient Conditions | | Effluent | | Mixed Water | |
|---|---|---|---|---|---|
| Flow (L/sec) | TP (mg/L) | Flow (L/sec) | TP (mg/L) | Flow (L/sec) | TP (mg/L) |
| 430 | 0.02 | 75 | 0.05 | 505 | 0.024 |
| | 0.025 | | | | 0.029 |
| | 0.028 | | | | 0.031 |
| | 0.03 | | | | 0.033 |

Although the above analyses suggest that exceedances above the PWQO of 0.03 mg/L may result from the discharge, the assessment in our opinion is very conservative and the predicted exceedances marginal. It is also our opinion that the likelihood for effluent flows to be at the maximum design flow when stream flows are under extreme low flow conditions is low. The assessment also does not account for the fact that the design objective is still 0.03 mg/L – the plant would be expected to meet this target reliably. The October 2016 memo includes a more realistic monthly mass balance prediction for TP (using average monthly TP concentrations for the Creek and monthly minimum flows). This analysis shows that the effect of the discharge on downstream TP levels will be insignificant (still using the design flow of 75 L/sec and the limit of 0.05 mg/L). The analysis provided in this memo is more appropriate and more realistic, and adequate to demonstrate that the discharge is unlikely to violate Policy 1 or Policy 2 requirements. Therefore, the ministry has no objections to the proposed effluent TP targets (limits and objectives). As an additional precautionary measure, the feasibility of adding a monthly loading limit of about 6 kg TP per month (based on the proposed design flow of 75 L/sec and the proposed design objective of 0.03 mg/L objective over 31 days) could be considered for phase 1 during the ECA approval stage. This would ensure that the plant still achieves the design objectives for much of the time in any given month.

***Response:*** *Acknowledged and we look forward to further dialogue with the MOECC at the ECA stage regarding the inclusion of a monthly loading limit. In the interim the ESR will continue with the proposed effluent TP targets.*

c) Feasibility of Proposed TP Targets: The ministry recommends that the proponents hold early pre-consultation with the ministry's approvals branch regarding the acceptability of the selected treatment technology to reliably achieve the TP targets (which are quite low) and exactly how effluent limits and objectives should be established (note that the proposed effluent limit for the full build-out case is the same as the proposed objective).

***Response:*** *Acknowledged and we look forward to further dialogue with the MOECC at the ECA stage regarding the proposed TP targets.*

d) Bioavailability of P: Another question that has come up is how the proposal may affect bioavailability of phosphorus post development. The issue is that while a significant proportion of the total phosphorus measured in the Creek at present is attached to particulate matter (hence unlikely to be bioavailable), some of the phosphorus in the effluent will be in the form of dissolved (hence, more readily bioavailable phosphorus.

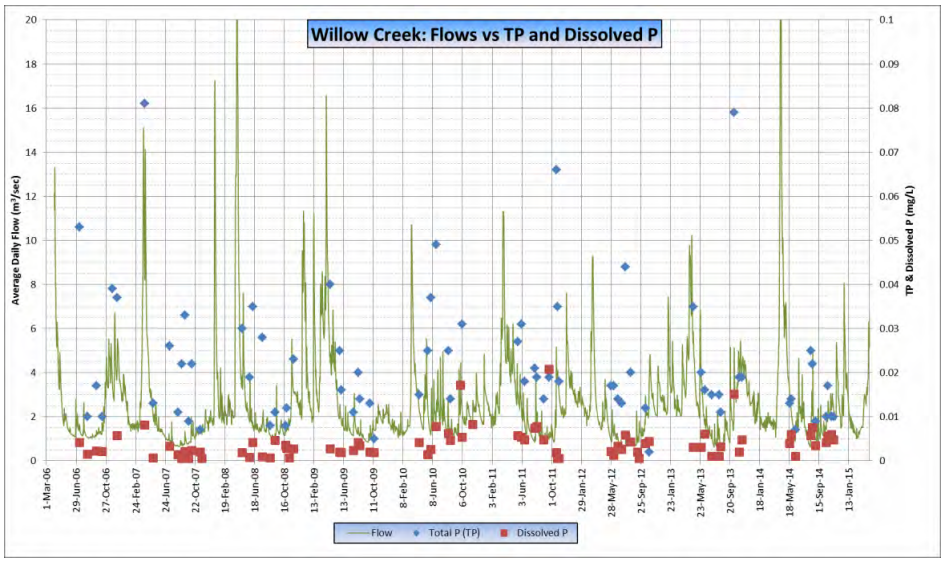
The consultant has offered opinions on bioavailability in section 7.5 of the May 2016 Phosphorus Budget Update report, attached as Appendix N to the ESR. While noting

lack of data on current concentrations of bioavailable P in Willow Creek, this report suggests that the discharge is unlikely to significantly increase bioavailability of P post development. It also offers to undertake further monitoring in Willow Creek in the future for bioavailable P. The ministry's review is focused on TP given that the PWQO is for TP – not for bioavailable P. Further, as noted above, the evaluation undertaken for TP relies on conservative assumptions and ensures that the proposed discharge will not elevate TP concentrations in the stream above PWQO/ background levels. Therefore, it is our opinion that our review of the ESR need not consider this issue further.

***Response:*** Acknowledged.

If the proponent wishes to follow up on the proposal to undertake more studies regarding bioavailability (as proposed in the May 2016 P Budget update report), the PWQMN dataset should be reviewed, which includes results for both TP (i.e. unfiltered samples) as well as for field filtered samples which represent the "dissolved phosphorus" fraction. The usefulness of the filtered sample results in assessing bioavailability should be considered first before undertaking further investigations.

The chart below shows daily flows in Willow Creek with the TP and dissolved P data from the PWQMN station:




Other Potential Impacts on Willow Creek: In this section, potential effects on the Creek that cannot be addressed though effluent quality targets are discussed (such as thermal impacts and geomorphic impacts).

i. Thermal impacts: The ESR shows the 75$^{th}$ percentile summer temperature in Willow Creek to be about 18 degrees while the maximum effluent temperature estimated around 20 degrees (see section 4 of the ACS). A much more detailed evaluation of potential thermal effects is provided in Appendix Y to the ESR (this Appendix is a compilation of Notices and presentations at Public Information Sessions and a summary of comments received and responses provided). In particular, see Item No. 39 & 48 in the Table in Appendix Y entitled: "Brief Summary of Comments Received and Responses…, March 3, 2017". Here, a thorough and

satisfactory analysis is provided demonstrating there will be no thermal impacts. Given this, it is our opinion that the discharge is unlikely to result in measurable thermal effects;

***Response:*** *Acknowledged.*

ii. Hydrologic & geomorphic impacts: Various documents of the ESR adequately demonstrate that the additional flow from the sewage treatment plant (STP) (max of 143 L/sec after full buildout) is small compared to the natural flows experienced in Willow Creek, and unlikely to result in meaningful changes in the Creek's hydrologic and hydraulic properties (low and high flows, flow velocities and water depth will remain unaffected). These discussions are also repeated in several places in the Table in Appendix Y, mentioned above. The ministry agrees with the conclusions in the ESR that changes in the hydrologic and hydraulic characteristics of Willow Creek resulting from the discharge will be insignificant.

The ACS (Appendix M to the ESR) also includes a report that specifically addresses potential geomorphic effects of the discharge on Willow Creek (Fluvial Geomorphological Assessment of Willow Creek…, Palmer Environmental Consulting Group (PECG), April 2014). The PECG report indicates that the effects of the discharge on erosion would be insignificant/not measurable.

***Response:*** *Acknowledged.*

### 2.4.2 Addressing Potential Impacts on Downstream Waterbodies

The ministry agrees with the conclusion of the EA that by protecting water quality in Willow Creek, downstream water bodies including the Nottawasaga River, Georgian Bay and the Minesing Wetland, will also be protected.

***Response:*** *Acknowledged.*

### 2.4.3 "No Net Increase" in Phosphorus Loading Requirement & STP Approval

Master Drainage Plan/SWM: The Midhurst development proposal includes a commitment that the cumulative input of phosphorus into Willow Creek/ Minesing wetland from stormwater from developed areas and from treated sewage should not be more than the input under existing conditions ("no net increase"). Our understanding is that this requirement is from the NVCA and it is now part of the approvals for the development under the Planning Act. To address this requirement, the developers group committed to prepare and implement a "Master Drainage Plan"/ comprehensive SWM plan which is to be developed in consultation with the NVCA. The commitments stipulate that the SWM that would be implemented would at a minimum, meet MOECC's current guidelines and would also include requirements to implement low impact development (LIDs) to achieve minimum infiltration targets of up to 25 mm.

This process (agreement between developers and NVCA and the development of SWM for the lands) is independent of the EA process, and this review is not intended to look into the SWM proposal for the developable lands. In any case, documents submitted as part of the EA do not include details of the Master Drainage Plan (it is not clear if this plan is complete or currently being prepared).

Phosphorus Budget Assessment:To determine how the improved SWM affects phosphorus loads and to determine if the "no net increase" requirement is met or not, the proponents have prepared a phosphorus budget analysis report entitled: "*Phosphorus Budget Update, Hutchinson Environmental Sciences Ltd. May 2016*". This report is included in the EA as Appendix N to the ESR. In this report, phosphorus (P) budgets for phase 1 and full build-out scenarios are presented that are developed based on several assumptions/considerations. These include:

- The sewage plant will achieve a TP target of 0.05 mg/L during phase 1, resulting in a maximum load of 118 kg/year from all of the phase 1 development. The plant will achieve 0.03 mg/L once development beyond phase 1 starts , resulting in a maximum total load of 134 kg/year after all development is connected (full build-out); and

- SWM for developed areas will go beyond the minimum enhanced level of treatment and will include LIDs to infiltrate the first 20 mm - 25 mm of rain.

Section 2 and Section 5 of the report explains the methodology used to determine the phosphorus budgets for pre and post development scenarios. Based on these, the report concluded that:

- The contribution of P from runoff under existing conditions from phase 1 (about 298 ha in size) is 46 kg/year (see Table 7). Post development, the amount of P that can be exported from the same area would be 575.7 kg/year. If only conventional SWM measures with enhanced level of treatment (i.e. 80% TSS removal) are implemented (wet ponds expected to remove 63% of the P load in stormwater) the export from the area would be 213 kg/year (i.e. 37% of the potential load of 575.7 kg/year). If LIDs for infiltrating 20 - 25 mm of rain are also implemented, then significant further reduction will be achieved. LIDs that can infiltrate the runoff from 20-25 mm storms are expected to infiltrate 90 – 95% of the predicted annual runoff volume and 100% of the P load from this volume of infiltrated water would be discounted. Hence, the P load from the un-infiltrated portion of runoff would only be 10 to 5% of the total potential load of 575.7 kg/year (i.e. 57.6 kg/year to 28.8 kg/year). Further, the approach used also assumes that the un-infiltrated water will also be treated using wet ponds which will achieve a further 63% reduction (i.e. only 37% of the 57.6 kg/year = 21.3 kg/year will be exported. If 25 mm could be infiltrated the load will be 11 kg/year only) – see Table 8.

- For phase 2, a similar analysis shows that the additional P load under pre-developed (existing) conditions from the additional lands outside of phase 1 (about 597 ha) is 88 kg/year. So, the cumulative total loading from all lands (phase 1 and phase 2) under existing conditions would be 134 kg/year (46 + 88). Post development, the P contribution from the phase 2 additional area (i.e. the 597 ha) without any SWM control would be 1,216 kg/year. With conventional SWM (wet ponds) only, the load would be 450 kg/year (i.e. the total post development P load, if only conventional SWM measures excluding infiltration are implemented, would be 213 + 450 = 663 kg/year). If LIDs for infiltrating 20 - 25 mm of rain are also implemented flowed by wet ponds for the un-infiltrated water (as was done for phase 1), the post development load from stormwater runoff from the phase 2 additional area would be reduced to 45 – 22.5 kg/year only. So, under the full build-out scenario (i.e. all phases developed) the cumulative load after implementing all SWM measures (wet ponds with LIDs to infiltrate 20 – 25 mm of rain) would be 66 – 33.5 kg/year. So, the total post development contribution from urban runoff would be much lower than the contribution under existing conditions (134 kg/year) by 68 – 100.5 kg/year (see Tables 11 and 12);

- The purpose of the P budget exercise is to evaluate the net increase from runoff as well as sewage disposal. As noted above, the STP will be discharging a total of 118 kg/year at the full phase 1 flows and a total of 134 kg/year at the full build-out flows. So, although the post development contribution from runoff (assuming infiltration of 20- 25 mm of rain) is predicted to be lower than the contribution

from runoff at present, the net total amount from runoff and sewage will increase under both phase 1 and full build-out scenarios. The net increase from existing conditions during phase 1 will be 93 kg/year (based on infiltration of 20 mm only). If infiltration can achieve the 25 mm target, then the net increase will be to 83 kg/year only. The net increase after full build-out will be 66 (if only 20 mm is infiltrated). It will be 33 kg/year, if 25 mm could be infiltrated.

The May 2016 P Budget report was peer reviewed by XCG in June 2016 (memo dated June 22, 2016 – not available in the ESR documents). The main comment by XCG was that in calculating the amount of infiltration that the LIDs would provide, consideration should be given to the amount of time needed to recover infiltration capacity between events. HESL agreed and recalculated the amount of infiltration that LIDs designed to infiltrate 20- 25 mm of rain can achieve, with consideration for recovery time (see HESL's memo dated March 7, 2017 provided in Appendix M). The result is that measures designed to infiltrate 20 mm of rain can only capture about 87% of the runoff volume (as opposed to the previously calculated 90%). Measures designed to infiltrate 25 mm of rain would only capture 92% (as opposed to previous estimate of 95%). The implication to the P budget analysis was: under the revised calculations, the net P export amount with measures to infiltrate 20 mm of rain for phase 1 would be 100 kg/year (vs the previous calculation of 93 kg/year). At full build-out, the total load would be 86 kg/year (vs 66 kg/year previously calculated). If LIDs to infiltrate 25 mm are implemented, the revised load during phase 1 will be 89 kg/year (vs previously calculated value of 83 kg/year). Under the full build-out scenario, the total load would be 53 kg/year (vs previous estimate of 33 kg/year).

The conclusion of the May 2016 P budget report was that the estimated net increase in P load is small and would not be significantly different from existing conditions. Potential effects of the STP discharge are shown to be acceptable (see previous section in this memo). Contribution from runoff is estimated to be lower than existing conditions. Although total loads to the downstream wetland would increase, the P load assessment for the wetland shows that the additional amount is very small compared to the total loading to the wetland. On this basis, the recommendation in the May 2016 report was that there would be no need to implement additional P offset measures. The changes to the P budget calculation resulting from XCG's peer review were also minor.

On this basis, the conclusion in the April 2017 ESR (draft) was that there would be no significant increases in P loading. However, in a letter dated April 27, 2017, Ainley clarified that the "no net increase" requirement would still need to be met and sections of the ESR that suggest that no further action would be required would be revised during the commenting period. The letter also indicated that a P offsetting program would be developed and implemented to achieve the "no net increase" requirement prior to issuance of the ECA for the sewage plant.

General Comments:

The proposal as discussed in the EA ties approval conditions for the sewage treatment plant to the estimated phosphorus loading from stormwater as well. To address this, the ministry is offering limited input on SWM and how the two sources of P loading are evaluated in the P budget assessment. As noted from the outset, this is not a review of SWM for the development. It is also not intended to be a detailed review of the P budget assessment. It is our understanding that the analysis presented on P budget and how the proposal satisfies the "no net increase" requirement will be reviewed by the agency (agencies) that required it.

**Comments on SWM:**

- The ministry notes that the proponent has indicated that SWM plans for the development will meet MOECC's current guidelines (enhanced level of water quality protection) and would also include

requirements to implement LIDs and minimum infiltration targets of up to 25 mm. These criteria are consistent with current ministry guidelines, but this is not an exhaustive review by the ministry of the SWM plans for the development. The ministry expects that SWM plans will be prepared for each development phase and would be submitted to the ministry for review, either as part of the SWM ECA process (ECAs are required for the structural controls that make up the SWM) or as part of the approval of the SWM strategies during the various stages of the development approval process.

***Response:*** *Acknowledged.*

- While the proposal to infiltrate up to 25 mm of rain is supportable, the feasibility of achieving this target is yet to be proven. The P budget analysis relies on the ability to infiltrate this much water throughout the entire development area.

  ***Response:*** *Acknowledged.*

- We understand that SWM will include LIDs to infiltrate up to 25 mm of rain AND wet ponds. We note that one advantage of LIDs would be to minimize the need and reliance on wet ponds. We'd recommend that the proponent consider whether wet ponds will indeed be constructed in addition to the LIDs and if not, the need to revise the P budget assessment.

  ***Response:*** *Acknowledged.*

**Comments on the P Budget Assessment:**

- The export coefficients used to determine pre & post development P loads from various land uses are values previously reviewed and accepted by the ministry. We are also aware that the P Budget report was peer reviewed by an independent consultant.

  ***Response:*** *Acknowledged.*

- As indicated above, the "no net increase" is a requirement of the NVCA. Nevertheless, it would be prudent for the ministry to consider the potential environmental effects of the cumulative loading of phosphorus from all sources – especially when information on the relative contribution from the various sources is available. The ministry has looked at the P budget assessment in this context, with the specific focus on what additional approval conditions would be warranted for the sewage treatment plant. The P budget assessment concludes that, with implementation of LIDs, the post development P load from runoff would be significantly lower than existing conditions. As noted above, we have not identified significant issues with this assessment. However, for our purposes here, let us assume that post development P load from stormwater estimated through the P budget exercise is optimistic. As a conservative measure, let us instead assume that the P load from storm water post development would be as high P load from runoff under pre development conditions (i.e. it could be as high as 134 kg/year even with LIDs). This would mean that there are no load reductions from runoff to be realized to offset some of the new load from treated sewage. This also means that the sewage plant discharge can be looked at without the need to consider P load contributions or reductions from SWM, as was done in the evaluation of proposed effluent TP targets (presented under the previous section of this review memo). As presented above, the ministry finds that the proposed TP effluent concentration targets are acceptable to protect Willow Creek. It is also our opinion that the TP load discharged from the plant (which could be up to a maximum of 134 kg/year) would be a very small fraction of the total load that is annually released into the downstream systems (Minesing Wetland) and unlikely to be of any concern.

***Response:*** *Acknowledged.*

- Given the above, provided the STP is designed and operated as proposed in the EA, it is our opinion at this time that it will not be necessary to include the P offsetting requirements as part of the ECA for the STP. The proponents should continue to work directly with the NVCA regarding the "no net increase" requirement and the kind of additional P control that may need to be implemented.

  ***Response:*** *Acknowledged.*

### 3.0 Air Quality

In July 2017, Central Region reviewed the draft ESR with respect to air quality impacts from the proposed WWTP, WTP facilities and transportation improvements. The ministry's review requested an air quality impact assessment be conducted to address air quality impacts from odour and other contaminants of concern that may be emitted from the proposed WWTP, WTP facilities and transportation improvements (MOECC letter, July 5, 2017).

In response to the ministry's request, the proponent submitted an AQIA for review on February 13, 2018.

### 3.1 Background

The following is a list of potential air emission sources from the proposed undertaking:

- The wastewater treatment plant (WWTP), which is to be located within an abandoned sand and gravel pit north of Snow Valley Road and east of Wilson Drive. The maximum daily flow for the full build out is proposed to treat 12314 $m^3$/day of effluent.

  The preliminary preferred liquid treatment solution for the WWTP includes:
  - Screening and degritting
  - Step feed biological nitrogen removal (BNR) with chemical addition for phosphorus removal
  - Tertiary membrane filtration
  - Ultraviolet disinfection
  - Effluent discharge to Willow Creek

  The preliminary preferred biosolids management solution is:
  - Biological stabilized liquid sludge to beneficial re-use with mechanical thickening and Autothermal Thermophilic Aerobic Digestion (ATAD) with 240 day storage

- Supporting infrastructure including sewers, pumping stations, and transportation improvements

### 3.2 AQIA Technical Comments

1. As outlined in the ministry's letter dated July 5, 2017, the ministry recommends addressing potential fugitive odours not only from the WWTP but also from sources such as sewers and pumping stations.

   The AQIA did not discuss the potential fugitive odour emissions from the trucking of biosolids off-site, exhaust from pumping stations, and other potential sources of fugitive emissions such as

sewer manholes, shafts and air handing facilities. Furthermore, the AQIA did not address how the proponent will mitigate odours from the sewage pumping station.

Please clarify the potential odour impacts from the above noted sources and how the proponent will mitigate such odours during operating conditions.

***Response:*** *Mitigation control at the WWTP consists of a biofilter at the headworks building and two biofilters servicing the ATADs, Sludge Storage Tanks, Thickening Building and an indoor Truck Loading Area. Proper capture of odorous air from these sources and proper operation of the biofilters will adequately mitigate odours from these sources. See Section 2.1 of the AQIA report for further details.*

*As agreed with the MOECC, during the Aug 2017 tele-conference we have not completed Odour assessments for all the Sewage Pumping Stations (and associated sewers) given their relatively small size (less than 100 L/s flow) but that we would complete a high-level assessment of a worst case scenario Sewage Pumping Station.*

*It was also acknowledged in the tele-conference, that each Sewage Pumping Station would be reviewed in detail at the time of the ECA application, when detailed design information would be available."*

2. In addition, further clarification is required with respect to the potential fugitive odour emissions for the final biosolid products while stored onsite for 240 days.

   ***Response:*** *As noted in Item #1, there will be two biofilters servicing the ATADs, Sludge Storage Tanks, Thickening Building and an indoor Truck Loading Area all of which are entirely enclosed. Proper capture of odorous air from the stored biosolids and proper operation of the biofilters will adequately mitigate odours from these sources.*

3. The dispersion modelling done for the AQIA (December 15, 2017) used the regulatory AERMOD version that was current at that time. However, a new regulatory AERMOD version (16216r) was posted by the ministry for compliance with O.Reg419/05 on April 4, 2018. Please note that the new version of AERMOD must be used in the ECA submission. It may also be helpful to clarify at this time the maximum point of impingement for all contaminants of concern and whether or not the maximum POI concentrations will be below the O.Reg. 419/05 standards if the newer version of AERMOD were to be used.

   ***Response:*** *Air dispersion re-modelling was done using the older version of AERMOD and we acknowledge that the most current version of the model will be utilized at the ECA stage in the future. Based on RWDI's experience with the two versions of AERMOD, and considering the specific source configurations of this facility, we would expect results using the updated AERMOD version to be lower than those predicted by the earlier version.*

4. The dispersion modelling assessment using AERMOD to determine compliance with O.Reg. 419/05 standards followed the ministry's guidance documentation as stipulated in the *Air Dispersion Modelling Guideline in Ontario* (ADMGO guideline) and the *Technical Bulletin – Methodology for modelling assessments of contaminants with 10-minute average standards and guidelines for Odour under O.Reg.419/05* (MOECC, 2016).

   However, please clarify why the urban dispersion coefficient was applied in the air quality impact assessment for the proposed WWTP. Typically, the rural dispersion coefficient is more

conservative than the urban dispersion coefficient, except during night conditions, due to the urban heat island effect.

Since the definition of urban in the ADMGO guideline refers to more than 50% urban land use surrounding 3 km of the facility, this definition does not apply to the current land use conditions at the proposed Midhurst WWTP facility. Please clarify what the land use surrounding the facility will be in the future. In addition, please explain how the maximum point of impingement for all contaminants of concern would be affected if the WWTP were modelled using the rural dispersion coefficient. If the future land use surrounding the facility is considered to be rural based on the ADMGO guidelines, the model is required to use the rural dispersion coefficient at the ECA stage.

***Response:*** *Original modelling assumed urban growth around the facility (some residential developments are planned), but we agree that using rural dispersion coefficient is still appropriate, as it would still characterize much of the area within 3 km of the facility. The AERMOD model was re-run with this change. Modelled contaminant concentrations did increase as a result but are still predicted to be compliant with relevant standards.*

***Response:*** *The future land use surrounding the facility within 3 km will continue to be rural, including the proposed future residential development. As noted, the model was re-run with the rural dispersion coefficient, and the results were shown to be compliant with relevant standards.*

5. The AQIA does not discuss how the proposed facilities will comply with the current D series guidelines with respect to land use compatibility. Currently, the proponent considered a buffer of 150 metres from the property line of the WWTP to the existing sensitive receptors (R10, R11 and R12). However, it is not clear if the proponent considered a buffer around the proposed pumping stations for future sensitive receptors.

   ***Response:*** *Commenting on D series guidelines for land use planning is not really of relevance to the AQIA. Any issues with buffer zones would lead to a need for an air quality assessment, which has already been done, and which demonstrates that predicted concentrations are below applicable guidelines at the property boundary. Sewage Pumping Stations will not have buffer zones, but modelled impacts for the contaminant of greatest concern, NOx, were compliant with applicable standards. Potential odour impacts from Sewage Pumping Stations will be mitigated through proper design, including mitigation measures such as to dose a chemical into the system such as Nutriox or Iron Salts to prevent hydrogen sulfide from being stripped from the sewage. In the event of persistent issues an adsorption system on the air ventilation would be added.*

6. The exhaust temperature for the aeration tanks noted on the Source Summary Table for the Sand and Gravel Site (Table 3) appears to be high. Although, this parameter will not have an impact on the emissions or the dispersion modelling results, it is recommended to revisit the exhaust temperature for the aeration tanks (35 degrees Celsius). Typically when aeration tanks are open the exhaust temperatures are closer to ambient conditions.

   ***Response:*** *The facility was re-modelled with the revised assumption of ambient temperature. Because they are area sources, temperature does not significantly affect the results. The modelled results were compliant with applicable standards.*

7. For the WTP facilities and the sewage pumping station there are 4 emergency diesel generators proposed. In addition to $NO_X$ emissions, the proponent should consider assessing $SO_2$ impacts from the proposed Sand and Gravel facility together with the proposed Midhurst WWTP facility at the ECA stage.

Typically, air quality impact assessments for WWTP Class EAs are recommended to assess only the contaminants of concern, including but not limited to odour, TRS, $H_2S$, $NO_x$ and ammonia. The ministry notes that there are 4 emergency diesel generators proposed. In addition to $NO_x$ emissions, the proponent should consider assessing $SO_2$ impacts due to the change in $SO_2$ standards prior to the ECA stage.

In the time since the August 10, 2017 teleconference with the proponent, the ministry has adopted more stringent $SO_2$ standards for which facilities have a 5-year phase in period before being assessed for compliance against these standards. The proposed WWTP facility will most likely be comprised of combustion sources such as boilers and other equipment which may emit $SO_2$. It is recommended to assess O.Reg. 419/05 compliance with the new $SO_2$ standards for the proposed WWTP and WTP facilities prior to the design stage.

***Response:*** *The facility was re-modelled and SO2 was included. Results were compliant with the new standards are included in the revised report.*

8. The proponent should consider modelling all NOx sources from the WWTP and the nearby pumping station at the Sand and Gravel site to determine the combined maximum Point of Impingement concentration. These sites appear to meet the definition of adjacent properties under section 4 of O. Reg. 419/05. Although only required for the ECA package submission, this assessment is recommended prior to the design stage to identify any potential exceedance and the expected mitigation measures.

   ***Response:*** *The modelling was done combining all WWTP sources of NOx as well as the nearest pumping station. Other pumping stations further from the site were not included as they were too far away to be considered as combined emissions.*

9. The draft ESR proposed transportation improvements to support the development of the Midhurst Area. The AQIA assessed this aspect of the project by conducting a qualitative assessment. However, this qualitative assessment lacks details that the ministry typically requests for an air quality impact assessment under the Class EA process. For example, background conditions are typically summarized based on representative MOECC and Environment Canada stations for criteria air contaminants and selective transportation related toxics emissions, including benzene and benzo(a)pyrene.

   Since the proposed undertaking will be shipping the biosolids off-site, the AQIA should clarify the additional number of trucks that will be travelling on the new and widened roads in the Midhurst Development Area.

   In addition, this assessment failed to discuss the possible mitigation measures to minimize transportation related impacts on the most impacted sensitive receptors during the construction and operation of the proposed new and widened roads.

   Section 5.3 "*Vehicle Emissions*" should be expanded to include the above noted recommendations.

   ***Response:*** *The qualitative assessment relied on RWDI experience with previous studies with similar, relatively small traffic volumes on a two-lane roadway. These previous studies took background air quality into account noting, in particular, that background levels of some*

*contaminants (such as benzene and benzo(a)pyrene) may at times meet or exceed their appropriate air quality standards. The conclusion of the studies, however, was that the contribution of predicted traffic emissions to these ambient levels of these contaminants will be very small.*

*Additional trucking activity associated with the facility would be minimal compared to overall traffic. The maximum truck volumes for shipping biosolids off-site will be between 5-10 trucks per day.*

*The report has been expanded as suggested.*

10. During construction, further to the mitigation measures discussed, it is recommended to apply best management practices to mitigate any air quality impacts caused by construction dust. Please note that the ministry recommends that non-chloride dust suppressants be applied.

***Response:*** *Acknowledged*

For a comprehensive list of fugitive dust prevention and control measures, please refer to *Cheminfo Services Inc. Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities.* Report prepared for Environment Canada. March 2005.

http://www.bieapfremp.org/Toolbox%20pdfs/EC%20-%20Final%20Code%20of%20Practice%20-%20Construction%20%20Demolition.pdf
Section 5.4 "*Construction Emissions*" should be expanded to include the above noted recommendations.

***Response:*** *Acknowledged*

11. The AQIA did not include particulate matter in the assessed contaminants of concern. Particulate emissions are common at WWTP facilities and at a minimum a Best Management Practice plan for particulate matter should be developed and included in the ECA submission.

***Response:*** *Particulate matter is not typically a compliance concern at WWTPs, but it is agreed that a BMPP for dust (PM) should be included in the ECA submission.*

12. The development of an odour mitigation and management plan is expected for the WWTP facility and should be included in the ECA submission. This plan should include how the proponent will mitigate other fugitive sources such as the trucking of biosolids off-site, a procedure for recording and responding to complaints and a protocol for managing process upsets and equipment malfunctions.

***Response:*** *Acknowledged*

13. The proponent is planning to use 2 biofilters to control odours at the proposed Midhurst WWTP facility, and assumes a control efficiency of 80% for TRS species and odour. The ministry expects the manufacturer's recommendations for proper operation and maintenance of the biofilter to be followed such that the biofilter is able to achieve the assumed control efficiency.

***Response:*** *Acknowledged*

Please explain how ammonia emissions will be reduced by 70%, as presented in the emission estimates.

***Response:*** *Refer to Section 4.1.3, and especially Appendix A of the AQIA. The ammonia concentration from the ATAD Biofilters was provided in a vendor memo by B&V, which noted a removal rate of 70% concentration based on the first stage of odour control (SNDR).*

Although the AQIA demonstrates that the maximum predicted off-site odour concentrations will exceed 1 odour unit, the frequency of these exceedances proposed is less than 1% which follows the ministry's guidelines. It is however the ministry's experience that WWTP facilities can cause higher off-site odour impacts which often result in complaints. For this reason, the ministry recommends that the comments and recommendations outlined in this letter be considered during the design and operation of the proposed WWTP facilities and be included as part of the ECA submission package.

***Response:*** *Acknowledged*

We trust that these responses are provide sufficient clarification for the finalization of the Class EA planning. However, if you have any questions or additional comments, please do not hesitate to contact us.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P.Eng.
President & CEO

*S:\113027 Midhurst\Correspondence\Letter\113027 Midhurst Class EA - Response to MOECC (Jun 5 2018).docx*

cc: Heather Coleman - Township of Springwater (By Email)

## Reid Mitchell

**From:** Renata Sadowska <rsadowska@nvca.on.ca>
**Sent:** June-30-17 9:27 AM
**To:** Joe Mullan
**Cc:** Heather Coleman (heather.coleman@springwater.ca); Chris Hibberd; Glenn Switzer
**Subject:** Midhurst EA Comments

Good morning Joe,
Attached please find additional comments from the NVCA Staff concerning the Midhurst EA project.

Please advise if a copy of the ESR, as submitted to the MOECC, can be provided to us to aid our review process.

Regards,

Renata

**Renata Sadowska, P.Eng.** | **Senior Engineer**

**Nottawasaga Valley Conservation Authority**
8195 8th Line, Utopia, ON L0M 1T0
**T** 705-424-1479, ext. 247 | **F** 705-424-2115
**rsadowska@nvca.on.ca** | **nvca.on.ca**

********** NVCA COMMENTS (June 30, 2017) **********

NVCA staff have reviewed the Ainley response (March 3, 2017) to NVCA comments dated May 29, 2013, as well as the 2016 draft reports prepared in support of Phases 3 and 4 of the Class Environment Assessment (Midhurst Servicing). We offer the following comments.

**Provincial Water Quality Monitoring Network**

The Assimilative Capacity report (Hutchinson) uses Provincial Water Quality Monitoring Network (PWQMN) data from Willow Creek at County Road 28 as a base for a portion of its assessment. This data is collected by NVCA staff. 75th percentile data is used, apparently under the assumption that NVCA randomly samples at this station. NVCA staff actually undertake targeted sampling to capture a mix of seasonal baseflow and storm events. 75th percentile data actually represents a lower order storm event rather than typical/higher end baseflow conditions. Use of 75th percentile data is not appropriate for baseflow analysis of total phosphorus or instream temperature analysis.

**Water Supply**

NVCA staff question the finding that water supply is sustainable and won't adversely impact Willow Creek and its tributaries. Low flow alteration analysis appears to be based on non-baseflow conditions.

Willow Creek 7Q20 under present conditions is 509-542 L/s at Highway 26. A minimum of 79 L/s loss (August) has been modeled as a result of proposed wells/water-taking (maximum loss=120 L/s in March). Willow Creek 7Q20 following is then 430-464 L/s 7Q20 based on natural less water-taking loss.

Based on NVCA staff calculations, this would result in approximately 20% loss at 7Q20 at 79 L/s. At "average" summer baseflow minimums (600-700 L/s as per Table 6 of ACS) there would be approximately 10-15% loss.

The Golder report looks at impacts at three gauge locations – Willow upstream of 400 (little loss), Willow in urban Midhurst (some loss), Willow at Golf Course Road (most loss). Does this provide spatial coverage of all impacts? Are impacts on Willow Creek only? What about Matheson Creek and Black Creek? Tributaries? Which reaches may be most heavily impacted?

NVCA staff suggest that >10% loss of baseflow is likely during average summer baseflow conditions. More information is required re: spatial extent/magnitude of impacts on Willow Creek and its tributaries west of Highway 400. What are the impacts of water-taking/reduced baseflow on: available habitat, groundwater upwellings and instream summer temperatures?

**Proposed WWTP Outlet**

The Beacon report reviewed two potential outfall locations: Golf Course Road and Highway 26. NVCA staff concur that Highway 26 is the preferred outlet location from a terrestrial natural heritage perspective.

**Total Phosphorus (TP)**

NVCA staff have some questions regarding the proponent's analysis with regard to average TP and proposed effluent objectives – they appear to use the 75th percentile TP from PWQMN data as "baseflow TP" when, based on our sampling protocols, this is actually a lower end storm event. NVCA staff would be pleased to provide the project team with our baseflow TP data/analysis upon request.

The proposed long-term effluent objective is 0.03 mg/L but the reports note that 0.05-0.07 mg/L is more regularly achieved. Mean baseflow TP from NVCA baseflow analysis (spring through fall) is 0.018 mg/L at County Road 28. Based on this analysis, higher TP concentrations will be associated with baseflow conditions in Willow Creek downstream of the effluent discharge point.

Assuming 142.53 L/s effluent discharge and "worst case" 430 L/s 7Q20 at effluent:

- 0.03 mg/L effluent = 0.021 mg/L downstream of outfall
- 0.05 mg/L effluent = 0.026 mg/L downstream of outfall
- 0.07 mg/L effluent = 0.031 mg/L downstream of outfall

Staff note that at TP = 0.031 mg/L (75$^{th}$ percentile as identified in ACS) any effluent concentrations over 0.031 mg/L TP would increase TP loads/concentrations which may not meet MOECC Policy 2 criteria

A greater proportion of TP will be reactive/soluble phosphorus which is more immediately available to biota. What are the potential impacts of this on Willow Creek?

**Total Phosphorus/Mass Balance**

Reports note that a combination of LID and WWTP effluent will not meet Midhurst Secondary Plan objective of no net increase in annual TP loadings to the Willow Creek system.

Increases proposed are proposed to be offset by retrofitting existing Midhurst urban area with municipal servicing i.e. taking urban Midhurst off existing septic systems. How will this be implemented? In what timeframe could this be implemented relative to proposed timeframe for initiation of WWTP operations? What actual TP reductions will be achieved – potential benefits may be limited to those septic systems adjacent to Willow Creek. Significant time lags (possibly decades) are associated with benefits associated with potential removal of septic systems due to long time of travel for associated nutrient plumes to slowly clear the system.

Conventional agricultural best management practice offset project opportunities are limited in the upstream watershed of the Midhurst area and have limited ability to meet TP reduction needs. However, there are potential opportunities to acquire floodplain agricultural lands downstream of Midhurst for purposes of buffer/wetland restoration which, with restoration, would contribute to significant TP reductions and may assist with resolution of local flooding issues in this area.

Eroding valley walls can also be a source of TP inputs. Remediating these areas may reduce TP inputs to the Willow Creek.

**Total Phosphorus Target**

Please demonstrate that the nutrient management target of 'no net increase in the nutrient loading downstream as a result of both the land development and the WWTP' will be achieved for the Phase 1 development and maintained for the remaining phases of the development.

**Thermal Impacts**

Report analysis uses 75th percentile PWQO data (and inherent limitations) and does not truly reflect critical summer instream temperature regimes in this section of Willow Creek. Hutchinson analysis suggests a slight warming associated with effluent discharge using 18.5 C Willow Creek ambient as a base.

NVCA logger data suggests summer daily maxima of 24-25 C from Highway 26 downstream to County Road 28 with minimal diurnal recovery (22-23 C minimums) during periods of heat stress. Effluent temperature of 20 C suggests that instream temperatures will not be impacted during periods of heat stress and that heat stresses may be slightly moderated downward by effluent discharge. This may benefit coldwater habitat on Willow Creek downstream of Highway 26.

**Dissolved Oxygen**

Dissolved oxygen analysis in the draft ACS uses 75$^{th}$ percentile summer water temperature (18.5 C) and 25$^{th}$ percentile dissolved oxygen (10.16 mg/L – unknown time period – possibly entire record) for model analysis. As noted above (Thermal Impacts), NVCA logger data indicates summer daily maxima of 24-25 C at and downstream of the proposed effluent outlet. Saturated DO at these temperatures is 8.24-8.4 mg/L – significantly lower than the 10.16 mg/L used in the model analysis. NVCA staff do not have DO logger data in this area and it is unknown whether saturated DO is appropriate to use or whether there may be diurnal DO deficits (DO less than saturation) to consider here.

Given that modeling indicates a 2.4 km (Full Build-out) to 4.4 km (Phase 1) reach of DO decrease, NVCA staff recommend that DO be remodeled with more conservative summer water temperature and DO assumptions. Data acquired through DO logger deployment would be helpful in refining modeling.

As noted in "Comprehensive Modeling Program" comments below, significant DO sags have been recently observed in Willow Creek (NVCA unpublished data) within Minesing Wetlands and it is important to understand whether WWTP effluent may potentially exacerbate this condition.

**Cumulative Impacts**

NVCA staff question why the potential impacts of multiple sewage systems on Willow Creek (future Craighurst would lie outside the scope of the Class EA. Significant development in Craighurst (headwaters of Willow/Matheson Creek) will also require wastewater servicing. If this results in reduced assimilative capacity in Willow Creek and potential impacts to aquatic biota, how will this be addressed?

**WWTP Safeguards**

Are proposed systems/redundancies part of standard practice or do they go beyond industry standard to best protect Willow Creek/Minesing Wetlands?

**Source Water Protection**

Please advise why the Kempenfelt Bay Model was used instead of the more recently constructed Barrie Tier 3 water budget model which incorporates the proposed development area.

The report outlines the modelled well head protection areas for the respective new wells. The proponent is required to complete works according to the MOECC technical rules, e.g. determine the vulnerability score, evaluate transport pathways, and evaluate issues and threats, etc. Once this is completed, this information must be submitted to the Source Protection Committee/MOECC for review and approval.

**Comprehensive Monitoring Program**

NVCA staff note that baseline information has not been collected from Minesing Wetlands by the project team. NVCA staff have some recent water quality monitoring data and can make this available to project team). This work (2014-2016) suggests that the wetland itself likely has a significant impact on water quality including potential summer TP generation and significant downstream dissolved oxygen sags. Would effluent (TP, CBOD) have an effect on water quality through the Minesing Wetlands or would internal wetland processes overwhelm any changes associated with effluent?

To address such questions, monitoring of Willow Creek through Minesing Wetlands should be added to the Midhurst AMP. As per recent project team/NVCA discussions, it may be beneficial to paddle the Willow/Edenvale route through Minesing Wetlands with project team/Township staff to better understand the physical/chemical environment in this area.

Ainley & Associates Limited
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E-mail collingwood@ainleygroup.com

April 5, 2018 113027

"By Email"

Nottawasaga Valley Conservation Authority
8195 8th Line,
Utopia, Ontario
L0M 1T0

**Attn: Chris Hibberd, MCIP, RPP**
**Director, Watershed Management Services**

**Ref: Township of Springwater**
**Midhurst Class EA (Water Wastewater & Transportation)**
**Response to NVCA Comments dated June 30, 2017**

**Dear Mr. Hibberd:**

In response to the comments received from the NVCA on June 30, 2017, regarding the Draft Reports associated with the Midhurst Class EA and further to our meeting on Oct 30, 2017 we have now completed the additional investigations that we discussed and therefore provide the following responses. For your convenience, we have provided the NVCA's comments, in blue, followed by our responses.

### *1. Provincial Water Quality Monitoring Network*

*The Assimilative Capacity report (Hutchinson) uses Provincial Water Quality Monitoring Network (PWQMN) data from Willow Creek at County Road 28 as a base for a portion of its assessment. This data is collected by NVCA staff. 75$^{th}$ percentile data is used, apparently under the assumption that NVCA randomly samples at this station. NVCA staff actually undertake targeted sampling to capture a mix of seasonal baseflow and storm events. 75$^{th}$ percentile data actually represents a lower order storm event rather than typical/higher end baseflow conditions. Use of 75$^{th}$ percentile data is not appropriate for baseflow analysis of total phosphorus or instream temperature analysis.*

Hutchinson Environmental looked at three different approaches to determine the appropriateness of using the 75$^{th}$ percentile data to establish effluent objectives in Willow Creek, as follows:

a) Evaluation of the flow regime at the Water Survey of Canada station on Willow Creek at Highway 26 during PWQMN data collection periods to determine the number of sampling events which captured low flow ("baseflow") and storm events;

- PWQMN data in Willow Creek is representative of both baseflow and high flow conditions as is recommended in MOECC guidance when developing receiving water based effluent objectives. Data is not overly skewed to characterize storm events as 86% of sampling events between 2006 and 2014 captured low flow conditions.

b) Comparison of PWQMN data collection approaches by NVCA at County Rd. 28 to sampling protocols of other Conservation Authorities and to the Ministry of Environment and Climate Change's (MOECC) recommendations;

- Conservation Authorities employ various sampling protocols as part of the PWQMN program. 75th percentile data from datasets targeting some high flow events are used routinely throughout Ontario to determine effluent objectives.

c) Determination of how data was collected and used to inform other Assimilative Capacity Studies, and how the approach relates to MOECC guidance in order to assess if our approach constitutes a "standard of practice" for receiving water assessments.

- The use of the 75th percentile to determine effluent objectives for Willow Creek is a conservative assessment designed to protect aquatic features and biota. If a lower percentile is used to reflect a lower flow regime, background water quality parameters such as total phosphorus would be lower, resulting in a higher threshold for increased loadings of effluent contaminants and less strict effluent objectives.

In addition to the aforementioned, the Assimilative Capacity Study (ACS) was completed to the requirements of the MOECC (1994[1]) which stipulate the water quality statistics to use.

Based upon the above, it is our professional opinion that the use of 75$^{th}$ percentile data is appropriate for baseflow analysis of total phosphorus or instream temperature analysis.

### *2. Water Supply*

*NVCA staff question the finding that water supply is sustainable and won't adversely impact Willow Creek and its tributaries. Low flow alteration analysis appears to be based on non-baseflow conditions.*

*Willow Creek 7Q20 under present conditions is 509-542 L/s at Highway 26. A minimum of 79 L/s loss (August) has been modeled as a result of proposed wells/water-taking (maximum loss=120 L/s in March). Willow Creek 7Q20 following is then 430-464 L/s 7Q20 based on natural less water-taking loss.*

*Based on NVCA staff calculations, this would result in approximately 20% loss at 7Q20 at 79 L/s. At "average" summer baseflow minimums (600-700 L/s as per Table 6 of ACS) there would be approximately 10-15% loss.*

*The Golder report looks at impacts at three gauge locations – Willow upstream of 400 (little loss), Willow in urban Midhurst (some loss), Willow at Golf Course Road (most loss). Does this provide spatial coverage of all impacts? Are impacts on Willow Creek only? What about Matheson Creek and Black Creek? Tributaries? Which reaches may be most heavily impacted?*

*NVCA staff suggest that >10% loss of baseflow is likely during average summer baseflow conditions. More information is required re: spatial extent/magnitude of impacts on Willow Creek and its tributaries west of Highway 400. What are the impacts of water-taking/reduced baseflow on: available habitat, groundwater upwellings and instream summer temperatures?*

The attached Technical Memorandum prepared by Hutchison Environmental, in conjunction with Golder, dated Jan 29, 2018 concludes that the base flow losses are all less than 10% and that the predicted potential effects on habitat and water temperature in Matheson, Black and Willow Creeks associated with groundwater takings will not adversely affect the habitat.

[1] Ontario Ministry of Environment and Energy. 1994. Deriving Receiving Water-Based, Point Source Effluent Requirements for Ontario Waters. Procedure B-1-5. PIBS#3302. July 1994. 53pp.

In addition, in response to the comment regarding the location of the three gauges, used within the Golder report, it is our opinion that the gauges are in excellent locations to assess upstream, proximal, and downstream impacts of pumping at the proposed development. Further, the gauges are dually important as the source of streamflow data for model calibration. The gauge at Willow Creek & Highway 26 is the furthest downstream and accounts for approximately 70% of the proposed development pumping impacts within the Willow Creek subwatershed, with the remaining flow losses occurring further downstream.

The Willow Creek subwatershed includes Willow Creek, Matheson Creek, and Black Creek. The maximum % monthly baseflow losses at these features are as follows:

- Willow Creek: <10%
- Matheson Creek: <5%
- Black Creek: <10%

### 3. *Proposed WWTP Outlet*

*The Beacon report reviewed two potential outfall locations: Golf Course Road and Highway 26. NVCA staff concur that Highway 26 is the preferred outlet location from a terrestrial natural heritage perspective.*

No response necessary.

### 4. *Total Phosphorus (TP)*

a) *NVCA staff have some questions regarding the proponent's analysis with regard to average TP and proposed effluent objectives – they appear to use the 75th percentile TP from PWQMN data as "baseflow TP" when, based on our sampling protocols, this is actually a lower end storm event. NVCA staff would be pleased to provide the project team with our baseflow TP data/analysis upon request.*

See the response to item 1 above.

b) *The proposed long-term effluent objective is 0.03 mg/L but the reports note that 0.05-0.07 mg/L is more regularly achieved. Mean baseflow TP from NVCA baseflow analysis (spring through fall) is 0.018 mg/L at County Road 28. Based on this analysis, higher TP concentrations will be associated with baseflow conditions in Willow Creek downstream of the effluent discharge point.*

*Assuming 142.53 L/s effluent discharge and "worst case" 430 L/s 7Q20 at effluent:*
*0.03 mg/L effluent = 0.021 mg/L downstream of outfall*
*0.05 mg/L effluent = 0.026 mg/L downstream of outfall*
*0.07 mg/L effluent = 0.031 mg/L downstream of outfall*

*Staff note that at TP = 0.031 mg/L ($75^{th}$ percentile as identified in ACS) any effluent concentrations over 0.031 mg/L TP would increase TP loads/concentrations which may not meet MOECC Policy 2 criteria*

The NVCA's analysis regarding TP and use of lower end storm events and baseflow would classify Willow Creek has a Policy 1 creek; however, as discussed and agreed at our Oct. 30, 2017 meeting the approach that has been taken by our team is more conservative and in line with MOECC policy. Therefore, no changes are necessary.

*c) A greater proportion of TP will be reactive/soluble phosphorus which is more immediately available to biota. What are the potential impacts of this on Willow Creek?*

This area of study remains difficult because some species of phosphorus are available to some organisms and some are not. Therefore, the measurement of bioavailable phosphorus is a very complex topic. However, we have researched the matter the found the following two papers that provide insight:

*I.* Michael T. Brett and Bo Li (2015[2]). The Abstract from this paper reads as follows:

*"Due to the widespread severity of eutrophication in surface waters, there is a strong impetus to require ultra-low effluent phosphorus (P) concentrations (i.e., <100 µg $L^{-1}$) in many municipal water resource recovery facility (WRRF) discharges. Chemical addition, with filtration or membrane separation, is commonly used to meet these low targets and therefore most of the effluent P from tertiary P removal facility is in the soluble phase. This study examined the bioavailability of phosphorus (BAP) in the effluents of advanced phosphorus removal treatment systems using algal bioassay experiments. Effluent BAP was determined for 17 full-scale facilities representing a wide range of phosphorus removal technologies, including enhanced biological phosphorus removal and chemical coagulant addition in secondary and tertiary treatment processes. The phosphorus in the effluent samples was operationally characterized as particulate or dissolved, and reactive or nonreactive P using filtration and chemical characterization. A standard bioassay was used to determine the BAP of both total and soluble fractions. The operational fractions were then statistically compared to the BAP concentrations. The nutrient removal technologies tested included alum and ferric based chemical P removal, enhanced biological P removal (EBPR), single- and two-stage tertiary treatment, and membrane separation processes.*

*The results of this study suggest that the effluent total reactive phosphorus (TRP) concentration has, of the operational characterizations that the team assessed, the strongest statistical association with the total effluent BAP concentration ($r^2$ = 0.81) with an average total BAP to TRP ratio of 0.61 ± 0.24. The results of this work should encourage water quality modelers and total maximum daily load (TMDL) permit writers to consider the importance of BAP when assessing the likely ecological impacts of effluent discharges from municipal nutrient removal facilities. These results also indicate that the bioavailability and P species composition varies with the nutrient removal process and that in most cases a large portion (>50%) of the effluent P was recalcitrant to algal growth. Comparisons between different technologies indicate higher chemical doses, which also achieved lower effluent P concentrations, decreased the fraction of the phosphorus that was bioavailable (BAP%). The research team also characterized the bioavailability of a variety of well-defined P containing compounds. These results clearly showed the operationally defined P classification scheme from classic chemical methods is problematic. Algal phosphorus uptake experiments also suggest that P species with high bioavailability, including some organic P species, are unlikely to persist in natural surface waters because their uptake kinetics are very rapid. Finally, these results further suggest recalcitrant P compounds, such as humic-metal-P complexes, phytic acid, and/or apatite may be the dominant components of the recalcitrant dissolved P pool in effluents identified in this and other studies."*

Within the Final Considerations of this paper it is noted that:

*"This study indicates that P removal processes employing high chemical doses for flocculation followed by filtration very effectively removed the bioavailable P fraction. Furthermore, these results show that bioavailability of phosphorus (BAP) concentrations in autoclaved samples were*

[2] Michael T. Brett and Bo Li. 2015 The Bioavailable Phosphorous (BAP) Fraction in Effluent from Advanced Secondary & Tertiary Treatment. University of Washington and published by Water Environment Research Foundation (WERF).

*consistently higher than for filtered samples suggesting autoclaved BAP samples are more conservative because they include the particulate P fraction which can also be bioavailable."*

*II.* M. T. Brett (2015[3]). The Abstract from this paper reads as follows:

*"Because different phosphorus (P) forms vary greatly in their bioavailability, total phosphorus concentrations are a problematic predictor of the eutrophication potential of natural surface waters and wastewater treatment facility effluents. It is currently not known which operational P characterizations (i.e., dissolved/particulate and reactive/non-reactive) best predict effluent P bioavailability. We characterized the P speciation and directly measured the bioavailability of P (BAP) using algal bioassays for 14 full-scale advanced nutrient removal wastewater treatment plants representing a wide range of P removal technologies. A strong statistical relationship was observed between the effluent total BAP (tBAP) and total reactive P (TRP) ($r^2 \approx 0.81$), with a tBAP/TRP ratio of 0.61 ± 0.24, indicating that TRP can be used as a conservative surrogate predictor of tBAP. A comparison of different operational categories for phosphorus indicated that sBAP is consistently lower than both soluble P (SP) and soluble reactive P (SRP) with average ratios of 0.34 ± 0.19 and 0.62 ± 0.27, respectively. This shows a large fraction of the dissolved non-reactive P (i.e., SPSRP), and ≥40 % of the P classified as SRP was not bioavailable. Total BAP concentrations were on average 30 % higher than soluble BAP (sBAP) concentrations, indicating that the particulate P fraction was an important component of the BAP for the tested effluents. Comparisons between different P removal technologies suggest the bioavailability, and P species composition varies with the nutrient removal process, and that in many cases, a large portion (>60 %) of the effluent P is recalcitrant to algal growth."*

Within the Considerations of the paper it is noted that:

*"The results indicate that certain filtration processes with high chemical doses (such as tertiary membrane system, Trident HS System, Actiflo or multiple-stage filtration) achieved extremely low effluent tBAP concentrations (>5 μg $L^{-1}$) and also reduced the percentage total BAP (tBAP %) to less than 30 % of TP. These processes would be the preferred design for dischargers that must meet the most stringent P removal goals."*

The proposed Midhurst Wastewater Treatment Plant will utilize the best available Membrane treatment technology and will discharge extremely low amounts of phosphorus to Willow Creek (134kg/year at full build out of the Midhurst Secondary Plan (MSP)). Based upon the aforementioned papers, it is estimated that only 30 to 40% of this phosphorus will be of bioavailable phosphorus, which equates to 40 to 50 kg/year. When comparing this amount to the annual Phosphorus loads within Willow Creek of approximately 3,000 kg/year, we are confident that it will not have a measurable impact on Willow Creek and even less of an impact on the Minesing Wetland.

### *5. Total Phosphorus/Mass Balance*

*Reports note that a combination of LID and WWTP effluent will not meet Midhurst Secondary Plan objective of no net increase in annual TP loadings to the Willow Creek system.*

*Increases proposed are proposed to be offset by retrofitting existing Midhurst urban area with municipal servicing i.e. taking urban Midhurst off existing septic systems. How will this be implemented? In what timeframe could this be implemented relative to proposed timeframe for*

[3] B. Li • M. T. Brett. February 2015. The relationship between operational and bioavailable phosphorus fractions in effluents from advanced nutrient removal systems. Received: 30 May 2014 / Revised: 23 November 2014 / Accepted: 12 January 2015 / Published online: 17 February 2015

*initiation of WWTP operations? What actual TP reductions will be achieved – potential benefits may be limited to those septic systems adjacent to Willow Creek. Significant time lags (possibly decades) are associated with benefits associated with potential removal of septic systems due to long time of travel for associated nutrient plumes to slowly clear the system.*

*Conventional agricultural best management practice offset project opportunities are limited in the upstream watershed of the Midhurst area and have limited ability to meet TP reduction needs. However, there are potential opportunities to acquire floodplain agricultural lands downstream of Midhurst for purposes of buffer/wetland restoration which, with restoration, would contribute to significant TP reductions and may assist with resolution of local flooding issues in this area.*

*Eroding valley walls can also be a source of TP inputs. Remediating these areas may reduce TP inputs to the Willow Creek.*

The Environmental Study Report (ESR) that is prepared at the completion of the Class EA, includes a cumulative assessment of the phosphorus loading (from stormwater and wastewater) associated with the development of the MSP and identifies the net difference, between the pre-development condition and the post-development condition for the Phase 1 (300ha) approved lands and for full build out of the MSP. This analysis currently shows a small increase in the phosphorus loading, and the ESR will identify, at a high level, phosphorus offsetting methods such as; the elimination of residential septic systems in Midhurst, watercourse improvements, and/or agricultural improvements and then confirm that it would be possible to implement a phosphorus offset strategy to achieve a net-zero increase. However, the phosphorus offset strategy cannot be developed until after the finalization and acceptance of the Class EA, at which time the net difference in the phosphorus loading will be known (currently estimated at in 93 kg/year for Phase 1 and 66 kg/year for full build out of the MSP).

After the finalization and acceptance of the Class EA, a comprehensive phosphorus offset strategy will be developed with input from the Township, NVCA & MOECC with the requirement of achieving the zero-net increase in phosphorus loading to the watershed as a result of the development of the MSP.

Specifics relating to what types of phosphorus offset strategies that would be implemented, including the time frame and the advantages and disadvantages of each strategy would be discussed and reviewed in detail, as part of the phosphorus offset strategy.

### *6. Total Phosphorus Target*

*Please demonstrate that the nutrient management target of 'no net increase in the nutrient loading downstream as a result of both the land development and the WWTP' will be achieved for the Phase 1 development and maintained for the remaining phases of the development.*

See the response to Item 5 above.

### *7. Thermal Impacts*

*Report analysis uses 75th percentile PWQO data (and inherent limitations) and does not truly reflect critical summer instream temperature regimes in this section of Willow Creek. Hutchinson analysis suggests a slight warming associated with effluent discharge using 18.5 C Willow Creek ambient as a base.*

*NVCA logger data suggests summer daily maxima of 24-25 C from Highway 26 downstream to County Road 28 with minimal diurnal recovery (22-23 C minimums) during periods of heat*

*stress. Effluent temperature of 20 C suggests that instream temperatures will not be impacted during periods of heat stress and that heat stresses may be slightly moderated downward by effluent discharge. This may benefit coldwater habitat on Willow Creek downstream of Highway 26.*

The attached Technical Memorandum prepared by Hutchison Environmental, in conjunction with Golder, dated Jan 29, 2018 includes mass balance thermal calculations that conclude that the baseflow losses associated with future Municipal water takings will not have an impact on the Willow Creek or its tributaries.

In addition, we agree with the comment that the effluent discharge at temperature of 20 C suggests that instream temperatures will not be impacted during periods of heat stress and that heat stresses may be slightly moderated downward by effluent discharge and that this may benefit coldwater habitat on Willow Creek downstream of Highway 26.

### *8. Dissolved Oxygen*

*Dissolved oxygen analysis in the draft ACS uses 75$^{th}$ percentile summer water temperature (18.5 C) and 25$^{th}$ percentile dissolved oxygen (10.16 mg/L – unknown time period – possibly entire record) for model analysis. As noted above (Thermal Impacts), NVCA logger data indicates summer daily maxima of 24-25 C at and downstream of the proposed effluent outlet. Saturated DO at these temperatures is 8.24-8.4 mg/L – significantly lower than the 10.16 mg/L used in the model analysis. NVCA staff do not have DO logger data in this area and it is unknown whether saturated DO is appropriate to use or whether there may be diurnal DO deficits (DO less than saturation) to consider here.*

*Given that modeling indicates a 2.4 km (Full Build-out) to 4.4 km (Phase 1) reach of DO decrease, NVCA staff recommend that DO be remodeled with more conservative summer water temperature and DO assumptions. Data acquired through DO logger deployment would be helpful in refining modeling.*

*As noted in "Comprehensive Modeling Program" comments below, significant DO sags have been recently observed in Willow Creek (NVCA unpublished data) within Minesing Wetlands and it is important to understand whether WWTP effluent may potentially exacerbate this condition.*

The attached Technical Memorandum prepared by Hutchison Environmental dated Mar 28, 2018 regarding Dissolved Oxygen, confirms that the Assimilative Capacity Study (ACS) was completed to the requirements of the MOECC and it shows that dissolved oxygen concentrations are predicted to remain well above the PWQO in Willow Creek, even during the most sensitive low flow period.

### *9. Cumulative Impacts*

*NVCA staff question why the potential impacts of multiple sewage systems on Willow Creek (future Craighurst would lie outside the scope of the Class EA. Significant development in Craighurst (headwaters of Willow/Matheson Creek) will also require wastewater servicing. If this results in reduced assimilative capacity in Willow Creek and potential impacts to aquatic biota, how will this be addressed?*

As discussed and acknowledged at our Oct 30, 2017 meeting, we don't believe we should have to account for other developments in other municipalities which may or may not proceed. Whereas, we would expect that the NVCA and/or other Agencies will require these other developments to meet the same high standards that were imposed on the Midhurst Secondary Plan, including but not limited to;

no additional nutrient loading, infiltrate the first 25mm of rainfall, develop a comprehensive Adaptive Management Plan, etc., which would ensure that these other developments have no impact on Willow Creek and/or Minesing Wetland.

### *10. WWTP Safeguards*

*Are proposed systems/redundancies part of standard practice or do they go beyond industry standard to best protect Willow Creek/Minesing Wetlands?*

As noted during our Oct. 30, 2017 meeting the Wastewater Treatment Plant (WWTP) will be designed and constructed in accordance with Municipal and MOECC "Standard Practices". It was also noted that since the collection system will be new and "tight", inflow and infiltration (I & I) will be minimal which will significantly reduce the chances of the collection system being impacted by storm events and therefore reduce the chance of the WWTP having any bypasses and/or overflows events.

### *11. Source Water Protection*

*Please advise why the Kempenfelt Bay Model was used instead of the more recently constructed Barrie Tier 3 water budget model which incorporates the proposed development area.*

As discussed at our Oct. 30, 2017 meeting, it is Golder's opinion that the Kempenfelt Bay model is better calibrated using the latest Midhurst drilling and testing results. The Barrie Tier 3 model focuses on Barrie and therefore was deemed to be less suited for the Midhurst assessment. In determining this opinion, the following points were considered:

- The groundwater component of the Barrie Tier 3 model (2013) was derived from the Kempenfelt Bay model and most of the groundwater input parameters remained the same as originally conceived in 2004;
- The model described in Golder, June 2016 report, incorporated the results of recent drilling and aquifer testing in the Midhurst area and thus represents the most current and comprehensive understanding of the Midhurst area hydrogeology to-date.
- The model described in Golder, June 2016 report, is significantly smaller in scale than the Barrie Tier 3 model and thus allowed for more localized detail and less computational overhead. We note that localized updates to the current model provided a markedly improved calibration to baseflow in Willow Creek, which was of central importance in the impact assessment.

The report outlines the modelled well head protection areas for the respective new wells. The proponent is required to complete works according to the MOECC technical rules, e.g. determine the vulnerability score, evaluate transport pathways, and evaluate issues and threats, etc. Once this is completed, this information must be submitted to the Source Protection Committee/MOECC for review and approval.

As discussed and agreed at our Oct. 30, 2017 meeting, until the project is approved under the Class EA process, the design details finalized, and the well operators determined, the development of an formal Source Water Protection Plan would be premature. We have however, provided the foundation for a SWP plan via reporting on wellhead protection areas, drawdown, well interference, subwatershed flow losses, vulnerability scoring and threats (Golder, 2016).

### *12. Comprehensive Monitoring Program*

*NVCA staff note that baseline information has not been collected from Minesing Wetlands by the project team. NVCA staff have some recent water quality monitoring data and can make this available to project team). This work (2014-2016) suggests that the wetland itself likely has a significant impact on water quality including potential summer TP generation and significant downstream dissolved oxygen sags. Would effluent (TP, CBOD) have an effect on water quality through the Minesing Wetlands or would internal wetland processes overwhelm any changes associated with effluent?*

*To address such questions, monitoring of Willow Creek through Minesing Wetlands should be added to the Midhurst AMP. As per recent project team/NVCA discussions, it may be beneficial to paddle the Willow/Edenvale route through Minesing Wetlands with project team/Township staff to better understand the physical/chemical environment in this area.*

As noted during our Oct. 30, 2017 meeting the Midhurst Secondary Plan Developments have been designed to maintain no net increase in phosphorus loadings and no net change in annual hydrologic budget to the Minesing Wetland, in line with NVCA's requirements for the Master Drainage Plan. The ACS shows that all parameters are maintained within the PWQO after ~230m downstream of the WWTP discharge, and that Dissolved Oxygen concentrations remain above the PWQO at all downstream locations. These predictions were made for the low flow (7Q20) condition and changes will be less than those predicted 95% of the time. The predictions will be verified through the Monitoring and Adaptive Management Plan for Willow Creek and other sites upstream of the wetland, and so there is no need for monitoring in the wetland itself. Questions on the dynamics of nutrient cycling in the Minesing Wetland (which appear to be important to the NVCA in the absence of the development) are of a research nature and are outside of the reasonable scope of the Class EA or the Master Drainage Plan. The Midhurst Development Group will provide annual reports on the water quality in Willow Creek, and how it has responded to the development and this will be beneficial to any NVCA efforts to understand nutrients dynamics in the wetland itself.

In addition, the attached Figure 1 show all of our surface water monitoring points

Thank you again for your interest in this Class EA. If you have any other concerns, please do not hesitate to contact us.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P.Eng.
President & CEO

*S:\113027 Midhurst\Correspondence\Letter\113027 Midhurst Class EA - Response to NVCA (Apr 3 2018).docx*

cc: Heather Coleman - Township of Springwater (By Email)

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# Memorandum

Date: January 29, 2018
To: Joe Mullan – Ainley Group
From: Brent Parsons and Neil Hutchinson
**Re: Assessment of Potential Fisheries Impacts due to Groundwater Drawdown at Midhurst**

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On October 30th, 2017, a meeting was held between NVCA, HESL, Golder Associates, The Midhurst Landowner's Group, Ainley and the NVCA to discuss NVCA comments, dated June 30, 2017, on the Ainley response (March 3, 2017) to NVCA comments dated May 29, 2013 which included NVCA concerns relating to potential fisheries impacts associated with groundwater drawdown. The NVCA concerns were focused on the potential that the pumping of groundwater for the municipal supply for the Midhurst Secondary Plan Area would reduce baseflow in Willow Creek and its tributaries with potential implications for aquatic life:

> *"NVCA staff suggest that >10% loss of baseflow is likely during average summer baseflow conditions. More information is required re: spatial extent/magnitude of impacts on Willow Creek and its tributaries west of Highway 400. What are the impacts of water-taking/reduced baseflow on: available habitat, groundwater upwellings and instream summer temperatures."*

NVCA emphasized during the October 30th meeting that potential changes to water temperature was also a concern, especially in sensitive, headwater tributaries with coldwater thermal regimes.

The municipal servicing of water to the Midhurst Secondary Plan Area (SPA) will draw water from regional aquifers A3 and A4. There is some connection between these aquifers and the shallow aquifers A2 and A1 that provide groundwater to local area creeks which support cold water fisheries. Details of the interaction between the proposed water supply and the groundwater system are provided in *Hydrogeological Study, Midhurst Water Supply Exploration Program, Township of Springwater, Ontario* (Golder, June 2016).

We assessed the fisheries concerns through the following approaches:

1) A review of Golder's groundwater modelling results.
2) A review of literature to determine ecological guidelines associated with water level drawdown through a desktop approach.
3) Predicted changes in wetted perimeter of tributaries as a surrogate for habitat.
4) A thermal mass balance calculation to predict changes in water temperature in relation to habitat requirements of sensitive, resident coldwater fish species.

## 1. Groundwater Modelling

Golder Associates modelled baseflow losses in Matheson Creek, Black Creek and Willow Creek based on average climatic conditions and maximum permitted pumping rates for the summer period. Pumping rates were pro-rated as a function of these maximum rates for the remainder of the year based on existing Midhurst usage. Modelled baseflow losses are presented as both $m^3$/day and % in Table 1.

Table 1. Simulated Baseflow Losses[1]

| Month | Matheson Creek | | Black Creek | | Willow Creek at Midhurst | |
|---|---|---|---|---|---|---|
| | Loss ($m^3$/day) | % Loss | Loss ($m^3$/day) | % Loss | Loss ($m^3$/day) | % Loss |
| **JAN** | 2325 | 3.8 | 1383 | 6.4 | 1671 | 5.2 |
| **FEB** | 2306 | 3.5 | 1336 | 6 | 1694 | 4.2 |
| **MAR** | 2470 | 2.5 | 1869 | 7.1 | 2131 | 2.6 |
| **APR** | 2465 | 2.3 | 1822 | 6.3 | 2595 | 2.5 |
| **MAY** | 2166 | 2.8 | 1878 | 7.2 | 2288 | 4.5 |
| **JUN** | 2096 | 3.4 | 1515 | 6.6 | 1929 | 7.4 |
| **JUL** | 2107 | 4 | 1529 | 7.2 | 1161 | 8.4 |
| **AUG** | 2245 | 4.5 | 1684 | 8.3 | 985 | 9.6 |
| **SEP** | 2390 | 4.7 | 1744 | 8.7 | 1110 | 8.5 |
| **OCT** | 2403 | 4.9 | 1669 | 8.4 | 1118 | 9 |
| **NOV** | 2542 | 4.5 | 1546 | 7.4 | 1612 | 6.4 |
| **DEC** | 2402 | 4 | 1447 | 6.8 | 1786 | 5.6 |
| ***AVG*** | *2326* | *3.7* | *1619* | *7.2* | *1673* | *6.2* |

Monthly estimates of volumetric baseflow losses ranged from 985 $m^3$/day in Willow Creek in August to 2595 $m^3$/day in April, while percent losses ranged from 2.5% in Matheson Creek in February to 9.6% in Willow Creek in August. Average monthly volumetric baseflow loss was highest in Matheson Creek (2326 $m^3$/day), while average percent loss was highest in Black Creek (7.2%).

## 2. Ecological Low Flow Guidelines

A variety of ecological flow guidelines have been developed to provide scientists and decision-makers with management tools for assessing potential flow alterations and any resulting impacts on aquatic features and functions. Guidelines have been developed for various parts of Canada based on general hydrological and ecological traits of watercourses prevalent in those areas. Most guidelines are focused on predicted changes in surface water flows because of direct surface water taking, while fewer focus on predicted changes to streamflow resulting from losses of groundwater inflow to watercourses.

[1] *Golder Associates. 2016. Midhurst Water Supply Exploration Program, Township of Springwater, Ontario. Hannan. D., RE: Baseflow Loss – Midhurst, Message to B. Parsons, December 4, 2017. E-Mail*

Groundwater is a sensitive habitat feature in the study area as coldwater thermal regimes and elevated dissolved oxygen concentrations support a variety of cold water fish species, and groundwater upwellings provide both overwintering habitat for a variety of fish and critical spawning habitat for Brook Trout (*Savelinus fontinalis*) and Brown Trout (*Salmo trutta*).

Fisheries and Oceans Canada (DFO 2013[2]) state that flow alterations <10% of the instantaneous flow *"…have a low probability of detectable impacts to ecosystems that support commercial, recreational or Aboriginal fisheries based on "expert consensus""* and recommend that site-specific studies should be completed where flows are subjected to >10% flow alteration. The modelled baseflow losses presented in Table 1 are predicted on the basis of maximum permitted pumping rates during summer and are less than the 10% instantaneous flow guideline recommended by DFO and so there is a low probability that the losses will result in a detectable impact.

The Ontario Ministry of Natural Resources (MNR) and Ontario Ministry of Environment (MOE; 2011[3]) compared consumptive water demand to water supply and developed thresholds which reflect Ontario's climate, including summer peak water demand. Surface water and groundwater stress levels were developed in accordance with monthly surface water level demands and both annual and monthly groundwater demands (Tables 2 and 3). They advise that additional assessment of threats to aquatic life is required if water demands exceed the thresholds.

Monthly surface water (Table 2) and ground water (Table 3) demands of <20% and <25% respectively represent a low stress level and so the maximum demands predicted for the Midhurst SPA represent a low probability of stress to aquatic life.

Table 2. Surface Water Quantity Stress Threshold (MNR/MOE 2011).

| Surface Water Quantity Stress Level Assignment | Maximum Monthly Percent Water Demand |
|---|---|
| Significant | >50% |
| Moderate | 20%-50% |
| Low | <20% |

Table 3. Groundwater Quantity Stress Threshold (MNR/MOE 2011).

| Groundwater Quantity Stress Level Assignment | Monthly Maximum Percent Water Demand |
|---|---|
| Significant | >50% |
| Moderate | >25% |
| Low | 0-25% |

MNR/MOE (2011) also developed more conservative stress thresholds for coldwater streams. An unacceptable impact is defined by a reduction in groundwater discharge of more than 20% of average monthly baseflow. Localized areas are assigned moderate risk if groundwater discharge is reduced

[2] *DFO. 2013. Framework for Assessing the Ecological Flow Requirements to Support Fisheries in Canada. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/017.*

[3] *MNR and MOE. 2011. Water Budget and Water Quantity Risk Assessment Guide, Drinking Water Source Protection Program.*

between 10% - 20% of existing monthly baseflow. These thresholds are directly applicable to Midhurst as they represent the response of surface water to removal of groundwater, and not to direct surface water takings.

The modelled baseflow losses presented in Table 1 therefore represent a “Low” probability of stress for Black Creek, Matheson Creek and Willow Creek and do not require additional assessment of water budget requirements.

Gleeson and Richter (2017[4]) determined that high-levels of ecological protection are provided if groundwater pumping decreases monthly baseflow by <10% through time.

Linnansaari et al. (2013[5]) compared approaches to deriving ecological flow thresholds and listed a number of advantages to Percentage of Flow (POF) methods such as those discussed above. Advantages include:

- POF methods suggest allowable deviation from natural flow regime, rather than assigning specific volume of flow to be maintained, which is more protective of flow variability.
- POF methods reduce scientific uncertainty because they consider only the magnitude of flow altered and not the timing, duration or frequency.
- POF methods are easy to implement and understand.

The modelled baseflow losses presented in Table 1 do not account for surface water inputs that would mitigate loss of groundwater. Nonetheless, the modelled percent flow losses shown in Table 1 remain less than the most stringent guidelines of 10% presented in peer-reviewed and regulator-based literature and so will not adversely affect existing aquatic habitat and ecological functions.

3. Changes in Wetted Perimeter

The Wetted Perimeter Method is a hydraulic rating method commonly used in Canada and the USA to assess ecological flow thresholds through an assessment of habitat quantity (Kilgour et al. 2005[6]). A relationship between wetted perimeter (potential habitat area) and discharge is developed at a site and a breakpoint is identified along the curve, below which the aquatic habitat conditions for benthic invertebrates rapidly decline as the water level drops.

Willow Creek was selected for our analysis because the highest monthly % baseflow reductions were predicted in the study reach as compared to Black or Matheson Creeks. Existing data that were used to measure flows in Willow Creek approximately 100 m downstream of Finlay Mill Road in 2015, 2016 and 2017 (HESL 2018[7]) were used to develop a wetted perimeter-discharge curve (Table 4; Figure 1). These

[4] *Gleeson, T. and B. Richter. 2017. How much groundwater can we pump and protect environmental flows through time? Presumptive standards for conjunctive management of aquifers and rivers. River Research and Applications.*

[5] *Linnansaari, T., W.A. Monk, D.J. Baird and R.A. Curry. 2013. Review of approaches and methods to assess Environmental Flows across Canada and internationally. DFO. Can. Sci. Advis. Sec. Res. Doc. 2012/039. Vii + 75 pp.*

[6] *Kilgour, B.K., Neary,, J., Ming, D. and D. Beach. 2005. Preliminary Investigations of the Use and Status of Instream -Flow-Needs Methods in Ontario with Specific Reference to Application with Hydroelectric Developments. Canadian Manuscript Report of Fisheries and Aquatic Sciences 2723.*

[7] *Hutchinson Environmental Sciences Ltd. 2018. Baseline Aquatic Studies for Midhurst Development – Willow Creek. Prepared for Midhurst Landowners Group.*

data are adequate for calculation of flows but not precise enough for a clear determination of the breakpoint below which aquatic habitat conditions for benthic invertebrates rapidly decline. Nonetheless, the information provides an indication of the relationship between discharge and wetted width in Willow Creek and the equation of the trendline can be used to estimate changes in wetted width associated with future groundwater takings.

Table 4. Wetted Perimeter and Discharge Measurements Collected from Willow Creek Between 2015 and 2017.

| Date | Discharge ($m^3$/sec) | Wetted Perimeter (m) |
|---|---|---|
| **18-Jun-15** | 0.949 | 9 |
| **30-Jul-15** | 0.204 | 8.5 |
| **20-Aug-15** | 0.895 | 8 |
| **31-Aug-15** | 0.269 | 7.6 |
| **14-Sep-15** | 0.435 | 7.7 |
| **30-Sep-15** | 0.297 | 7.2 |
| **18-May-16** | 1.323 | 8.4 |
| **16-Jun-16** | 0.1387 | 7.6 |
| **5-Jul-16** | 0.0823 | 7.2 |
| **11-Aug-16** | 0.0452 | 7.6 |
| **14-Aug-16** | 0.1093 | 7.6 |
| **3-Oct-16** | 0.1088 | 7.5 |
| **21-Oct-16** | 0.1936 | 7.6 |
| **24-Jul-17** | 1.0458 | 8.6 |
| **25-Aug-17** | 0.098 | 7.2 |
| **11-Sep-17** | 0.0779 | 7 |
| **25-Sep-17** | 0.0823 | 7.4 |
| **30-Oct-17** | 0.3185 | 8.6 |
| **22-Nov-17** | 1.2786 | 9.2 |

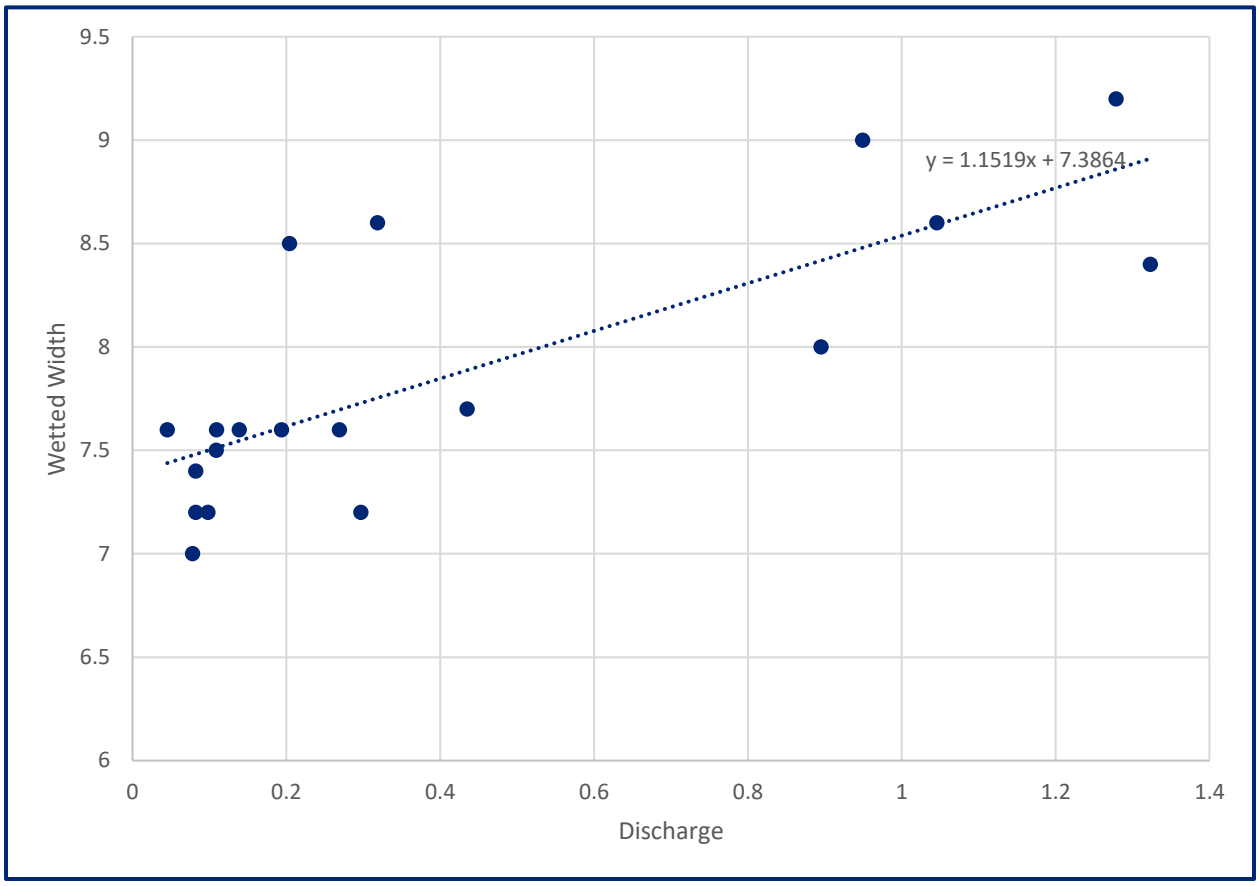


Figure 1. Wetted Width-Discharge Relationship in Willow Creek Downstream of Finlay Mill Road.

Changes in wetted width were assessed in Willow Creek for August, September and October 2017 because continuous data were available for that period and those months were predicted to have the greatest percentage baseflow loss associated with future groundwater takings (Table 1). Changes in wetted width were also predicted on the three days of the lowest measured discharge: July 5, 2016, August 11, 2016 and September 11, 2017.

Predicted changes in wetted width and supporting data are provided in Tables 5 and 6. Data includes:

- Average discharge values from continuous logger data (Table 5)
- Discharge values measured in the field with a flow meter (Table 6)
- Wetted width calculated from the wetted width-discharge trendline equation (Table 5)
- Wetted width measured in the field (Table 6)
- Average discharge values less volumetric baseflow losses presented in Table 1
- Future predicted wetted width resulting from baseflow loss
- Resulting changes in wetted width

Changes in wetted width were calculated to range from 0.013 m to 0.015 m (Table 5). Predicted changes during low flows were similar as changes in wetted perimeter were based on the same trendline equation

and volumetric baseflow loss (Table 6). It is clear that predicted changes to the wetted perimeter are minute (<0.5%) and well within natural variation.

Table 5. Predicted Changes in Continuously Measured Wetted Width Associated with Groundwater Takings.

| Month | Average Discharge ($m^3$/sec) | Modelled Wetted Width (m) | Discharge less Groundwater Takings ($m^3$/sec) | Future Predicted Wetted Width (m) | Change in Wetted Width (m) | Change in Wetted Width (%) |
|---|---|---|---|---|---|---|
| **AUG** | 0.11 | 7.52 | 0.10 | 7.50 | 0.013 | 0.17% |
| **SEPT** | 0.13 | 7.53 | 0.12 | 7.52 | 0.015 | 0.2% |
| **OCT** | 0.31 | 7.75 | 0.30 | 7.73 | 0.015 | 0.19% |

Table 6. Predicted Changes in Wetted Width Associated with lowest Measured Discharge Due to Groundwater Takings

| Date | Measured Discharge ($m^3$/sec) | Measured Wetted Width (m) | Discharge less Groundwater Takings ($m^3$/sec) | Future Predicted Wetted Width (m) | Change in Wetted Width (m) | Change in Wetted Width (%) |
|---|---|---|---|---|---|---|
| **JUL 5, 2016** | 0.08 | 7.2 | 0.07 | 7.18 | 0.015 | 0.22% |
| **AUG 11, 2016** | 0.05 | 7.6 | 0.03 | 7.59 | 0.013 | 0.17% |
| **SEPT 11, 2017** | 0.08 | 7.0 | 0.30 | 6.99 | 0.015 | 0.21% |

4. Willow Creek Mass Balance Thermal Calculation

A mass balance thermal calculation was used to predict the response of Willow Creek and its tributaries to any loss of base flow and cool groundwater inputs during the summer period of maximum stream temperatures and low flows. Three sites were modelled using the records of flow and temperature obtained by HESL between 2015 and 2017 for the baseline studies (HESL 2018a, HESL 2018b[8], HESL 2018c[9]):

- Black Creek at Wilson Road (Site SWC), a cold water watercourse that drains the Carson Neighbourhood, supports a reproducing brook trout population, and has records of flow and temperature from the summer of 2015 (May 13 – August 31).
- Matheson Creek at County Road 27 (Site Math3) is a cold water creek that will receive stormwater flow from the Midhurst Heights development which forms a portion of the Doran Neighbourhood and has records of flow and temperature from the summer of 2016 (May 18 – August 31).

[8] *Hutchinson Environmental Sciences Limited. 2018. Baseline Aquatic Studies for Midhurst Development – Carson Road Development. Prepared for Midhurst Landowners Group*

[9] *Hutchinson Environmental Sciences Limited. 2018. Baseline Aquatic Studies for Midhurst Secondary Plan – Midhurst Heights Development. Prepared for Midhurst Landowners Group.*

- Willow Creek at Finlay Mill Road (Site Mid2) in Midhurst is the cool-warm water main stem of Willow Creek that will receive a portion of the stormwater flow from the Doran Neighbourhood and has records of flow and temperature from the late summer of 2017 (July 25 – August 31).

Estimates of the potential reductions in groundwater flow during the summer months were provided by Golder Associates (Table 1. pers. comm. Devin Hannan, November 2017). These are considered to be the maximum potential volumetric reductions as a result of using the maximum permitted pumping rates for summer. The modelled flow losses were estimated for much greater catchment areas of Willow Creek, Black Creek and Matheson Creek than the monitoring point catchment areas and thus overestimate the potential losses for the MSPA in the upper portions of the watershed. These flow losses were converted to percentage reductions in baseflow and applied to the low flow measurements made by HESL to estimate the losses to the creeks and any resultant changes in temperature.

Daily stream flow records for each site were obtained as described in the baseline reports prepared by HESL for the Midhurst SPA (HESL 2017 a[10],b[11],c[12]). The streamflow hydrograph is made up of surface and ground water components with the proportion of groundwater increasing as surface runoff decreases after a rain event and as summer proceeds. Minimum flows in the Midhurst SPA occur in mid to late summer but the actual contributions of surface and ground water to total flow during these periods is not known. We therefore made a conservative assumption that all creek flow over the period of the simulation was groundwater such that all flow was considered "baseflow".

Groundwater temperatures were estimated from records of "stream bed temperature" data provided for local groundwater streams within the NVCA watershed by Golder Associates (John Easton. pers. comm. December 2017). These data showed an approximately linear increase in temperature from 8$^{o}$C - 12$^{o}$C between May and September. These increases and rates of increase were assumed for the groundwater portion of the thermal model and applied to the daily estimates.

The calculation used the measured daily flow records for each creek and reduced these by the percentage reductions provided in Table 1 for each creek and each month of simulation. This calculation estimated the response to the potential loss of groundwater to each creek at full Midhurst SPA build out. The heat content of the total creek flow (temperature x flow) was adjusted by the heat content (cooling) contributed by the groundwater (groundwater loss x groundwater temperature) to calculate the heat content of the resultant new (lower) flow in the streams. The revised heat content (temperature x flow) was then divided by the reduced flow to estimate the resultant temperature increases (Table 7).

[10] *Hutchinson Environmental Sciences Ltd. 2017. Baseline Aquatic Studies for Midhurst Development – Carson Road Development. Prepared for Midhurst Landowners Group*

[11] *Hutchinson Environmental Sciences Ltd. 2017. Baseline Aquatic Studies for Midhurst Development – Midhurst Heights Development 2015-2016. Prepared for Midhurst Landowners Group*

[12] *Hutchinson Environmental Sciences Ltd. 2017. Baseline Aquatic Studies for Midhurst Development – Village of Midhurst 2015-2016. Prepared for Midhurst Landowners Group*

Table 7. Predicted temperature response of Midhurst area tributaries to reduced groundwater inputs in summer.

| | Black Creek | Matheson Creek | Willow Creek |
|---|---|---|---|
| **Simulation Period** | **May 13-Aug 31 2015** | **May 18 - Aug 31 2016** | **July 25 - Aug 30 2017** |
| **Baseline** | | | |
| Mean Temperature | 13.8 | 14.0 | 19.4 |
| Maximum Temperature | 16.7 | 16.4 | 23.7 |
| 75th Percentile Temperature | 14.6 | 15.2 | 21.2 |
| **Model Scenario Pumping at Full Build Out** | | | |
| Mean Temperature | 14.1 | 14.2 | 20.0 |
| Maximum Temperature | 17.3 | 16.6 | 24.4 |
| 75th Percentile Temperature | 14.9 | 15.4 | 21.9 |
| **Change** | | | |
| Mean Temperature | 0.28 | 0.15 | 0.61 |
| Maximum Temperature | 0.66 | 0.25 | 0.72 |
| 75th Percentile Temperature | 0.34 | 0.19 | 0.68 |

Average summer temperatures in Black Creek and Matheson Creek are estimated to increase by 0.28 and 0.15°C to 14.1 and 14.2°C respectively, with maximum temperatures of 17.3 and 16.6°C. The average summer temperature in Willow Creek will increase from 19.4 to 20°C and maximum temperature from 23.7 to 24.4°C. Current and predicted future flows and temperatures are plotted for each creek in Figures 2 – 4.

Figure 2. Current and predicted future flows and temperatures for Black Creek at Wilson Drive.

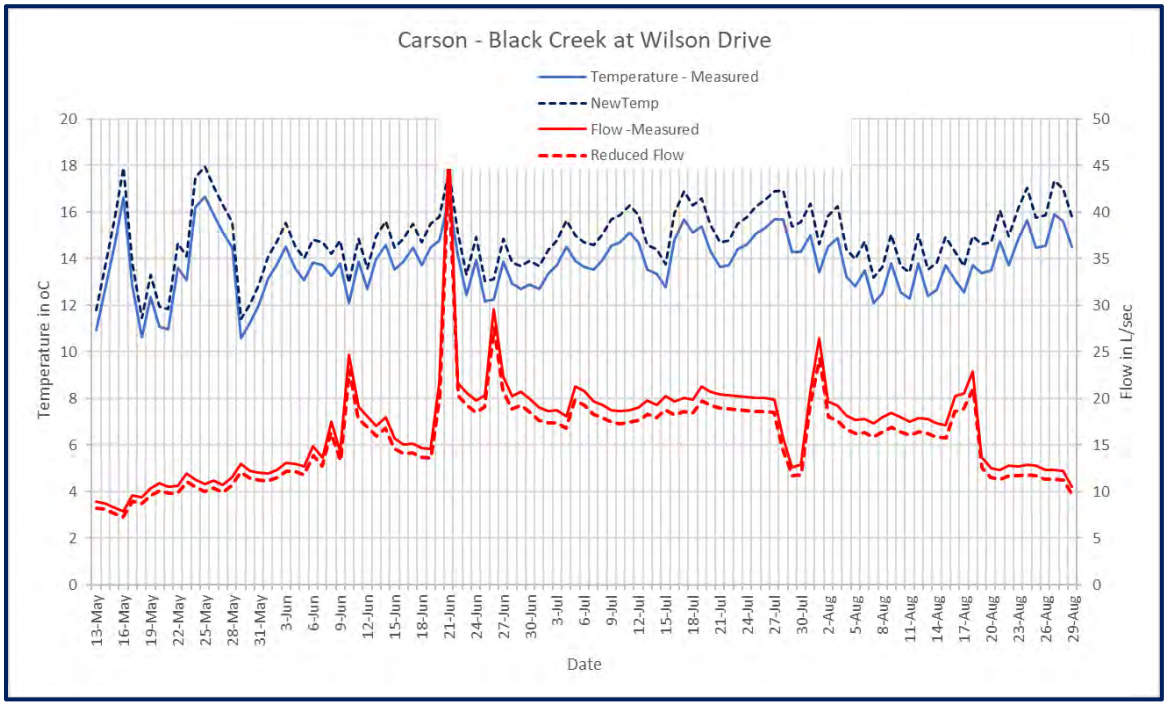



Figure 3. Current and predicted future flows and temperatures for Matheson Creek at CR 27.

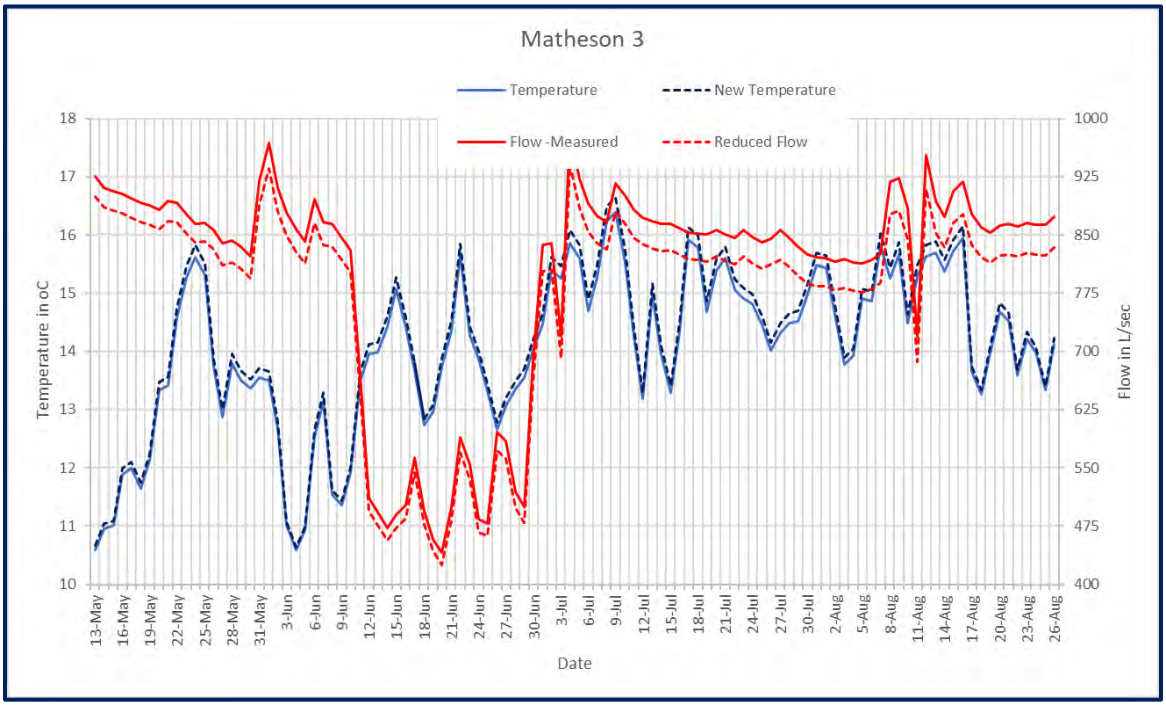
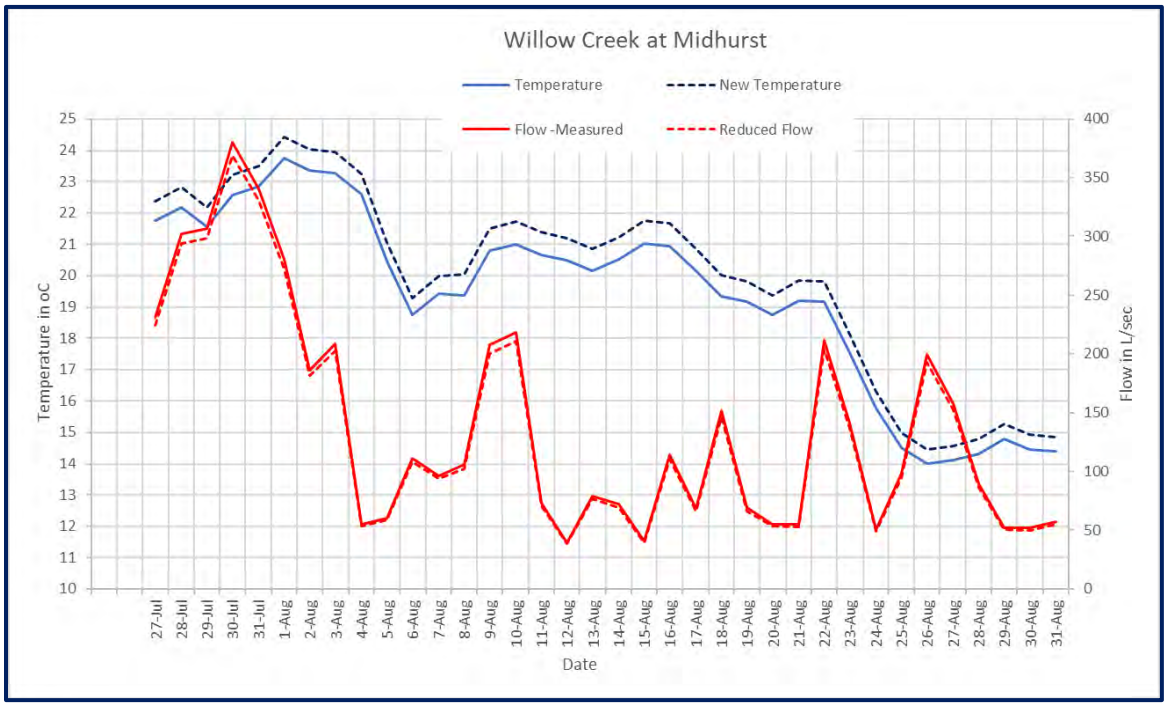


Figure 4. Current and predicted future flows and temperatures for Willow Creek in Midhurst.




The Provincial Water Quality Objective for water temperature is, *"The natural thermal regime of any body of water shall not be altered so as to impair the quality of the natural environment. In particular, the diversity, distribution and abundance of plant and animal life shall not be significantly changed."* (MOE 1994[13]). The determination of "significance" is difficult to define but NVCA has requested that aquatic communities should not be impacted by the proposed developments. Predicted changes in water temperature are best assessed against habitat requirements of a keystone species and in this case, appropriate target species are Brook Trout in Matheson and Black Creek, and Brown Trout in Willow Creek since those species are known to occupy the study reaches under investigation (HESL a,b,c).

Brook trout are sensitive to changes in water temperature because they do not tolerate water temperatures greater than 19 – 20 °C for long (Gibson 1966[14]). Brook trout are known to seek thermal refuge within streams at small scales (Ebersole et al. 2001[15]) but a general upper tolerance of 19 – 20 °C is evident throughout the literature. The predicted temperature changes in Black and Matheson Creek will still maintain creek temperatures well below the upper tolerance limits of Brook Trout.

Reported temperature limits for Brown Trout include a range from 12 - 19°C to support good growth and survival (US Department of the Interior 1986[16]) and 27.2°C as an upper limiting, near lethal water

[13] *Ministry of Environment. 1994. Provincial Water Quality Objectives.*

[14] *Gibson, R.J. 1966. Some Factors Influencing the Distribution of Brook Trout and Young Atlantic Salmon. Journal of the Fisheries Research Board of Canada 23: 1977-1980.*

[15] *Ebersole, J.L., Liss, W.J., and C.A. Frissell. 2001. Relationship Between Stream Temperature, Thermal Refuge and Rainbow Trout Abundance in Arid Land Streams in the Northwestern United States. Ecology of Freshwater Fish 10:1-10.*

[16] *US Department of the Interior. 1986. Habitat Suitability Index Models and Instream Flow Suitability Curves: Brown Trout. Fish and Wildlife Service.*

temperature (Needham 1969[17]). The predicted changes to water temperature associated with groundwater taking are <0.75°C and will maintain creek temperatures well below the upper limiting temperature requirements of Brown Trout.

Daily temperatures in Black Creek and Matheson Creek are <19°C at present and all predicted temperatures will remain below 19°C (Figures 2 and 3). Daily temperatures in Willow Creek exceeded the 19°C upper limit of the range defined to support good growth and survival on 25 of the 35 days modelled (Figure 4) and resident fish have adapted to these localized conditions and have the ability to seek cool water refuge. The thermal model predicted that temperatures will exceed 19°C on 27 of the 35 days under the maximum water taking, an increase of 2 days.

***Conclusions***

Modelling completed by Golder (2016) established that monthly volumetric baseflow losses as a result of proposed MSPA pumping at full build out are estimated to range from 985 $m^3$/day in Willow Creek at Midhurst in August to 2595 $m^3$/day in April, while percent losses range from 2.5% in Matheson Creek in February to 9.6% in Willow Creek at Midhurst in August. Average monthly volumetric baseflow loss was highest in Matheson Creek (2326 $m^3$/day), while percent loss was highest in Black Creek (7.2%).

1. Ecological Low Flow Guidelines

Modelled baseflow losses are less than the maximum loss guidelines presented in peer-reviewed and regulator-based literature, indicating no threats to aquatic life related to the water takings.

2. Changes in Wetted Perimeter

Changes in wetted width were calculated to range from 0.0131 m in August to 0.0149 m in October using data collected from 2015-2017. As noted previously, it is not possible to calculate a breakpoint in accordance with Wetted Perimeter Method protocols but it is clear that predicted changes to the wetted perimeter are a) minute, b) well within natural variation, and c) not anticipated to negatively affect ecosystem functions or features within Willow Creek.

3. Thermal Mass Balance Model

Average summer temperatures in Black Creek and Matheson Creek are estimated to increase by 0.28 and 0.15°C to 14.1 and 14.2°C respectively with maximum temperatures of 17.3 and 16.6°C. The average summer temperature in Willow Creek at Mid-2 will increase from 19.4 to 20°C and maximum temperature from 23.7 to 24.4°C.

Additionally, substantial baseline monitoring has been completed to characterize fish communities and habitat, including water temperatures, as part of the Adaptive Monitoring Plan (HESL 2017a.b,c). This monitoring will continue into the future construction and post-construction periods to assess impacts and

[17] *Needham, P.R. 1969. Trout Streams (Revised Edition). Winchester Press, New York. 241 pp.*

determine if adaptive management associated with stormwater or wastewater management is required to mitigate any potential impacts associated with groundwater taking.

In summary, the predicted potential effects on habitat and water temperature in Matheson, Black and Willow Creeks associated with groundwater takings will not adversely affect the habitat and future monitoring will allow early identification of changes and the implementation of mitigation, if required.

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# Memorandum

**Date:** **March 28, 2018**

**To:** **Joe Mullan – Ainley Group**

**From:** **Brent Parsons and Neil Hutchinson**

**Re:** **NVCA Dissolved Oxygen Comments**

---

On October 30th, 2017, a meeting was held between NVCA, HESL, Golder Associates, The Midhurst Landowner's Group, Ainley and the NVCA to discuss NVCA comments, dated June 30, 2017, on the Ainley response (March 3, 2017) to NVCA comments dated May 29, 2013 which included the following comment on dissolved oxygen effluent modelling and concentrations in the Minesing Wetland:

> *Dissolved oxygen analysis in the draft ACS uses 75th percentile summer water temperature (18.5 C) and 25th percentile dissolved oxygen (10.16 mg/L – unknown time period – possibly entire record) for model analysis. As noted above (Thermal Impacts), NVCA logger data indicates summer daily maxima of 24-25 C at and downstream of the proposed effluent outlet. Saturated DO at these temperatures is 8.24-8.4 mg/L – significantly lower than the 10.16 mg/L used in the model analysis. NVCA staff do not have DO logger data in this area and it is unknown whether saturated DO is appropriate to use or whether there may be diurnal DO deficits (DO less than saturation) to consider here.*
>
> *Given that modeling indicates a 2.4 km (Full Build-out) to 4.4 km (Phase 1) reach of DO decrease, NVCA staff recommend that DO be remodeled with more conservative summer water temperature and DO assumptions. Data acquired through DO logger deployment would be helpful in refining modeling.*
>
> *As noted in "Comprehensive Modeling Program" comments below, significant DO sags have been recently observed in Willow Creek (NVCA unpublished data) within Minesing Wetlands and it is important to understand whether WWTP effluent may potentially exacerbate this condition.*

HESL reviewed continuous temperature and dissolved oxygen monitoring data and updated the far-field dissolved oxygen concentrations using the QUAL2K model. The following paragraphs summarize those efforts.

Dissolved oxygen concentrations were predicted to decrease to a minimum concentration of 8.1 mg/L approximately 4.4 km downstream during Phase 1 and decrease to a minimum concentration of 7.8 mg/L approximately 2.4 km downstream of the proposed discharge location during full build-out.

As noted during our Oct. 30, 2017 meeting, the Assimilative Capacity Study (ACS) was completed to the requirements of the MOECC (1994) which stipulate the water quality statistics to use – in this case a 75$^{th}$ percentile summer water temperature data of 18.5°C measured at the Provincial Water Quality Monitoring Network station from 2002-2014, and 25$^{th}$ percentile dissolved oxygen data of 10.16 mg/L gathered from the Provincial Water Quality Monitoring Network station in Willow Creek at County Road 28 from 2005-2014.

Continuous water temperature data have been measured in Willow Creek by HESL and NVCA (Table 1). Note that NVCA temperature data often increases rapidly from <20°C to >24°C over a short duration (e.g. <1 hr). In our experience, such rapid increases occur when water levels drop and expose the loggers to air temperatures or loggers are removed but not shut off. NVCA agreed with this assessment and had not completed a thorough review of the dataset we received (I. Ockenden, personal communication, March 16, 2018). As a result, air temperatures were being recorded and were later misinterpreted as water temperatures. NVCA data collected in Willow Creek is presented in Figure 1 as an example. Breakpoints were therefore defined for each of these occurrences, datasets were refined by removing the suspect data points, and summary statistics were recalculated based on these refined datasets and included in Table 1 in *italics*. Corrected NVCA water temperature data ranged from 14.3°C to 23.9°C, with 75$^{th}$ percentile data ranging from 16.5°C to 21.0°C.

NVCA deployed water temperature loggers to define the thermal stability of Willow Creek following protocol outlined by Stoneman and Jones (1996[1]), which includes targeted sampling with the specific intent of recording the time of greatest heat stress (i.e. between July 1 and September 7) when air temperatures were predicted to be >24.5°C as recommended in the Stoneman and Jones protocol. While short deployments during maximum heat stress will capture extreme values, as intended, these episodes are short lived and not suitable for an ACS, because water quality guidelines for dissolved oxygen are intended to protect long-term exposure. As such, use of the 75$^{th}$ percentile value generated from a longer-term data set provides an appropriate comparison for the ACS because it provides a more realistic and appropriate dataset with which to calculate water temperature input values.

75$^{th}$ percentile water temperature values calculated from data collected by HESL in 2014 and 2017 ranged from 12.3°C to 18.0°C. The value of 18.5°C, used for assimilation modelling is higher than the 75$^{th}$ percentile logger values recorded by HESL, was gathered over a longer and more robust dataset, and represents the appropriate approach as preferred by MOECC, and therefore water temperatures included in the assimilation modelling were not updated since updated results would be less conservative.

[1] *Stoneman, C.L., and M.L. Jones. 1996. A simple method to classify stream thermal stability with single observations of daily maximum water and air temperature. North American Journal of Fisheries Management. 16:728-737.*

Figure 1. Continuous Water Temperature Data Collected by NVCA in Willow Creek between July 30 and August 12, 2014. Note the sudden increase in temperature on August 6, 2014.

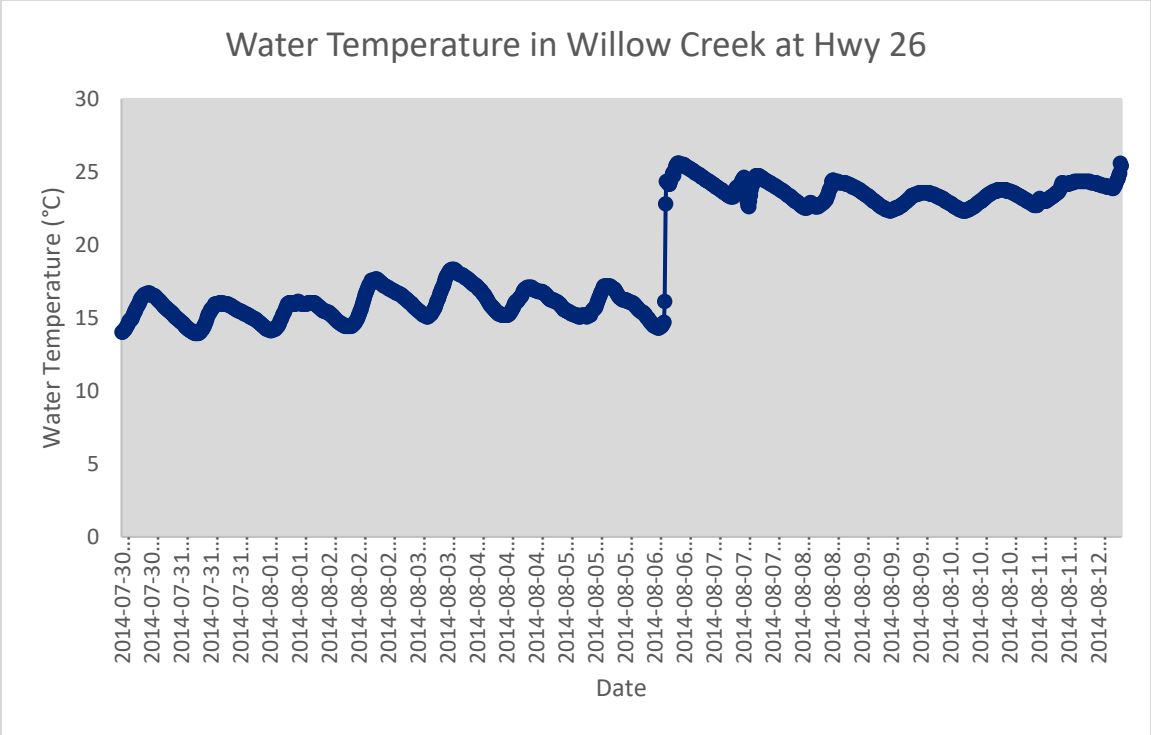



Table 1. Water Temperature Results from Continuous Loggers Located in Willow Creek.

| Organization | Location | Dates | Water Temperature (°C) | | |
|---|---|---|---|---|---|
| | | | Min | Max | 75% |
| HESL | Golf Course Rd | July 11 - Aug 13, 2014 | 13.9 | 20.8 | 18.0 |
| | | Sept 26 - Oct 31, 2017 | 6.30 | 17.4 | 12.3 |
| | Hwy 26 | July 11 - Aug 13, 2014 | 14.0 | 21.6 | 17.9 |
| | Vespra Valley | Sept 26 - Oct 31, 2017 | 6.28 | 17.6 | 12.4 |
| | Hwy 28 | Jul 26 - Oct 31, 2017 | 6.18 | 21.6 | 16.8 |
| NVCA | Golf Course Rd | July 30 - August 11, 2014 | 13.9 | 25.6 (*18.3*) | 23.5 (*16.5*) |
| | | June 22 - 29, 2009 | 14.6 | 20.9 | 19.5 |
| | Vespra Valley | July 30 - August 11, 2014 | 14.3 | 25.3 (*18.5*) | 23.4 (*16.7*) |
| | Hwy 28 | July 30 - August 12, 2014 | 14.6 | 25.5 (*19.7*) | 23.4 (*17.3*) |
| | Hwy 28 | July 11 - July 14, 2016 | 17.2 | 23.9 | 21.0 |
| | Hwy 28 | July 1 - July 14, 2017 | 16.8 | 25.8 (*22.7*) | 20.2 (*19.9*) |

Note: Results in *italics* have been corrected after a critical examination of the dataset.

Dissolved oxygen loggers were installed, and recorded dissolved oxygen concentrations every hour in Willow Creek at Golf Course Road, Vespra Valley Road and Highway 28 in 2017 (Table 2). Values ranged from 8.70 mg/L to 14.2 mg/L, and from 86.1% to 133%. Daily diurnal variation in dissolved oxygen saturation was evident in all datasets and was likely driven by photosynthesis and respiration patterns of algae and macrophytes. The lowest and most conservative 25$^{th}$ percentile value calculated was 9.99 mg/L at Highway 28 between July and October, 2017. This value was based on hourly measurements, including a representative number recorded at night and in the early morning to properly account for dissolved oxygen diurnal fluctuation within the creek.

The Qual2K model that was previously used to predict impacts to oxygen concentrations in Willow Creek was updated with 9.99 mg/L in response to NVCA comments as part of a conservative assessment. Originally, dissolved oxygen concentrations were predicted to decrease to a minimum concentration of 8.1 mg/L approximately 4.4 km downstream during Phase 1 and decrease to a minimum concentration of 7.8 mg/L approximately 2.4 km downstream of the proposed discharge location during full build-out based on an input value for dissolved oxygen of 10.16 mg/L (Table 3). **Minimum dissolved oxygen concentrations did not change when the model was updated.** The location of the minimum dissolved oxygen concentrations did change slightly, from 4.4 km downstream of the proposed effluent outfall during Phase 1 to 5.5 km downstream, and from 2.4 km downstream of the outfall during full build-out to 2.6 km downstream.

Table 2. Dissolved Oxygen Results from Continuous Loggers Located in Willow Creek.

| Site | Dates | Dissolved Oxygen (mg/L) | | | | | |
|---|---|---|---|---|---|---|---|
| | | mg/L | | | % | | |
| | | Min | Max | 25% | Min | Max | 25% |
| Golf Course Rd | Sept 26 - Oct 31, 2017 | 9.53 | 13.8 | 11.1 | 97.4 | 123 | 102 |
| Vespra Valley | Sept 26 - Oct 31, 2017 | 9.11 | 13.4 | 10.7 | 93.0 | 117 | 98.0 |
| Hwy 28 | Jul 26 - Oct 31, 2017 | 8.70 | 14.2 | 9.99 | 86.1 | 133 | 97.5 |

Table 3. Qual2k Dissolved Oxygen Modelling Results.

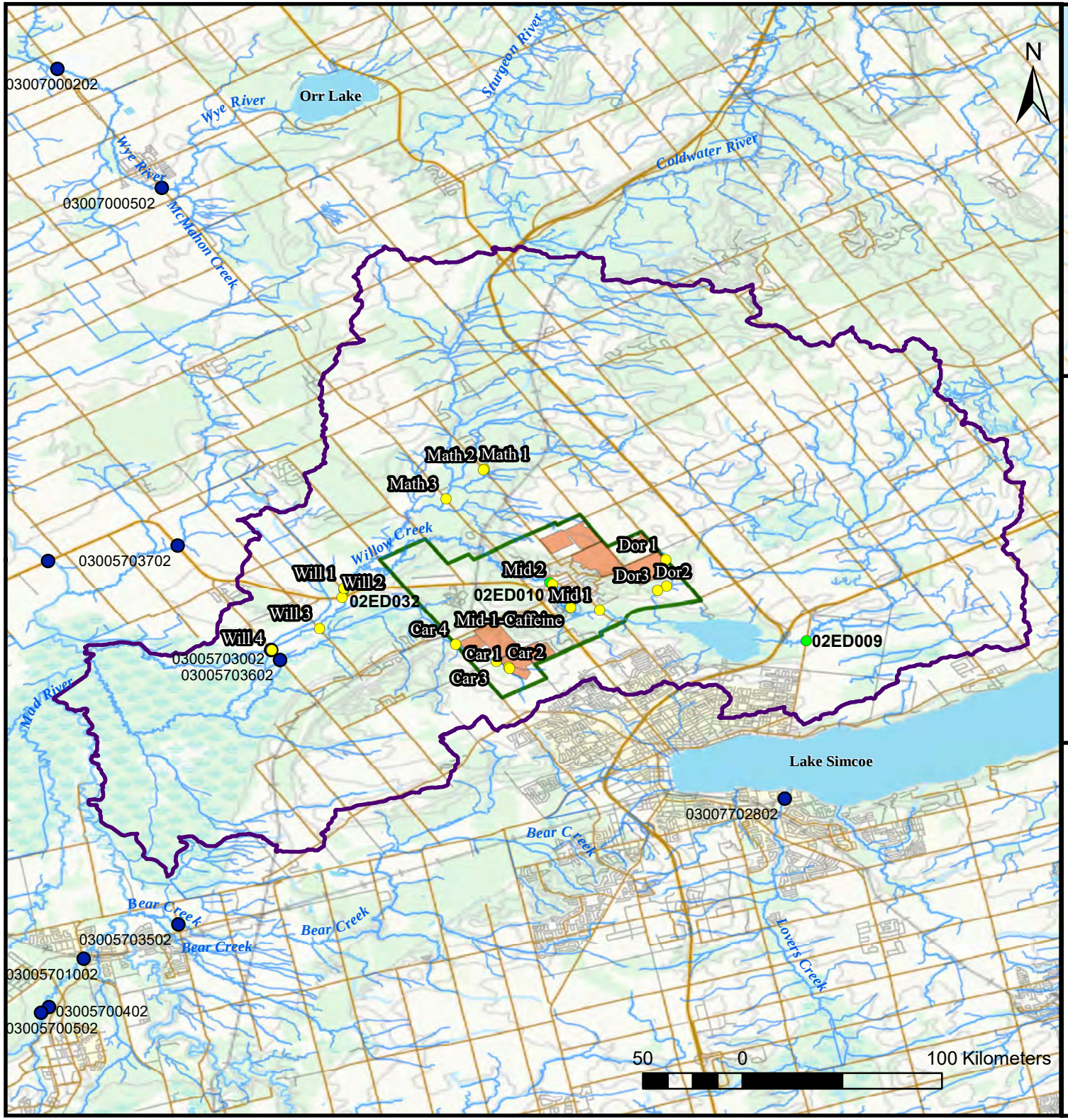
| | Phase | Background DO (mg/L) | Predicted Min DO (mg/L) | Predicted Min Location (km d/s) |
|---|---|---|---|---|
| ACS report (May 2016 draft) | Phase 1 | 10.16 | 8.1 | 4.4 |
| | Full Build-Out | | 7.8 | 2.4 |
| 2018 Model Update | Phase 1 | 9.99 | 8.1 | 5.5 |
| | Full Build-Out | | 7.8 | 2.6 |

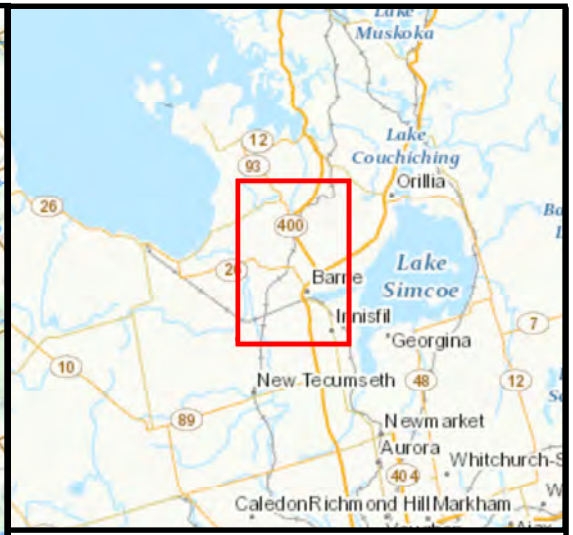
The ACS shows that all parameters are maintained within the PWQO after ~230m downstream of the WWTP discharge, and that dissolved oxygen concentrations remain above the PWQO at all downstream locations, even within the mixing zone. These predictions were made for the low flow (7Q20) condition and 7Q20 flows will be exceeded 99.5 – 99.9% of the time[2]. Therefore, changes in dissolved oxygen will be less than those predicted more than 99% of the time. These predictions will be verified through the Monitoring and Adaptive Management Plan for Willow Creek and other sites upstream of the wetland.

The Minesing Wetland is >6,000 hectares in size and four major and twenty minor watersheds flow into the wetland, including the Willow Creek subwatershed which encompasses 11% of the total watershed area. There are a multitude of biotic and abiotic factors such as the consumption of oxygen by microorganisms during decomposition and oxygen produced by periphyton, phytoplankton and macrophytes during photosynthesis, that impact dissolved oxygen concentrations in the Minesing Wetland and the inflowing riverine systems. All of the abiotic and biotic factors also vary in response to physical, chemical and biological factors and land use in the watershed.

The NVCA has stated that “significant dissolved oxygen sags” have been recently observed in the Minesing Wetland and although it is not clear what natural processes are driving these changes in concentration, or what is meant by “significant”, we conclude that any changes resulting from the introduction of highly treated effluent into Willow Creek will be minute, impossible to measure or separate from natural processes and will not result in any additional exceedances of water quality guidelines. Assimilation modelling has been completed to the requirements of the MOECC and shows that dissolved oxygen concentrations are predicted to remain well above the PWQO in Willow Creek, even in the most sensitive low flow period. Questions on the dynamics of dissolved oxygen patterns in the Minesing Wetland are of a research nature and are outside of the reasonable scope of the ACS and the Master Drainage Plan which show that there will be minimal changes in dissolved oxygen and that the changes will have no ecological consequence. As previously mentioned, this will be monitored as part of the Adaptive Management Plan.

[2] *Trent University, 2004. Considering baseflow as a low flow or instream flow. WSC Report No.04-2004 Appendix. Watershed Science Centre 21pp.*




## Legend

- Baseline Monitoring Sites
- Water Survey of Canada Stations
- PWQMN Stations
- Draft Plan Boundaries
- Lakes
- Rivers
- Midhurst Settlement Area Boundary
- Willow CreekWatershed

**Figure 1:**
Willow Creek
Watershed

**Project:** Midhurst Baseline Monitoring Program

**Project #:** J140054

Project Lead: Kris Hadley
Prepared by: Kris Hadley
Data Source: HESL,Ontario Land
Coordinate System: WGS 1984

Hutchinson
Environmental Sciences Ltd.

## Reid Mitchell

**From:** Joe Mullan <mullan@ainleygroup.com>
**Sent:** May-15-18 11:41 PM
**To:** Reid Mitchell
**Subject:** FW: Traffic Summaries
**Attachments:** VER 1 Traffic Cumm. Chart.xls; VER 2 Traffic Cumm. Chart 3-13-2017.xls

**Hi Reid**

Here is the Mar 13, 2017 email from Gerald Scanlan that we received via the Mayor.

Regards,

J. A. Mullan, P.Eng.
President & CEO

Ainley

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**From:** Bill French [mailto:Bill.French@springwater.ca]
**Sent:** Monday, March 13, 2017 10:16 AM
**To:** Joe Mullan <mullan@ainleygroup.com>
**Cc:** Robert Brindley <Robert.Brindley@springwater.ca>; Mark Archer <Mark.Archer@springwater.ca>
**Subject:** FW: Traffic Summaries

Can you respond as Gerry has requested.

As I mentioned a while back I would like to see a chart showing current road design capacity of streets like Doran, Findlay Mill, Park Trail, Belmont, St Vincent, Pooles and Wattie, their current usage in actual traffic numbers and then compare that to new designs and capacity and expected traffic flows. I would imagine some streets that will be used as alternative routes will see 5 and 10 fold increases and I would like the residents to know that up front. To me the EA lacks an important study "Social Impact".

Thanks

Bill

*Bill French*
Mayor
Township of Springwater
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The information contained in this message is directed in confidence solely to the person(s) named above and may not be otherwise distributed, copied or disclosed.

**From:** GERALD SCANLAN [geraldscanlan@rogers.com]
**Sent:** March 13, 2017 8:34 AM
**To:** Bill French; Bill French; Gerry Scanlan
**Subject:** Traffic Summaries

Bill

Attached are two versions of the traffic summaries we discussed on Friday.
These are excel sheets for easy manipulation of numbers,

version 1 is a lot more palatable then version 2.

Could you please have Joe Mullan confirm which summary is correct and let me know.

Thanks
gerry

Gerry Scanlan
Broker of Record / Owner
Scanlan Real Estate Limited
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Fax 416 491 7635
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MIDHURST TRAFFIC ESTIMATES

VERSION 1

| | | AADT 2018-2031 Cumulative MSP Phase 1 Totals | AADT 2034-2041 Cumulative MSP Phase 2 Totals | AADT 2041 NO MSP TRAFFIC TOTALS | Cumulative 2018-2041 TOTALS |
|---|---|---|---|---|---|
| Pooles Road | Just East of St Vincent St Int. | 1865 | 5370 | 1710 | 8945 |
| St Vincent Street | Just South of Willow Creek | 2095 | 5010 | 3650 | 10755 |
| Finlay Mill Road | Just East of Hwy 26 int. | 3755 | 5700 | 6975 | 16430 |
| Forbes Road | Between Hwy 400 and Old Sec. | 11230 | 23870 | 2970 | 38070 |
| Forbes Rd./Craig Rd | Just East of County Rd 27 int. | 4720 | 5850 | 0 | 10570 |
| Doran Road | Just East of Finlay Mill Rd int | 2970 | 5210 | 3640 | 11820 |
| Doran Road | Just East of County Rd 27 int. | | | | |
| Anne Street | South of Carson Rd | | | | |
| Snow Valley Road | Just West of Hwy 26 int | 8575 | 9745 | 3680 | 22000 |
| Hwy 26 | South of Carson Rd | 11020 | 12495 | 23350 | 46865 |
| County Rd 27 | North of Craig Road Int | 4150 | 5205 | 10075 | 19430 |
| Wilson Road | South of Carson Rd Int. | 5790 | 6125 | 8930 | 20845 |
| TOTALS | | 56170 | 84580 | 64980 | 205730 |

MIDHURST TRAFFIC ESTIMATES

VERSION 2

| | | AADT 2018-2031 Cumulative MSP Phase 1 Totals | AADT 2034-2041 Cumulative MSP Phase 2 Totals | AADT 2041 NON MSP TRAFFIC TOTALS | Cumulative 2018-2041 TOTALS |
|---|---|---|---|---|---|
| Pooles Road | Just East of St Vincent St Int. | 6496 | 5370 | 1710 | 13576 |
| St Vincent Street | Just South of Willow Creek | 5514 | 5010 | 3650 | 14174 |
| Finlay Mill Road | Just East of Hwy 26 int. | 11438 | 5700 | 6975 | 24113 |
| Forbes Road | Between Hwy 400 and Old Sec. | 30627 | 23870 | 2970 | 57467 |
| Forbes Rd./Craig Rd | Just East of County Rd 27 int. | 15216 | 5850 | 0 | 21066 |
| Doran Road | Just East of Finlay Mill Rd int | 9104 | 5210 | 3640 | 17954 |
| Doran Road | Just East of County Rd 27 int. | | | | |
| Anne Street | South of Carson Rd | | | | |
| Snow Valley Road | Just West of Hwy 26 int | 30659 | 9745 | 3680 | 44084 |
| Hwy 26 | South of Carson Rd | 38291 | 12495 | 23350 | 74136 |
| County Rd 27 | North of Craig Road Int | 14351 | 5205 | 10075 | 29631 |
| Wilson Road | South of Carson Rd Int. | 21012 | 6125 | 8930 | 36067 |
| TOTALS | | 182708 | 84580 | 64980 | 332268 |

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, Ontario, L9Y 4J58Z7
Tel: (705) 445-3451 ▪ Fax: (705) 445-0968
E-mail collingwood@ainleygroup.com

May 25, 2017 File #113027

Mr. Gerry Scanlan
17 Pooles Road
Midhurst, Ontario
L0L 1X1

Ref: **Township of Springwater,**
**Midhurst Class Environmental Assessment (Phase 3 & 4)**
**Response to Follow Up Enquiry**

Dear Mr. Scanlan:

Thank you for your continued interest in the Midhurst Class EA. In response to your March 13, 2017 email that we received via Mayor French we provide the following response.

As part of your email you had provided two spreadsheets within your interpretation of the traffic data previously provided, in that you were attempting to calculate the "Total Traffic" for the 2041 including both general background growth and the development traffic resulting from the Midhurst Secondary plan. Unfortunately, both your methods of calculating the Totals were incorrect. In particular, within your table labeled Version 1 the first three columns are correct; however, the total is only the summation of the columns 2 and 3. Within your table labelled Version 2 columns 2 and 3 are correct but column 1 is incorrect.

To assist with the calculation of the "Total Traffic" in the horizon year 2041 we attached a new Table 3, which is a combination of the previously provided Tables 1 & 2. As you can see the Total 2041 Traffic is the summation of the 2041 Background and 2041Development Traffic (highlighted columns).

Hopefully this clarifies this matter for you, however if you have any further questions on, please do not hesitate to contact our office.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P. Eng.
President & CEO

*S:\113027 Midhurst\Correspondence\Letter\Follow Response to Mr Scanlan (May 25 2017).docx*

## MIDHURST CLASS EA

## TABLE 3 - 2013 TO 2041 BACKGROUND AND DEVELOPMENT TRAFFIC ON EXISTING STREETS

| | | Existing 2013 Traffic Counts | | | Background Growth Without MSP Development Two Way Traffic | | | | | | | | | | Development Generated Traffic Two Way Traffic | | | | | | | | | Total 2041 Traffic (Existing + Development |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Road Links** | **Position** | | | | **2016** | **2018** | **2022** | **2025** | **2027** | **2031** | **2034** | **2036** | **2039** | **2041** | **2018** | **2022** | **2025** | **2027** | **2031** | **2034** | **2036** | **2039** | **2041** | |
| | | | | | | | | | | | | | | | Ph1 - St 1 | Ph1 - St 2 | Ph1 - St 3 | Ph1 - St 4 | P1 - St 5 | Ph2 - St 1 | Ph2 - St 2 | Ph2 - St 3 | Ph2 - St 4 | |
| Residential units | | | | | | | | | | | | | | | 980 | 1,116 | 778 | 626 | 1,150 | 1,009 | 750 | 725 | 724 | |
| Equivalent Employment | | | | | | | | | | | | | | | 100 | 100 | 100 | 50 | 0 | 0 | 0 | 0 | 0 | |
| Stage Total Units | | | | | | | | | | | | | | | 1,080 | 1,216 | 878 | 676 | 1,150 | 1,009 | 750 | 725 | 724 | |
| Cumulative Total Units | | | | | | | | | | | | | | | 1,080 | 2,296 | 3,174 | 3,850 | 5,000 | 6,009 | 6,759 | 7,484 | 8,208 | |
| | | **AM** | **PM** | **AADT** | **AADT** | **AADT** | **AADT** | **AADT** | **AADT** | **AADT** | **AADT** | **PM** | **AADT** | **AADT** | **AADT** | **AADT** | **AADT** | **AADT** | **AADT** | | | | **AADT** | **AADT** |
| Pooles Road | Just East of St. Vincent Street Int. | 116 | 143 | 1,295 | 1,230 | 1,360 | 1,415 | 1,465 | 1,495 | 1,555 | 1,602 | 182 | 1,699 | 1,710 | 403 | 1,172 | 1,620 | 1,436 | 1,865 | | | | 5,370 | 7,080 |
| St. Vincent Street | Just South of Willow Creek | 243 | 308 | 2,755 | 2,815 | 2,900 | 3,015 | 3,105 | 3,170 | 3,300 | 3,399 | 391 | 3,606 | 3,650 | 453 | 568 | 785 | 1,613 | 2,095 | | | | 5,010 | 8,660 |
| Finlay Mill Road | Just East of Hwy 26 int. | 435 | 619 | 5,220 | 5,440 | 5,555 | 5,770 | 5,945 | 6,080 | 6,315 | 6,504 | 786 | 6,901 | 6,975 | 811 | 1,671 | 2,310 | 2,891 | 3,755 | | | | 5,700 | 12,675 |
| Forbes Road | Between Hwy 400 and Old Second Rd. | 187 | 262 | 2,245 | 2,315<br>2,300 | 2,365 | 2,460 | 2,420 | 2,590 | 2,685 | 2,739 | 326 | 2,877 | 2,970 | 2,426 | 3,494 | 4,830 | 8,647 | 11,230 | | | | 23,870<br>5,850 | 26,840<br>5,850 |
| Forbes Rd/Craig Rd | Just East of County Rd 27 Int | NA | NA | | | | | | | | | | | | 1,020 | 2,452 | 3,390 | 3,634 | 4,720 | | | | | |
| Doran Road | Just east of Finlay Mill Rd Int | 233 | 368 | 3,005 | 3,095 | 3,130 | 3,210 | 3,275 | 3,310 | 3,395 | 3,463 | 434 | 3,603 | 3,640 | 642 | 1,345 | 1,860 | 2,287 | 2,970 | | | | 5,210 | 8,850 |
| Doran Road | Just east of County Rd 27 Int. | UNK | UNK | | | | | | | | | | | | NA | NA | NA | | NA | | | | | |
| Anne Street | South of Carson Rd | UNK | UNK | | | | | | | | | | | | NA | NA | NA | | NA | | | | | |
| Snow Valley Road | Just west of Hwy 26 int. | 233 | 323 | 2,780 | 2,865<br>3,000 | 2,925 | 3,050 | 3,130 | 3,210 | 3,335 | 3,435 | 412 | 3,644 | 3,680 | 1,852 | 5,679 | 7,850 | 6,603 | 8,575 | | | | 9,745 | 13,425 |
| Hwy 26 | South of Carson Road Int. | 1,565 | 2,021 | 17,930 | 18,490<br>21,000 | 18,840 | 19,560 | 20,115 | 20,500 | 21,275 | 21,913 | 2,545 | 23,248 | 23,350 | 2,380 | 6,886 | 9,520 | 8,485 | 11,020 | | | | 12,495 | 35,845 |
| County Rd 27 | North of Craig Road Int | 608 | 916 | 7,620 | 7,870<br>10,900 | 7,935 | 8,345 | 8,595 | 8,770 | 9,125 | 9,399 | 1,164 | 9,971 | 10,075 | 896 | 2,564 | 3,545 | 3,196 | 4,150 | | | | 5,205 | 15,280 |
| Wilson Road | South of Carson Rd Int. | 622 | 675 | 6,485 | 7,150<br>6,800 | 7,275 | 7,540 | 7,750 | 7,890 | 8,170 | 8,415 | 958 | 8,841 | 8,930 | 1,251 | 3,993 | 5,520 | 4,458 | 5,790 | | | | 6,125 | 15,055 |

Notes: AADT derived from 5 X (AM +PM Peak)
AADT for Phase 1 Stage 2 is an interpolation between 2018 and 2025 proportioned on cumulative total of units
AADT for Phase 1 Stage 4 is an interpolation between 2025 and 2031 proportioned on cumulative total of units

## Reid Mitchell

**From:** Brian Goodreid <goodreidplanninggroup@gmail.com>
**Sent:** March-23-15 1:34 PM
**To:** Joe Mullan
**Cc:** Stan Kirsch
**Subject:** Frankcom Estate Lands - Draft Plan Concept & Related Engineering Drawings
**Attachments:** Draft Plan Concept August 2014.pdf; Midhurst Select Features Diagram (2).pdf; SAN-1 Sanitary Sewer Plan Concept_July 2014 .pdf; STM-1 Storm Sewer Plan Concept_July 2014 .pdf; WM-1 Watermain Plan Concept _July 2014 .pdf

Hi Joe,

The Goodreid Planning Group provides planning services to the Estate of Marie Louise Frankcom in connection with the development of its lands at 124 Doran Road in Midhurst.

In this regard, and for your use and information, I am providing you with the Estate's draft plan subdivision concept and related engineering drawings that form part of the Estate's bonus population application filed pursuant to the County of Simcoe's Official Plan.

I would ask that the Estate's draft plan concept and its engineering drawings (see attached) be taken into consideration in any work that your firm does as part of the Municipal Class EA program currently underway for Midhurst.

If you need anything further from the Estate (for example, its engineering firm's functional servicing report) please let me or Stan Kirsch know.

Mr. Kirsch can be reached by email at the address shown above or by calling 416-487-4835.

Kind Regards,

Brian Goodreid, MCIP, RPP
Principal

GOODREID PLANNING GROUP
274 Burton Avenue
Suite 1201
Barrie, Ontario
L4N 5W4
P: 705-331-5717
F: 705-722-5660

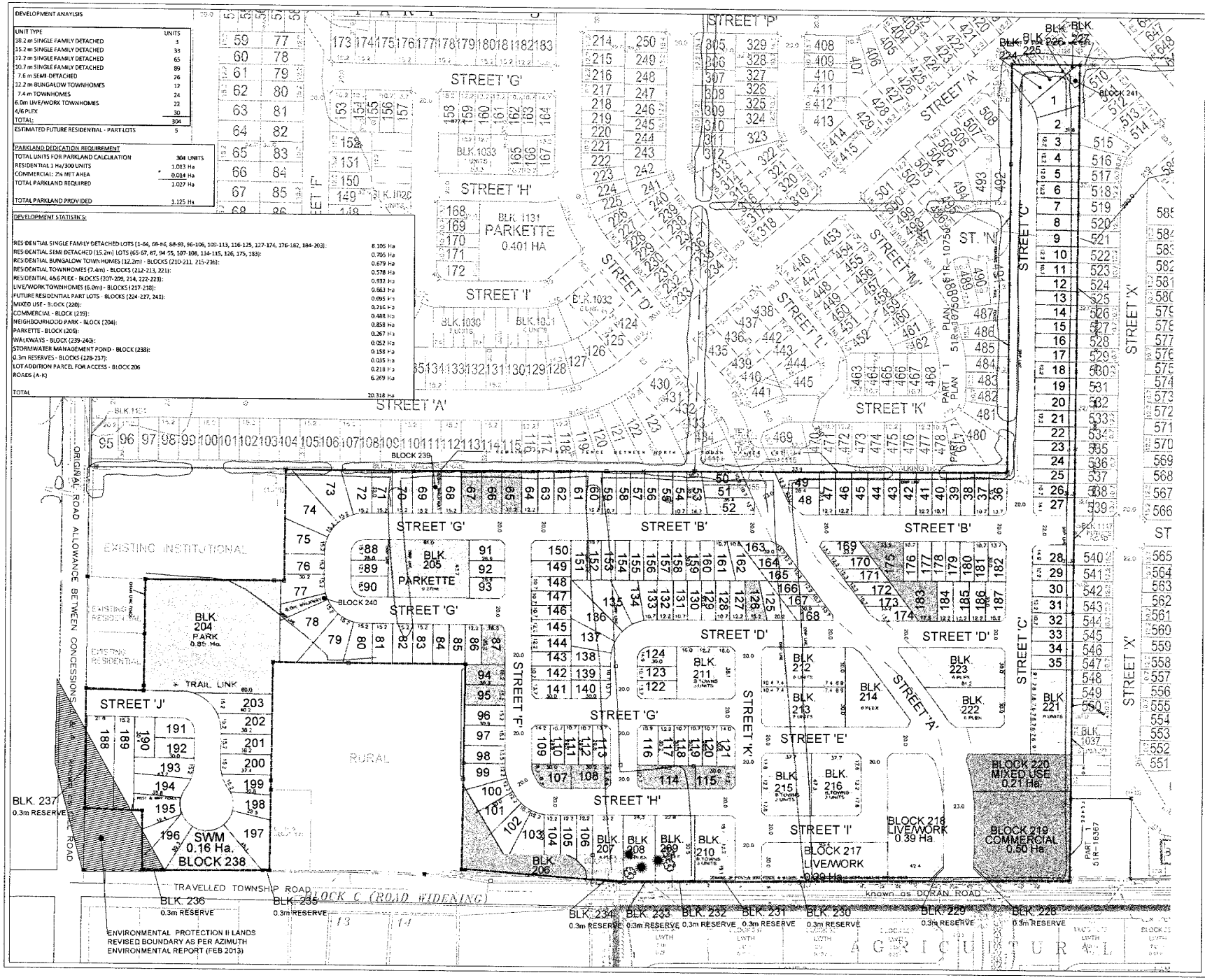


FIGURE 6 - DRAFT P
AUGUST

SUBMISSIO
COUNTY OF S

ESTATE of MARIE LOUI

124 DORAN RD., MI

FRANKCOM ES

PART OF LOT 12, C
TOWNSHIP OF SPRIN
COUNTY OF SIM

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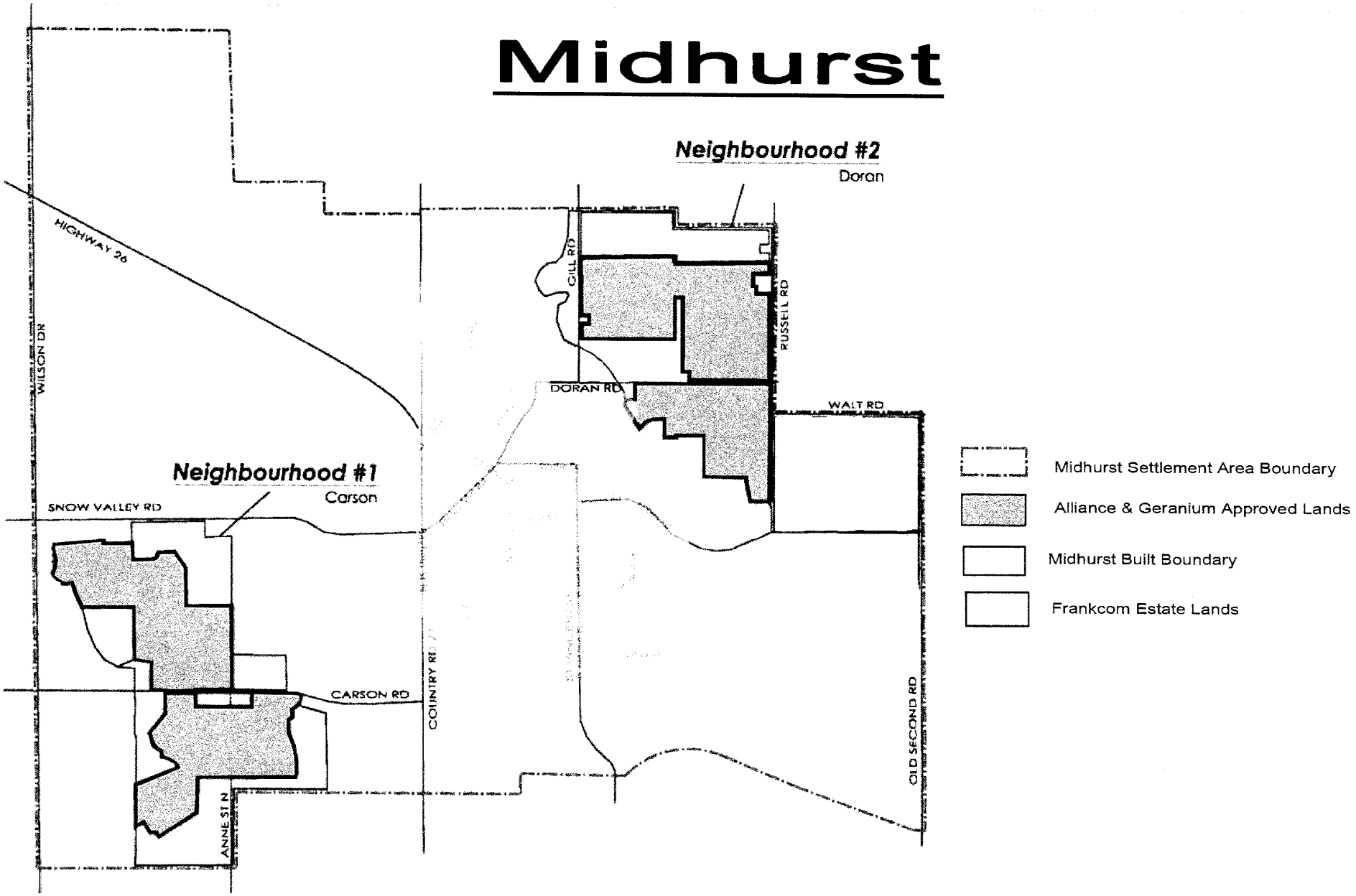
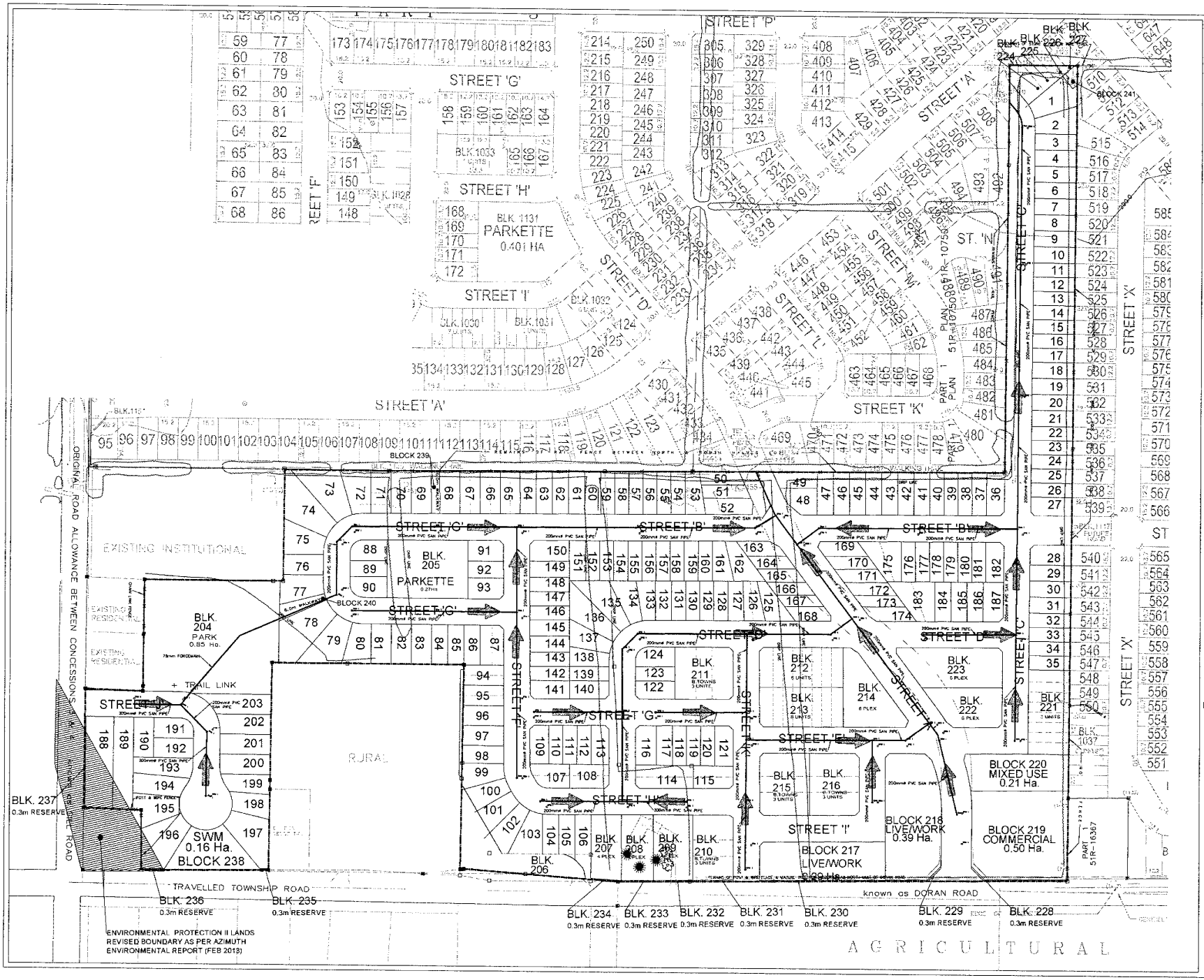
# Midhurst


Neighbourhood #2
Doran
HIGHWAY 26
WILSON DR
GILL RD
RUSSELL RD
DORAN RD
WALT RD
Neighbourhood #1
Carson
SNOW VALLEY RD
CARSON RD
COUNTRY RD
OLD SECOND RD
ANNE ST N
Midhurst Settlement Area Boundary
Alliance & Geranium Approved Lands
Midhurst Built Boundary
Frankcom Estate Lands




FUNCTION
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ESTATE of MARIE LOUI

124 DORAN RD., MI

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PART OF LOT 12, C
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COUNTY OF SIM

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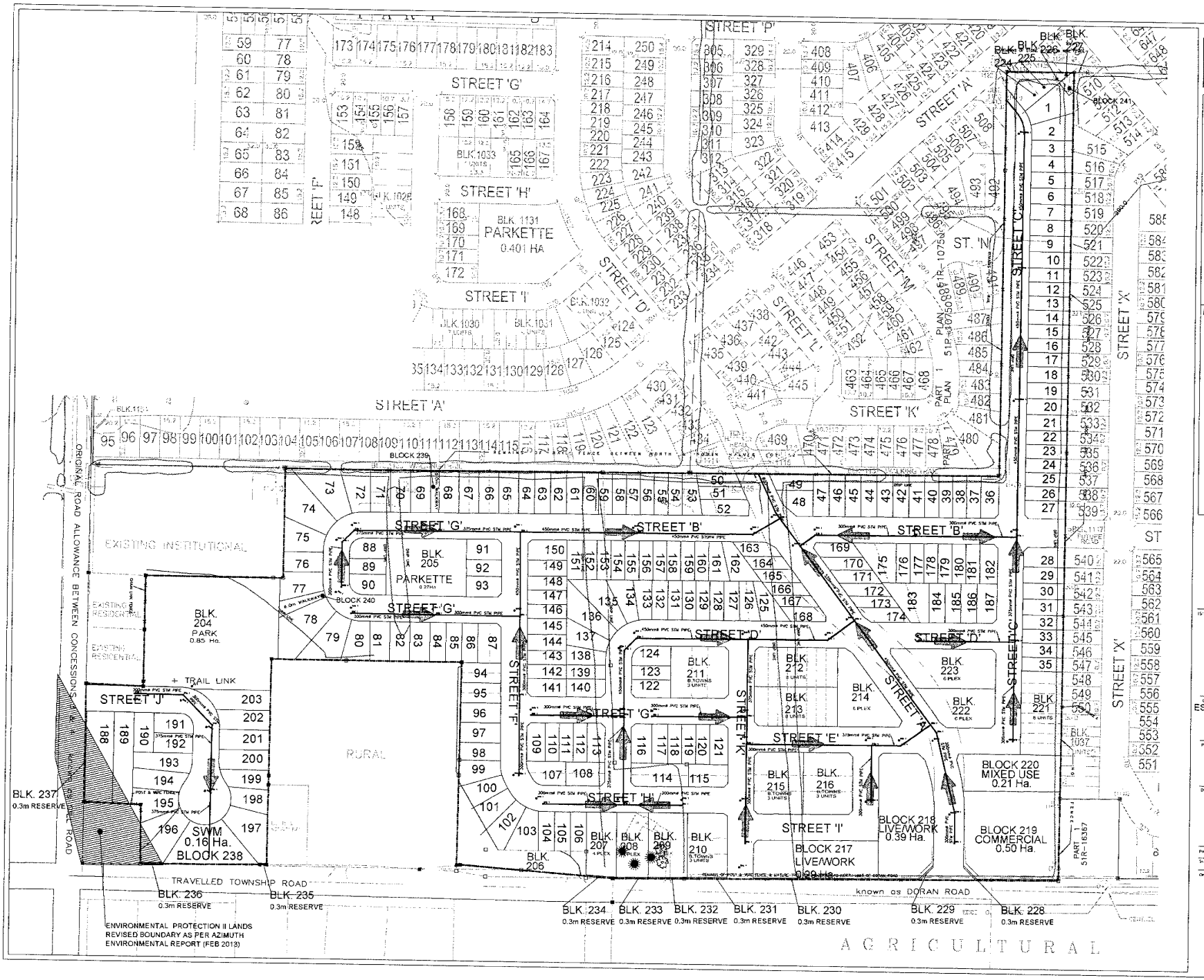


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ESTATE of MARIE LOUI

124 DORAN RD., MI

FRANKCOM ES

PART OF LOT 12 C
TOWNSHIP OF SPRIN
COUNTY OF SIM

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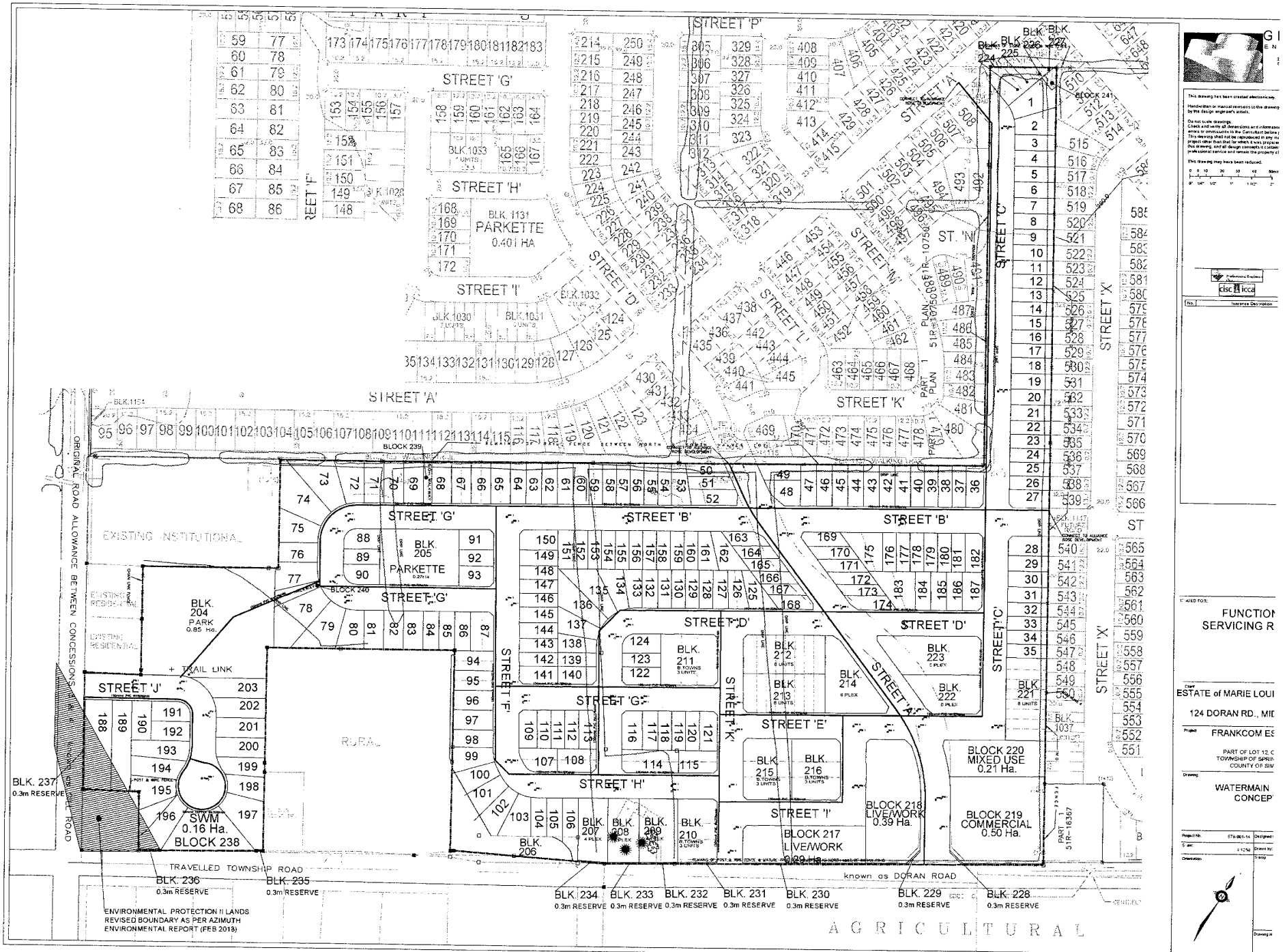


FUNCTION
SERVICING R

ESTATE of MARIE LOUI

124 DORAN RD., MI

FRANKCOM ES

PART OF LOT 12 C
TOWNSHIP OF SPRIN
COUNTY OF SIM

WATERMAIN
CONCEP

## Reid Mitchell

**From:** Joe Mullan <mullan@ainleygroup.com>
**Sent:** June-05-15 1:08 PM
**To:** Brian Goodreid
**Cc:** 'Brent Spagnol'; Robert Brindley
**Subject:** RE: Frankcom Estate
**Attachments:** image001.jpg

Hi Brian:

The Class EA is being completed for the following two main scenarios:

1. Phase 1 being a total of 5,000 units, which was based upon the approved 300 hectares having 4,623 units, plus an equivalent of 350 units for the Employment Lands;

2. The Ultimate development being 7,858 units plus an equivalent of 350 units for the Employment Lands plus existing residential;

Therefore, if the 306 residential units for your Clients lands were added to Phase 1A, the Phase 1 scenario of 5,000 units that we are currently using would have to be revised.

Regards,

J. A. Mullan, P.Eng.
President & CEO

www.ainleygroup.com<http://www.ainleygroup.com/>
Tel: (705) 445-3451 Ext. 126
Cell: (705) 718-7230

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-----Original Message-----
From: Brian Goodreid [mailto:goodreidplanninggroup@gmail.com]
Sent: June 3, 2015 7:20 PM
To: Joe Mullan
Subject: Frankcom Estate

Hi Joe,

Would you please let me know whether there would be any issue from a Municipal Class EA point of view of expanding the consolidated first phase of development in Midhurst (i.e. the Alliance & Geranium consolidated phase 1A 1A*) to include the Frankcom Estate's land development project which at the moment is based on 306 dwelling units?

A response before the end of the day Friday would be appreciated as the Estate requires the information in advance of the upcoming technical review session of the Township's long range financial plan (the session is to be held this coming Tuesday).

Thanks.

Brian Goodreid, MCIP, RPP
Principal

GOODREID PLANNING GROUP
274 Burton Avenue
Suite 1201
Barrie, Ontario
L4N 5W4
P: 705-331-5717
F: 705-722-5660

62

**From:** S. Kirsch
**To:** Joe Mullan
**Cc:** Barney Krussner; Mark Archer; Brent Spagnol; Jay Feehely; Mario Giampietri; Alex Troop
**Subject:** Your Environmental Assessment Work for Midhurst
**Date:** Wednesday, November 30, 2016 3:06:07 PM

Good afternoon Joe,

The purpose of this email is to contact you on behalf of the Estate of Marie Louise Frankcom in regard to your Environmental Assessment work for Midhurst and the Estate's lands at the intersection of Gill and Doran Road in Midhurst.

It appears from your PIC paperwork, and other information available to me, that the Estate's lands are not being properly addressed in your EA work for Midhurst.

This is especially the case as the Ministry of Municipal Affairs' appeal of the Midhurst Secondary Plan no longer applies to the Estate's lands due to the Ontario Municipal Board's recent decision to approve the Midhurst Secondary Plan in respect to the Estate's lands as well as its decision to provide urban land use designations for the Estate's lands.

As the Frankcom Estate's lands are clearly in the development stream in an area of Midhurst where infrastructure is to be provided early on, and given that the Estate's lands ought to go forward early on in the development of Midhurst due to their location adjacent to Midhurst's built boundary (and in accordance with the County's built boundary phasing policy in force and effect since May 15, 2014) your EA work needs to properly address the Estate's land development status and location. Otherwise, it will be necessary to request a bump-up (i.e. a Part II Order) to deal with the matter.

I trust you understand the Estate's position in this matter and will properly reflect the Estate's land development status and location in your EA work and phasing of infrastructure for Midhurst.

Regards,

Stan

## Reid Mitchell

**From:** S. Kirsch <skirsch@bellnet.ca>
**Sent:** January-11-17 6:27 PM
**To:** Joe Mullan
**Cc:** Brent Spagnol; Mark Archer
**Subject:** Re: Frankcom Estate - Midhurst EA Queries & Comments
**Attachments:** Your Environmental Assessment Work for Midhurst (4.24 KB)

Good Evening Joe,
Your email of today's date indicates that a formal response to my November 30th email on behalf of the Estate (copy attached) will be issued, but you haven't given any indication of the date on or before which this is expected to happen. Are you currently able to provide such a date, and if so, when is it?
With respect to the balance of my email of January 9th (detailed below) I have asked a number of specific EA related questions, made a number of EA related comments, and requested EA information all of which you have ignored in getting back to me. Surely, providing a copy of a missing EA report figure and answering simple EA questions like where certain phased lands are located is not an onerous matter nor one that can or should be ignored when doing your EA work.
Accordingly, (and given that the EA process is to be open and transparent) I ask that you answer the questions I asked, provide me with what I asked for, and address the matters raised in points 2 through 9 of my email to you of January 9th.
I look forward to hearing back from you on these matters.
Regards,
Stan

----- Original Message -----
**From:** Joe Mullan
**To:** S. Kirsch
**Cc:** Mark Archer ; Brent Spagnol
**Sent:** Wednesday, January 11, 2017 11:30 AM
**Subject:** Frankcom Estate - Midhurst EA Queries & Comments

**Hi Mr. Kirsch:**

This is to confirm that we did receive your Nov. 30 email containing comments on the Midhurst Class EA and to advise you that they are being reviewed and discussed with the Class EA Steering Committee in conjunction will all other comments that were received following the Oct. 18 Public Information Centre (PIC).

Subsequent to the Steering Committee reviewing and finalizing the response comments, formal responses will be issued to all parties who submitted comments.

Regards,

J. A. Mullan, P.Eng.
President & CEO

Ainley

www.ainleygroup.com
Tel: (705) 445-3451 Ext. 126
Cell: (705) 718-7230

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**From:** S. Kirsch [mailto:skirsch@bellnet.ca]
**Sent:** Monday, January 9, 2017 10:14 AM
**To:** Joe Mullan
**Cc:** Mark Archer ; Brent Spagnol
**Subject:** Frankcom Estate - EA Queries & Comments

Joe,

My current EA queries and comments are as follows;

1. I haven't heard back from you in respect to my email to you of November 30th. When can I expect your response and when do you plan on addressing the Estate's EA issues?
2. During October's PIC I mentioned to several members of your company that Figure 5 was missing from your Draft Traffic Operational Analysis Report (copy attached) and I asked that the missing figure be provided to me. I still haven't received it. Accordingly, I would appreciate it if you would email it to me.
3. The lower right hand corner of Figure 14 of the draft traffic study (see enlarged and marked up excerpt of it attached) shows your proposed phasing related to lands approved for development in accordance with the 300 hectare rule as well as the "development phasing and staging" you say is "to be used to determine infrastructure phasing". Am I correct that all current EA 3 & 4 studies are based on this phasing?
4. The residential housing units (and employment units) phased and circled in red on the enlarged and marked up excerpt of the lower right hand corner of Figure 14 are all residential housing units (or employment units) shown and phased on lands that are not part of those lands that were approved for development under the 300 hectare rule. Given that this is the case, please provide me with a diagram showing where these lands are located and who owns them.
5. Where are the Estate's lands shown in the phasing and staging numbers (or are they) and if they aren't why aren't they, given that among other points a) the Estate's lands are in a prime development location adjacent to Midhurst's built boundary b) the Estate's concept diagram, engineering report and other such documentation showing and addressing the Estate's residential housing units, roads, storm water management pond and so forth have all been on file with the Township since August 29, 2014, and c) the Township has been aware of the Estate's land development project for many years now.
6. As well, Figure 14 of the draft traffic study (attached) shows purple cross-hatch markings on the Estate's lands in neighbourhood 2 (along with some of the Midhurst Development Doran Road Inc.("MDDRI") lands in neighbourhood 3 to the south and east of the Estate's lands) however the legend for the diagram does not include what this means. Accordingly, please advise as to what the purple cross-hatch markings on the Estate's lands are intended to mean. By the way, my wife asked you personally about this matter during the PIC in October but you dismissed her query at that time in regard to this matter by advising her that "purple was used because we just ran out of other colours". Your response to her at the PIC was clearly evasive, and I would ask that you provide a clear and meaningful response to the query at the present time.
7. Additionally, I note that roads are shown and phased (and perhaps residential housing units are phased as well) in your August 2016 study on some of the lands owned by MDDRI that are not part of what was approved for development under the 300 hectare rule. At the same time, no phased roads or housing units are being shown for the Estate's lands in spite of the fact that the Township has had the Estate's Concept Diagram for its land development project since at least August of 2014 and has known about the Estate's land development project for many years now. This is improper, and needs to be corrected at the present time (and certainly before your EA phase 3 & 4 work is completed).
8. To the extent not already done, your EA work needs to be modified to provide infrastructure early on to the Estate's lands for reasons as detailed in my email to you of November 30, 2016 and for other good and sufficient reasons including economy of scale savings, integration, less disruption to the area in which the Estate's lands are located, County phasing policy related to development outward from a local municipality's built boundary (in this case Midhurst's built boundary) and so on.
9. The Estate's lands should never have been excluded from infrastructure development phasing and staging and it certainly shouldn't be now. When do you plan to address this matter? As you know the 30 day review period is coming up soon and the Estate's issues related to your EA work need to be addressed asap and should have been addressed a long time ago.

Regards,

Stan

## Reid Mitchell

**From:** S. Kirsch <skirsch@bellnet.ca>
**Sent:** January-09-17 10:14 AM
**To:** Joe Mullan
**Cc:** Mark Archer; Brent Spagnol
**Subject:** Frankcom Estate - EA Queries & Comments
**Attachments:** Figure 14 from Midhurst Class EA - Draft Traffic Operational Analysis - Aug 26, 2016.pdf; Marked Up Excerpt from Traffic Study Figure 14.pdf; Midhurst Class EA - Draft Traffic Operational Analysis - Aug 26, 2016.pdf

Joe,
My current EA queries and comments are as follows;

1. I haven't heard back from you in respect to my email to you of November 30th. When can I expect your response and when do you plan on addressing the Estate's EA issues?
2. During October's PIC I mentioned to several members of your company that Figure 5 was missing from your Draft Traffic Operational Analysis Report (copy attached) and I asked that the missing figure be provided to me. I still haven't received it. Accordingly, I would appreciate it if you would email it to me.
3. The lower right hand corner of Figure 14 of the draft traffic study (see enlarged and marked up excerpt of it attached) shows your proposed phasing related to lands approved for development in accordance with the 300 hectare rule as well as the "development phasing and staging" you say is "to be used to determine infrastructure phasing". Am I correct that all current EA 3 & 4 studies are based on this phasing?
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5. Where are the Estate's lands shown in the phasing and staging numbers (or are they) and if they aren't why aren't they, given that among other points a) the Estate's lands are in a prime development location adjacent to Midhurst's built boundary b) the Estate's concept diagram, engineering report and other such documentation showing and addressing the Estate's residential housing units, roads, storm water management pond and so forth have all been on file with the Township since August 29, 2014, and c) the Township has been aware of the Estate's land development project for many years now.
6. As well, Figure 14 of the draft traffic study (attached) shows purple cross-hatch markings on the Estate's lands in neighbourhood 2 (along with some of the Midhurst Development Doran Road Inc.("MDDRI") lands in neighbourhood 3 to the south and east of the Estate's lands) however the legend for the diagram does not include what this means. Accordingly, please advise as to what the purple cross-hatch markings on the Estate's lands are intended to mean. By the way, my wife asked you personally about this matter during the PIC in October but you dismissed her query at that time in regard to this matter by advising her that "purple was used because we just ran out of other colours". Your response to her at the PIC was clearly evasive, and I would ask that you provide a clear and meaningful response to the query at the present time.
7. Additionally, I note that roads are shown and phased (and perhaps residential housing units are phased as well) in your August 2016 study on some of the lands owned by MDDRI that are not part of what was approved for development under the 300 hectare rule. At the same time, no phased roads or housing units are being shown for the Estate's lands in spite of the fact that the Township has had the Estate's Concept Diagram for its land development project since at least August of 2014 and has known about the Estate's land development project for many years now. This is improper, and needs to be corrected at the present time (and certainly before your EA phase 3 & 4 work is completed).
8. To the extent not already done, your EA work needs to be modified to provide infrastructure early on to the Estate's lands for reasons as detailed in my email to you of November 30, 2016 and for other good and sufficient reasons including economy of scale savings, integration, less disruption to the area in which the Estate's lands are located, County phasing policy related to development outward from a local municipality's built boundary (in this case Midhurst's built boundary) and so on.
9. The Estate's lands should never have been excluded from infrastructure development phasing and staging and it certainly shouldn't be now. When do you plan to address this matter? As you know the 30 day review period is

coming up soon and the Estate's issues related to your EA work need to be addressed asap and should have been addressed a long time ago.

Regards,
Stan

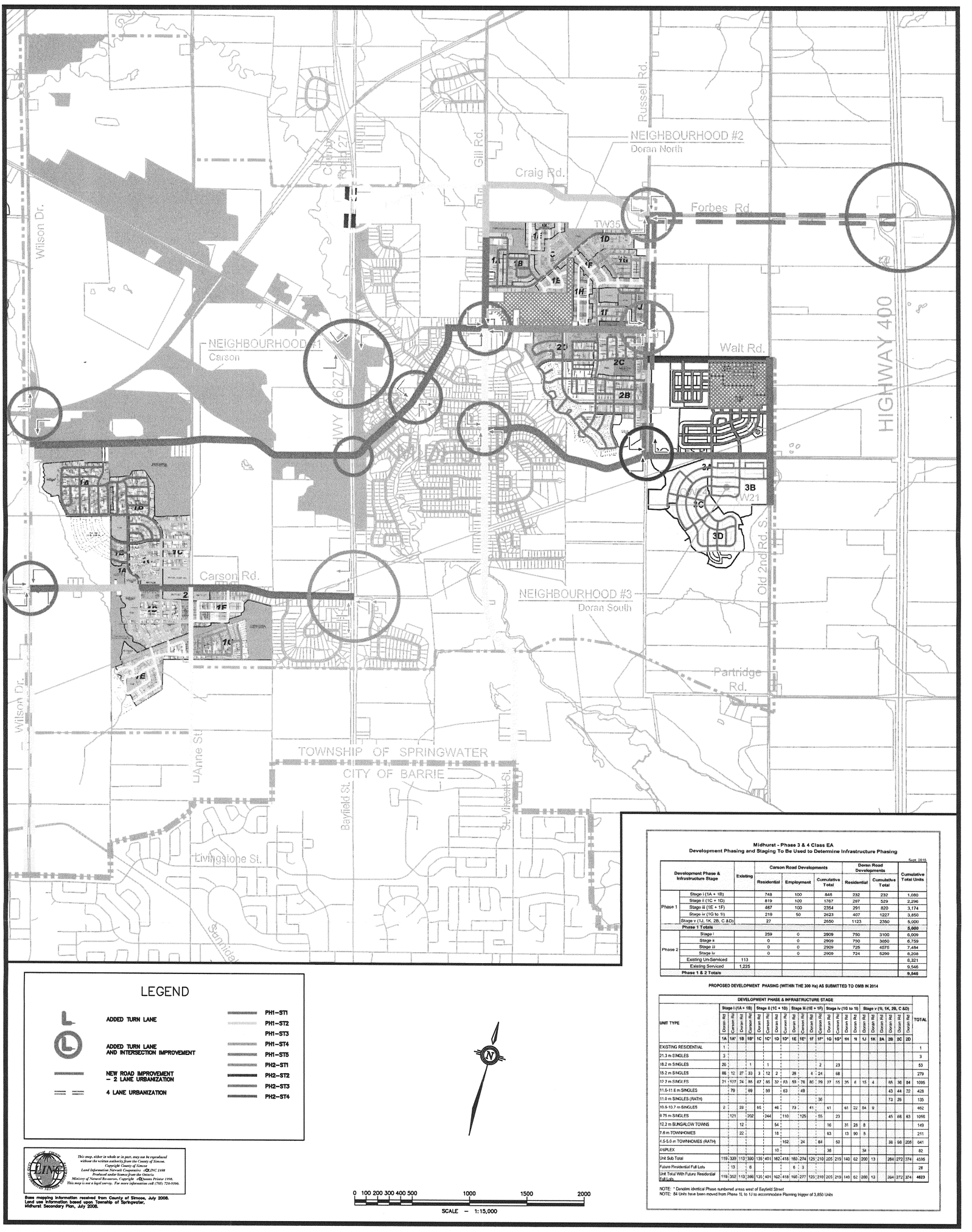
MIDHURST SECONDARY PLAN

Township of Springwater

# TRANSPORTATION ROAD IMPROVEMENT PHASING PLAN

Ainley GROUP CONSULTING ENGINEERS PLANNERS

FIGURE 14




## LEGEND

- ADDED TURN LANE
- ADDED TURN LANE AND INTERSECTION IMPROVEMENT
- NEW ROAD IMPROVEMENT – 2 LANE URBANIZATION
- 4 LANE URBANIZATION

PH1–ST1
PH1–ST2
PH1–ST3
PH1–ST4
PH1–ST5
PH2–ST1
PH2–ST2
PH2–ST3
PH2–ST4

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This map is not a legal survey. For more information call (705) 726-9300.

Base mapping information received from County of Simcoe, July 2008.
Land use information based upon Township of Springwater, Midhurst Secondary Plan, July 2008.

0 100 200 300 400 500 1000 1500 2000

SCALE – 1:15,000

**Midhurst - Phase 3 & 4 Class EA**
**Development Phasing and Staging To Be Used to Determine Infrastructure Phasing**

Sept. 2015

| Development Phase & Infrastructure Stage | | Existing | Carson Road Developments | | | Doran Road Developments | | Cumulative Total Units |
|---|---|---|---|---|---|---|---|---|
| | | | Residential | Employment | Cumulative Total | Residential | Cumulative Total | |
| Phase 1 | Stage i (1A + 1B) | | 748 | 100 | 848 | 232 | 232 | 1,080 |
| | Stage ii (1C + 1D) | | 819 | 100 | 1767 | 297 | 529 | 2,296 |
| | Stage iii (1E + 1F) | | 487 | 100 | 2354 | 291 | 820 | 3,174 |
| | Stage iv (1G to 1I) | | 219 | 50 | 2623 | 407 | 1227 | 3,850 |
| | Stage v (1J, 1K, 2B, C &D) | | 27 | | 2650 | 1123 | 2350 | 5,000 |
| | **Phase 1 Totals** | | | | | | | 5,000 |
| Phase 2 | Stage i | | 259 | 0 | 2909 | 750 | 3100 | 6,009 |
| | Stage ii | | 0 | 0 | 2909 | 750 | 3850 | 6,759 |
| | Stage iii | | 0 | 0 | 2909 | 725 | 4575 | 7,484 |
| | Stage iv | | 0 | 0 | 2909 | 724 | 5299 | 8,208 |
| | Existing Un-Serviced | 113 | | | | | | 8,321 |
| | Existing Serviced | 1,225 | | | | | | 9,546 |
| | **Phase 1 & 2 Totals** | | | | | | | 9,546 |

**PROPOSED DEVELOPMENT PHASING (WITHIN THE 300 Ha) AS SUBMITTED TO OMB IN 2014**

| UNIT TYPE | DEVELOPMENT PHASE & INFRASTRUCTURE STAGE | | | | | | | | | | | | | | | | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Stage i (1A + 1B) | | | | Stage ii (1C + 1D) | | | | Stage iii (1E + 1F) | | | | Stage iv (1G to 1I) | | | | Stage v (1J, 1K, 2B, C &D) | | | | 2 | | | | | |
| | (Doran Rd) | (Carson Rd) | (Doran Rd) | (Carson Rd) | (Doran Rd) | (Carson Rd) | (Doran Rd) | (Carson Rd) | (Doran Rd) | (Carson Rd) | (Doran Rd) | (Carson Rd) | (Doran Rd) | (Carson Rd) | (Doran Rd) | (Carson Rd) | (Doran Rd) | (Carson Rd) | (Doran Rd) | (Carson Rd) | (Doran Rd) | (Carson Rd) | (Doran Rd) | (Carson Rd) | (Doran Rd) | (Carson Rd) | |
| | 1A | 1A* | 1B | 1B* | 1C | 1C* | 1D | 1D* | 1E | 1E* | 1F | 1F* | 1G | 1G* | 1H | 1I | 1J | 1K | 2A | 2B | 2C | 2D | | | | | |
| EXISTING RESIDENTIAL | 1 | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 21.3 m SINGLES | 3 | | | | | | | | | | | | | | | | | | | | | | | | | 3 |
| 18.2 m SINGLES | 26 | | | 1 | | 1 | | | | | | 2 | 23 | | | | | | | | | | | | | 53 |
| 15.2 m SINGLES | 66 | 12 | 27 | 33 | 3 | 12 | 2 | | 28 | | 4 | 24 | | 68 | | | | | | | | | | | | 279 |
| 12.7 m SING FS | 31 | 107 | 24 | 85 | 67 | 85 | 32 | 63 | 59 | 78 | 80 | 99 | 77 | 55 | 35 | 6 | 15 | 4 | | | | | 65 | 36 | 84 | 1095 |
| 11.0-11.6 m SINGLES | | 79 | | 69 | | 99 | | 63 | | 49 | | | | | | | | | | | | | 43 | 44 | 22 | 428 |
| 11.0 m SINGLES (RATH) | | | | | | | | | | | | | | | | | | | | | | | 73 | 26 | | 135 |
| 10.5-10.7 m SINGLES | 2 | | 28 | | 65 | | 46 | | 73 | | 41 | | 61 | | 61 | 22 | 54 | 9 | | | | | | | | 462 |
| 9.75 m SINGLES | | 121 | | 202 | | 244 | | 110 | | 125 | | 55 | | 23 | | | | | | | | | 45 | 68 | 63 | 1056 |
| 12.2 m BUNGALOW TOWNS | | 12 | | | | 54 | | | | | | 16 | | | 31 | 28 | 8 | | | | | | | | | 149 |
| 7.6 m TOWNHOMES | | 22 | | | | 18 | | | | | | 63 | | | 13 | 90 | 5 | | | | | | | | | 211 |
| 6.5-5.6 m TOWNHOMES (RATH) | | | | | | | 152 | | 24 | | 64 | | 50 | | | | | | | | | | 38 | 68 | 208 | 641 |
| 4-PLEX | | | | | | 10 | | | | | 36 | | | | | | | | | | | | | | | 82 |
| Unit Sub Total | 119 | 339 | 113 | 390 | 135 | 401 | 162 | 418 | 180 | 274 | 125 | 210 | 205 | 219 | 140 | 62 | 200 | 13 | | | | | 264 | 272 | 374 | 4595 |
| Future Residential Full Lots | | 13 | | 6 | | | | 6 | 3 | | | | | | | | | | | | | | | | | 28 |
| Unit Total With Future Residential Full Lots | 119 | 352 | 113 | 396 | 135 | 401 | 162 | 418 | 180 | 277 | 125 | 210 | 205 | 219 | 140 | 62 | 200 | 13 | | | | | 264 | 272 | 374 | 4623 |

NOTE: * Denotes identical Phase numbered areas west of Bayfield Street
NOTE: 84 Units have been moved from Phase 1L to 1J to accommodate Planning trigger of 3,850 Units

## Midhurst - Phase 3 & 4 Class EA
## Development Phasing and Staging To Be Used to Determine Infrastructure Phasing

Sept. 2015

| Development Phase & Infrastructure Stage | | Existing | Carson Road Developments | | | Doran Road Developments | | Cumulative Total Units |
|---|---|---|---|---|---|---|---|---|
| | | | Residential | Employment | Cumulative Total | Residential | Cumulative Total | |
| Phase 1 | Stage i (1A + 1B) | | 748 | 100 | 848 | 232 | 232 | 1,080 |
| | Stage ii (1C + 1D) | | 819 | 100 | 1767 | 297 | 529 | 2,296 |
| | Stage iii (1E + 1F) | | 487 | 100 | 2354 | 291 | 820 | 3,174 |
| | Stage iv (1G to 1I) | | 219 | 50 | 2623 | 407 | 1227 | 3,850 |
| | Stage v (1J, 1K, 2B, C &D) | | 27 | | 2650 | 1123 | 2350 | 5,000 |
| **Phase 1 Totals** | | | | | | | | **5,000** |
| Phase 2 | Stage i | | 259 | 0 | 2909 | 750 | 3100 | 6,009 |
| | Stage ii | | 0 | 0 | 2909 | 750 | 3850 | 6,759 |
| | Stage iii | | 0 | 0 | 2909 | 725 | 4575 | 7,484 |
| | Stage iv | | 0 | 0 | 2909 | 724 | 5299 | 8,208 |
| | Existing Un-Serviced | 113 | | | | | | 8,321 |
| | Existing Serviced | 1,225 | | | | | | 9,546 |
| **Phase 1 & 2 Totals** | | | | | | | | **9,546** |

**PROPOSED DEVELOPMENT PHASING (WITHIN THE 300 Ha) AS SUBMITTED TO OMB IN 2014**

| DEVELOPMENT PHASE & INFRASTRUCTURE STAGE | | | | | | | | | | | | | | | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UNIT TYPE | Stage i (1A + 1B) | | | | Stage ii (1C + 1D) | | | | Stage iii (1E + 1F) | | | | Stage iv (1G to 1I) | | | | Stage v (1I, 1K, 2B, C &D) | | | | | | | |
| | Doran Rd | Carson Rd | Doran Rd | Carson Rd | Doran Rd | Carson Rd | Doran Rd | Carson Rd | Doran Rd | Carson Rd | Doran Rd | Carson Rd | Doran Rd | Carson Rd | Doran Rd | Doran Rd | Doran Rd | Doran Rd | Doran Rd | Doran Rd | Doran Rd | Doran Rd | Doran Rd | |
| | 1A | 1A* | 1B | 1B* | 1C | 1C* | 1D | 1D* | 1E | 1E* | 1F | 1F* | 1G | 1G* | 1H | 1I | 1J | 1K | 2A | 2B | 2C | 2D | | |
| EXISTING RESIDENTIAL | 1 | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 21.3 m SINGLES | 3 | | | | | | | | | | | | | | | | | | | | | | | 3 |
| 18.2 m SINGLES | 26 | | | 1 | | 1 | | | | | | 2 | | 23 | | | | | | | | | | 53 |
| 15.2 m SINGLES | 66 | 12 | 27 | 33 | 3 | 12 | 2 | | 28 | | 4 | 24 | | 68 | | | | | | | | | | 279 |
| 12.2 m SINGLES | 21 | 127 | 24 | 85 | 67 | 85 | 32 | 83 | 59 | 76 | 80 | 29 | 27 | 55 | 35 | 6 | 15 | 4 | | 65 | 36 | 84 | | 1095 |
| 11.0-11.6 m SINGLES | | 79 | | 69 | | 59 | | 63 | | 49 | | | | | | | | | | 43 | 44 | 22 | | 428 |
| 11.0 m SINGLES (RATH) | | | | | | | | | | | | 36 | | | | | | | | 73 | 26 | | | 135 |
| 10.5-10.7 m SINGLES | 2 | | 28 | | 65 | | 46 | | 73 | | 41 | | 61 | | 61 | 22 | 54 | 9 | | | | | | 462 |
| 9.75 m SINGLES | | 121 | | 202 | | 244 | | 110 | | 125 | | 55 | | 23 | | | | | | 45 | 68 | 63 | | 1056 |
| 12.2 m BUNGALOW TOWNS | | | 12 | | | | 54 | | | | | | 16 | | 31 | 28 | 8 | | | | | | | 149 |
| 7.6 m TOWNHOMES | | | 22 | | | | 18 | | | | | | 63 | | 13 | 90 | 5 | | | | | | | 211 |
| 4.5-5.0 m TOWNHOMES (RATH) | | | | | | | | 162 | | 24 | | 64 | | 50 | | | | | | 38 | 98 | 205 | | 641 |
| 4/6PLEX | | | | | | | 10 | | | | | | 38 | | | | 34 | | | | | | | 82 |
| Unit Sub Total | 119 | 339 | 113 | 390 | 135 | 401 | 162 | 418 | 160 | 274 | 125 | 210 | 205 | 219 | 140 | 62 | 200 | 13 | | 264 | 272 | 374 | | 4595 |
| Future Residential Full Lots | | 13 | | 6 | | | | | 6 | 3 | | | | | | | | | | | | | | 28 |
| Unit Total With Future Residential Full Lots | 119 | 352 | 113 | 396 | 135 | 401 | 162 | 418 | 166 | 277 | 125 | 210 | 205 | 219 | 140 | 62 | 200 | 13 | | 264 | 272 | 374 | | 4623 |

NOTE: * Denotes identical Phase numbered areas west of Bayfield Street
NOTE: 84 Units have been moved from Phase 1L to 1J to accommodate Planning trigger of 3,850 Units

Ainley GROUP CONSULTING ENGINEERS PLANNERS

# TOWNSHIP OF SPRINGWATER
# MIDHURST SECONDARY PLAN
# CLASS ENVIRONMENTAL ASSESSMENT

DRAFT

## TRAFFIC OPERATIONAL ANALYSIS

Source: Google Maps

August 2016

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, ON, L9Y 4J5
Tel: (705) 445-3451 • Fax: (705) 445-0968
E-mail collingwood@ainleygroup.com

March 3, 2017

Mr. Stan Kirsch
skirsch@bellnet.ca

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. Kirsch:

On behalf of the Township of Springwater, we wish to thank you for your interest in the above-mentioned Class EA. We have reviewed your comments which were received following the October 18, 2016 Public Information Centre (PIC). Your comments/requests have been summarized and our responses are provided following each comment.

- *It appears from your PIC paperwork, and other information available to me, that the Estate's lands are not being properly addressed in your EA work for Midhurst.*

All proposed development lands identified within Official Plan Amendment 38 (OPA 38 or the Midhurst Secondary Plan) are included within this Class Environmental Assessment. Further this Class EA is an extension/continuation of the Phase 1 and 2 Master Plan that was approved in 2009 which identified a total projected growth four the Midhurst Secondary Plan of 8,208 units comprised of 7,858 new residential units and 350 employment equivalent residential units.

It is the Midhurst Secondary Plan that provides specific policy direction with respect to phasing of development, not the Class EA. It is for this reason that lands with draft plan approval are categorized as Phase 1 lands and are specifically accounted for within the EA process, since lands that are already draft approved are less likely to have significant changes.

Lands that are current working their way through the development approval process (Pending Applications as per the Planning Act) and have not received draft approval are being considered, but not fully accounted for because those applications/draft plans remain subject to change.

Therefore, this Class Environmental Assessment will accommodate new growth of 8,208 units (7,858 + 350) within the Midhurst Secondary Plan Area. This is sufficient to accommodate both the development lands within the 300 ha that were released for development back in 2012 and received Draft Plan approval by the OMB in 2014, as well as the development lands that were recently given population allocations by the County and whose OPA 38 designations were approved by the OMB in 2016 on that basis (including Frankcom).

- *This is especially the case as the Ministry of Municipal Affairs' appeal of the Midhurst Secondary Plan no longer applies to the Estate's lands due to the Ontario Municipal Board's recent decision to approve the Midhurst Secondary Plan in respect to the Estate's lands as well as its decision to \provide urban land use designations for the Estate's lands.*

The statement that urban land use designations are now in place for the Frankcom property is accurate. However, planning applications (draft plan of subdivision, zoning) for actual development of the Frankcom property under the Planning Act have not been submitted. At this stage, it remains unclear how the 50% population allocations which were approved by the County as the basis for OMB approval of the designations are to be implemented, due to the following considerations:

- Is the approved 50% population allocation to be applied to the entire land holding (i.e., at one-half the density originally proposed) and if so, how is that proposed to be implemented? or
- Is only 50% of the land holding to be utilized for development? If so, which 50% and how is it to be determined?

  - *As the Frankcom Estate's lands are clearly in the development stream in an area of Midhurst where infrastructure is to be provided early on, and given that the Estate's lands ought to go forward early on in the development of Midhurst due to their location adjacent to Midhurst's built boundary (and in accordance with the County's built boundary phasing policy in force and effect since May 15, 2014) your EA work needs to properly address the Estate's land development status and location. Otherwise, it will be necessary to request a bump-up (i.e. a Part II Order) to deal with the matter.*

As previously noted, all lands intended for development as identified within the Midhurst Secondary Plan are included within this Class Environmental Assessment. Accordingly, the Frankcom lands are not excluded from the Class EA.

However, allocation of population does not dictate phasing of development. Phasing is determined in accordance with the approved Secondary Plan policies. In particular, Section 9.2(b) of OPA 38 directs that the first phase of development is intended to accommodate "a total of 3,850 new dwelling units plus employment generating uses". In this regard, it is noted that the Draft Plan approvals to date for other development lands under OPA 38 already exceed the 3,850 new dwelling units intended for the first phase of development, by a substantial margin.
Section 9.2 f) of OPA 38 in turn provides as follows:

f) The timing of release of subsequent phases of new growth within the Secondary Plan Area beyond the first phase will be reviewed with each five-year review of the Township of Springwater Official Plan. The justification of subsequent phases will take into account the overall population and employment forecasts of the Township, satisfactory absorption of residential and employments lands in previous phases, and requiring confirmation of Council of the Township as to the need for additional land for urban residential growth across the Township in keeping with an up-to-date land budget for the municipality and consistent with Provincial, County and Township policies. No amendment is required to this Plan to release subsequent phases of growth provided all other policies of this Plan are met.

The Minutes of Settlement dated October 6, 2016 between the County and various Landowners within OPA 38 (including Frankcom) expressly provide that the Landowners "will ensure that all future development applications to implement OPA 38 will conform with the Secondary Plan policies including Policy 9.2(f) and will also conform with applicable Provincial and County policies, plans and requirements".

The Frankcom lands are located within the development area of Midhurst and currently do not have approval status. As such, development of the Frankcom lands can only be considered as part of a subsequent phase of development beyond Phase I, in accordance with the above noted policy and

the criteria specified therein, and in consultation with the County and other approval authorities. The County's position in that regard is quite clear from the letter dated October 24, 2016 which was provided by the County to the Township and filed as Exhibit 40 in the OMB proceedings respecting the OPA 38 appeals. Item #1 in the Attachment to that letter provides in part as follows:

> Section 9.2(f) of OPA 38 is in force following the Province's withdrawal of that part of its appeal. Given that the population allocation for the lands which are subject to the Minutes of Settlement is well in excess of the 3,850 units intended for the first phase of development under Section 9.2(b), it is staff's opinion that the lands could only proceed as part of subsequent phases of new growth within the Secondary Plan under Section 9.2(f).

This applies to the Frankcom lands and is further underscored by the fact that development applications under the Planning Act (Draft Plan of Subdivision/Zoning By-law Amendment) have not been submitted yet for the Frankcom lands - in contrast with the pending development applications already submitted (and in some cases, already approved) for various other OPA 38 landowners. The following questions arise from this key distinction:

- What are the infrastructure needs required to service the Frankcom lands?
- What basis is there for establishing these infrastructure needs?
- What is the approved unit yield for the property (as distinct from population allocation)?
- What is the basis for establishing the unit yield?
- How can the E.A. specifically consider the Frankcom lands when key information that is normally tied to development applications/approvals is not yet available?

2. *During October's PIC I mentioned to several members of your company that Figure 5 was missing from your Draft Traffic Operational Analysis Report (copy attached) and I asked that the missing figure be provided to me. I still haven't received it. Accordingly, I would appreciate it if you would email it to me.*

Figure 5 is the same as Figure 14 referenced and attached to your email.

3. *The lower right hand corner of Figure 14 of the draft traffic study (see enlarged and marked up excerpt of it attached) shows your proposed phasing related to lands approved for development in accordance with the 300 hectare rule as well as the "development phasing and staging" you say is "to be used to determine infrastructure phasing". Am I correct that all current EA 3 & 4 studies are based on this phasing?*

The Table at the bottom right hand corner of Figure 14 (which is also identified on Slide 5 at the recent Public Information Centre (PIC) represents the proposed growth within the Midhurst Secondary Plan that is being utilized within this Class Environmental Assessment. The total number of 9,546 cumulative total units, shown within Figure 14 and Slide 5 table, was carried over from the Midhurst Phase 1 & 2 Master Plan that was completed and approved in 2009 and is broken down as follows:

- 7,858 new residential units
- 350 employment equivalent residential units
- 1,338 existing units (service and on serviced)

4. *The residential housing units (and employment units) phased and circled in red on the enlarged and marked up excerpt of the lower right hand corner of Figure 14 are all residential housing units (or employment units) shown and phased on lands that are not part of those lands that were approved for development under the 300 hectare rule. Given that this is the case, please provide me with a diagram showing where these lands are located and who owns them.*

The referenced employment units within Phase 1 are not specifically identified on our plans, however these would be located within the employment lands designated under the Midhurst Secondary Plan. The referenced units within Phase 2 are not specifically identified within the phasing or staging plans.

All lands (residential, employment, commercial, institutional, open space) that were designated for urban uses prior to the approval of the MSP continue to possess urban land use designations that remain in-force and are not covered under the umbrella of the Ministry's appeal (per the Ministry's letter dated November 28, 2012). A site-specific appeal remains for one property with an employment designation, but this site is not subject to the Ministry's appeal. Reference materials which substantiate this point can be found on Attachment 1 to the Ministry's OMB Withdrawal letter as referenced, which clearly shows that existing residential and employment lands are not subject to the Ministry's appeal.

That said, all lands identified within Phase 1 for residential uses are within the 300 hectares for which OPA 38 came into force as a result of the partial withdrawal of the Ministry's appeal in 2012.

5. *Where are the Estate's lands shown in the phasing and staging numbers (or are they) and if they aren't why aren't they, given that among other points a) the Estate's lands are in a prime development location adjacent to Midhurst's built boundary b) the Estate's concept diagram, engineering report and other such documentation showing and addressing the Estate's residential housing units, roads, storm water management pond and so forth have all been on file with the Township since August 29, 2014, and c) the Township has been aware of the Estate's land development project for many years now.*

Ainley has not been provided any documentation relating to the Frankcom lands. Applications for the Frankcom lands under the Planning Act (draft plan of subdivision and zoning by-law) have not been approved or even submitted to date. The concept plan submitted for the Frankcom lands as a part of the County's approval of population allocation under the 20,000 Population Program does not provide status from an application standpoint. The merits of a draft plan of subdivision can only be tested through an application under the Planning Act, which includes the consideration of required infrastructure. Moreover, as noted above, significant questions remain to be answered in terms of the 50% population allocations approved by the County and how those allocations are to be implemented on the lands to which they apply, including Frankcom. As such, no specific lot fabric can be shown for the Frankcom lands.

Until such time as the Frankcom lands can proceed to development in accordance with the approved OPA 38 phasing policies noted above and complete applications are submitted under the Planning Act, the status of the Frankcom lands will remain as potential lands for future development which will be continue to be considered through the EA process. However, all lands designated for development within OPA 38 approved, including the Frankcom lands, are included in our Phasing and Staging Plan.

6. *As well, Figure 14 of the draft traffic study (attached) shows purple cross-hatch markings on the Estate's lands in neighbourhood 2 (along with some of the Midhurst Development Doran Road Inc.("MDDRI") lands in neighbourhood 3 to the south and east of the Estate's lands) however the legend for the diagram does not include what this means. Accordingly, please advise as to what the purple cross-hatch markings on the Estate's lands are intended to mean. By the way, my wife asked you personally about this matter during the PIC in October but you dismissed her query at that time in regard to this matter by advising her that "purple was used because we just ran out of other colours". Your response to her at the PIC was clearly evasive, and I would ask that you provide a clear and meaningful response to the query at the present time.*

Please see our response to item #5 above.

7. *Additionally, I note that roads are shown and phased (and perhaps residential housing units are phased as well) in your August 2016 study on some of the lands owned by MDDRI that are not part of what was approved for development under the 300 hectare rule. At the same time, no phased roads or housing units are being shown for the Estate's lands in spite of the fact that the Township has had the Estate's Concept Diagram for its land development project since at least August of 2014 and has known about the Estate's land development project for many years now. This is improper, and needs to be corrected at the present time (and certainly before your EA phase 3 & 4 work is completed).*

The lot fabric associated with applications for Draft Plan of Subdivision under the Planning Act for the MDDRI future lands within Phase 2 (beyond 300 ha) was provided to Ainley and therefore inserted. As noted above, applications for Draft Plan of Subdivision have not been submitted to date for the Frankcom lands. Please also see our response to item #5 above.

8. *To the extent not already done, your EA work needs to be modified to provide infrastructure early on to the Estate's lands for reasons as detailed in my email to you of November 30, 2016 and for other good and sufficient reasons including economy of scale savings, integration, less disruption to the area in which the Estate's lands are located, County phasing policy related to development outward from a local municipality's built boundary (in this case Midhurst's built boundary) and so on.*

The Phasing and Staging Plan being used for the Class EA and identified at the recent PIC is based upon the Draft Plans for lands within the 300 ha that were released for development as part of the Ministry's partial withdrawal of its OPA 38 appeal back in 2012 and that were subsequently approved by the OMB, with Draft Plan conditions, back in 2014. After allowing for the 350 employment equivalent units, this equates to a total of approximately 4,973 units (4,623 + 350). The remaining development units available for Phase 2 (beyond the 300 ha) represent the difference between the total within the Class EA and the Phase 1 numbers (8,208 - 4,973). This amount was then equally subdivided over four stages in Phase 2.

9. *The Estate's lands should never have been excluded from infrastructure development phasing and staging and it certainly shouldn't be now. When do you plan to address this matter? As you know the 30 day review period is coming up soon and the Estate's issues related to your EA work need to be addressed asap and should have been addressed a long time ago.*

As previously noted, all lands intended for development within the Midhurst Secondary Plan area under OPA 38 are included within this Class Environmental Assessment. Therefore, the Frankcom Estates lands are not excluded from this Class EA.

Thank you again for your interest in this Class EA.

Should you have any questions please do not hesitate to contact the undersigned.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P.Eng.
President & CEO

## Reid Mitchell

**From:** S. Kirsch <skirsch@bellnet.ca>
**Sent:** March-27-17 2:15 PM
**To:** Joe Mullan
**Cc:** Brent Spagnol; Barney Kussner; Robert Brindley; Jay Feehely
**Subject:** Frankcom Estate Response to your EA letter to the Estate dated 3.3.17
**Attachments:** Kirsch - Letter #62 (Mar 3 2017).pdf; Frankcom Estate Response Letter 3.27.17.pdf

Joe,
The Estate's response to your letter is attached along with a copy of your original letter.
I look forward to meeting with you, members of the Township staff and others in regard to your EA work and the Estate's lands in Midhurst.
Regards,
Stan
----- Original Message -----
**From:** Joe Mullan
**To:** S. Kirsch
**Cc:** midhurst.classea@springwater.ca ; Brent Spagnol ; Barnet Kussner ; Reid Mitchell
**Sent:** Sunday, March 05, 2017 5:50 PM
**Subject:** Midhurst Class EA Response Letter #62

**Hi Stan:**

On behalf of the Township of Springwater, we wish to thank you for your interest in the above-mentioned Class EA. We have reviewed your comments which were received following the October 18, 2016 Public Information Centre (PIC). Your comments/requests have been summarized and our responses are provided in the attached letter.

Thank you again for your interest in this Class EA.

Regards,

J. A. Mullan, P.Eng.
President & CEO

Ainley

www.ainleygroup.com
Tel: (705) 445-3451 Ext. 126
Cell: (705) 718-7230

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FRANKCOM ESTATE
124 Doran Road
Midhurst, Ontario
L9X 1L6

Email: Stan Kirsch
skirsch@bellnet.ca

March 27, 2017

Ref: Township of Springwater
Municipal Class Environmental Assessment (Phases 3 & 4)
Midhurst Servicing

Dear Mr. Mullan:

This will respond to your letter of March 3, 2017 sent to me by email on Sunday, March 5th at 4:50 pm (see attached for details) which in and of itself responded to my emails to you of November 30, 2016, and my follow-up emails of January 9, 2017 and January 11, 2017.

I understand that while your signature is on the attached letter a number of individuals have provided input to it. So while I am responding to you (given that you signed the letter) I understand that your response is very much a coordinated effort falling under the direction and control of the Township acting in its capacity as the Proponent of this Municipal Class EA process and who in essence you reported to and took instruction from in the preparation of what are nominally your responses to me.

Be this as it may, on reviewing your letter (regardless of whose points you are actually making) I have found it to contain unanswered questions, a number of incorrect assertions, many positions contrary to what we understand to be applicable, what we see as faulty analysis, and so on.

Having said all of this, I will respond to the points made in your letter although not necessarily in the order in which you made them. In this regard, and in order to facilitate ongoing dialogue and meetings going forward, I will number my responses.

Accordingly, I respond to your letter as follows;

1. There is a legal requirement under the Environmental Assessment Act to consult with interested parties early on (i.e. to talk to, and hold meetings with, interested parties early on). Also, municipal class environmental assessment work is to be done in an open, transparent, and objective manner. When it comes to the Frankcom Estate's lands in Midhurst there was no consultation with the Estate early on (or at all so far) and the Estate has not been dealt with in an open and transparent manner putting it and its land development project at risk of harm.
2. The Class EA process currently under way in Midhurst can be updated to accommodate additional information received during the course of the study but this has not been done in respect to the Estate's lands or infrastructure matters related to the Estate's lands.

3. The County's built boundary phasing policy is not being followed in the EA phasing and staging of infrastructure work for Midhurst. If the currently proposed phasing and staging goes forward this would keep the Estate's lands from being developed as early on as they should be. This is not right.
4. The Estate's lands have sufficient development rights to be phased and staged for EA purposes particularly given that the Ontario Municipal Board (the "OMB") has approved the Midhurst Secondary Plan in respect to the Estate's lands and has provided urban land use designations for the Estate's lands to go along with the population allocated to its lands by the County.
5. There is nothing in the Midhurst Secondary Plan that says that only draft plan approved lands (like the Alliance and Geranium 300 hectare rule lands) can be phased and staged for infrastructure purposes early on.
6. Midhurst Secondary Plan policy 9.2(b) and 9.2(f) do not constitute a bar to the Estate's lands going forward in Midhurst's Phase 1 Stage 1 of infrastructure servicing for the Midhurst settlement area contrary to what you suggest in your letter.
7. The County's built boundary phasing policy calls for lands adjacent to Midhurst's built boundary (like the Frankcom lands) to be serviced and developed first, except in some limited cases that don't apply to the Estate's lands in Midhurst. As a result, any proposal to service the Estate's lands later on (or perhaps, not at all) is not good land development planning or good engineering.
8. Good infrastructure planning is not limited to draft plan approved lands regardless of where they are located in the settlement area or for that matter draft plan approved lands only. Also, good infrastructure planning does not give such lands priority status simply because they were approved first. So, in our view the reasons given in your response letter, to propose that only the Alliance and Geranium 300 hectare lands go forward first, are flawed.
9. The OMB did approve some of the Alliance and Geranium lands for development in July of 2014 and in doing so the Board did require them to phase their own projects BUT the Board did not address the matter of whose lands would get to go forward in Midhurst's first phase of development (i.e. they did not address whose land holdings in Midhurst [whether the Alliance companies lands, the Geranium companies lands, the Estate's lands, or anyone else's lands] would get to fill Midhurst's first phase of development). In passing, development of the Estate's lands and the related servicing of same has been held up for some 28 years now and there is no good reason to hold development of the Estate's lands up any longer now that the OMB has approved the Midhurst Secondary Plan on the Estate's lands and provided land use designations for the Estate's lands to go along with the population allocated to the Estate's lands by the County.
10. There is nothing in the Midhurst Secondary Plan that says that Midhurst's Phase 1 Stage 1 (or any other phase or stage) of infrastructure work in Midhurst (none of which has started yet or will start for say 1½ to 2 years) is to be filled on a first come-first served basis. In fact, to do so would neither be good land development planning nor would it be good infrastructure planning. So, in point of fact, there is nothing to say that solely the Alliance and Geranium 300 hectare rule lands should fill up the whole first phase of development in Midhurst and the infrastructure servicing related thereto.
11. The Township is obligated to phase and stage development and the related required infrastructure in accordance with both good planning principles and good engineering

principles. Ignoring the County's built boundary phasing policy and leapfrogging over the Estate's lands is neither good planning nor good engineering and is not consistent with the notion of building complete communities efficiently, and cost effectively.

12. Any unknowns related to the Estate's lands that cannot be resolved through discussion can be addressed by the OMB before shovels go in the ground for the provision of services to the Midhurst area whether such matters relate to lot fabric, the number of housing units to be allowed on the Estate's lands or anything else. Accordingly the Estate's lands do not need to be held back or held up.
13. The Midhurst Secondary Plan is not the only source of policy direction that is to be followed contrary to the suggestion in your response letter that it is. The Planning Act, The Growth Plan, the Provincial Policy Statement 2014, and the County OP all need to be complied with in doing planning or EA work as do all applicable codes, the Municipal Engineer's manual, municipal laws, and so forth. In the case of the Estate's lands the required policy directives are not being followed.
14. The proposed phasing and staging table shown on page 10 and 11 of your draft traffic study of August 2016 needs to be revised and updated.

    REASON - it doesn't match up against what you have told me verbally, nor does it line up with what you have had to say in your response letter to me. It also doesn't agree to what was approved under the Municipal Class EA 1 & 2 work.

    Note - The portion of neighbourhood 2 that the Estate's lands are in, should show 2379 residential dwelling units not 1440 such units and the Doran Road South figure should show 2920 residential dwelling units and not the 3859 residential dwelling units that you are showing.
15. The Estate's lands do not need to be draft plan approved to be shown as Phase 1 Stage 1 lands for EA purposes. Other jurisdictions have shown lands like the Estate's lands in phase 1 of development for phasing and staging infrastructure purposes without such lands being draft plan approved yet and you can too. This is particularly true due to the OMB's approval of the Estate's lands for development and the fact that the Estate's lands received a population allocation from the County after going through a rigorous application process that included draft plan concept work, preparation and submission of engineering drawings, NVCA review of the Estate's plans and so on.
16. Neither the Alliance nor Geranium companies (and in particular the Alliance companies) can object to the Estate's lands going forward in Phase 1 Stage 1 of development in Midhurst and for planning and infrastructure reasons whatever is necessary for the Estate's land to go forward in Phase 1 Stage 1 should be done.
17. In your response letter you state that "Ainley has not been provided any documentation related to the Frankcom lands" - this is not correct. Brian Goodreid of the Goodreid Planning Group personally emailed you the Estate's Draft Plan Subdivision Concept (done to the same performance standards as those used by Alliance and Geranium with respect to their 300 hectare lands) and related engineering diagrams on March 23, 2015 thereby providing you with more than enough information to show lot fabric on the Estate's lands as was done for the Geranium lands (to the south and east of the Estate's lands) which received Midhurst Secondary Plan approval at the same time as the Estate's

lands did. To show lot fabric on the Geranium lands in this circumstance and not show lot fabric on the Estate's lands in the same circumstance is simply wrong.

18. The Estate's settlement agreement with the County is not a bar to the Estate's lands going forward in Phase 1 Stage 1 for infrastructure purposes although you suggest that it is. It only says that the Estate will adhere to all relevant policies and the Estate is ready, willing, and able to do so, and in fact the Estate has been doing so. You and your client on the other hand have not been adhering to all relevant policies in dealing with the Estate's lands because as you know or should know you need, among other things, to follow the County's built boundary phasing policy in dealing with the Estate's lands and you and your client are not doing so to the detriment of the Estate's land development project in Midhurst. Of course, as already mentioned previously, there has also not been any consultation with the Estate to date even though there ought to have been, nor has the Estate been dealt with in an open and transparent manner as is also a requirement of the current environmental assessment process.
19. The County's letter agreement with your client is between your client and the County. We are not a party to it and are not bound by it. Furthermore, the position taken by the County staff in the County's letter agreement with the Township is contrary to the County's own built boundary phasing policy.
20. If you are missing any information in dealing with the Estate's lands it is because you and your client have been refusing to deal with Estate matters since at least August of 2014. A situation that is particularly galling given that you are spending so much time with our developer neighbours; meeting with them, discussing your responses to us with them and so on.
21. Figure 5 to the draft traffic study will not be the same as figure 14 to the draft traffic study because two separate figure numbers would not be assigned to the same diagram if they were the same. Also, the wording on page 10 of the draft traffic study makes it clear that the two diagrams are not the same in spite of what you have had to say on the matter. Accordingly, please provide me with figure 5 to the draft traffic study. It was requested 5 months ago and there is no excuse to fail to provide it.
22. Item number 4 from my email to you of January 9, 2017;
    a. My question regarding the 27 Phase 1 Stage v residential housing units shown (on the excerpt of the lower right hand corner of figure 14 to your draft traffic study) in the Carson Road area has not been answered. Query: Who owns these lands and where exactly are they located?
    b. My question regarding the 259 Phase 2 Stage i residential housing units shown (on the excerpt of the lower right hand corner of figure 14 to your draft traffic study) in the Carson Road area has not been answered. Query: Who owns these lands and where exactly are they located?
    c. My question regarding the Phase 2 stage i, ii, iii, and iv residential housing units shown (on the excerpt of the lower right hand corner of figure 14 to your draft traffic study) in the so called Doran Road Developments area of that excerpt (750, 750,725, and 724 residential housing units respectively) has not been answered. Query: Who owns these lands and where exactly are they located?
23. You indicated in your letter that all residential housing unit lands currently proposed for infrastructure phasing and staging in Phase 1 of your EA work all come from the 300 hectare lands approved by the Board on July 4, 2014. We don't agree that this should be

the case for reasons already stated but in any case this is not correct anyway as 49 residential housing units shown by you were not Board approved on July 4, 2014 (i.e.5000 -350-4601= 49 residential housing units not approved by the Board on July 4, 2014). Additionally I don't recall the Board dealing with the 350 employment lands figure either.

24. Lot fabric has been shown for others in the same position as the Estate (i.e. lands not yet draft plan approved show lot fabric) so lot fabric can and should be shown for the Estate's lands as well.
25. The Frankcom lands can proceed to development now in accordance with the phasing policies of both OPA 38 and the County OP contrary to what is suggested in your response letter.
26. The Future Development Potential land category is still under appeal by the Ministry and doesn't, nor cannot, apply to the Estate's lands as the Estate's lands are no longer under appeal by the Ministry given that the OMB has approved the Midhurst Secondary Plan on the Estate's lands and has provided the Estate's lands with urban land use designations that do not include the Future Development Potential land category contrary to what your letter suggests.
27. Item 5 from my email to you of January 9, 2017;
    a. You say that the Estate's lands are phased and staged. What phase and what stage are the Estate's lands in? Note: On February 21, 2017 you told me verbally after the Township Council meeting that the Estate's lands are in Phase 2 Stage 1 but this is not reflected in your current phasing and staging table nor is it reflected in your response letter.

       Of course we believe that the Estate's lands should be phased and staged much earlier on than what you said verbally in any case, for all the reasons we have stated here and elsewhere.
28. If the purple cross hatch colour shown on the Estate's lands in figure 14 of the draft traffic study is intended to mean that lot fabric can't be shown for these lands then you ought to have said so in the legend for the diagram and have told me and my wife this when we first asked you about the matter. Furthermore, if this is the position that is now being taken it is not consistent with what you personally told me just 10 days prior to the date of your response letter.
29. Item 7 from my email to you of January 9, 2017;
    a. "The lot fabric ... for the MDDRI future lands within Phase 2 was provided to Ainley and therefore inserted".

       Comment: The lot fabric for the Frankcom lands was also provided to your firm contrary to your assertion that no documentation was provided. Accordingly, it should also be inserted as was done for the MDDRI lands.
30. Your response to item 8 of my email to you of January 9, 2017 is not correct. The phasing and staging of the Class EA is not limited to the 300 hectare lands as you suggested in the first sentence of your response to this item nor does it need to be. Other comments on your response to this item of my email are as follows;
    a. The OMB did not approve 4623 residential housing units for development as you say in your second sentence of your response to this item. Only 4601 residential

housing units were approved by the OMB and the OMB never said that any or all of these units must go forward in Midhurst's first phase of development (see my earlier comments on this for details).

b. Midhurst's first phase of development is limited to 3850 residential housing units not 4623 such units or the 4650 such units you show currently in Phase 1 of your EA work. In fact by proposing 4650 such Phase 1 residential housing units you actually exceed the allowable limit for Midhurst's first phase of development by 800 residential housing units.
c. The remaining residential housing units you talk about (8208 - 4973) are not equally subdivided into 4 stages in Phase 2 of your phasing and staging table contrary to what you have had to say in this regard.

THE BOTTOM LINE

Any issues related to the Estate's lands that cannot otherwise be resolved through consultation and discussion at the present time via a sit down meeting or meetings can be addressed by the OMB before shovels go in the ground with respect to infrastructure servicing for Midhurst. Accordingly, there are no good reasons not to phase and stage the Estate's lands early on for infrastructure purposes and there are a lot of reasons why you should.

The benefits of phasing and staging the Frankcom lands in Phase 1 Stage 1 of the Municipal Class EA 3 & 4 work for the Midhurst area include the following;

1. With servicing starting right next door to the Estate's lands in any case, servicing of the Estate's lands at the same time will be less disruptive to the local community than doing only some of the work now and having to come back to do more work later on.
2. Servicing the Estate's lands early on will allow for the early completion of significant infrastructure in the portion of Neighbourhood 2 getting infrastructure early on (i.e. dealing with the Estate's lands early on will help complete the local area community which is a requirement under the Growth Plan.
3. There will be a more orderly progression of development than there would be otherwise. Plus, an orderly progression of development is required in any case in accordance with the Provincial Policy Statement 2014, the County Official Plan and the Midhurst Secondary Plan as well, and won't be achieved without dealing with infrastructure for the Estate's lands early on.
4. It is more efficient and cost effective to deal with the Estate's lands at the same time as the lands of its developer neighbour (i.e. the Alliance companies) which have been phased and staged for development early on. This is particularly the case since the Alliance companies' lands surround the Estate's lands and the Estate's lands will be sharing a common road network, a common water and wastewater handling network, and a common storm water management pond with them as well.
5. Compliance with Provincial, County and local policy directives will be achieved by phasing and staging the Estate's lands for EA purposes early on but cannot and will not be achieved otherwise.
6. There are economies of scale and efficiencies to be achieved by providing infrastructure for the Estate's lands early on.

7. Servicing the Estate's lands early on will enhance traffic flow into and out of the Doran Road area where the Estate's lands are located. This is particularly consequential due to the importance of the Estate's Street "A" in providing early access to Doran Road. Note: The Alliance companies will have no access to Doran Road early on without going through the Estate's lands and without this access there will be much more traffic congestion in the area than there would or should be otherwise. Additionally, the Estate's road "A" provides a vital connective link between the Geranium lands to the south of the Estate's lands and the Alliance companies' lands to the north. In fact, when getting their 300 hectare rule Board approvals the Alliance and the Geranium companies were required to align their roads with the Estate's street "A" a clear indicator of the importance of the Estate's street "A" as a vital connector road for the area.
8. By servicing the Estate's lands early on water main looping can be provided for.
9. Sanitary trunk line savings can likely be achieved as well.

I look forward to meeting with you and/or members of the Township staff to deal with and resolve all such matters.

Regards,

Stan Kirsch
Authorized Agent for the Frankcom Estate

## Reid Mitchell

**From:** Joe Mullan <mullan@ainleygroup.com>
**Sent:** August-04-17 7:02 AM
**To:** Paul Martin (MOECC)
**Cc:** Chunmei Liu; Brent Spagnol; Heather Coleman; Barnet Kussner; Reid Mitchell
**Subject:** Frankcom Estate - Outstanding Concerns - Midhurst

**Hi Paul:**

Thank you for providing us a copy of the Ministry's response back to Mr. Stan Kirsch regarding the Midhurst Class EA. To assist us fully understand Mr. Kirsch's concerns would it be possible for you to send us a copy of the correspondence (email/letter) that Mr. Kirsch sent to the Ministry originally?

Regards,

J. A. Mullan, P.Eng.
President & CEO

Ainley

www.ainleygroup.com
Tel: (705) 445-3451 Ext. 126
Cell: (705) 718-7230

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**From:** Martin, Paul (MOECC) [mailto:Paul.D.Martin@ontario.ca]
**Sent:** Thursday, August 3, 2017 2:10 PM
**To:** Joe Mullan <mullan@ainleygroup.com>; midhurst.classea@springwater.ca
**Subject:** Frankcom Estate - Outstanding Concerns - Midhurst

Good afternoon Joe / Mark
Please see below our response to Stan Kirsch as an FYI
If you have any questions, please feel free to let me know
Thanks

Thank you for your email dated June 29, 2017 regarding our response to your concerns with the ongoing Midhurst Water, Wastewater & Transportation Class Environmental Assessment (Class EA) undertaking.

Please be assured that during planning, all development must consider environmental impacts either through the *Planning Act* or *EA Act* processes. Under the *EA Act,* municipal infrastructure works are subject to the *Municipal Class Environmental Assessment* (October 2000, as amended in 2007&2011), including private sector proposed Schedule C municipal roads, water & wastewater projects for residential developments. The Township of Springwater is currently proceeding with a Class EA study to evaluate water, wastewater and transportation for servicing the Midhurst Secondary Plan area.

In your letter, you asked if the ministry also deals with wastewater and transportation matters. For projects that follow the Class EA process, including wastewater and transportation projects, the ministry's review focuses on the potential

impacts from the proposed undertaking related to the ministry's mandate, including air, water and land. We also note that other bodies including federal, provincial and municipal agencies may also be asked to provide input on a project such as this, and provide comments based on their respective mandates.

In your letter, you listed six items for which I am responding to you as follows:

**Items 1, 3 and 4:** As per your request for a copy of Figure 5 to the Draft Traffic Study of August 2016, and the EA Phasing and Staging Table in Items 3 and 4, we have spoken with Ainley Group and the Township of Springwater and they will follow up with you regarding your inquiry. For your request of a copy of the draft ESR for review in Item 1, please be aware that under the Municipal Class EA, there is no obligation that the draft ESR be provided for public review. We encourage you to work with Ainley Group and the Township directly to address your specific concerns prior to the 30-day public review when a Notice of Completion is issued. If you still want to review the draft ESR, you may request the draft ESR under the Freedom of Information (FOI) process.

**Items 2, 4 and 6:** For your questions related to the scope of this Class EA, please be aware that the Municipal Class EA study is the process to evaluate options for municipal servicing, but does not determine details about how or which parcels of land will be developed. Phasing and staging of land development are decisions made by the municipality under the planning process, although the Class EA may use information and data to evaluate alternative solutions and design concepts. We encourage you to discuss your concerns with the phasing and staging of the land development in Midhurst with the Township of Springwater planning department directly, as they will not be addressed by the Class EA process.

**Item 5:** The draft ESR includes the Ainley Group's March 3, 2017 letter to you, however, your response letter to Ainley Group of March 27, 2017 is not included. We assume that Ainley Group was wrapping up the draft ESR during that time. Ainley is expected to include all correspondence in the final ESR for the 30-day public review when a Notice of Completion is issued, as required by the Municipal Class EA.

The Class EA is a proponent driven process and we would encourage you to follow up with the Township (and it's consultants) if you have further questions. For our part, we have reached out to Ainley to remind them of the importance of engaging with all interested stakeholders and making meaningful efforts to address comments received. If your concerns are not resolved through discussions with the Township during the Class EA study, under the provisions of subsection 16 of the amended *EA Act*, you may write to the Minister or delegate and request a Part II Order during the 30-day review period after the Notice of Completion has been issued. Upon receipt of your concerns, the Minister or delegate will make a decision on the Part II Order in accordance with section A. 2.8 of the Municipal Class EA. Please note that only matters within the scope of the Class EA process will be considered.

Thank you for bringing the issues to our attention.

**Paul Martin, GISP** | Supervisor – Air, Pesticides & Environmental Planning | Technical Support Section, Central Region
Ontario Ministry of the Environment and Climate Change | 5775 Yonge St. 9th Floor | Toronto, ON | M2M 4J1 | T: 416-326-3477 F: 416-325-6347

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E-mail collingwood@ainleygroup.com

May 30, 2018 113027

"By Email"

**Attn: Stan Kirsch**
skirsch@bellnet.ca

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. Kirsch:

On behalf of the Township of Springwater, we wish to thank you for your interest in the above-mentioned Class EA. When we received your March 27, 2017 email and comment letter we were in the process of finalizing and submitting a draft Environmental Study Report (ESR) to the Ministry of Environment and Climate Change (MOECC) for their review and comments. In conjunction with the submission of the draft ESR to the MOECC, the Class EA was put unofficially on hold until MOECC comments were received. Now that we recently received formal MOECC comments on the draft ESR we are re-initiating the Class EA and as such are now responding to Mar 27, 2017 letter.

For your convenience, we have provided your specific comments in blue, followed by our responses.

1. *There is a legal requirement under the Environmental Assessment Act to consult with interested parties early on (i.e. to talk to, and hold meetings with, interested parties early on). Also, municipal class environmental assessment work is to be done in an open, transparent, and objective manner. When it comes to the Frankcom Estate's lands in Midhurst there was no consultation with the Estate early on (or at all so far) and the Estate has not been dealt with in an open and transparent manner putting it and its land development project at risk of harm.*

We respectfully disagree and believe that the Midhurst Class EA has been undertaken in an extremely open and transparent manner. In particular, we have held multiple Open Houses, provided regular updates to Council (during open Council meetings), held at least 15 Resident Liaison Group Meetings, plus posted all Reports and documentation on the Township website, as soon as they became throughout the past three years.

With regard to your specific involvement, we added your name and contact information to the Class EA distribution list as soon as we became aware of your interest in the Class EA in the fall 2016. Since then you have submitted a number of comments (letters and emails) related to the Class EA and we have taken them into consideration and provided response comments back to you.

Finally, as noted previously the Frankcom Estates development lands are included in the Class EA process and can be accommodated within the 7,858 residential units that are planned within the Midhurst Secondary Plan.

2. *The Class EA process currently under way in Midhurst can be updated to accommodate additional information received during the course of the study but this has not been done in respect to the Estate's lands or infrastructure matters related to the Estate's lands.*

Again, we respectfully disagree as responses have been provided to all of the documentation received to date and as noted later in this letter, the Class EA maps and associated tables have been updated to include the proposed lot fabric for the Frankcom Estates.

3. *The County's built boundary phasing policy is not being followed in the EA phasing and staging of infrastructure work for Midhurst. If the currently proposed phasing and staging goes forward this would keep the Estate's lands from being developed as early on as they should be. This is not right.*
4. *Estate's lands have sufficient development rights to be phased and staged for EA purposes particularly given that the Ontario Municipal Board (the "OMB") has approved the Midhurst Secondary Plan in respect to the Estate's lands and has provided urban land use designations for the Estate's lands to go along with the population allocated to its lands by the County.*
5. *There is nothing in the Midhurst Secondary Plan that says that only draft plan approved lands (like the Alliance and Geranium 300 hectare rule lands) can be phased and staged for infrastructure purposes early on.*
6. *Midhurst Secondary Plan policy 9.2(b) and 9.2(f) do not constitute a bar to the Estate's lands going forward in Midhurst' s Phase 1 Stage 1 of infrastructure servicing for the Midhurst settlement area contrary to what you suggest in your letter.*
7. *The County's built boundary phasing policy calls for lands adjacent to Midhurst's built boundary (like the Frankcom lands) to be serviced and developed first, except in some limited cases that don't apply to the Estate's lands in Midhurst. As a result, any proposal to service the Estate's lands later on (or perhaps, not at all) is not good land development planning or good engineering.*
8. *Good infrastructure planning is not limited to draft plan approved lands regardless of where they are located in the settlement area or for that matter draft plan approved lands only. Also, good infrastructure planning does not give such lands priority status simply because they were approved first. So, in our view the reasons given in your response letter, to propose that only the Alliance and Geranium 300 hectare lands go forward first, are flawed.*
9. *The OMB did approve some of the Alliance and Geranium lands for development in July of 2014 and in doing so the Board did require them to phase their own projects BUT the Board did not address the matter of whose lands would get to go forward in Midhurst' s first phase of development (i.e. they did not address whose land holdings in Midhurst [whether the Alliance companies lands, the Geranium companies lands, the Estate's lands, or anyone else's lands] would get to fill Midhurst's first phase of development). In passing, development of the Estate's lands and the related servicing of same has been held up for some 28 years now and there is no good reason to hold development of the Estate's lands up any longer now that the OMB has approved the Midhurst Secondary Plan on the Estate's lands and provided land use designations for the Estate's lands to go along with the population allocated to the Estate's lands by the County.*
10. *There is nothing in the Midhurst Secondary Plan that says that Midhurst's Phase 1 Stage 1 (or any other phase or stage) of infrastructure work in Midhurst (none of which has started yet or will start for say 1 to 2 years) is to be filled on a first come-first served basis. In fact, to do so would neither be good land development planning nor would it be good infrastructure planning. So, in point of fact, there is nothing to say that solely the Alliance and Geranium 300 hectare rule lands should fill up the whole first phase of development in Midhurst and the infrastructure servicing related thereto.*
11. *The Township is obligated to phase and stage development and the related required infrastructure in accordance with both good planning principles and good engineering principles. Ignoring the County's built boundary phasing policy and leapfrogging over the*

*Estate's lands is neither good planning nor good engineering and is not consistent with the notion of building complete communities efficiently, and cost effectively.*

12. *Any unknowns related to the Estate's lands that cannot be resolved through discussion can be addressed by the OMB before shovels go in the ground for the provision of services to the Midhurst area whether such matters relate to lot fabric, the number of housing units to be allowed on the Estate's lands or anything else. Accordingly the Estate's lands do not need to be held back or held up.*
13. *The Midhurst Secondary Plan is not the only source of policy direction that is to be followed contrary to the suggestion in your response letter that it is. The Planning Act, The Growth Plan, the Provincial Policy Statement 2014, and the County OP all need to be complied with in doing planning or EA work as do all applicable codes, the Municipal Engineer's manual, municipal laws, and so forth. In the case of the Estate's lands the required policy directives are not being followed.*

Items 3 through 13 are related to Phasing and Staging of land development, which are decisions made by the Municipality under the Planning Approval process, and should be directly to the Township of Springwater Planning department directly, as they will not be addressed by the Class EA process. We also note that Mr. Paul Martin of MOECC in his Aug. 3, 2017 email to you also noted this.

14. *The proposed phasing and staging table shown on page 10 and 11 of your draft traffic study of August 2016 needs to be revised and updated.*

    *REASON - it doesn't match up against what you have told me verbally, nor does it line up with what you have had to say in your response letter to me. It also doesn't agree to what was approved under the Municipal Class EA 1 & 2 work.*

    *Note - The portion of neighbourhood 2 that the Estate's lands are in, should show 2379 residential dwelling units not 1440 such units and the Doran Road South figure should show 2920 residential dwelling units and not the 3859 residential dwelling units that you are showing.*

See the Response to Items 25 through 27.

15. *The Estate's lands do not need to be draft plan approved to be shown as Phase 1 Stage 1 lands for EA purposes. Other jurisdictions have shown lands like the Estate's lands in phase 1 of development for phasing and staging infrastructure purposes without such lands being draft plan approved yet and you can too. This is particularly true due to the OMB's approval of the Estate's lands for development and the fact that the Estate's lands received a population allocation from the County after going through a rigorous application process that included draft plan concept work, preparation and submission of engineering drawings, NVCA review of the Estate's plans and so on.*
16. *Neither the Alliance nor Geranium companies (and in particular the Alliance companies) can object to the Estate's lands going forward in Phase 1 Stage 1 of development in Midhurst and for planning and infrastructure reasons whatever is necessary for the Estate's land to go forward in Phase 1 Stage 1 should be done.*

Items 15 & 16 are related to Phasing and Staging of land development, which are decisions made by the Municipality under the Planning Approval process, and should be directly to the Township of Springwater Planning department directly, as they will not be addressed by the Class EA process.

17. *In your response letter you state that "Ainley has not been provided any documentation related to the Frankcom lands" - this is not correct. Brian Goodreid of the Goodreid Planning Group personally emailed you the Estate's Draft Plan Subdivision Concept (done to the same performance standards as those used by Alliance and Geranium with respect to their 300 hectare lands) and related engineering diagrams on March 23, 2015 thereby providing you with more than enough information to show lot fabric on the Estate's lands as was done for the Geranium lands (to the south and east of the Estate's lands) which received Midhurst Secondary Plan approval at the same time as the Estate's lands did. To show lot fabric on the Geranium lands in this circumstance and not show lot fabric on the Estate's lands in the same circumstance is simply wrong.*

We have updated the maps within the Class EA, to show the proposed lot fabric for the Frankcom Estates property (based on the Concept Plan, dated Aug 2014 provided by Brian Goodreid).

However, it must be noted that the inclusion of this Concept Plan does not constitute acceptance of the Plan by the Township and from our review of the Concept Plan, it can be expected that changes will be be required before it is acceptable.

18. *The Estate's settlement agreement with the County is not a bar to the Estate's lands going forward in Phase 1 Stage 1 for infrastructure purposes although you suggest that it is. It only says that the Estate will adhere to all relevant policies and the Estate is ready, willing, and able to do so, and in fact the Estate has been doing so. You and your client on the other hand have not been adhering to all relevant policies in dealing with the Estate's lands because as you know or should know you need, among other things, to follow the County's built boundary phasing policy in dealing with the Estate's lands and you and your client are not doing so to the detriment of the Estate's land development project in Midhurst. Of course, as already mentioned previously, there has also not been any consultation with the Estate to date even though there ought to have been, nor has the Estate been dealt with in an open and transparent manner as is also a requirement of the current environmental assessment process.*
19. *The County's letter agreement with your client is between your client and the County. We are not a party to it and are not bound by it. Furthermore, the position taken by the County staff in the County's letter agreement with the Township is contrary to the County's own built boundary phasing policy.*
20. *If you are missing any information in dealing with the Estate's lands it is because you and your client have been refusing to deal with Estate matters since at least August of 2014. A situation that is particularly galling given that you are spending so much time with our developer neighbours; meeting with them, discussing your responses to us with them and so on.*

Items 18 through 20 are related to Phasing and Staging of land development, which are decisions made by the Municipality under the Planning Approval process, and should be directly to the Township of Springwater Planning department directly, as they will not be addressed by the Class EA process.

*21. Figure 5 to the draft traffic study will not be the same as figure 14 to the draft traffic study because two separate figure numbers would not be assigned to the same diagram if they were the same. Also, the wording on page 10 of the draft traffic study makes it clear that the two diagrams are not the same in spite of what you have had to say on the matter. Accordingly, please provide me with figure 5 to the draft traffic study. It was requested 5 months ago and there is no excuse to fail to provide it.*

All of the Figures within the Transportation section of the ESR have been revised and updated.

*22. Item number 4 from my email to you of January 9, 2017;*

*a. My question regarding the 27 Phase 1 Stage v residential housing units shown (on the excerpt of the lower right hand comer of figure 14 to your draft traffic study) in the Carson Road area has not been answered. Query: Who owns these lands and where exactly are they located?*

*b. My question regarding the 259 Phase 2 Stage i residential housing units shown (on the excerpt of the lower right hand comer of figure 14 to your draft traffic study) in the Carson Road area has not been answered. Query: Who owns these lands and where exactly are they located?*

*c. My question regarding the Phase 2 stage i, ii, iii, and iv residential housing units shown (on the excerpt of the lower right hand comer of figure 14 to your draft traffic study) in the so called Doran Road Developments area of that excerpt (750, 750,725, and 724 residential housing units respectively) has not been answered. Query: Who owns these lands and where exactly are they located?*

*23. You indicated in your letter that all residential housing unit lands currently proposed for infrastructure phasing and staging in Phase 1 of your EA work all come from the 300 hectare lands approved by the Board on July 4, 2014. We don't agree that this should be the case for reasons already stated but in any case this is not correct anyway as 49 residential housing units shown by you were not Board approved on July 4, 2014 (i.e. 5000 - 350 - 4601 = 49 residential housing units not approved by the Board on July 4, 2014). Additionally I don't recall the Board dealing with the 350 employment lands figure either.*

In response to 22 & 23 we note that during Phase 1 & 2 of the Class EA in 2008 it was determined, using an estimated number of units per hectare, that the Class EA would allow for 7,858 residential units plus 350 equivalent employment units for a total of 8,208 equivalent units. Then at the initiation of Phase 3 & 4 Class EA process in 2013, it was agreed by the Steering Committee that for the purpose of the Class EA process, we would continue with a total of 8,208 equivalent units and that the first Phase would include 5,000 equivalent units with the remaining 3,208 in Phase 2. In addition, the Steering Committee noted that they wanted the employment units to be included in the first Phase. Therefore, within our table, we have identified the OMB Draft Plan approved units (4,601) plus the 350 employment units and then the number was rounded up from 4,951 to 5,000; therefore 49 units were taken out of Phase 2 and brought into Phase 1.

However, we want to emphasize that the phasing table developed as part of the Class EA, was solely for identifying infrastructure needs and should not be taken in a Planning Approval context, as the timing associated when and which developments can proceed, is dealt with by the Township Planning department and not this Class EA.

*24. Lot fabric has been shown for others in the same position as the Estate (i.e. lands not yet draft plan approved show lot fabric) so lot fabric can and should be shown for the Estate's lands as well.*

See the response to item 17

*25. The Frankcom lands can proceed to development now in accordance with the phasing policies of both OPA 38 and the County OP contrary to what is suggested in your response letter.*

*26. The Future Development Potential land category is still under appeal by the Ministry and doesn't, nor cannot, apply to the Estate's lands as the Estate's lands are no longer under appeal by the Ministry given that the OMB has approved the Midhurst Secondary Plan on the Estate's lands and has provided the Estate's lands with urban land use designations that do not include the Future Development Potential land category contrary to what your letter suggests.*

*27. Item 5 from my email to you of January 9, 2017;*

*a. You say that the Estate's lands are phased and staged. What phase and what stage are the Estate's lands in? Note: On February 21, 2017 you told me verbally after the Township Council meeting that the Estate's lands are in Phase 2 Stage 1 but this is not reflected in your current phasing and staging table nor is it reflected in your response letter.*

*Of course we believe that the Estate's lands should be phased and staged much earlier on than what you said verbally in any case, for all the reasons we have stated here and elsewhere.*

Based upon the updated maps and associated tables within the ESR, 375 residential units have been redistributed within Phase 2 - Stage 1, from Doran Road South to Doran Road North. Therefore, with this revision, the infrastructure within the Class EA now includes 375 units north of Doran Road, in addition to the 1,440 units that are Draft Plan approved north of Doran Road. These 375 units “could” represent the Frankcom Estates if the appropriate Planning Approvals were received from the Township in the future. We also note that the Concept Plan for the Frankcom Estates, dated Aug 2014 and provided by Brian Goodreid on your behalf, identifies 304 units within the Frankcom Estates development.

*28. If the purple cross hatch colour shown on the Estate's lands in figure 14 of the draft traffic study is intended to mean that lot fabric can't be shown for these lands then you ought to have said so in the legend for the diagram and have told me and my wife this when we first asked you about the matter. Furthermore, if this is the position that is now being taken it is not consistent with what you personally told me just 10 days prior to the date of your response letter.*

See responses to Item 17 & 27.

*29. Item 7 from my email to you of January 9, 2017;*

*a. "The lot fabric ... for the MDDRI future lands within Phase 2 was provided to Ainley and therefore inserted."*

*Comment: The lot fabric for the Frankcom lands was also provided to your firm contrary to your assertion that no documentation was provided. Accordingly, it should also be inserted as was done for the MDDRI lands.*

See responses to Item 17 & 27.

30. *Your response to item 8 of my email to you of January 9, 2017 is not correct. The phasing and staging of the Class EA is not limited to the 300 hectare lands as you suggested in the first sentence of your response to this item nor does it need to be. Other comments on your response to this item of my email are as follows;*

    a. *The 0MB did not approve 4623 residential housing units for development as you say in your second sentence of your response to this item. Only 4601 residential housing units were approved by the OMB and the OMB never said that any or all of these units must go forward in Midhurst's first phase of development (see my earlier comments on this for details).*
    b. *Midhurst's first phase of development is limited to 3850 residential housing units not 4623 such units or the 4650 such units you show currently in Phase 1 of your EA work. In fact by proposing 4650 such Phase 1 residential housing units you actually exceed the allowable limit for Midhurst's first phase of development by 800 residential housing units.*
    c. *The remaining residential housing units you talk about (8208 - 4973) are not equally subdivided into 4 stages in Phase 2 of your phasing and staging table contrary to what you have had to say in this regard.*

See responses to Item 17, 23 & 27.

*THE BOTTOM LINE*

*Any issues related to the Estate's lands that cannot otherwise be resolved through consultation and discussion at the present time via a sit down meeting or meetings can be addressed by the OMB before shovels go in the ground with respect to infrastructure servicing for Midhurst. Accordingly, there are no good reasons not to phase and stage the Estate's lands early on for infrastructure purposes and there are a lot of reasons why you should.*

*The benefits of phasing and staging the Frankcom lands in Phase 1 Stage 1 of the Municipal Class EA 3 & 4 work for the Midhurst area include the following;*

1. *With servicing starting right next door to the Estate's lands in any case, servicing of the Estate's lands at the same time will be less disruptive to the local community than doing only some of the work now and having to come back to do more work later on.*
2. *Servicing the Estate's lands early on will allow for the early completion of significant infrastructure in the portion of Neighbourhood 2 getting infrastructure early on (i.e. dealing with the Estate's lands early on will help complete the local area community which is a requirement under the Growth Plan.*
3. *There will be a more orderly progression of development than there would be otherwise. Plus, an orderly progression of development is required in any case in accordance with the Provincial Policy Statement 2014, the County Official Plan and the Midhurst Secondary Plan as well, and won't be achieved without dealing with infrastructure for the*

*Estate's lands early on.*

4. *It is more efficient and cost effective to deal with the Estate's lands at the same time as the lands of its developer neighbour (i.e. the Alliance companies) which have been phased and staged for development early on. This is particularly the case since the Alliance companies' lands surround the Estate's lands and the Estate's lands will be sharing a common road network, a common water and wastewater handling network, and a common storm water management pond with them as well.*
5. *Compliance with Provincial, County and local policy directives will be achieved by phasing and staging the Estate's lands for EA purposes early on but cannot and will not be achieved otherwise.*
6. *There are economies of scale and efficiencies to be achieved by providing infrastructure for the Estate's lands early on.*
7. *Servicing the Estate's lands early on will enhance traffic flow into and out of the Doran Road area where the Estate's lands are located. This is particularly consequential due to the importance of the Estate's Street "A" in providing early access to Doran Road. Note: The Alliance companies will have no access to Doran Road early on without going through the Estate's lands and without this access there will be much more traffic congestion in the area than there would or should be otherwise. Additionally, the Estate's road "A" provides a vital connective link between the Geranium lands to the south of the Estate's lands and the Alliance companies' lands to the north. In fact, when getting their 300 hectare rule Board approvals the Alliance and the Geranium companies were required to align their roads with the Estate's street "A" a clear indicator of the importance of the Estate's street "A" as a vital connector road for the area.*
8. *By servicing the Estate's lands early on water main looping can be provided for.*
9. *Sanitary trunk line savings can likely be achieved as well.*

These closing comments are all related to Phasing and Staging of land development, which are decisions made by the Municipality under the Planning process, and should be directly to the Township of Springwater Planning department directly, as they will not be addressed by the Class EA process.

Thank you again for your interest in this Class EA.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P.Eng.
President & CEO

cc: Heather Coleman - Township of Springwater (By Email)

RECU/RECEIVED
03 -05- 2017

1/05/17

Dear Mayor and Members of Springwater Council,

My property backs onto Willow Creek and I am very concerned about both surface and ground water quality in our township. I ask that you answer my three requests.(

1) Very large municipal wells are proposed for the coming development near our village. I would like to ask that all the homes near these wells are surveyed to determine how many are on well water and could be impacted.

2) Water bills are expensive for seniors what type of treatment does the water coming from these proposed wells require before it can be used municipally? Further will all Springwater users be billed for this treatment?

3) Big new wells need more than minimal pumping tests. Many municipalities require at least 30 days of pumping. I would like to see our Council request the same pumping to find out how other wells may be influenced": loss of flow or even loss of water totally.

From Gisele Armstrong 21 Doran Rd. Midhurst

G. Armstrong

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, ON, L9Y 4J5
Tel: (705) 445-3451 ▪ Fax: (705) 445-0968
E-mail collingwood@ainleygroup.com

May 30, 2018

File No. 113027

Gisele Armstrong
21 Doran Rd.
Midhurst, On
L9X1L3

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. Armstrong:

On behalf of the Township of Springwater, we wish to thank you for your interest in the above-mentioned Class EA.

On April 25, 2017 the draft Environmental Study Report (ESR) was submitted to the Ministry of Environment and Climate Change (MOECC) for their review and comment. Given the significance of the Midhurst Class EA, the Township also sent a letter specifically requesting the MOECC to review a number of key items within the draft ESR, so that the Township and residents would be satisfied that the appropriate investigations and studies had been completed. After April 2017 the Class EA process was "unofficially" put on hold until we received MOECC comments on the draft ESR. Comments were recently received from the MOECC and as such we are re-initiating the Class EA process and responding to your May 3, 2017 letter to Council.

Your comments/requests have been summarized and our responses are provided following each comment.

1) *Very large municipal wells are proposed for the coming development near our village. I would like to ask that all the homes near these wells are surveyed to determine how many are on well water and could be impacted.*

A complete survey of private wells is not required by the Ministry of Environment & Climate Change (MOECC) when completing a Class EA process. In addition, when Golder Associates applied for and received the PTTW's for the Township of Springwater at Anton Mills, Minesing, or Del Trend, plus dozens of other municipalities in Simcoe County a complete survey of private wells was not required. Furthermore, neither the Township of Springwater, the City of Barrie nor any other municipality in Simcoe County, have ever done this for any of their municipal water systems.

When compared to a door-to-door survey, an examination of potential impacts through an examination of the water well records and the development of a calibrated computer model, results in more actual usable data that can be used to evaluate the available water resources of an entire area. Thus, in Golder's professional opinion, a door to door survey is not the most reliable way to measure impacts.

In addition, we also note there are four main aquifers (A1, A2, A3 & A4) within the overall area and we provide the following responses in relation to each of the specific aquifers and what the modeling shows:

Aquifer A1 There are no wells located within the 2.5-metre drawdown cone for any of the proposed wells in Aquifer A1. There are 11 wells located within the 1.5-metre drawdown cone, which have a water column above the well screen of between 6 and 14 m. None of these wells are expected to be vulnerable to a loss of water as a result of the proposed water taking;

Aquifer A2 There are 16 wells within the 2-metre drawdown cone for Aquifer A2 and they have a water column above the well screen of between 10 and 34 m. None of these wells are expected to be vulnerable to a loss of water supply as a result of the proposed water taking.

Aquifer A3 There are three wells within the 2-metre drawdown cone for Aquifer A3 and these wells have a water column above the well screen of between 46 and 71 m. It is not expected that these wells will be vulnerable to a loss of water supply as a result of the proposed water taking.

Aquifer A4 There are three wells within the 2-metre drawdown cone for Aquifer A4 and one well constructed in the bedrock aquifer. These wells have a water column above the well screen of between 69 and 112 m. It is not expected that these wells will be vulnerable to a loss of water supply as a result of the proposed water taking.

In summary the extensive modeling confirms that there will be no impacts to private water supply wells as a result of the proposed water taking.

In addition, and prior to a Permit to Take Water (PTTW) of the various wells being received from Ministry of Environment & Climate Change (MOECC) over the next 25 years, detailed aquifer performance testing will be required in conjunction with the application for a Permit to Take Water. Also, the Permit to Take Water process involves the MOECC posting the proposed application for Public comment on the Environmental Registry of the Ontario Ministry of Environment & Climate Change.

Finally, the Developer, through suitable legal Agreements with the Township will be responsible for replacing any private water supply that it has been proven to have been impacted by the Municipal water taking. This could be in the form of a new drilled well or connection to the municipal system.

*2) Water bills are expensive for seniors, what type of treatment does the water coming from these proposed wells require before it can be used municipally? Further will all Springwater users be billed for this treatment?*

At each of the proposed Municipal well sites, test pumping and water quality sampling, in accordance with MOECC requirements, was completed and the results are included in the Hydrogeological Study.

Based on the water quality sampling and testing done to date, treatment technologies have been identified for both of the proposed water treatment plants and there is nothing unusual with the water supplies.

With regard to the Annual Operating Cost, which are only paid by the connected users, we know the specifics of the proposed treatment technologies and therefore we know that that the operating costs will be in line with other Municipal systems of similar size.

3) *Big new wells need more than minimal pumping tests. Many municipalities require at least 30 days of pumping. I would like to see our Council request the same pumping to find out how other wells may be influenced": loss of flow or even loss of water totally.*

Golder Associates has confirmed that the 3 day pumping tests, such as those conducted in Midhurst, are an industry standard and are a reliable method of estimating well yield and aquifer properties.

In addition, extending the length of these tests would not provide more accurate/useful results. It is the first day of pumping data that are important in analysis of aquifer transmissivity and storage. Thirdly, long-term groundwater impacts were predicted using a calibrated groundwater model that simulated all proposed operational wells using full build-out pumping rates. The model considers a 10-year simulation which provides better data, than the 30 day pumping approach.

Finally, the groundwater flow model was calibrated based on the results of the pumping tests. These included the interference among the aquifers that was noted at TW21. The drawdown predicted in the shallow wells is representative of the results of the pumping tests.

In closing we wish to note that the MOECC as part of their recent comprehensive review of the draft ESR did not identify any major issues with the Reports and Investigations that have been completed as part of the Class EA and therefore we are confident that the development of the proposed infrastructure to support the Midhurst Secondary Plan will not have a detrimental impact on the downstream wetlands and/or the water resources in the area.

Thank you again for your interest in this Class EA.

Should you have any questions please do not hesitate to contact the undersigned.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P.Eng.
President & CEO

*S:\113027 Midhurst\Correspondence\Letter\Response letters May 2018\113027 Midhurst Class EA - Response to Armstrong (May 30 2018).docx*

cc: Heather Coleman - Township of Springwater (By Email)

REÇU/RECEIVED
11 -05- 2017

Major French and Members of Council
2231 Nursery Road, Minesing
Ontario, L9X 1A8

May 10, 2017

Dear Mayor French and Members of Council,

We have ongoing concerns as to how our municipality will handle the expensive sewage treatment processes needed to release water to Willow Creek. We received a letter from Joe Mullen basically saying that there are no regulations yet so they are proposing to do nothing. Given the work being done at the University of Waterloo's engineering departments and research that is listed in the link we have provided, this approach is not acceptable. We need a flexible treatment plant that can be updated – nothing less.

If we know anything its that the household waste water stream is changing constantly. Nano particles are an emerging issue. Some nano particles like those used in anti-bacterial sportswear such as socks etc. are toxic while others are plastics. We do not want these compounds entering the environment where they become part of the food chain. Locally, the sports fishery, for example in the Nottawasaga River and Georgian Bay is a huge economic driver. Research is now showing plastic in the flesh of both fresh and salt water species. Council is within their rights to act on behalf of residents and ask our consultants to demonstrate that the treatment method can remove nano particles now or can be upgraded to do so.

We also urge you to research the issue of so called "flushable" wipes that are growing in number for baby use and cosmetics etc. All over Ontario municipal sewage treatment engineers are facing huge challenges as this amount of plastic is clogging their equipment. It is proving very labour intensive to remove this debris, which becomes tangled in machinery, as it does not biodegrade. It was either TVO's The Water Brothers or CBC, which documented this issue. A massive expense that no municipality was prepared for – just another junk product for consumers to "flush away".

Given the recent massive floods in Ontario, Quebec and New Brunswick where municipal infrastructure has been overwhelmed by the surface discharge how are we proposing to deal with massive storm water ponds and a sewage treatment plant that will need large pits to hold sewage water if the

plant's capacity is overwhelmed? The treatment plant in Creemore has pits to take untreated sewage at these times and that requires haulage contracts in place if an "event" exceeds the on site storage available.

We have an internationally significant wetland The Minesing, immediately downstream of the discharge pipe. Would a clean up even be possible? Are we willing to accept that costly level of risk?

The large development proposed means massive ground water taking. And that of course means massive amounts of sewage to be treated. Why don't we have a clear idea of these costs?

We see some costs identified for wastewater treatment but are totally in the dark as to how much it will cost to treat water from these proposed wells. Not all the wells are even drilled so we have no quality test results. Again, hidden costs for residents to absorb?

We should take a cautionary page from other municipalities experience. What does state of the art sewage treatment really cost? What about the actual cost for fixes needed to deal with consumer products? How long do other municipalities insist test wells are pumped to determine their impact on other groundwater users? Why do they do house to house well surveys to determine potential well/water supply mitigation costs? And what is the potential cost to do a clean up of the Minesing if there is a sewage plant failure?

The decision for Council is a simple one reject this EA. We simply do not have enough data to support what is proposed.

Sincerely,

Mr. and Mrs. Spek
47 Doran Rd., Midhurst, L9X 0L5

http://www.nanowerk.com/nanotechnology-news/newsid=46456.php

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E-mail collingwood@ainleygroup.com

May 30, 2018

File No. 113027

Connie Spek
47 Doran Rd.
Midhurst, ON
L9X0L5

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. Spek:

On behalf of the Township of Springwater, we wish to thank you for your interest in the above-mentioned Class EA.

On April 25, 2017 the draft Environmental Study Report (ESR) was submitted to the Ministry of Environment and Climate Change (MOECC) for their review and comment. Given the significance of the Midhurst Class EA, the Township also sent a letter specifically requesting the MOECC to review a number of key items within the draft ESR, so that the Township and residents would be satisfied that the appropriate investigations and studies had been completed. After April 2017 the Class EA process was "unofficially" put on hold until we received MOECC comments on the draft ESR. Comments were recently received from the MOECC and as such we are re-initiating the Class EA process and responding to your May 10, 2017 letter to Council.

Your comments/requests have been summarized and our responses are provided following each comment.

1. *We have ongoing concerns as to how our municipality will handle the expensive sewage treatment processes needed to release water to Willow Creek. We received a letter from Joe Mullen basically saying that there are no regulations yet so they are proposing to do nothing. Given the work being done at the University of Waterloo's engineering departments and research that is listed in the link we have provided, this approach is not acceptable. We need a flexible treatment plant that can be updated - nothing less.*

   *If we know anything its that the household waste water stream is changing constantly. Nano particles are an emerging issue. Some nano particles like those used in anti-bacterial sportswear such as socks etc. are toxic while others are plastics. We do not want these compounds entering the environment where they become part of the food chain. Locally, the sports fishery, for example in the Nottawasaga River and Georgian Bay is a huge economic driver. Research is now showing plastic in the flesh of both fresh and salt water species. Council is within their rights to act on behalf of residents and ask our consultants to demonstrate that the treatment method can remove nano particles now or can be upgraded to do so.*

As noted previously, there are currently no Federal and/or Provincial regulations in Canada relating to the levels of 1) Pharmaceuticals and Personal Care Products (PPCPs) and Endocrine Disruptors Compounds (EDCc) in wastewater and/or drinking water. In addition, neither the US Environmental Protection Agency nor the equivalent agencies in Europe and Asia have any regulations for PPCPs and EDCs in wastewater and/or drinking water.

The advanced Wastewater Treatment process that is being proposed for Midhurst will provide one of the best barriers available in the industry and as such will significantly minimize PPCPs, EDCs or other items such as plastics within the wastewater, entering Willow Creek.

2. *We also urge you to research the issue of so called "flushable" wipes that are growing in number for baby use and cosmetics etc. All over Ontario municipal sewage treatment engineers are facing huge challenges as this amount of plastic is clogging their equipment. It is proving very labour intensive to remove this debris, which becomes tangled in machinery, as it does not biodegrade. It was either TVO's The Water Brothers or CBC, which documented this issue. A massive expense that no municipality was prepared for -just another junk product for consumers to "flush away".*

   The pumping stations and the Wastewater Treatment process will be designed to the latest Industry standards, which includes lessons learned in relation to dealing with flushable wipes.

   However, this issue is global in nature, and as North American Water and Wastewater Associations (AWWA & WEFTEC) are in dialogue with the manufactures such that a truly flushable product is developed and are also looking at education programs to educate the public about the proper disposal of these products.

3. *Given the recent massive floods in Ontario, Quebec and New Brunswick where municipal infrastructure has been overwhelmed by the surface discharge how are we proposing to deal with massive storm water ponds and a sewage treatment plant that will need large pits to hold sewage water if the plant's capacity is overwhelmed? The treatment plant in Creemore has pits to take untreated sewage at these times and that requires haulage contracts in place if an "event" exceeds the on site storage available.*

   Modern sanitary sewer collection systems are closed systems, whereby they are designed and constructed to eliminate the impacts from external storm events. Unfortunately, this was not always the case and there are many older sanitary collections systems around Ontario (such as Creemore) that have “cross connections” whereby storm sewers, catch basins, sump pumps, etc. are directly connected to the sanitary collection system; therefore after a major storm event the sanitary collection systems gets impacted with additional storm flows, from the cross connections.

   The collection system that will be constructed within Midhurst will be in accordance with current Ontario Standards, which now accommodate allowances for Climate change.

   In addition, the Wastewater Treatment Plant design will include redundancy to addresses the risk of power upsets and or equipment failures as follows:

   a) A Standby power will be provided so that the plant can operate during power failure situation.
   b) Redundant units will be provided – if one unit fails, it can be isolated and the other units will treat the flow (ATs, SCs, Membranes, Screens).

c) Two Stage – the biological treatment will enable the plant to meet the nitrogen limits. The secondary process will also discharge effluent that is close to the final limits. The second stage tertiary process will polish the secondary effluent to meet the final limits. Each stage has redundancy so if the secondary stage is stressed, the tertiary stage will compensate.

Therefore, we are confident that there will be no discharge of untreated wastewater to adjacent creeks.

4. *We have an internationally significant wetland The Minesing, immediately downstream of the discharge pipe. Would a clean up even be possible? Are we willing to accept that costly level of risk?*

See response to Item 3.

5. *The large development proposed means massive ground water taking. And that of course means massive amounts of sewage to be treated. Why don't we have a clear idea of these costs?*

The “Evaluation of the Treatment Alternatives for Midhurst Wastewater Treatment Plant” and the “Evaluation of the Midhurst Water Supply and Treatment Alternatives” prepared by Black & Veatch, which form part of the Environmental Study Report (ESR) have details associated with the Life Cycle Costs (Capital Construction costs plus Maintenance Costs over the life of the infrastructure) for the Water and Wastewater Systems.

With regard to the Annual Operating Cost, which are only paid by the connected users, we know the specifics of the proposed treatment technologies and therefore we know that that the operating costs will be in line with other Municipal systems of similar size.

6. *We see some costs identified for wastewater treatment but are totally in the dark as to how much it will cost to treat water from these proposed wells. Not all the wells are even drilled so we have no quality test results. Again, hidden costs for residents to absorb?*

At each of the proposed Municipal well sites, test pumping and water quality sampling, in accordance with MOECC requirements, was completed and the results are included in the Hydrogeological Study.

Based on the water quality sampling and testing done to date, treatment technologies have been identified for both of the proposed water treatment plants and there is nothing unusual with the water supplies.

Additional testing and water quality sampling will be required, in the future, at the Permit to Take Water (PTTW) stage as each of the wells are required over the next 25 years

7. *What about the actual cost for fixes needed to deal with consumer products?”*

The Life Cycle costs referenced above includes the replacements of the various pieces of equipment within the Wastewater Treatment facilities, including pumps, screens, blowers etc. Therefore, the analysis that has been done includes allowance for the replacement of equipment based upon actual life cycles

8. *How long do other municipalities insist test wells are pumped to determine their impact on other groundwater users?*

   Golder Associates has confirmed that the 3 day pumping tests, such as those conducted in Midhurst, are an industry standard and are a reliable method of estimating well yield and aquifer properties.

   In addition, extending the length of these tests would not provide more accurate/useful results. It is the first day of pumping data that are important in analysis of aquifer transmissivity and storage. Thirdly, long-term groundwater impacts were predicted using a calibrated groundwater model that simulated all proposed operational wells using full build-out pumping rates. The model considers a 10-year simulation which provides better data, than the 30 day pumping approach.

9. *Why do they do house to house well surveys to determine potential well/water supply mitigation costs?"*

   A complete survey of private wells has not been done nor is it required by the Ministry of Environment & Climate Change (MOECC) when applying for a Permit To Take Water (PTTW). In addition, when Golder Associates applied for and received the PTTW's for the Township of Springwater at Anton Mills, Minesing, or Del Trend, plus dozens of other municipalities in Simcoe County a complete survey of private wells was note required. Furthermore, neither the Township of Springwater, the City of Barrie nor any other municipality in Simcoe County, have ever done this for any of their municipal water systems.

   When compared to a door-to-door survey, an examination of potential impacts through an examination of the water well records and the development of a calibrated computer model, results in more actual usable data that can be used to evaluate the available water resources of an entire area. Thus, in Golder's professional opinion, a door to door survey is not the most reliable way to measure impacts.

   Finally, the groundwater flow model was calibrated based on the results of the pumping tests. These included the interference among the aquifers that was noted at TW21. The drawdown predicted in the shallow wells is representative of the results of the pumping tests.

   In summary the extensive modeling confirms that there will be no impacts to private water supply wells as a result of the proposed water taking.

   In addition, and prior to a Permit to Take Water (PTTW) of the various wells being received from Ministry of Environment & Climate Change (MOECC) over the next 25 years, detailed aquifer performance testing will be required in conjunction with the application for a Permit to Take Water. Also, the Permit to Take Water process involves the MOECC posting the proposed application for Public comment on the Environmental Registry of the Ontario Ministry of Environment & Climate Change.

   Finally, the Developer, through suitable legal Agreements with the Township will be responsible for replacing any private water supply that it has been proven to have been impacted by the Municipal water taking. This could be in the form of a new drilled well or connection to the municipal system.

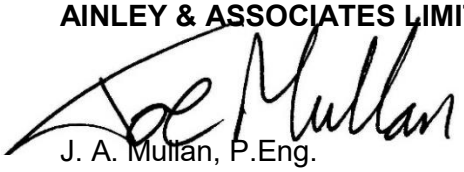
In closing we wish to note that the MOECC as part of their recent comprehensive review of the draft ESR did not identify any major issues with the Reports and Investigations that have been

completed as part of the Class EA and therefore we are confident that the development of the proposed infrastructure to support the Midhurst Secondary Plan will not have a detrimental impact on the downstream wetlands and/or the water resources in the area.

Thank you again for your interest in this Class EA. However, should you have any questions please do not hesitate to contact the undersigned.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**



J. A. Mullan, P.Eng.
President & CEO

*S:\113027 Midhurst\Correspondence\Letter\Response letters May 2018\113027 Midhurst Class EA - Response to Spek (May 30 2018).docx*

cc: Heather Coleman - Township of Springwater (By Email)

**From:** Ann Truyens <at@iglide.net>
**Sent:** May 15, 2017 12:08 AM
**To:** CouncilMail
**Subject:** MSP

**Importance:** High

To Springwater Council,

Midhurst knows all too well that misinformation by those who st
bad policy and growth approvals. There is more than enough sup
development. What is the point of jeopardizing your residents' w
significant wetland PLUS putting your Township into tens of mi
houses that aren't needed??

Let's stop building expensive sprawling infrastructure that you c
or upgrade. Let's take care of our water resources so that future g
clean water.

Please reject the environmental assessment and stop this travesty

Ann Truyens

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, ON, L9Y 4J5
Tel: (705) 445-3451 ▪ Fax: (705) 445-0968
E-mail collingwood@ainleygroup.com

May 30, 2018 File No. 113027

Ann Truyens
at@iglide.net

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. Truyens:

On behalf of the Township of Springwater, we wish to thank you for your interest in the above-mentioned Class EA.

On April 25, 2017 the draft Environmental Study Report (ESR) was submitted to the Ministry of Environment and Climate Change (MOECC) for their review and comment. Given the significance of the Midhurst Class EA, the Township also sent a letter specifically requesting the MOECC to review a number of key items within the draft ESR, so that the Township and residents would be satisfied that the appropriate investigations and studies had been completed. After April 2017 the Class EA process was "unofficially" put on hold until we received MOECC comments on the draft ESR. Comments were recently received from the MOECC and as such we are re-initiating the Class EA process and responding to your May 15, 2017 email to Council.

Your comments/requests have been summarized and our responses are provided following each comment.

Your concerns are related to the approval of the Midhurst Secondary Plan. The Secondary Plan was previously approved by Township Council, Simcoe County and subsequently 300 hectares of the total 756 hectares were approved by the Ontario Municipal Board for development and this is not a matter that can be dealt within Class EA process. The Class EA is being undertaken to determine the best infrastructure solutions for providing water, wastewater and transportation to accommodate the proposed Midhurst Secondary Plan.

Your request that Council "..reject the environmental assessment…" is noted. Under the Environmental Assessment Act, any person can request that the planning process be bumped up from a Class EA to a Full EA. Such a request must be made in writing to the MOECC following the publication of the "Notice of Completion" when the draft Environmental Study Report (ESR) will be made available for the 30-day public review. At that time the MOECC will review any requests received and will subsequently issue a decision, that is binding on all parties.

With regard to your specific concerns with respect to the "…significant wetland…" and "…our water resources…". The Class EA planning process has considered all environmental implications of growth in the Midhurst area and is proposing industry proven solutions for water, wastewater and transportation servicing. Further we wish to note the MOECC as part of their comprehensive review of the draft ESR did not identify any major issues with the Reports and

Investigations that have been completed as part of the Class EA and therefore we are confident that the development of the proposed infrastructure to support the Midhurst Secondary Plan will not have a detrimental impact on the downstream wetlands and/or the water resources in the area.

Thank you again for your interest in this Class EA.

Should you have any questions please do not hesitate to contact the undersigned.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P.Eng.
President & CEO

*S:\113027 Midhurst\Correspondence\Letter\Response letters May 2018\113027 Midhurst Class EA - Response to Truyens (May 30 2018).docx*

cc: Heather Coleman - Township of Springwater (By Email)

May 2, 2017

Dear Mr French and Springwater Councillors,

I'm very concerned about our water. The impact of the Midhurst Secondary Plan could have a devastating effect on Willow Creek, Matheson Creek, our internationally significant Minesing Wetlands, plus our own private wells hence our drinking water.

I have several questions that I think you and the council should ask yourselves and discuss .

-Will the discharged water pumped into Willow Creek be free from harmful sewage?
-Will the addition of the new wells cause a reduction of water into the Minesing Swamp? Is its health in jeopardy? Are the rare and endangered species in danger?
-Will Willow Creek and Matheson Creek continue to receive an adequate amount of water to support life?
-Do we have enough water to support 24,000 people?
-How much ground water will be reduced?
-Is a door to door survey going to be conducted to ensure all private wells were used to determine water usage in the tabulation to determine impact on the environment?
-Will the township be able to restore water to a private well owner if the source of his water is depleted or disrupted?
-What is the outcome if all 11 new wells are pumped together? I believe only 3 were running when the assessment was done.
-Also what will the impact be if the pumping of individual wells was done for a longer time period?
-Can the water treatment facilities ensure we do not experience a "Walkerton" tragedy?

I believe it is my duty as a resident of Springwater to protect Midhurst and its surrounding area . I believe the MSP mega development may not be sustainable growth.
I believe MSP will have damaging effects on the people, water and wildlife that inhabit the area.
Please stop the massive MSP. The Environmental Assessment should never be passed.

I can not believe you think this plan is a good idea.

Yours truly,
Deb Tyler
39 Paddy Dunn's Circle

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280 Pretty River Parkway, Collingwood, ON, L9Y 4J5
Tel: (705) 445-3451 ▪ Fax: (705) 445-0968
E-mail collingwood@ainleygroup.com

May 30, 2018 File No. 113027

Deb Tyler
39 Paddy Dunn's Circle
Midhurst, On
L9X 0T2

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. Tyler:

On behalf of the Township of Springwater, we wish to thank you for your interest in the above-mentioned Class EA.

On April 25, 2017 the draft Environmental Study Report (ESR) was submitted to the Ministry of Environment and Climate Change (MOECC) for their review and comment. Given the significance of the Midhurst Class EA, the Township also sent a letter specifically requesting the MOECC to review a number of key items within the draft ESR, so that the Township and residents would be satisfied that the appropriate investigations and studies had been completed. After April 2017 the Class EA process was "unofficially" put on hold until we received MOECC comments on the draft ESR. Comments were recently received from the MOECC and as such we are re-initiating the Class EA process and responding to your May 2, 2017 letter to Council.

Your comments/requests have been summarized and our responses are provided following each comment.

1. *Will the discharged water pumped into Willow Creek be free from harmful sewage?"*

The effluent from the Wastewater Treatment Plant will be treated to a level that is approved by the Ministry of the Environment and Climate Change (MOECC). The proposed level of treatment will be outlined in the draft Environmental Study Report (ESR) which has been reviewed by the MOECC and in their response, they noted "The ministry agrees with the conclusion of the EA that by protecting water quality in Willow Creek, downstream water bodies including the Nottawasaga River, Georgian Bay and the Minesing Wetland, will also be protected."

2. *Will the addition of the new wells cause a reduction of water into the Minesing Swamp? Is its health in jeopardy? Are the rare and endangered species in danger?*

Groundwater base flow reductions within the Willow Creek watershed were evaluated and are described in Appendix M of the Hydrogeological Study. It was found that post-development base flow loss was minor throughout the year with a maximum reduction of less than 10%. The Hydrogeological Consultant, Golder Associates, also predicts that groundwater taking for the Midhurst Secondary Plan Area will lead to a maximum base flow reduction in Willow Creek of 9% in the late summer. Ministry of Environment &

Climate Change (MOECC) / Ministry of Natural Resources and Forestry (MNRF) threshold is 20% in a cold water stream. The predicted base flow loss is well below the 20% maximum allowed. In addition, the Department of Fisheries (DFO) requirement is that a cumulative flow alteration of less than 10% of the instantaneous flow will "…have a low probability of detectable impacts to ecosystems that support commercial, recreational or Aboriginal fisheries." Therefore, the predicted reduction of 9% is undetectable and therefore, not a concern.

We have also confirmed that the aforementioned losses will not affect the "habitat" or "temperature" within the local creeks. In addition, the base flow reduction calculations do not take into consideration the 140L/s of water that will be discharged back into Willow Creek, nor the extensive use of Low Impact Development measures through the Midhurst Secondary Plan that will extensively promote groundwater recharge.

Therefore, the health of the Minesing Wetlands is not in jeopardy nor are there any rare or endangered species in danger due to the addition of the proposed municipal wells.

3. *Will Willow Creek and Matheson Creek continue to receive an adequate amount of water to support life?*

*As noted above, the* proposed municipal wells will not affect the "habitat" or "temperature" within the local creeks.

4. *Do we have enough water to support 24,000 people?*

The Hydrogeological Study confirms that the proposed municipal wells can be developed to accommodate the proposed Midhurst Secondary Plan.

5. *"How much groundwater will be reduced?"*

The groundwater flow model accounts for all of the municipal water taking in Midhurst, not just the proposed new wells. The aquifer testing and groundwater flow model both indicate that the groundwater supply for existing Midhurst, the proposed Midhurst Secondary Plan, plus the surrounding municipal wells in the City of Barrie, is sustainable. Therefore, the nominal base flow losses associated with the proposed municipal wells will not affect the "habitat" or "temperature" within the local creeks and is considered to be sustainable in the long term. As noted earlier these calculations and models do not take into consideration the 140L/s of water that will be discharged back into Willow Creek, nor the extensive use of Low Impact Development measures through the Midhurst Secondary Plan that will extensively promote groundwater recharge.

6. *"Is a door to door survey going to be conducted to ensure all private wells were used to determine water usage in the tabulation to determine impact on the environment?"*

A complete survey of private wells has not been done nor is it required by the Ministry of Environment & Climate Change (MOECC) during the completion of the Class EA process. In the future and in advance of the proposed municipal wells being constructed, the MOECC will outline the studies and investigations that need to be completed in support of the future Permit To Take Water (PTTW) application. However it should be noted that

when developing other municipal wells for other communities within the Township (Anton Mills, Minesing, or Del Trend), plus dozens of other municipalities across Simcoe County a complete survey of private wells was not required. Furthermore, neither the Township of Springwater, the City of Barrie nor any other municipality in Simcoe County, have ever done this for any of their municipal water systems.

When compared to a door-to-door survey, an examination of potential impacts through an examination of the water well records and the development of a "calibrated" computer model, results in more actual usable data that can be used to evaluate the available water resources of an entire area. Thus, in Golder's professional opinion, a door to door survey is not the most reliable way to measure impacts.

7. *"Will the township be able to restore water to a private well owner if the source of his water is depleted or disrupted?"*

There are four main aquifers (A1, A2, A3 & A4) within the overall area and we provide the following responses in relation to each of the specific aquifers and what the modeling shows:

Aquifer A1 There are no wells located within the 2.5-metre drawdown cone for any of the proposed wells in Aquifer A1. There are 11 wells located within the 1.5-metre drawdown cone, which have a water column above the well screen of between 6 and 14 m. None of these wells are expected to be vulnerable to a loss of water as a result of the proposed water taking;

Aquifer A2 There are 16 wells within the 2-metre drawdown cone for Aquifer A2 and they have a water column above the well screen of between 10 and 34 m. None of these wells are expected to be vulnerable to a loss of water supply as a result of the proposed water taking.

Aquifer A3 There are three wells within the 2-metre drawdown cone for Aquifer A3 and these wells have a water column above the well screen of between 46 and 71 m. It is not expected that these wells will be vulnerable to a loss of water supply as a result of the proposed water taking.

Aquifer A4 There are three wells within the 2-metre drawdown cone for Aquifer A4 and one well constructed in the bedrock aquifer. These wells have a water column above the well screen of between 69 and 112 m. It is not expected that these wells will be vulnerable to a loss of water supply as a result of the proposed water taking.

In summary the extensive modeling confirms that there will be no impacts to private water supply wells as a result of the proposed water taking.

In addition, and prior to a Permit to Take Water (PTTW) of the various wells being received from Ministry of Environment & Climate Change (MOECC) over the next 25 years, detailed aquifer performance testing will be required in conjunction with the application for a Permit to Take Water. Also, the Permit to Take Water process involves the MOECC posting the proposed application for Public comment on the Environmental Registry of the Ontario Ministry of Environment & Climate Change.

Finally, the Developer, through suitable legal Agreements with the Township will be responsible for replacing any private water supply that it has been proven to have been impacted by the Municipal water taking. This could be in the form of a new drilled well or connection to the municipal system.

8. *"What is the outcome if all 11 new wells are pumped together?"*

The Hydrogeological Study found that the required water taking for development purposes (at full buildout) can be provided from new groundwater wells and that when all of the proposed new wells are pumped together, there will be no impact to existing private and municipal wells.

9. *What will the impact be if the pumping of individual wells was done for a longer time period?*

Golder Associates has confirmed that the 3-day pumping tests, such as those conducted in Midhurst, are an industry standard and are a reliable method of estimating well yield and aquifer properties.

In addition, extending the length of these tests would not provide more accurate/useful results. It is the first day of pumping data that are important in analysis of aquifer transmissivity and storage. Thirdly, long-term groundwater impacts were predicted using a calibrated groundwater model that simulated all proposed operational wells using full build-out pumping rates. The model considers a 10-year simulation which provides better data, than the 30-day pumping approach.

Finally, the groundwater flow model was calibrated based on the results of the pumping tests. These included the interference among the aquifers that was noted at TW21. The drawdown predicted in the shallow wells is representative of the results of the pumping tests.

10. *Can the water treatment facilities ensure we do not experience a "Walkerton" tragedy?*

The tragedy that occurred in Walkerton was the result of poor operation of the well supply and in particular the disruption of chlorination of the raw water. The water supply and treatment facilities proposed for the Midhurst developments will be designed and constructed to ensure the delivery of potable water to current Ontario Standards. The operation of the water supply system will be undertaken by qualified, licensed, professionals. This is no different from the operation and maintenance of the numerous existing water systems throughout the Township.

11. *…the MSP mega development may not be sustainable growth. Please stop the massive MSP. The Environmental Assessment should never be passed.*

Your concerns are related to the approval of the Midhurst Secondary Plan. The Secondary Plan was previously approved by Township Council, Simcoe County and subsequently 300 hectares of the total 756 hectares were approved by the Ontario Municipal Board for development and this is not a matter that can be dealt within Class EA process. The Class

EA is being undertaken to determine the best infrastructure solutions for providing water, wastewater and transportation to accommodate the proposed Midhurst Secondary Plan.

In closing we wish to note that the MOECC as part of their recent comprehensive review of the draft ESR did not identify any major issues with the Reports and Investigations that have been completed as part of the Class EA and therefore we are confident that the development of the proposed infrastructure to support the Midhurst Secondary Plan will not have a detrimental impact on the downstream wetlands and/or the water resources in the area.

Thank you again for your interest in this Class EA.

Should you have any questions please do not hesitate to contact the undersigned.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P.Eng.
President & CEO

*S:\113027 Midhurst\Correspondence\Letter\Response letters May 2018\113027 Midhurst Class EA - Response to Tyler (May 30 2018).docx*

cc: Heather Coleman - Township of Springwater (By Email)

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, Ontario, L9Y 4J58Z7
Tel: (705) 445-3451 ▪ Fax: (705) 445-0968
E-mail collingwood@ainleygroup.com

May 31, 2017 File #113027

City of Barrie
70 Collier Street, P.O. Box 400
Barrie, Ontario
L4M 4T5

Attn: **Mr. Lorran Cooney**

Ref: **Township of Springwater,**
**Midhurst Class Environmental Assessment (Phase 3 & 4)**
**Response to Follow Up Enquiry**

Dear Mr. Lorran:

In response to your previous comment regarding the estimate of background growth for the Midhurst area and application in the traffic projections we offer the following rationale for the strategy applied. The initial comment from the City was:

> *Why did the Draft Traffic Operational Analysis select only the Bayfield Street corridor to determine annual transportation growth rates? Forbes Road is indicated to be higher growth rate and is to be the primary traffic route for the Doran Road Development area.*

In our development of a suitable background growth figure to be applied to the area in general we looked at several main roads in the area and these are listed in Table 2 of the Draft Operational Analysis Report. The rate varied between 0.5% on County Road 27 and 3.6% on Forbes Road. Snow Valley Road and Hwy 26 had growth rates of 1.3 and 1.1 respectively. Our aim was to apply a growth figure to the area as a whole and we deemed 1% as applicable considering that the trip generation for the proposed development would be added to the background growth. Although Forbes Road has a higher growth rate the actual existing traffic volume is light. Adding another 2% to our projection for that corridor is insignificant when compared to the growth resulting from the Midhurst Secondary Plan but adding 2% to roads such as Highway 26 would highly overstate the background volumes in the model for that corridor.

We also note the that the current population of Springwater is approximately 19,000. The traffic analysis assumes that Phase 1 is built out by 2031. That will create an additional 5,000± residential units which is equivalent to an added population of approximately 14,500. Compared to the existing population of 19,000 this is an increase of approximately 75% or a growth rate of approximately 5.5% per year over the next 15 years. On top of the applied background growth of 1% the total is 6.5% per year.

Hopefully this clarifies this matter for you, however if you have any further questions on, please do not hesitate to contact our office.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

*Creating Quality Solutions Together*

J. A. Mullan, P. Eng.
President & CEO

*S:\113027 Midhurst\Correspondence\Letter\Follow Response to Mr Scanlan (May 25 2017).docx*

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June 9, 2017 File #113027

City of Barrie
70 Collier Street, P.O. Box 400
Barrie, Ontario
L4M 4T5

Attn: **Mr. Ralph Scheunemann, P.Eng.**
**Sr. Infrastructure Planning Engineer**

Ref: **Township of Springwater,**
**Midhurst Class Environmental Assessment (Phase 3 & 4)**
**Response to Follow Up Enquiry**

Dear Mr. Scheunemann:

Thank you for your continued interest in the Midhurst Class EA. Within your March 6, 2017 email, you identified questions/concerns that the City of Barrie have relating to the background growth assumptions within the Midhurst Class EA. The questions/concerns from your and from Mr. Conney's Mar 13, 2017 email are noted below.

> *Places to Grow has forecast that Simcoe County will grow to the following population by 2031 from the current 2016 population of 480,000 this is more that 2% growth per year and in the areas around Barrie like Springwater it's significantly higher. I don't understand the logic behind the Midhurst EA traffic growth assumptions.*
>
> *The City is concerned with the Population Growth Assumptions for the Midhurst Secondary Plan. The reference to Simcoe County Road 11 which is outside of the identified Places to Grow planning area would not be logical basis for growth predictions.*

In our determination of a suitable background growth figure to be applied to the area in general, we looked at several main roads in the area and these were listed in Table 2 of the "Draft" Traffic Operational Analysis Report. The rate varied between 0.5% on County Road 27 to 3.6% on Forbes Road. Snow Valley Road and Hwy 26 had growth rates of 1.3% and 1.1% respectively. Our aim was to apply a growth figure to the area as a whole and we deemed 1% as applicable considering that the trip generation for the proposed development would be added to the background growth. Although Forbes Road has a higher growth rate, the actual existing traffic volume is quite light. Adding another 2% to our projection for that corridor is insignificant, when compared to the growth resulting from the Midhurst Secondary Plan but adding 2% to roads such as Highway 26 would highly overstate the background volumes in the model for that corridor.

The Midhurst Secondary Plan has two phases, with Phase 1 being 5,000± equivalent residential units, estimated to be built out by 2031 and Phase 2 being an additional 3,208± residential units estimated to be built out by 2041. Phase 1 will have a population of approximately 14,500 (5,000 units x 2.9 person per unit) and Phase 2 will have a population of approximately 9,300 (3,208 units x 2.9 person per unit). Comparing the existing population of the Township of Springwater of 19,000± to the future 2031 population plus Phase 1 of the Midhurst Secondary Plan would show an increase of approximately 75% or a growth rate of approximately 3.9% each year, over the next 15 years. Therefore, on top of the

applied background growth of 1%, noted earlier, the total traffic growth within the Midhurst Class EA equates to 4.9% per year for the next 15 years.

Hopefully this clarifies this matter for you, however if you have any further questions on, please do not hesitate to contact our office.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P. Eng.
President & CEO

*S:\113027 Midhurst\Correspondence\Letter\Followup Response to Cty Barrie (Jun 9 2017).docx*

**Ministry of Tourism, Culture and Sport**

Archaeology Programs Unit
Programs and Services Branch
Culture Division
401 Bay Street, Suite 1700
Toronto ON M7A 0A7
Tel.: (416) 314-7691
Email: Ian.Hember@ontario.ca

**Ministère du Tourisme, de la Culture et du Sport**

Unité des programmes d'archéologie
Direction des programmes et des services
Division de culture
401, rue Bay, bureau 1700
Toronto ON M7A 0A7
Tél. : (416) 314-7691
Email: Ian.Hember@ontario.ca

Ontario

Jul 14, 2017

Nimal Nithiyanantham (P390)
Archeoworks Inc.
1029 - 16715-12 Yonge Newmarket ON L3X 1X4

**RE: Review and Entry into the Ontario Public Register of Archaeological Reports: Archaeological Assessment Report Entitled, "Stage 1 Archaeological Assessment for the Proposed Craig Road Extension as part of the Midhurst Class Environmental Assessment Phase 3 & 4, In the Geographic Township of Vespra, Township of Springwater, County of Simcoe, Ontario.", Dated Feb 10, 2017, Filed with MTCS Toronto Office on Mar 10, 2017, MTCS Project Information Form Number P390-0206-2016, MTCS File Number 0004777**

Dear Mr. Nithiyanantham:

This office has reviewed the above-mentioned report, which has been submitted to this ministry as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, R.S.O. 1990, c 0.18.[1] This review has been carried out in order to determine whether the licensed professional consultant archaeologist has met the terms and conditions of their licence, that the licensee assessed the property and documented archaeological resources using a process that accords with the 2011 Standards and Guidelines for Consultant Archaeologists set by the ministry, and that the archaeological fieldwork and report recommendations are consistent with the conservation, protection and preservation of the cultural heritage of Ontario.

The report documents the assessment/mitigation of the study area as depicted in Map 7 of the above titled report and recommends the following:

1. Areas that exhibit disturbed conditions (per Section 1.3.1 of the 2011 S&G) need to be confirmed through an on-site property inspection during a Stage 2 AA.

2. Lands evaluated as having no or low potential (per Section 2.1, Standard 2.a of the 2011 S&G), need to be confirmed through an on-site property inspection during a Stage 2 AA.

3. All identified areas which contain archaeological potential, must be subjected to a Stage 2 AA.

The agricultural fields will require pedestrian survey at five metre intervals, which involves systematically walking ploughed areas and mapping and collecting any artifacts found on the ground surface. The land must be recently ploughed and subjected to the appropriate weathering requirements, in accordance with Section 2.1.1 of the 2011 S&G, in advance of pedestrian archaeological survey.

Where ploughing in advance of pedestrian archaeological survey will not be possible, such as the woodlots, overgrown grassed margins, areas of manicured grass and areas of heavy brush/vegetation, these areas will need to be subjected to a Stage 2 shovel test pit survey at five metre intervals, in accordance with Section 2.1.2 of the 2011 S&G.

No construction activities shall take place within the study area prior to the MTCS (Archaeology Program Unit) confirming in writing that all archaeological licensing and technical review requirements have been satisfied.

Based on the information contained in the report, the ministry is satisfied that the fieldwork and reporting for the archaeological assessment are consistent with the ministry's 2011 Standards and Guidelines for Consultant Archaeologists and the terms and conditions for archaeological licences. This report has been entered into the Ontario Public Register of Archaeological Reports. Please note that the ministry makes no representation or warranty as to the completeness, accuracy or quality of reports in the register.

Should you require any further information regarding this matter, please feel free to contact me.

Sincerely,

Ian Hember
Archaeology Review Officer

cc. Archaeology Licensing Officer
Joe Mullan,Ainley &Associates
Mark Archer,Township of Springwater

[1]In no way will the ministry be liable for any harm, damages, costs, expenses, losses, claims or actions that may result: (a) if the Report(s) or its recommendations are discovered to be inaccurate, incomplete, misleading or fraudulent; or (b) from the issuance of this letter. Further measures may need to be taken in the event that additional artifacts or archaeological sites are identified or the Report(s) is otherwise found to be inaccurate, incomplete, misleading or fraudulent.

ecojustice
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1.800.926.7744

December 15, 2014

*Laura Bowman*
*401- 550 Bayview Ave.*
*Toronto, Ontario M4W 3X8*
*Phone: 416-368-7533 x 522*
*Fax: 416-363-2746*
*lbowman@ecojustice.ca*

Mr. Brad Sokach, P. Eng.
Director of Planning and Public Works
Township of Springwater
2231 Nursery Road,
Minesing Ontario,
L0L 1Y2
Tel: (705) 728-4784 ext. 2034
Fax: (705) 728-6957
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Mr. Joe Mullan, P. Eng.
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Collingwood, Ontario
L9Y 4J5
Phone: (705) 445-3451
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Email: midhurst.classea@ainleygroup.com

Attention: Mr. Sokach and Mr. Mullan.

**Re: CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4) FOR THE MIDHURST WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE**

I am counsel representing the Midhurst Ratepayer's Association in the above matter. It is our understanding that the Phase 3 & 4 Class EA was commenced in May 2013. Our client advises that they have no knowledge of the contents of the forthcoming Phase 3 & 4 study, nor have they been consulted on this matter. The most recent meeting to which our client was invited was in April 2014.

Our client intends to conduct a peer review of the Phase 3 & 4 study. However, since our client has no knowledge of key matters related to the study this is not possible. As you are aware, the Phase 1 & 2 report was conceptual in nature, and did not identify the WWTP technology, stormwater infrastructure, or municipal well infrastructure that is contemplated.

The only information with respect to Phases 3 & 4 that our client possesses is a presentation dating back to May 2013. Our client has not been provided with supporting technical reports that are necessary to evaluate the preferred solutions identified in this presentation.

It is indicated that the Township intends to proceed with Phase 3 & 4 consideration of the new water and sewage systems as well as a variety of transportation projects as a Schedule "C" EA under the Municipal Class Environmental Assessment (**MCEA**). In keeping with this, extensive public consultation on the water and wastewater infrastructure as well as the disclosure of technical reports as part of that consultation process would be the norm. Our client advises that this has not occurred. The "Resident Liaison Group" was evidently disbanded some months ago and very little if any technical information was provided to that group.

In addition to the lack of public consultation, our client notes serious differences between the effluent criteria outlined by the Nottawasaga Valley Conservation Authority (**NVCA**) in the OMB settlement with various developers earlier this year and the criteria identified to-date through the EA process. For example, the current Phase 1 & 2 documents are consistent with adding additional flow, phosphorus and nutrients to Willow Creek, a plan not supported by the settlement agreement. Further, the settlement agreement required a cumulative impact assessment. As no Wastewater Treatment Process has been disclosed to our client, there is confusion about the intent of the Class EA process and which criteria will be applied. Our client has no means by which to evaluate the feasibility of the options since they have not been disclosed.

Finally, no environmental impact assessment data for Willow Creek has been provided to our client that would facilitate a peer review of downstream impacts to the internationally significant Minesing Wetland.

Please advise when this material will be provided to our client. I would be pleased to speak with you to discuss this further.

Sincerely,

Laura Bowman

Cc:

Client

VANCOUVER CALGARY OTTAWA TORONTO

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January 13, 2015

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Attention: Mr. Sokach and Mr. Mullan.

**Re: CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4) FOR THE MIDHURST WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE**

I am writing to follow up on our December 15, 2014 correspondence regarding our client the Midhurst Ratepayers Association. Mr. Mullan responded to me by email on December 15 (copying Mr. Sokach). This letter indicated that you would respond to our letter in "due course". I have received no communications from you since that time, approximately one month ago.

I understand that on short notice, the public was invited to a January 7, 2015 public information session with council. I note that because short notice was given, none of our client's experts, nor any Ecojustice staff scientists were able to attend this session to ask questions.

This session covered a large volume of information including key changes to the proposed infrastructure such as a new plan for water wells and WWTP location criteria.

Our client advises that no technical reports were provided to them at this session, nor have any been posted to the website. Accordingly there is not sufficient detail to understand any of the

above or to have them peer reviewed by our client's experts. Our client has grave concerns about a number of aspects of the proposed development including but not limited to:

1. No proper public consultations have occurred on the (now evidently revised) location of the WWTP or technology to be used. There have been no public liaison committee meetings on this topic.
2. No details have been provided of the phosphorus offsetting plan whatsoever.
3. No technical report was provided for the former or new drinking water wells.
4. Based on the timeline provided, the stormwater management in the development will be treated as a separate project with different proponents.

As mentioned previously, our client wishes to peer review the technical documentation and will need advance copies of specific technical information in order to do so. We requested these one month ago and we have received no response regarding when these will be provided. Evidently the timeline provided for completion and approval of the EA at the PI session on January 7 was as early as one year from now with a notice of completion this fall. No timeline was provided for public review of technical reports.

To be clear, our client requests an opportunity to peer review and comment on the technical reports prior to the notice of completion being issued for the EA and prior to the completion of Phase 3.

As you are aware, MOECC requires that the proponent and the public work together to address issues as part of the EA process. A reasonable timeline for public peer review of complete technical documentation would be 180 days. Given that no technical details have been provided and the location of the 4 new wells and the WWTP as well as technologies used is at this stage not provided to the public, we request that you revise this timeline to permit a reasonable opportunity to work with stakeholders on these items.

Our client objects to the decision to move to Phase 4 imminently without consulting on these items (including allowing for technical comments) as part of Phase 3. Phase 3 should not be completed without proper consultations on technical details.

Further, the decision to separate the stormwater EA and do it later than the WWTP EA is a concern given that phosphorus offsetting is contemplated. It is unclear what contribution to offsetting is going to come from future stormwater infrastructure within the development. There have been no public consultations on the preparation of a phosphorus budget for the MSP.

Our client believes that there are major feasibility and environmental impact issues with the phosphorus management plans relating to this infrastructure from both the WWTP and the stormwater. Our client feels the phosphorus filtration objective of 0.03-0.05 mg/L for the WWTP is not consistent with restoring the Minesing wetland to a pristine and ecologically resilient condition nor is it consistent with a no net increase in nutrient loading.

Flow information for Willow Creek provided at the PI session on January 7th needs to be reviewed by our client's experts. It is unclear what methodology was used to assess this issue.

The estimates of pre and post-development export coefficients for phosphorus from the MSP have not been substantiated with technical reports. Our client is concerned with the apparent approach of using net cumulative measurements instead of site-specific ones and average annual figures instead of site-specific and short term (as well as seasonal) variability for flow and phosphorus. There is no technical information regarding the identified offsetting opportunities for public review. Please provide our clients with the "preliminary studies" referenced in your January 7 presentation.

Finally, as currently scoped this EA is too narrow and does not appear to adequately address impacts on the Minesing wetland and endangered species within that wetland complex. This does not appear to have been properly studied. No consideration appears to have been given of the potential impact of emerging wastewater and stormwater contaminants on aquatic habitat and species in the Minesing. In the January 7 presentation, no mention was made of potential temperature impacts of any stormwater improvements that are contemplated as part of offsetting or of the cumulative impact assessment referenced in the NVCA settlement agreement.

In light of the numerous changes to the proposed infrastructure, our client requests that the Phase 2 be revisited and include stakeholder technical briefings on these key issues.

We reiterate our request that all technical reports and preliminary studies completed to-date be provided to our clients as soon as is possible.

Sincerely,

Laura Bowman

CC: Client

January 27, 2015

**Barnet H. Kussner**
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bkussner@weirfoulds.com

File 10862.00006

**VIA E-MAIL (LBOWMAN@ECOJUSTICE.CA)**

Ms. Laura Bowman
Ecojustice
401 - 550 Bayview Avenue
Toronto, ON M4W 3X8

Dear Ms. Bowman:

**Re: Class Environmental Assessment (Phase 3 & 4) for the Midhurst Water, Wastewater & Transportation Infrastructure**

Further to our recent e-mail exchange, we act as counsel for the Township of Springwater (the "**Township**") on matters relating to the Midhurst Secondary Plan. We are writing in reply to your letters dated December 15, 2014 and January 13, 2015 regarding the above matter.

On January 21, 2013, Township Council unanimously resolved to proceed with Phases 3 & 4 of the Class Environmental Assessment ("**Class EA**") for the Midhurst Secondary Plan. The staff report recommending in favour of that decision clearly outlines the process related to the Class EA for the relevant projects, a process that is regulated by the Ontario *Environmental Assessment Act* (the "**Act**"). Stormwater management is not subject to the Act.

As part of its resolution, Council requested that an enhanced public consultation process be developed whereby additional public information/input sessions (i.e. beyond the mandatory requirements of the Act) would be provided. For that purpose, on March 18, 2013 Township Council resolved to create both a Technical Steering Committee and a Residents Liaison Group. The Residents Liaison Group consists of the following representatives:

- three (3) members of Council;
- three (3) members of the Midhurst Ratepayers Association ("**MRA**");
- three (3) Township residents at-large;
- the Township's CAO; and
- the Midhurst Landowners Group.

On May 29, 2013 the Township hosted an Open House on Phase 3 & 4 of the Environmental Assessment. At that meeting, detailed information displays were available to reiterate the preferred solutions that were identified during Phases 1 & 2 of the process, as well as to detail the work program for the forthcoming Phases 3 & 4 study. Amongst the 70 attendees at that Open House, many of the members of the MRA (which you represent) and its executive were present.

Since the initiation of Phases 3 & 4 of the Class EA, to date the Midhurst Secondary Plan Resident Liaison Group has met on three occasions. During those sessions, the content of the Environmental Assessment, schedule and status updates were provided, and more than 140 questions were asked and comments provided.

We and our client's independent consultant on the Class EA, Ainley & Associates, are therefore most surprised at the comment in your December 15th letter that your client "has no knowledge of the key matters related to the [Phase 3 & 4] study". As counsel to the MRA, we expect you would have been made aware by its representative members who sit on the Liaison Group that these consultations were being held. We also expect you would have been made aware that during those sessions, the "key matters" of which your client purports to have no knowledge were in fact discussed at some length, as evidenced by the summaries of the meetings held with the Liaison Group. These summaries are dated July 25, 2013, January 13, 2014, and April 14, 2014, respectively. They have previously been provided to members of the Group and posted online for public review, but we attach them once again for ease of reference.

In our view and that of the Township's consultant, it is clear from these summaries that the very content of even the most recent meeting of April 14, 2014 related to the "key matters" of the Class EA, including the anticipated eight-month delay. You will also note from the materials posted on the Township website, and as provided to members of the Residents Liaison Group, that it was intended the Group would meet twice prior to the Public Information Centre for Phase 3. In fact, as noted above, this group has now met on three occasions, and the Public Information Centre is only now being scheduled.

Accordingly, and as has always been contemplated since 2013, a Residents Liaison Group meeting will be scheduled following the Public Information Centre.

During the course of an Environmental Assessment, detailed technical reports related to the Schedule C projects are prepared, discussed with the applicable agencies, and included as part of the draft Environmental Study Report. In accordance with the Council-approved Terms of Reference, the Municipal Class EA process and the Act itself, and as confirmed in the meeting summaries for the Residents Liaison Group meetings previously referenced, the draft Environmental Study Report ("**ESR**") will be prepared following Phase 3 of the Municipal Class EA process, including the appropriate public consultation. Once drafted, the report will be made

available to the Township, approval agencies and the public (including your clients) for review, as contemplated since 2013 and in accordance with the Municipal Class EA process.

The ESR will address the Schedule C projects identified in the Phase 1 and 2 Class EA process. The Final Phase 1 & 2 Class EA ESR (2009), which identified the preferred solutions reiterated at the May 29, 2013 presentation and includes all relevant background studies, continues to be available on the Township website.

Further to the ongoing consultations in 2014, on January 7, 2015 staff held an update session for the newly elected Township Council regarding the Environmental Assessment process for the Midhurst Secondary Plan. Notice of that meeting was provided as prescribed by the Township's Procedural By-law on December 19-20, 2014. Additional media outlets and social media were used between December 20th and January 7th to further communicate the upcoming session to the public.

At the January 7th meeting, a commitment was provided to ensure that all technical reports will be made available for public review upon their completion, which may well be in advance of the Environmental Study Report. The reports will also be included in the ESR itself, which is made available for public comment and review during the Notice of Completion period, as per the requirements of the Municipal Class EA.

The Ontario Ministry of Environment and Climate Change ("**MOECC**") has detailed the required process, including consultation, for the Municipal Class EA process – requirements which the Township and its consultants are following, and are in fact exceeding. The Township and its consultants remain committed to working with the stakeholders as defined in the Municipal Class EA and the 2013 approved Terms of Reference for the Class EA, including the Technical Steering Committee and the Residents Liaison Group.

We trust this responds to your enquiries. If you have any additional questions or require further clarification, please let us know.

Yours truly,

**WeirFoulds LLP**

Barnet H. Kussner

Encl.
BHK/ew
c: J. Mullan, Ainley & Associates Limited
c: R. Brindley, Township of Springwater
7641473.1

**From:** Joe Mullan [mailto:mullan@ainleygroup.com]
**Sent:** July 12, 2017 2:24 PM
**To:** Dorton, Peter (MTO)
**Cc:** Steve Fournier; Heather Coleman
**Subject:** Township of Springwater, Midhurst Secondary Plan - Hwy 400 / Forbes Road Interchange Analysis

**Hi Peter:**

Further to your previous comments, shown below, regarding Midhurst Class EA and specifically the Hwy 400/Forbes Road Interchange, we attach the following documentation in response to the Ministry's comments:

1. A letter entitled "Midhurst Class EA - Response to MTO Comments (Jul 10 2017).pdf" that contains specific responses to the items in your Jun 14, 2016 email.
2. A Tech Memo entitled "Technical Memo - Midhurst EA Traffic Analysis to MTO (Jul 2017).pdf" that presents the analysis and results (specifically related to MTO roads) from our overall Operational Analysis dated March 2017 which was prepared in conjunction with a Municipal Class Environmental Assessment for the Midhurst Class EA area road network improvements.
3. A file entitled "Midhurst EA - Intersection Schematics.pdf" that presents schematics for the MTO related intersections.
4. As requested, the Syncro Files associated with the traffic analysis.

After you and your team have had a chance to review this information, we be happy to meet with you to discuss any comments you may have.

Regards,

J. A. Mullan, P.Eng.
President & CEO
Ainley
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**From:** Dorton, Peter (MTO) [mailto:Peter.Dorton@ontario.ca]
**Sent:** Tuesday, June 14, 2016 3:41 PM
**To:** Brad Kalus <kalus@ainleygroup.com>
**Cc:** Joe Mullan <mullan@ainleygroup.com>; Sher, Ilya <ilya.sher@aecom.com>; Terro, Eric (MTO) <Eric.Terro@ontario.ca>; Uddin, Zaka (MTO) <Zaka.Uddin@ontario.ca>; Nikolic, Goran (MTO) <Goran.Nikolic@ontario.ca>; Vandenberg, Robert (MTO) <Robert.Vandenberg@ontario.ca>; Hao, Jiang Yang (MTO) <JiangYang.Hao@ontario.ca>; Venneri, Rita (MTO) <Rita.Venneri@ontario.ca>; Tuz, Sylvester (MTO) <Sylvester.Tuz@ontario.ca>; Deletsu, Jeanne-Marie (MTO) <Jeanne-Marie.Deletsu@ontario.ca>; Tai, Arthur (MTO) <Arthur.Tai@ontario.ca>
**Subject:** RE: Township of Springwater, Midhurst Secondary Plan - Hwy 400 / Forbes Road Interchange Analysis

Brad:

We've completed our review of the April 26, 2016 Memo (Hwy 400 / Forbes Rd. IC Analysis) and offer the following comments:

1. Please clarify how the 2041 background traffic is derived.

2. Exhibit 16, 2041 AM Westbound traffic turning south onto Hwy 400 is shown as 98, which is much less than the 2031 number of 389 shown in Exhibit 13. Also, the LOS in 2031 is shown as LOS C, but in 2041, with much less traffic, it is LOS D. Please clarify.

3. In the text explaining Exhibit 17, "To accommodate the 2041 traffic, there is a need for a left turn storage lane for eastbound left at the west ramp terminal." Please confirm this is a typo (and should be westbound left).

4. While the 2012 volumes used are acceptable, attached for your future reference is the latest July 2014 counts.

5. Please provide the electronic copies of the Synchro analysis in order for us to complete our review.

6. Please provide conceptual drawings showing the highway improvements recommended to accommodate Secondary Plan buildout.

7. Please provide an assessment of Secondary Plan impacts on Highway 26 in Midhurst for MTO to review.

Please feel free to contact me if you have any questions.

Thanks,
Peter Dorton
Senior Project Manager
MTO Central Region Engineering Office
Corridor Management Section
159 Sir William Hearst Ave., 7th Floor
Toronto, ON  M3M 0B7
Ph: 416-235-4280
Fx: 416-235-4267
Email: peter.dorton@ontario.ca

---

**From:** Brad Kalus [mailto:kalus@ainleygroup.com]
**Sent:** May 10, 2016 9:30 AM
**To:** Dorton, Peter (MTO)
**Cc:** Joe Mullan; Sher, Ilya
**Subject:** Township of Springwater, Midhurst Secondary Plan - Hwy 400 / Forbes Road Interchange Analysis

Hi Peter,

Further to the meeting held on October 22, 2015 with respect to the Midhurst Class EA Study and the proposed partial interchange on Hwy 400 at Pooles Road, AECOM was retained to complete a transportation analysis to investigate potential impacts to the existing Hwy 400 interchange at Forbes Road (without a new Pooles Road partial interchange) having regard for the Midhurst Phase 1 (2031) and Phase 2 (2041) development plans and to provide recommendations to mitigate such impacts. Attached is a copy of AECOM's memo report summarizing their traffic assessment, for the Ministry's review and comment.

In order to maintain the Class EA schedule, we respectfully request comments from the Ministry at your earliest opportunity.

Thanks Peter.

Regards,

Brad Kalus, C.E.T., LEL
Transportation Manager

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July 10, 2017

File #113027

**"BY EMAIL"**

MTO Central Region Engineering Office
Corridor Management Section
159 Sir William Hearst Avenue, 7th Floor
Toronto, Ontario
M3M 0B7

Attn: **Mr. Peter Dorton**
**Senior Project Manager**

Ref: **Township of Springwater, Midhurst Servicing EA**
**Response to MTO Comments**

Dear Mr. Dorton:

We provide the following answers to questions received from the MTO, in an e-mail of June 14, 2016, regarding the April 26, 2016 Memo (Hwy 400 / Forbes Rd. IC Analysis). As background reference, we have attached an Operational Analysis Memorandum that provides background information on the development of our traffic analysis for area intersections under the jurisdiction of the MTO.

The purpose of the earlier traffic analysis provided by AECOM was to determine if the existing interchange at Hwy 400 and Forbes Road, with any necessary improvements, would beneficial for traffic flow for the proposed development after the possibility of proving a new interchange at Hwy 400 and Pooles Road was eliminated. There trip routing is determined by general area linkages. The conclusion of the AECOM report was that the Hwy 400 / Forbes Road interchange will be a benefit to traffic flow for development in the Russell Road, Doran Road area (eastern portion of the Midhurst Secondary Plan). Following that conclusion; Ainley Group embarked on a traffic analysis for the Midhurst Secondary Plan area and looking at impacted intersections in a broader but more focused manner. Traffic forecasts were based on adding trips generated by development to background traffic. Trip generation was based on ITE trip generation rates and initial traffic as measured in June 2013 had a 1% per year growth factor applied. Trip distribution was based on information contained in the County Master Transportation Study and reliance on some rudimentary trip time trials. The attached Operational Analysis Memo is a summary of that study. The study provides analysis for the horizon years as 2031 and 2041 which correspond to the anticipated build out of Stage 1 and Stage 2 respectively.

1. **Please clarify how the 2041 background traffic is derived**.

   Base traffic for the year 2013 were collected for the AM and PM peak traffic hours on Tuesday, June 11, 2013. Background growth without the Mdhurst Secondary Plan Development was determined to be approximately 1% per year. The growth data was derived from historic AADT data on the section of Highway 26 from Barrie north limit to County Road 27 for the years 2006 to 2010. Observed traffic volumes were then extrapolated to the year 2041.

2. **Exhibit 16, 2041 AM Westbound traffic turning south onto Hwy 400 is shown as 98, which is much less than the 2031 number of 389 shown in exhibit 13, Also, the LOS in 2031 is shown as LOS C, but in 2041, with much less traffic, it is LOS D, please clarify.**

   In the current Operational Analysis, the projected Total Traffic Volumes for 2031 and 2041 are presented in Appendices E and F. In the current analysis, the westbound traffic on Forbes Road turning left in the AM peak to take the southbound Hwy 400 on ramp increases from 92 to 102. This is simple 1% background growth for the 10 year interval.

   Tables 6 and 7 provide a summary of the LOS projected for 2031 traffic with and without intersection improvements and Tables 8 and 9 provide a summary for 2041 traffic projections.

3. **In the text explaining Exhibit 17, "To accommodate the 2041 traffic, there is a need for a left turn storage lane for eastbound left at the west ramp terminal." Please confirm this is a typo (and should be westbound left). Please clarify how the 2041 background traffic is derived**.

   Yes, it is a typo and should be "westbound". Copies of the operational analysis for the various intersections have been attached to this e-mail.

4. **While the 2012 volumes used are acceptable, attached for your future reference are the latest July 2014 counts.**

   We thank you for the information provided but find that our 2013 traffic counts are comparable and slightly higher than the MTO figures and will continue with our numbers for consistency with the overall traffic count program that was completed. Our 2013 counts are provided in Appendix A.

5. **Please provide electronic copies of the Synchro analysis in order for us to complete our review.**

   Digital files have attached to this e-mail.

6. **Please provide conceptual drawings showing the highway improvements recommended to accommodate Secondary Plan build out.**

   We have attached schematics of the proposed intersection improvements for:
   - Highway 26 at Carson Road
   - Highway 26 at Snow Valley Road/Finlay Mill Road
   - Highway 26 at County Road 27 / Spence Ave.
   - Schematic of Hwy 400 Interchange

7. **Please provide an assessment of Secondary Plan impacts on Highway 26 in Midhurst for MTO to review.**

   The digital files noted in the response to item 5 include the Syncro files for Highway 26 intersections at Carson Road, Snow Valley Road and County Road 27. Pages 8 thru 13 of the attached Operational Analysis provide a summary of LOS for those intersections for the 2031 and 2041 horizons. That section also describes the improvements required at those intersection for those horizon years to maintain acceptable Levels of Service.

If you have any questions on the above, please do not hesitate to contact our office.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P.Eng.
President & CEO

*S:\113027\MTO Package\JM Response to MTO Comments (Jul 5 2017).docx*

Ainley GROUP CONSULTING ENGINEERS PLANNERS

# MEMORANDUM

**Ainley & Associates Limited**
550 Welham Road, Barrie, ON, L4N 8Z7
Tel: (705) 726-3371 P Fax: (705) 726-4391
Email: Barrie@ainleygroup.com

To: **MTO**

Copies to: **Joe Mullan – Ainley Group**
**Steve Fournier – Ainley Group**

From: **Lilly Chen**

Date: **July 3, 2017**

Ref: **Township of Springwater – Midhurst Phase 3 & 4 Operational Analysis**

File: **113027-311**

The analysis and results presented in this Memo has been derived from our overall Operational Analysis dated March 2017 which was prepared in conjunction with a Municipal Class Environmental Assessment for the Midhurst area road network improvements.

A Transportation Report had been prepared in 2008 to identify the major transportation needs in the area. However, significant changes have been made to the development plans, such as the numbers of units, land uses, timing and phasing of the developments etc. To fulfill the requirements of the EA, updated road and intersection improvement needs and timing of the improvements to the area road network are to be identified. In addition, traffic count data and traffic volume projections need to be updated given the 2008 traffic counts in the Transportation Report are out-of-date.

The overall purpose of this memo is to assess the transportation needs of the section of Highway 26 from Carson Road to Spence Ave/County Road 27, and the intersections of Hwy 400 ramps at Forbes Road under existing conditions and future traffic projections for the horizon years of 2031 (full build-out of Phase 1) and 2041 (ultimate horizon).

## 1. Existing Traffic Volumes

Weekday AM and PM peak hour Traffic Counts conducted on Tuesday June 11, 2013 from 7:45 to 8:45 and from 16:30 to 17:30 are available from BA Group's Midhurst Transportation Work Update Memo dated November 12, 2013.

A review of the traffic volumes along the boundary roads and key area intersections from March 2008 weekday and June 2013 weekday indicated the following:

- In most cases, 2013 traffic volumes are higher than the 2008 traffic volumes;
- 2013 traffic volumes are in the order of 77 % to 154% of the 2008 volumes at the locations where traffic volumes are higher (more than 100 vehicles per hour per lane for both AM and PM peak hours);
- Should a seasonal variation factor is considered, based on MTO Seasonal Variation Graphs for Commuter Recreation road character for Highway 26, June counts are approximately 30% higher than March counts;
- Higher growth is on the east-west oriented roads, such as Snow Valley Road (18% to 42%), Finlay Mill Road (27%) and Highway 26 west of County Road 27 (6 % to 54%); and
- Lower growth is on the north-south oriented roads, such as Bayfield Street (-23% to 15%), Wilson Drive (-3% to 22%).

Historic AADT data on the section of Highway 26 from Barrie northerly limits to County Road 27 obtained from

MTO indicates a 1.1% annual growth rate from 2006 to 2010. To reflect the current 2015 traffic volumes, the 2013 traffic counts were increased by 2.2%. The corresponding 2015 weekday peak hour traffic volumes are shown in Figure 1 for the three study intersections.

**2. Speed Limit & Existing 2015 Lane Configuration**

An 80 km/hr speed limit is posted on the following roads in the study area:

- Highway 26/27
- County Road 27
- Snow Valley Road west of Highway 26 to the west
- Forbes Road

A 60 km/hr speed limit is posted on the following roads in the study area:

- Snow Valley Road near Highway 26

A 50 km/hr speed limit is posted on the following roads in the study area:

- Carson Road from Anne Street to Highway 26/27
- Finlay Mill Road

The existing configurations of the key intersections are illustrated in Figure 2.

**3. Existing Intersection Operations**

Based on the existing intersection lane configurations and control, analyses of the Highway 26 intersections and Hwy 400 ramps/Forbes Road intersections were conducted for the existing peak hour traffic volumes. The methodology applied was consistent with the 2010 *Highway Capacity Manual* method for unsignalized and signalized intersections and the Synchro Delay method for signalized intersections as employed in the software program Synchro 8.

Table 1 summarizes the results of the analysis with level of service (LOS), estimated delays (measured in seconds) and volume to capacity (v/c) ratio provided. Level of service A, corresponding to minimal delays, is the best whereas level of service F, corresponding to high delays, is generally considered poor conditions. When volume is less than capacity, v/c ratio is less than 1. Otherwise, v/c ratio equals to 1 or more than 1, which means volume reaches capacity or is more than capacity.

For unsignalized intersections, the level of service corresponds to the minor street lane groups given that the major street movements proceed relatively unimpeded. For signalized intersections, the results pertain to the average intersection delay, lane group delay and assume optimal signal timing and phasing to achieve the most efficient overall network operations through signal coordination. If the actual situations are under expectations, adjustments to the signal timing and/or phasing can be readily implemented. Level of service definitions and the corresponding detailed worksheets are included in Appendix B.

**Table 1 – 2015 Intersection Operations**

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| Highway 26 & Carson Rd | all | signal | 8.6 | A | | 9.9 | A | |
| | EBL | | 15.9 | B | 0.26 | 16.5 | B | 0.37 |
| | EBT-R | | 15.6 | B | 0.28 | 15.0 | B | 0.21 |

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| | WBL | | 16.0 | A | 0.06 | 15.5 | B | 0.06 |
| | WBT-R | | 14.4 | B | 0.03 | 14.2 | B | 0.05 |
| | NBL | | 9.8 | A | 0.08 | 11.8 | B | 0.18 |
| | NBT | | 6.3 | A | 0.37 | 9.2 | A | 0.64 |
| | NBR | | 4.7 | A | 0.01 | 5.1 | A | 0.02 |
| | SBL | | 7.3 | A | 0.02 | 11.4 | B | 0.03 |
| | SBT | | 8.7 | A | 0.53 | 9.2 | A | 0.54 |
| | SBT-R | | 8.6 | B | 0.53 | 9.2 | A | 0.54 |
| Highway 26 & Snow Valley Rd/Finlay Mill Rd | all | signal | 15.2 | B | | 16.3 | B | |
| | EBL | | 19.1 | B | 0.09 | 18.3 | B | 0.10 |
| | EBT-R | | 21.9 | C | 0.14 | 22.1 | C | 0.30 |
| | WBL | | 15.0 | B | 0.38 | 15.4 | B | 0.28 |
| | WBT-R | | 17.8 | B | 0.27 | 19.4 | B | 0.30 |
| | NBL | | 9.8 | A | 0.10 | 9.4 | A | 0.18 |
| | NBT | | 13.9 | B | 0.44 | 17.0 | B | 0.68 |
| | NBR | | 11.7 | B | 0.12 | 14.9 | B | 0.44 |
| | SBL | | 9.8 | A | 0.06 | 10.1 | B | 0.24 |
| | SBT | | 16.4 | B | 0.51 | 16.5 | B | 0.55 |
| | SBT-R | | 16.4 | B | 0.51 | 16.4 | B | 0.55 |
| Hwy 26/CR 27 & Spence Ave | EB | stop | 42.3 | E | 0.08 | **59.9** | **F** | 0.30 |
| | WB | | 41.1 | E | 0.05 | **50.2** | **F** | 0.12 |
| | | | | | | | | |
| HWY 400 SB Off Ramp & Forbes Rd. | NBL | stop | 11 | B | 0.05 | 10.9 | B | 0.04 |
| | | | | | | | | |
| HWY 400 NB Off Ramp & Forbes Road | SBL | stop | 10.3 | B | 0.04 | 11.4 | B | 0.14 |
| | | | | | | | | |

As per the analyses, good levels of service (C or better) occur at the intersections of Highway 26/Snow Valley Road/Finley Mill Road, Hwy 26/Carson Rd, and Hwy 400 ramps on Forbes Road under the existing weekday conditions. However, at the intersection of Highway 26 at CR 27 and Spence Avenue, a poor level of service "F" is provided during the PM peak hour and thus improvements to the intersection should be considered.

The need for a traffic signal at the intersection of Highway 26 with CR27/Spence Avenue was reviewed. A signal warrant analysis was carried out based on the 2015 traffic volumes. A traffic signal is warranted (a completed signal warrant analysis is provided in Appendix C). Thus a traffic signal is recommended at the intersection.

**4. Historic Traffic Growth**

Historic traffic data for the area provincial highways and County Roads is available from MTO and the County of Simcoe. Growth rates were calculated based on the historic data as specified in Table 2.

**Table 2 - AADT Growth on the Area Major Roads**

| Section of Roads | Year | AADT | Year | AADT | Annual Growth Rate |
|---|---|---|---|---|---|
| Hwy 26 from Barrie N Limits to CR 27 | 2006 | 20,300 | 2010 | 21,200 | 1.09% |
| CR 27 from Hwy 26 to CR 22 | 2003 | 10,700 | 2012 | 11,200 | 0.51% |
| Snow Valley Rd from Hwy 26 to Wilson Dr | 2009 | 2,600 | 2012 | 2,700 | 1.27% |
| Forbes Road from CR 93 to Hwy 400 | 2008 | 3,000 | 2014 | 3,700 | 3.56% |

**5. Projected Growth**

In developing future traffic projections, consideration has been given to population and employment forecasts in addition to the Midhurst developments.

**Population & Employment Trends**

Traffic growth will depend largely on the population and employment growth of an area. The population and employment forecasts for the Township of Springwater are documented in the following reports:

- *Simcoe County Land Budget Data Collection and Analysis Phase 1: Population Growth* prepared by Simcoe County Planning Department dated February 2015
- *Proposed Amendment 1 to the Growth Plan for the Greater Golden Horseshoe, 2006* by the Ministry of Infrastructure dated October 2010
- *Simcoe Area Growth Plan* prepared by Hemson Consulting Ltd. Dated May 2008.

Future population and employment projections are provided in Table 3.

**Table 3 - Population and Employment Forecasts**

| Community | Population | | | Employment | | |
|---|---|---|---|---|---|---|
| | 2011 | 2031 | Annual Growth | 2006 | 2031 | Annual Growth |
| Township of Springwater | 18,749 | 24,000 | 1.2% | 5,000 | 5,600 | 0.5% |

It is assumed that projected growth includes partially Midhurst developments, but not all Phase 1 of the Midhurst developments.

**Growth from Midhurst Developments**

The Midhurst developments located within the Midhurst Settlement Area are illustrated in Figure 3 and are listed below:

1) Neighbourhood #1 Carson Road Development – 2559 residential units plus employment land equivalent to 350 residential units;
2) Neighbourhood #2 Doran Road North Development – 1440 residential units;
3) Neighbourhood #3 Doran Road South Development – 3859 residential units;
4) Employment land #1 located on the north side of Snow Valley Road and east side of Wilson Drive – 2655 jobs; and
5) Employment land #2 located on the south side of Snow Valley Road and west side of Highway 26 – 475 jobs and 495,000 sq. ft. GFA commercial.

Trips generated by the above Midhurst developments have been specifically estimated, as per the *ITE Trip Generation Manual*. For the residential developments, trip rates were calculated by using the equations and a combination of 77% single family detached units (land use code 210) and 23% residential condo/townhouse units (land use code 230) given that the percentage of townhouse units in Phase 1 is 23%. For the employment lands, trip rates were estimated by using the equations for general light industrial (land use code 110) and shopping centre land use (land use code 820).

Trips can be made between Carson Road development and the Employment Lands via an internal road between Snow Valley Road and Carson Road without using the boundary roads. These trips are considered internal trips and should be deduced from the total trips. An internal capture rate of 5% was assumed.

There are also trips to the commercial land use when people are on the way home or on the way to work etc. These are by-pass trips. These trips are already on the road network and should be deducted from the total trips. 25% by-pass trips for the commercial land use were assumed.

Trip estimates for the peak hours of the road network are provided in Table 4. In total, the Midhurst developments are expected to generate 6204 primary trips in the AM peak hour and 7842 trips in the PM peak hour (both inbound and outbound trips).

**Table 4 – Midhurst Developments Trip Generation Estimates**

| Development | Rate/ Estimate | Unit/ Size | Weekday AM Peak | | | Weekday PM Peak | | |
|---|---|---|---|---|---|---|---|---|
| | | | In | Out | Total | In | Out | Total |
| Carson Road | rate | unit | 0.15 | 0.47 | 0.62 | 0.443 | 0.254 | 0.697 |
| | estimate | 2909 | 435 | 1381 | 1816 | 1289 | 739 | 2028 |
| | 5% Internal Capture | | -22 | -69 | -91 | -64 | -37 | -101 |
| | Sub-total | | 413 | 1312 | 1725 | 1225 | 702 | 1927 |
| Doran Road North | rate | unit | 0.15 | 0.47 | 0.62 | 0.443 | 0.254 | 0.697 |
| | estimate | 1440 | 216 | 684 | 900 | 638 | 366 | 1004 |
| Doran Road South | rate | unit | 0.15 | 0.47 | 0.62 | 0.443 | 0.254 | 0.697 |
| | estimate | 3859 | 578 | 1832 | 2410 | 1710 | 980 | 2690 |
| Sub-total | | 8208 | 1207 | 3828 | 5035 | 3573 | 2048 | 5621 |

| Development | Rate/ Estimate | Unit/ Size | Weekday AM Peak | | | Weekday PM Peak | | |
|---|---|---|---|---|---|---|---|---|
| | | | In | Out | Total | In | Out | Total |
| Employment Land #1 | rate | employee | 0.25 | 0.05 | 0.3 | 0.07 | 0.24 | 0.31 |
| | estimate | 2655 | 661 | 136 | 797 | 173 | 650 | 823 |
| | 5% Internal Capture | | -33 | -7 | -40 | -9 | -32 | -41 |
| | Sub-total | | 628 | 129 | 757 | 164 | 618 | 782 |
| Employment Land #2 | rate | employee | 0.25 | 0.05 | 0.3 | 0.07 | 0.24 | 0.31 |
| | estimate | 475 | 118 | 25 | 143 | 31 | 116 | 147 |
| | rate | 1000 sq ft GFA | 0.49 | 0.31 | 0.8 | 1.84 | 1.91 | 3.75 |
| | estimate | 495 | 242 | 154 | 396 | 909 | 947 | 1856 |
| | 5% Internal Capture | | -18 | -9 | -27 | -47 | -53 | -100 |
| | 25% By-pass Trips | | -60 | -39 | -99 | -227 | -237 | -464 |
| | Sub-total | | 282 | 131 | 413 | 666 | 773 | 1439 |
| Total | | | 2117 | 4087 | 6204 | 4403 | 3439 | 7842 |

For the three residential developments, development phasing is shown in Figure 3 and Table 5. For the employment lands, it is anticipated that they will be completed during Phase 1 by 2031. By 2027, all approved units (3850 units) would be built. By 2031 Phase 1 of the Midhurst developments are expected to generated 4209 trips in the AM peak hour and 5615 trips in the PM peak hour (both inbound and outbound trips).

**Table 5 – Development Phasing**

| Build Out Timing/Phasing | Carson Rd Development | | | Doran Road North Dev. | | Doran Road South Dev. | | Cumulative Total Units |
|---|---|---|---|---|---|---|---|---|
| | Residential Units | Emp. Units | % Build Out | Units | % Build Out | Units | % Build Out | |
| Stage 1 - 2018 | 748 | 100 | 29 | 232 | 16 | | | 1080 |
| Stage 2 -2022 | 819 | 100 | 61 | 297 | 37 | | | 2296 |
| Stage 3 - 2025 | 487 | 100 | 81 | 291 | 57 | | | 3174 |
| Stage 4 - 2027 | 219 | 50 | 90 | 407 | 85 | | | 3850 |
| Stage 5- 2031 | 27 | | 91 | 213 | 100 | 910 | 24 | 5000 |
| Ph1 Subtotal 2031 | 2300 | 350 | 91 | 1440 | 100 | 910 | 24 | 5000 |
| Stage 6 - 2034 | 259 | | 100 | | | 750 | 43 | 6009 |
| Stage 7 - 2036 | | | | | | 750 | 62 | 6759 |
| Stage 8 - 2039 | | | | | | 725 | 81 | 7484 |
| Stage 9 - 2041 | | | | | | 724 | 100 | 8208 |
| Total 2041 | 2909 | | 100 | 1440 | 100 | 3859 | 100 | 8208 |

The Transportation Master Plan prepared by the County of Simcoe and the analysis of the area traffic during the assessment of a potential partial interchange on Highway 400 at Pooles Road (AECOM June 2015) describe the prime origin / destination for the Midhurst area as 70% to and from the south. No other guidance is provided on the other directions and we have assigned 10% to each of the other cardinal directions. There are several north south options available to existing and future residents of Midhurst and the route selection will be dependent on where they are situated within Midhurst. We have assumed that if you are in the Carson Road area development

the traffic to and from the south would typically use Highway 26/Bayfield or Anne Street or Wilson Road and unlikely to use St. Vincent Street or Highway 400. For those in the Russell Road/Doran Road area developments the route selection to and from the south would be on Highway 400 or St. Vincent Street or Highway 26/Bayfield Street.

Rudimentary time trials were carried out on the north south routes from Doran Road between Russell Road and St. Vincent Street to the intersection of Highway 400 and Bayfield Street by taking Russell to Forbes to Highway 400 and by taking Findley Mill Road/Highway 26/Bayfield and by taking Pooles to St. Vincent Street to Cundles Road to Bayfield to Highway 400. The data collected shows that the Forbes to Highway 400 route is the quickest during the PM Peak at approximately 10 minutes followed by the Highway 26 route at 11.5 minutes and then the St. Vincent Route at 13.5 minutes.

For the western development area of Carson Road between Highway 26 and Wilson Road we have assigned the 70% of traffic to and from the south as 30% along Highway 26, 20% along Anne Street and 20% along Wilson Road. For the eastern development area in the vicinity north of Doran Road between Russell and St Vincent we have assigned the 70% of traffic to and from the south as 45% to Forbes and Hwy 400, 5% to Findley Mill Road / Highway 26 and 10% to Craig Road to CR 27 / Hwy 26 and 5% to Pooles Road and St. Vincent. For the eastern development area in the vicinity south of Doran Road between Russell and St Vincent we have assigned the 70% of traffic to and from the south as 50% to Forbes and Hwy 400, 5% to Findley Mill Road and Highway 26 and 15% to Pooles Road and St. Vincent.

Based on the above, the following distributions were developed:

Carson Road Development

- 20% to/from the south via Wilson Drive
- 20% to/from the south via Anne Street
- 30% to/from the south via Highway 26
- 10% to/from the north via County Road 27
- 5% to/from the west via Highway 26
- 5% to/from the northwest via Wilson Drive/Snow Valley Rd.
- 5% to/from the west via Snow Valley Road / Hwy 26
- 5% to/from the east via Forbes Road

Doran Road North Development

- 45% to/from the south via Highway 400 and Forbes Road
- 5% to/from the south via St Vincent
- 5% to/from the south via Highway 26 and Finlay Mill Road
- 10% to/from the south via Highway 26 and Craig Road
- 5% to/from the north via County Road 27 and Craig Road
- 5% to/from the north via Highway 400 and Forbes Road
- 5% to/from the west via Doran, Spence and Highway 26
- 5% to/from the west via Snow Valley Road
- 10% to/from the east via Forbes Road
- 5% to/from the south via Russell and Pooles Road

Doran Road South Development

- 50% to/from the south via Highway 400 and Forbes Road
- 15% to/from the south via St Vincent
- 5% to/from the south via Highway 26 and Finlay Mill Road
- 0% to/from the south via Highway 26 and Craig Road
- 5% to/from the north via Russell – Craig Rd - County Road 27
- 5% to/from the north via Highway 400

- 5% to/from the west via Doran, Spence and Highway 26
- 5% to/from the west via Snow Valley Road
- 10% to/from the east via Forbes Road

Employment Land #1
- 20% to/from the south via Wilson Drive
- 10% to/from the south via Anne Street
- 20% to/from the south via Highway 26
- 13% to/from the east via Finlay Mill Road
- 5% to/from the east via Craig Road
- 1% to/from the east via Doran Road
- 1% to/from the east via Carson Road east
- 15 % to/from north via CR 27
- 2% to/from the west via Snow Valley Road
- 13% to/from the northwest via Wilson Drive

Employment Land #2
- 10% to/from the south via Wilson Drive
- 10% to/from the south via Anne Street
- 30% to/from the south via Highway 26
- 13% to/from the east via Finlay Mill Road
- 5% to/from the east via Craig Road
- 1% to/from the east via Doran Road
- 1% to/from the east via Carson Road east
- 15 % to/from north via CR 27
- 2% to/from the west via Snow Valley Road
- 13% to/from the northwest via Wilson Drive

The development specific trip estimates were assigned to the area road network. The resulting traffic volumes attributed to the above noted developments are presented in Appendix D.

**6. Future Traffic Volumes**

Given that development growth has been considered specifically and that the average growth rate for the section of Highway 26 is 1.09% for the past five years, an annual general background growth rate of 1.0% was applied for traffic volumes on Highway 26, CR 27, Wilson Drive, Snow Valley Road and Finlay Mill Road – Doran Road – Forbes Road corridor.

Estimates of future traffic volumes for the years 2031 and 2041 have been determined based on the following:
- 2015 traffic volumes;
- development specific trip generation volumes; and
- consideration for the 2031and 2041 horizon year growth rates.

The resulting future traffic projections are provided in Figures 4 and 5 for the 2031 and 2041 horizon respectively. The AM and PM peak hour volumes are provided, reflective of weekday conditions.

**7. Future Road Network**

The County of Simcoe has recently completed an updated Transportation Master Plan. The final draft report dated September 2014 has identified the following improvements in the study area:
- Snow Valley Road from CR 28 to Highway 26 widening to 4 lanes by 2021
- Wilson Drive from Barrie limit to Highway 26 widening to 4 lanes by 2031

- Widening of CR 93 from CR 11 (Forbes Road) to City of Barrie limit shall be coordinated with MTO's widening of Highway 11
- CR 27 from Highway 26 to CR 22 widening to 4 lanes by 2041

It is assumed that the following road connections will be in place by 2025:

- Craig Road is opened from Russell Road to County Road 27 2018
- St Vincent Street is connected between Belmont Crescent and Park Trail

The timing for the above improvements should be sooner than later. The 10 year horizon is considered the worst case scenario and is to allow time for design and construction.

Route selection for the Craig Road link between Russell Road and County Road 27 along the north limits of the study area is still in the preliminary stages which will be refined as the overall design of the transportation improvements proceeds. Completion of this link during the first stage of Phase 1 development is necessary as it provides alternate routing for some development traffic to access the County Road 27/Hwy 26/ Bayfield corridor and to some extent Hwy 400 without using existing Midhurst community roads. This Craig Road link is proposed as a two lane rural roadway.

**8. Future 2031 Operations**

The following improvements have been assumed:

- Add a traffic signal and an exclusive left turn lane on the SB, EB and WB approaches at the intersection of Highway 26 / CR 27 / Spence Ave
- Add a NB advance green phase at the intersection of Highway 26 / Carson Road.

The operations of the key study area intersections were investigated based upon the existing configurations, the above improvements and the 2031 traffic projections. The results of the 2031 analyses are presented in Table 6 whereas the corresponding worksheets are provided in Appendix C.

**Table 6 – 2031 Intersection Operations**

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| Highway 26 & Carson Rd | all | signal | 26.3 | C | | 39.3 | D | |
| | EBL | | 32.6 | C | 0.64 | 76.9 | E | 0.87 |
| | EBT-R | | 42.5 | D | 0.84 | 57.8 | E | 0.77 |
| | WBL | | 40.6 | D | 0.15 | 58.9 | E | 0.20 |
| | WBT-R | | 31.3 | C | 0.07 | 52.9 | D | 0.16 |
| | NBL | | 21.2 | C | 0.57 | 79.7 | E | 0.96 |
| | NBT | | 13.4 | B | 0.52 | 13.3 | B | 0.70 |
| | NBR | | 13.3 | B | 0.52 | 13.2 | B | 0.70 |
| | SBL | | 17.1 | B | 0.05 | 24.0 | C | 0.14 |
| | SBT | | 30.5 | C | 0.85 | 46.5 | D | 0.94 |
| | SBT-R | | 31.2 | C | 0.86 | 53.7 | D | 0.98 |
| Highway 26 & Snow Valley Rd/Finlay Mill Rd | all | signal | 35.5 | D | | 60.9 | E | |
| | EBL | | 24.5 | C | 0.39 | 31.4 | C | 0.62 |
| | EBT-R | | 44.4 | D | 0.79 | **115.9** | **F** | **1.09** |

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| | WBL | | 24.3 | C | 0.72 | 57.6 | E | 0.86 |
| | WBT-R | | 28.3 | C | 0.58 | 43.4 | D | 0.46 |
| | NBL | | 39.1 | D | 0.82 | **105.9** | **F** | **1.00** |
| | NBT | | 23.6 | C | 0.65 | 45.0 | D | 0.88 |
| | NBR | | 17.7 | B | 0.18 | 36.0 | D | 0.63 |
| | SBL | | 17.7 | B | 0.14 | 37.2 | D | 0.59 |
| | SBT | | 50.6 | D | 0.94 | 66.6 | E | 0.96 |
| | SBT-R | | 51.5 | D | 0.94 | 68.6 | E | 0.97 |
| Hwy 26/CR 27 & Spence Ave | all | signal | 12.8 | B | | 10.7 | B | |
| | EBL | | 34.1 | C | 0.29 | 33.6 | C | 0.54 |
| | EBT | | 32.3 | C | 0.12 | 28.5 | C | 0.17 |
| | EBR | | 0.5 | A | 0.30 | 0.7 | A | 0.39 |
| | WBL | | 31.6 | C | 0.03 | 27.8 | C | 0.03 |
| | WBT-R | | 35.2 | D | 0.37 | 28.3 | C | 0.12 |
| | NBL | | 14.8 | B | 0.76 | 14.8 | B | 0.74 |
| | NBT-R | | 2.1 | A | 0.20 | 3.8 | A | 0.45 |
| | SBL | | 15.6 | B | 0.00 | 14.7 | B | 0.04 |
| | SBT-R | | 23.6 | C | 0.76 | 21.7 | C | 0.74 |
| HWY 400 SB Off Ramp & Forbes Rd. | NBL | stop | 35.1 | E | 0.15 | 26.3 | D | 0.33 |
| | WB L | | 10.7 | B | 0.13 | 9 | A | 0.54 |
| | | | | | | | | |
| HWY 400 NB Off Ramp & Forbes Road | SBL | stop | 18.1 | C | 0.10 | 21.0 | C | 0.32 |
| | EBL | | 8.1 | A | 0.10 | | | |

Given the assumed improvements, all intersections and their lane groups will operate acceptably at a level of service "E" or better in the 2031 horizon except for the intersection of Highway 26 at Snow Valley Road where a poor level of service "F" occurs on the eastbound through-right shared lane and the northbound left turn lane, volumes are at or over capacity during the PM peak hour. Thus, improvements at the intersection are required.

Should an eastbound right turn lane be added at the intersection of Highway 26 at Snow Valley Road/Finlay Mill Road, the intersection would operate acceptably. The results of the analysis are summarized in Table 7.

As traffic grows the LOS for the Hwy 400 SB Off Ramp will soon reach unacceptable levels. Signalization of that intersection s proposed in 2031 to accommodate growth in the Russell Road – Doran Road area

**Table 7 – 2031 Intersection Operations with Improvements**

| Intersection | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| Highway 26 & Snow Valley Rd/Finlay Mill Rd | all | signal | 31.7 | C | | 36.8 | D | |
| | EBL | | 25.2 | C | 0.40 | 30.2 | C | 0.71 |
| | EBT | | 30.9 | C | 0.26 | 45.2 | D | 0.75 |
| | EBR | | 35.2 | D | 0.63 | 51.9 | D | 0.81 |
| | WBL | | 21.0 | C | 0.58 | 28.9 | C | 0.62 |
| | WBT-R | | 29.4 | C | 0.63 | 41.1 | D | 0.70 |
| | NBL | | 32.7 | C | 0.78 | 42.5 | D | 0.83 |
| | NBT | | 22.0 | C | 0.63 | 30.1 | C | 0.85 |
| | NBR | | 16.5 | B | 0.18 | 24.4 | C | 0.60 |
| | SBL | | 16.5 | B | 0.13 | 22.8 | C | 047 |
| | SBT | | 44.9 | D | 0.91 | 44.3 | D | 0.91 |
| | SBT-R | | 45.7 | D | 0.91 | 45.6 | D | 0.92 |
| | | | | | | | | |

**9. Future 2041 Operations**

Given the future 2041 total traffic volumes, an additional through lane in each direction for a total of 4 lanes are required on Forbes Road from Russell Road to Highway 400.

A traffic signal warrant analysis was carried out at Forbes Road / Highway 400 SB off-ramp intersection. A traffic signal is warranted at the intersection for the 2041 horizon.

The operations of the key study area intersections were investigated based upon the existing configurations, the 2031 improvements, the above noted improvements, and the 2041 traffic projections. It is assumed that significant improvements would be provided in the area of the Highway 400/Forbes Road interchange, Forbes Road and Russell Road. The results of the 2041 analyses are presented in Table 8 whereas the corresponding worksheets are provided in Appendix B.

**Table 8 – 2041 Intersection Operations**

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| Highway 26 & Carson Rd | all | signal | 26.3 | C | | 39.3 | D | |
| | EBL | | 32.6 | C | 0.64 | 76.9 | E | 0.87 |
| | EBT-R | | 42.5 | D | 0.84 | 57.8 | E | 0.77 |
| | WBL | | 40.6 | D | 0.15 | 58.9 | E | 0.20 |
| | WBT-R | | 31.3 | C | 0.07 | 52.9 | D | 0.16 |
| | NBL | | 21.2 | C | 0.57 | 79.7 | E | 0.96 |
| | NBT | | 13.4 | B | 0.52 | 13.3 | B | 0.70 |
| | NBT-R | | 13.3 | B | 0.52 | 13.2 | B | 0.70 |
| | SBL | | 17.1 | B | 0.05 | 24.0 | C | 0.14 |

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| | SBT | | 30.5 | C | 0.85 | 46.5 | D | 0.94 |
| | SBT-R | | 38.1 | D | | 52.6 | D | |
| Highway 26 & Snow Valley Rd/Finlay Mill Rd | all | signal | 46.7 | D | | 51.3 | D | |
| | EBL | | 27.4 | C | 0.46 | 46.3 | D | 0.82 |
| | EBT | | 33.3 | C | 0.34 | 88.4 | F | 0.97 |
| | EBR | | 39.3 | D | 0.67 | 68.4 | E | 0.86 |
| | WBL | | 23.8 | C | 0.71 | 48.9 | D | 0.86 |
| | WBT-R | | 30.7 | C | 0.69 | 51.8 | D | 0.74 |
| | NBL | | 63.7 | E | 0.94 | **81.6** | **F** | 0.95 |
| | NBT | | 27.9 | C | 0.74 | 36.5 | D | 0.88 |
| | NBR | | 20.0 | C | 0.24 | 31.6 | C | 0.71 |
| | SBL | | 19.9 | B | 0.18 | 31.6 | C | 0.60 |
| | SBT | | 79.3 | **F** | **1.05** | 57.5 | E | 0.96 |
| | SBT-R | | **81.5** | **F** | **1.05** | 60.6 | E | 0.97 |
| Hwy 26/CR 27 & Spence Ave | all | signal | 20.1 | C | | 15.0 | B | |
| | EBL | | 33.5 | C | 0.16 | 35.9 | D | 0.49 |
| | EBT | | 33.4 | C | 0.17 | 35.9 | D | 0.52 |
| | EBR | | 0.6 | A | 0.33 | 0.8 | A | 0.43 |
| | WBL | | 32.4 | C | 0.01 | 31.6 | C | 0.02 |
| | WBT-R | | 37.2 | D | 0.54 | 33.5 | C | 0.32 |
| | NBL | | 27.2 | C | 0.88 | 22.4 | C | 0.82 |
| | NBT-R | | 3.3 | A | 0.23 | 4.2 | A | 0.47 |
| | SBL | | 19.5 | B | 0.0 | 18.2 | B | 0.04 |
| | SBT-R | | 33.9 | C | 0.86 | 29.7 | C | 0.83 |
| | | | | | | | | |
| | | | | | | | | |
| HWY 400 SB Off Ramp & Forbes Rd. | all | | 11.3 | B | | 19.5 | B | |
| | NBL | signals | 11.8 | B | 0.12 | 19.5 | B | 0.32 |
| | WB L | | 15.3 | B | 0.29 | 9.5 | A | 0.10 |
| | WBT | | 11.0 | B | 0.46 | 22.6 | C | 0.93 |
| | EBT | | 10.8 | B | 0.43 | 7.9 | A | 0.23 |
| | | | | | | | | |
| HWY 400 NB Off Ramp & Forbes Road | SBL | stop | 34.8 | D | 0.22 | 52.4 | **F** | 0.63 |
| | EBL | | 8.6 | A | 0.18 | 9 | A | 0.14 |

Given the increase in traffic volumes, despite the assumed improvements, a poor level of service "F" occurs at the

following intersections:

- Highway 26 at Carson Road
- Highway 26 at Snow Valley Road
- Forbes Road at Highway 400 NB off-ramp

Thus improvements at these intersections should be considered. The following improvements are recommended:

Intersection of Forbes Road at Highway 400 NB off-ramp

- Add an eastbound left turn lane

Intersection of Highway 26 at Carson Road

- Add an eastbound right turn lane; and
- Add a northbound left turn lane to a double left turn lane

Intersection of Highway 26 at Snow Valley Road

- Add a southbound right turn lane. Add an eastbound right turn lane

Intersection of Highway 400 NB Off Ramp with Forbes Rd.

- Add an eastbound to northbound left turn lane

Based on the above improvements, the above intersections would operate acceptably. The results of the analysis are summarized in Table 9.

**Table 9 – 2041 Intersection Operations with Improvements**

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| Highway 26 & Carson Rd | all | signal | 30.9 | C | | 30.2 | C | |
| | EBL | | 36.3 | D | 0.71 | 69.5 | E | 0.89 |
| | EBT | | 23.6 | C | 0.00 | 34.8 | C | 0.02 |
| | EBR | | 33.8 | C | 0.79 | 34.4 | C | 0.57 |
| | WBL | | 32.4 | C | 0.09 | 45.6 | D | 0.15 |
| | WBT-R | | 32.0 | C | 0.08 | 45.8 | D | 0.21 |
| | NBL | | 20.3 | C | 0.36 | 46.2 | D | 0.86 |
| | NBT | | 13.3 | B | 0.56 | 16.3 | B | 0.80 |
| | NBT-R | | 13.2 | B | 0.56 | 16.2 | B | 0.81 |
| | SBL | | 17.4 | B | 0.05 | 30.2 | C | 0.17 |
| | SBT | | 40.8 | D | 0.95 | 31.9 | C | 0.91 |
| | SBR | | 44.4 | D | 0.97 | 39.4 | D | 0.96 |
| Highway 26 & Snow Valley Rd/Finlay Mill Rd | all | signal | 32.4 | C | | 38.0 | D | |
| | EBL | | 23.1 | C | 0.42 | 45.3 | D | 0.81 |
| | EBT | | 29.1 | C | 0.33 | 79.3 | E | 0.96 |
| | EBR | | 24.2 | C | 0.42 | 35.3 | D | 0.59 |
| | WBL | | 19.4 | B | 0.68 | 39.5 | D | 0.83 |
| | WBT-R | | 26.7 | C | 0.68 | 41.1 | D | 0.66 |
| | NBL | | 38.1 | D | 0.82 | 43.3 | D | 0.83 |
| | NBT | | 30.3 | C | 0.82 | 39.1 | D | 0.92 |

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| | NBR | | 8.4 | A | 0.16 | 15.3 | B | 0.55 |
| | SBL | | 20.1 | C | 0.18 | 28.8 | C | 0.59 |
| | SBT | | 50.8 | D | 0.98 | 35.9 | D | 0.85 |
| | SBR | | 20.0 | C | 0.38 | 15.4 | B | 0.27 |
| | | | | | | | | |
| HWY 400 NB Off Ramp & Forbes Road wt EB Lt | SBL | stop | 20.3 | C | 0.13 | 22.3 | C | 0.36 |
| | EBL | | 8.6 | A | 0.18 | 9 | A | 0.14 |

**10. Roundabout Alternative Considerations**

A roundabout alternative was considered at each of the future signalized intersections. Because of geometric and other constrains (i.e. train track, slope, sightline, property, natural environment etc.), only the following intersections were considered further:

- Highway 26 and Carson Road
- Highway 26 and County Road 27

Roundabout operational analysis was carried out for the above two intersections based on the 2041 traffic volumes and 2041 area road lane configurations. The results of the 2041 roundabout analyses are presented in Table 10 whereas the corresponding worksheets are provided in Appendix B.

**Table 10 – 2041 Intersection Operations - Roundabout**

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| Highway 26 & Carson Rd | all | 2 lane round-about | **98.9** | **F** | | **160.9** | **F** | |
| | EB | | **430.7** | **F** | **1.88** | **260.1** | **F** | **1.48** |
| | WB | | 11.9 | B | 0.11 | 29.8 | D | 0.27 |
| | NBL-T | | 17.3 | C | 0.71 | **145.2** | **F** | **1.27** |
| | NBT-R | | 21.7 | C | 0.79 | **204.2** | **F** | **1.41** |
| | SBL-T | | 21.7 | C | 0.82 | **95.7** | **F** | **1.13** |
| | SBT-R | | 32.0 | D | 0.91 | **141.8** | **F** | **1.25** |
| Hwy 26/CR 27 & Spence Ave | all | 2 lane round-about with an EB right turn bypass | 13.8 | B | | 25.4 | D | |
| | EBL-T | | 6.7 | A | 0.09 | 9.9 | A | 0.27 |
| | EBR | | 0 | A | 0.28 | 0 | A | 0.36 |
| | WB | | 11.9 | B | 0.23 | 17.1 | C | 0.22 |
| | NBL-T | | 13.0 | B | 0.66 | 28.8 | D | 0.89 |
| | NBT-R | | 10.3 | B | 0.56 | 47.4 | E | 0.99 |
| | SBL-T | | 23.4 | C | 0.72 | 19.6 | C | 0.68 |
| | SBT-R | | 27.0 | D | 0.78 | 22.3 | C | 0.74 |

As indicated in Table 10, volumes are over capacity on several lane groups/approaches at the intersection of Highway 26 with Carson Road. A roundabout is not a viable option for the intersection. Although, an eastbound right turn bypass has been added to the roundabout at the intersection of Highway 26 at County Road 27, the northbound through-right shared lane reaches its capacity. Thus a roundabout is not recommended at the intersection.

## 11. Conclusion

Based on the above analyses, it is concluded that the following timing and improvements are recommended.

**2015 horizon**

- Add a traffic signal at the intersection of Highway 26/Spence Avenue with Highway 26/County Road 27 including an exclusive left turn lane on the north, east and west approaches

**2031 horizon**

- Add an eastbound right turn lane at the intersection of Highway 26 with Snow Valley Road

**2041 horizon**

- Add an eastbound right turn lane on Carson Road at Highway 26, and add a northbound left turn lane (double northbound left turn lane) on Highway 26 at Carson Road
- Add a southbound right turn lane on Highway 26 at Snow Valley Road.
- Add an additional through lane in each direction for a total of 4 lanes on Forbes Road from Russell Road to Highway 400
- Add a traffic signal at the intersection of Forbes Road/Highway 400 SB on/off ramp along with a westbound left turn lane and an eastbound channelized right turn lane.
- Add an eastbound left turn lane on Forbes Road at Highway 400 NB on/off ramp.

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# APPENDIX A

## 2013 Traffic Counts

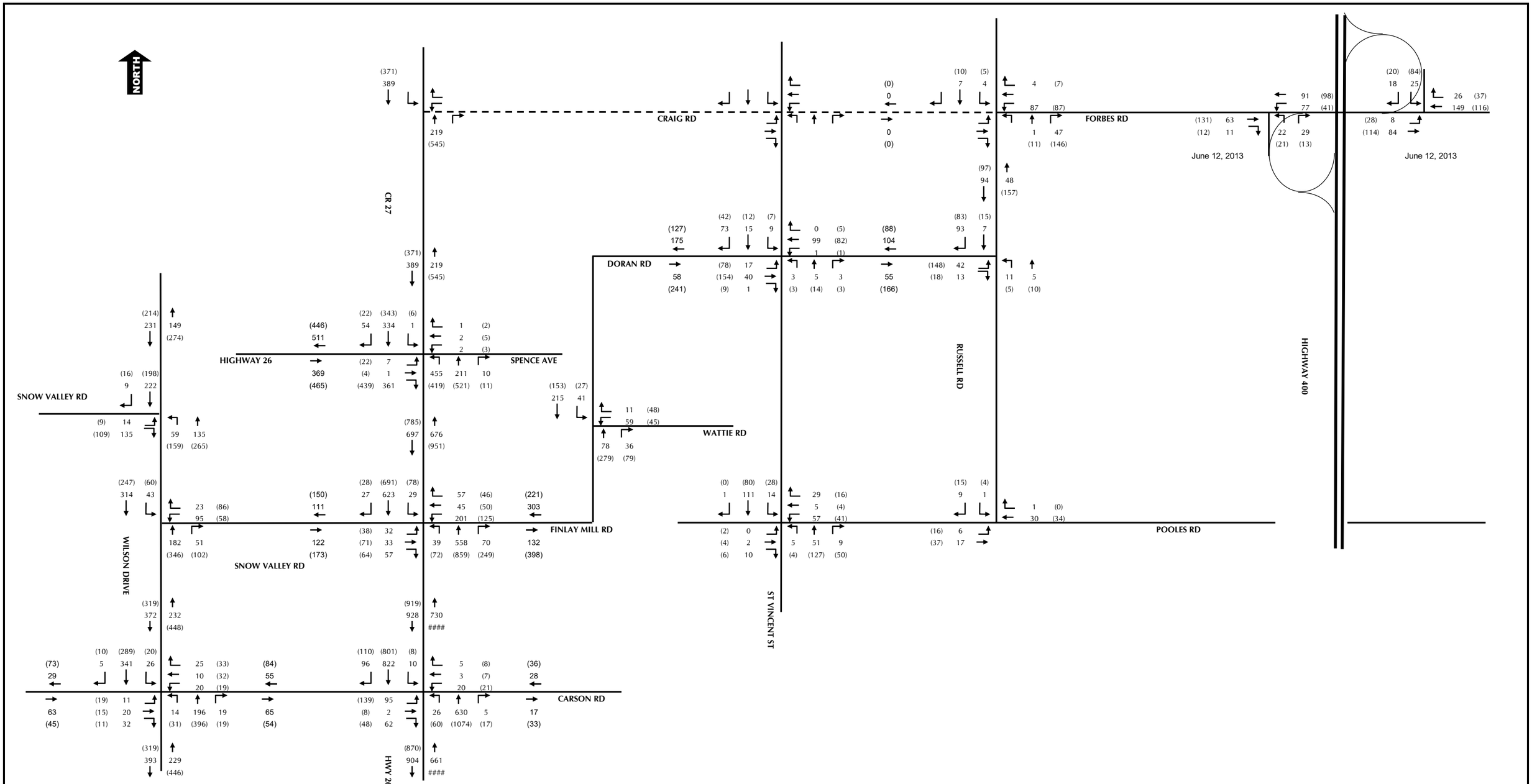



**Figure x**
**Traffic Counts**
**Midhurst EA Phases 3 & 4**
**Township of Springwater**

Ainley Group CONSULTING ENGINEERS PLANNERS

# APPENDIX B
# DEVELOPMENT GENERATED TRAFFIC

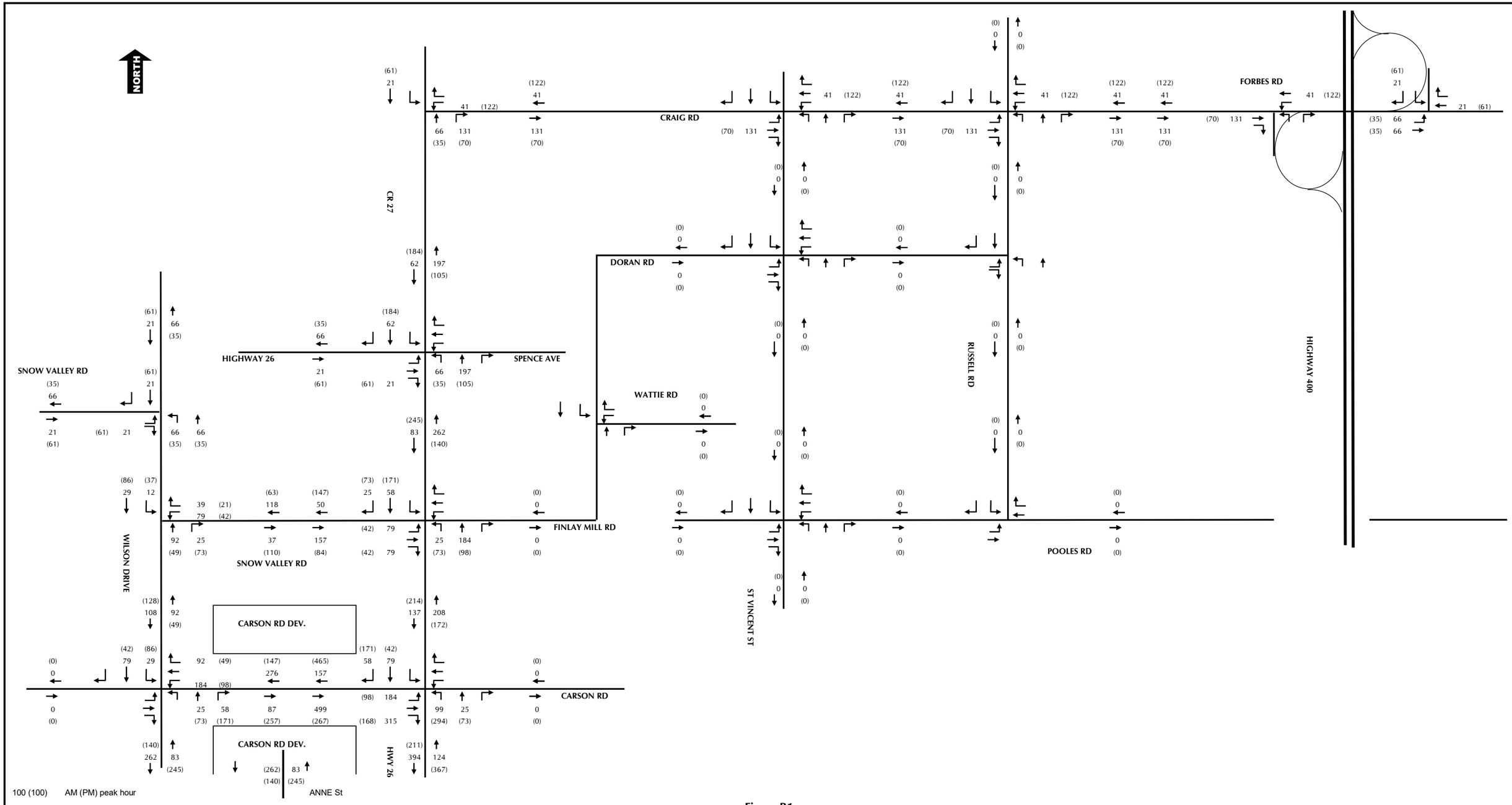


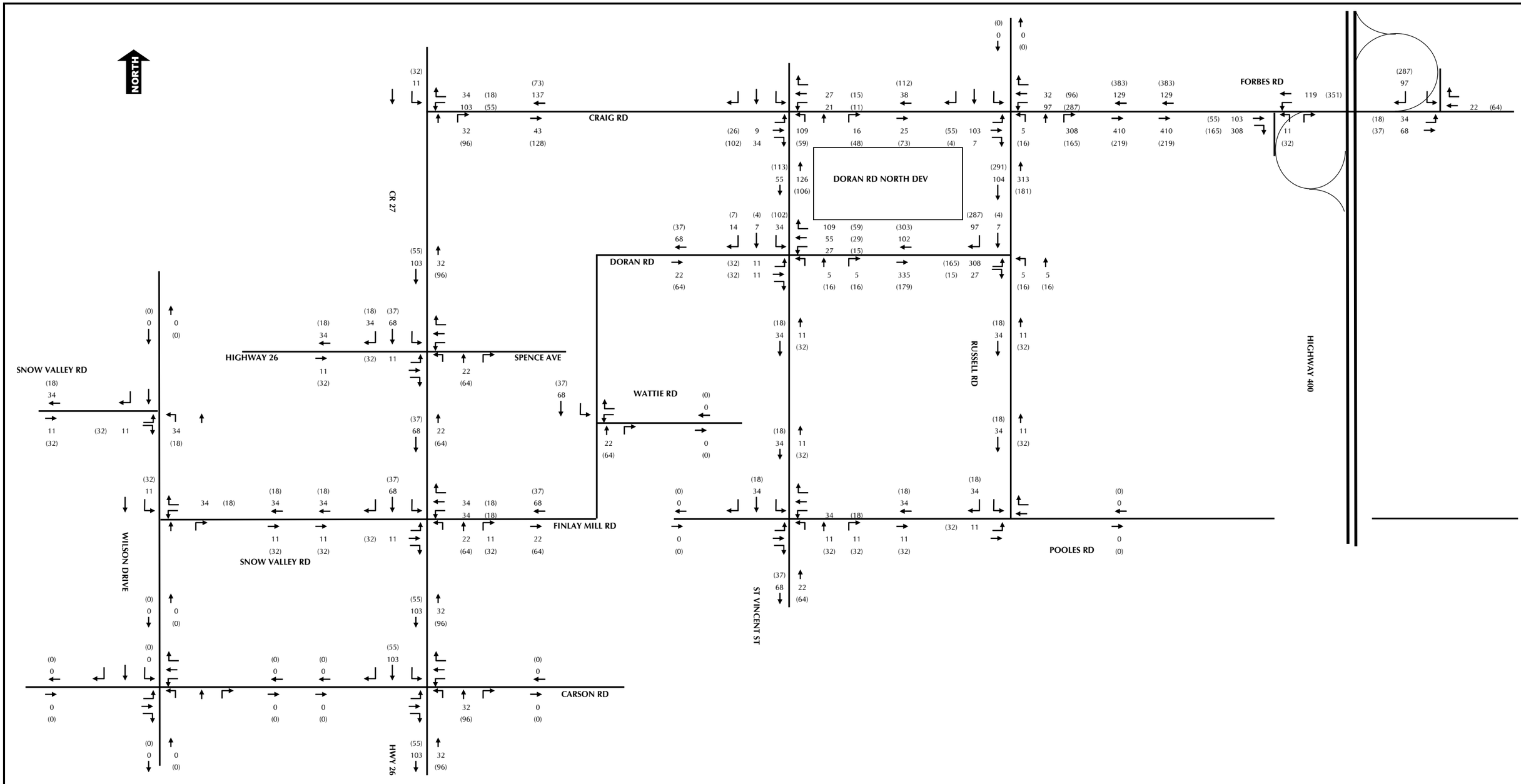

**Figure B1**

**Carson Road Development Generated Traffic Volumes - Without Anne Street Connection**

**Midhurst EA Phases 3 & 4**

**Township of Springwater**

Ainley Group CONSULTING ENGINEERS PLANNERS




100 (100) AM (PM) peak hour

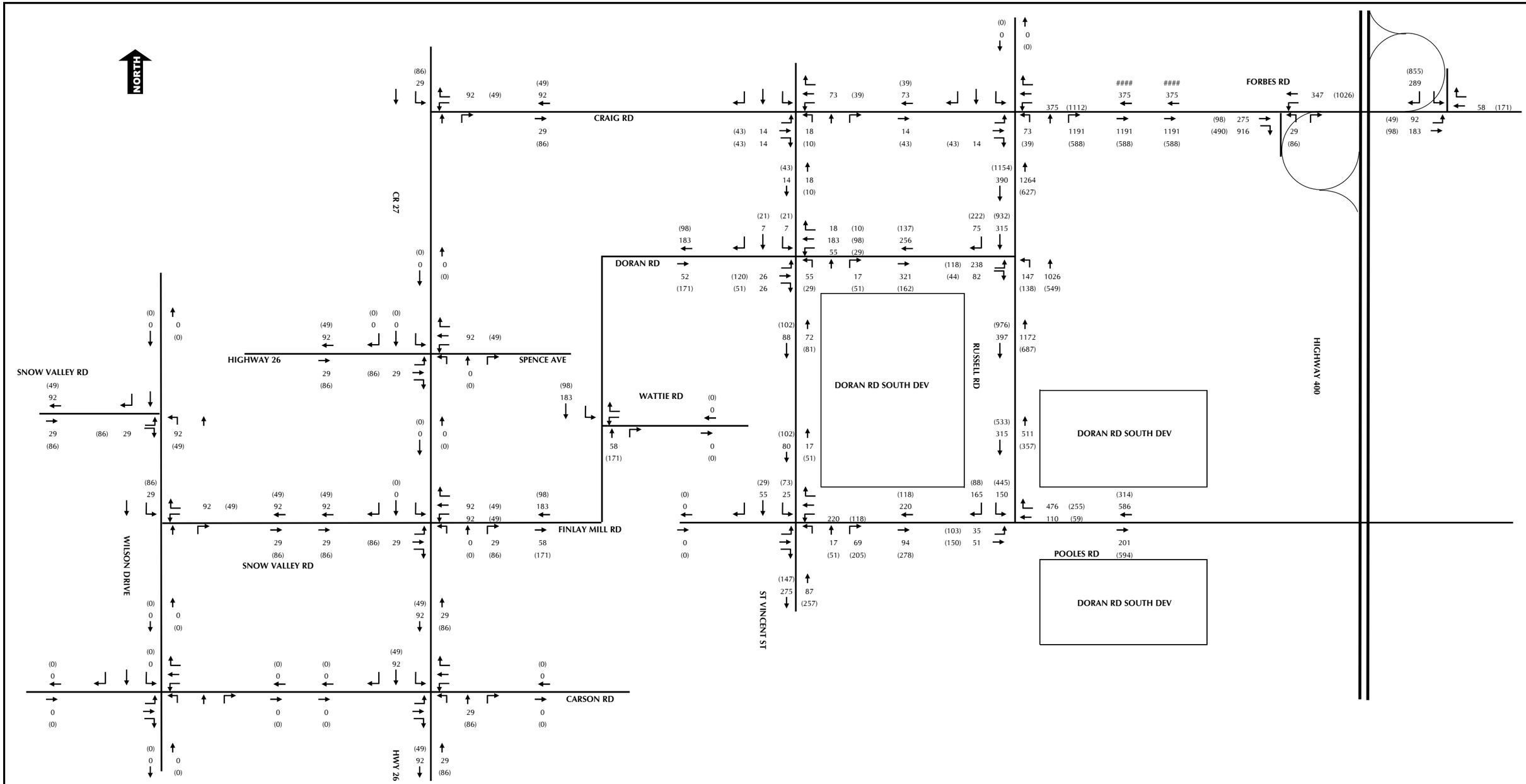
**Figure B2**

**Doran Road North Development Generated Traffic Volumes**

**Midhurst EA Phases 3 & 4**

**Township of Springwater**

Ainley Group CONSULTING ENGINEERS PLANNERS




100 (100) AM (PM) peak hour

**Figure B3**

**Doran Road South Development Generated Traffic Volumes**

**Midhurst EA Phases 3 & 4**

**Township of Springwater**

Ainley Group CONSULTING ENGINEERS PLANNERS

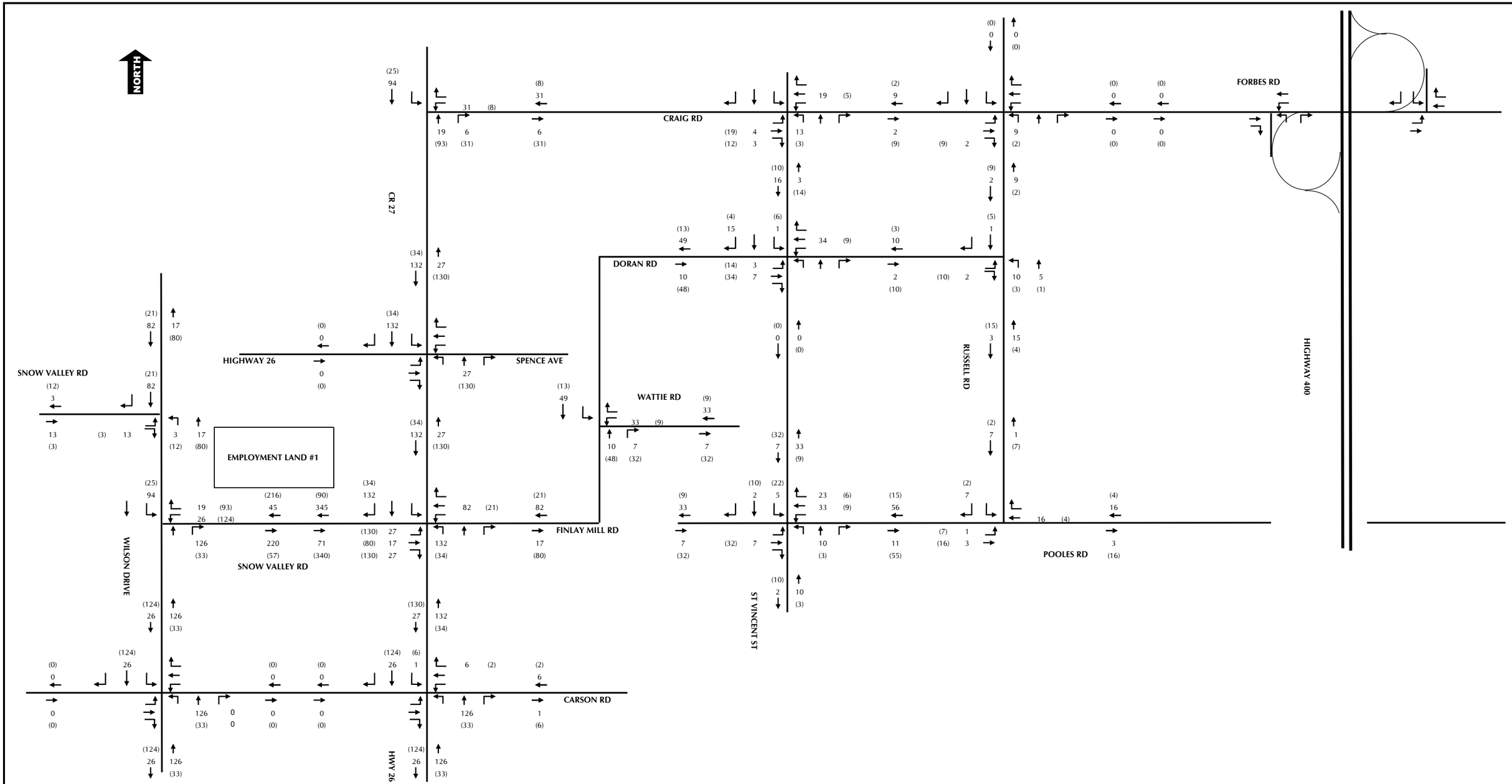


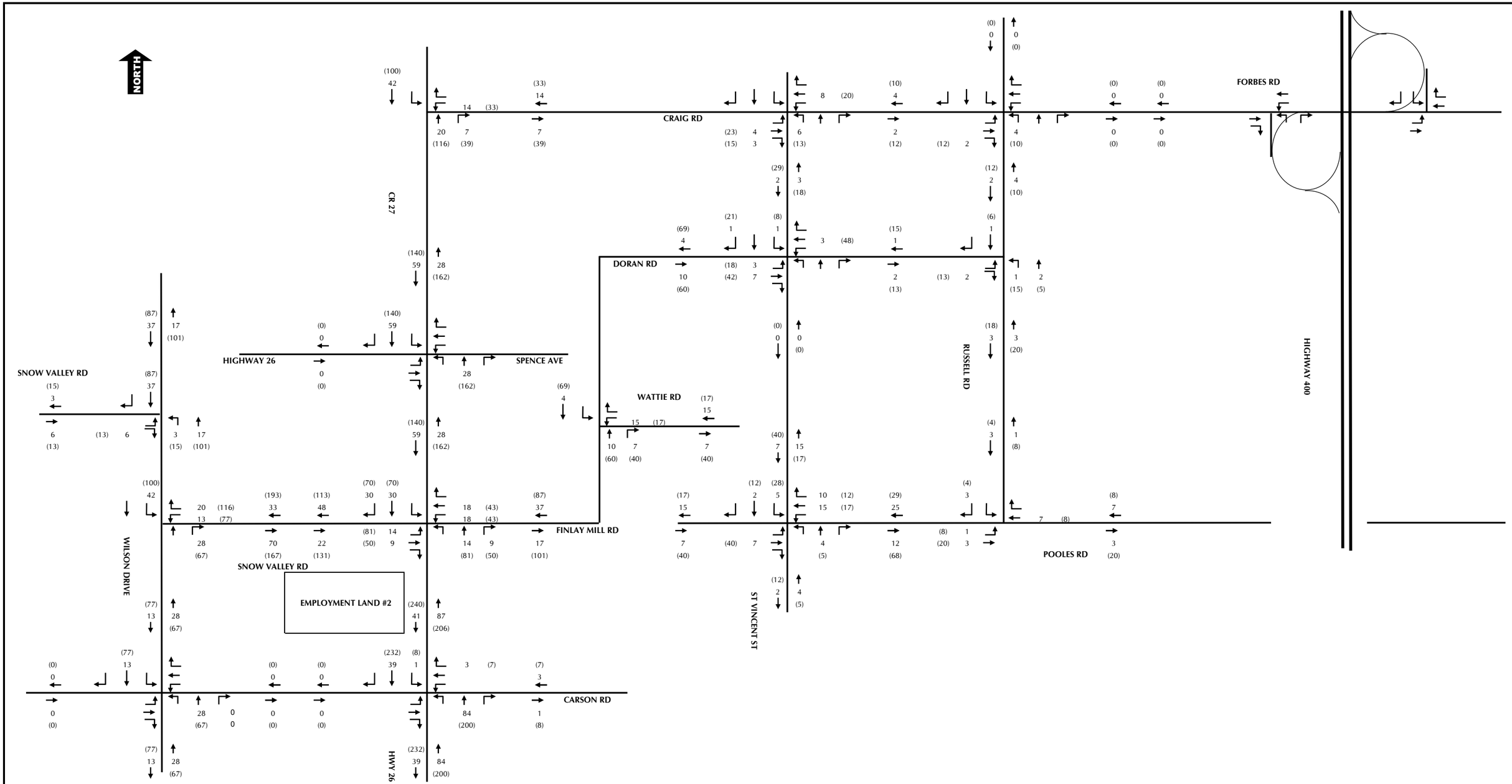

**Figure B4**

**Employment Land #1 Development Generated Traffic Volumes**

**Midhurst EA Phases 3 & 4**

**Township of Springwater**

Ainley Group — Consulting Engineers Planners




100 (100) AM (PM) peak hour

**Figure B5**

**Employment Land #2 Development Generated Traffic Volumes**

**Midhurst EA Phases 3 & 4**

**Township of Springwater**

Ainley Group CONSULTING ENGINEERS PLANNERS

# APPENDIX C

## Operational Analyses

# Existing 2015 Traffic Volumes

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.1 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 64 | 11 | 79 | 93 | 22 | 30 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | Free |
| Storage Length | - | - | - | - | 0 | 800 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 67 | 12 | 83 | 98 | 23 | 32 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 79 | 0 | 337 | - |
| Stage 1 | - | - | - | - | 73 | - |
| Stage 2 | - | - | - | - | 264 | - |
| Critical Hdwy | - | - | 4.12 | - | 6.42 | - |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | - | - | 2.218 | - | 3.518 | - |
| Pot Cap-1 Maneuver | - | - | 1519 | - | 658 | 0 |
| Stage 1 | - | - | - | - | 950 | 0 |
| Stage 2 | - | - | - | - | 780 | 0 |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1519 | - | 620 | - |
| Mov Cap-2 Maneuver | - | - | - | - | 620 | - |
| Stage 1 | - | - | - | - | 950 | - |
| Stage 2 | - | - | - | - | 735 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 3.4 | 11 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 620 | - | - | - | 1519 | - |
| HCM Lane V/C Ratio | 0.037 | - | - | - | 0.055 | - |
| HCM Control Delay (s) | 11 | 0 | - | - | 7.5 | 0 |
| HCM Lane LOS | B | A | - | - | A | A |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 0.2 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.1 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 8 | 86 | 152 | 27 | 26 | 18 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | Free |
| Storage Length | - | - | - | - | 0 | 800 |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 8 | 91 | 160 | 28 | 27 | 19 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 188 | 0 | - | 0 | 281 | - |
| Stage 1 | - | - | - | - | 174 | - |
| Stage 2 | - | - | - | - | 107 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | - |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | - |
| Pot Cap-1 Maneuver | 1386 | - | - | - | 709 | 0 |
| Stage 1 | - | - | - | - | 856 | 0 |
| Stage 2 | - | - | - | - | 917 | 0 |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1386 | - | - | - | 705 | - |
| Mov Cap-2 Maneuver | - | - | - | - | 705 | - |
| Stage 1 | - | - | - | - | 856 | - |
| Stage 2 | - | - | - | - | 911 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.6 | 0 | 10.3 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 | SBLn2 |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1386 | - | - | - | 705 | - |
| HCM Lane V/C Ratio | 0.006 | - | - | - | 0.039 | - |
| HCM Control Delay (s) | 7.6 | 0 | - | - | 10.3 | 0 |
| HCM Lane LOS | A | A | - | - | B | A |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.1 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 5 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 7 | 1 | 369 | 2 | 2 | 1 | 465 | 216 | 10 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free |
| RT Channelized | - | - | Free | - | - | None | - | - | None |
| Storage Length | - | - | 0 | - | - | - | 1500 | - | - |
| Veh in Median Storage, # | - | 1 | - | - | 1 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 7 | 1 | 388 | 2 | 2 | 1 | 489 | 227 | 11 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | |
|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1484 | 1607 | - | 1394 | 1631 | 119 | 417 | 0 | 0 |
| Stage 1 | 390 | 390 | - | 1212 | 1212 | - | - | - | - |
| Stage 2 | 1094 | 1217 | - | 182 | 419 | - | - | - | - |
| Critical Hdwy | 7.54 | 6.54 | - | 7.54 | 6.54 | 6.94 | 4.14 | - | - |
| Critical Hdwy Stg 1 | 6.54 | 5.54 | - | 6.54 | 5.54 | - | - | - | - |
| Critical Hdwy Stg 2 | 6.54 | 5.54 | - | 6.54 | 5.54 | - | - | - | - |
| Follow-up Hdwy | 3.52 | 4.02 | - | 3.52 | 4.02 | 3.32 | 2.22 | - | - |
| Pot Cap-1 Maneuver | 87 | 104 | 0 | 101 | 101 | 910 | 1138 | - | - |
| Stage 1 | 606 | 606 | 0 | 193 | 253 | - | - | - | - |
| Stage 2 | 228 | 252 | 0 | 802 | 588 | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - |
| Mov Cap-1 Maneuver | 57 | 59 | - | 67 | 58 | 910 | 1138 | - | - |
| Mov Cap-2 Maneuver | 103 | 120 | - | 95 | 78 | - | - | - | - |
| Stage 1 | 346 | 605 | - | 110 | 144 | - | - | - | - |
| Stage 2 | 128 | 144 | - | 800 | 587 | - | - | - | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 42.3 | 41.1 | 7.1 |
| HCM LOS | E | E | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | EBLn2 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1138 | - | - | 105 | - | 105 | 1326 | - | - |
| HCM Lane V/C Ratio | 0.43 | - | - | 0.08 | - | 0.05 | 0.001 | - | - |
| HCM Control Delay (s) | 10.5 | - | - | 42.3 | 0 | 41.1 | 7.7 | 0 | - |
| HCM Lane LOS | B | - | - | E | A | E | A | A | - |
| HCM 95th %tile Q(veh) | 2.2 | - | - | 0.3 | - | 0.2 | 0 | - | - |

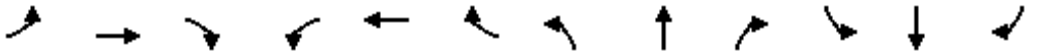
| Intersection | |
|---|---|
| Int Delay, s/veh | |

| Movement | SBL | SBT | SBR |
|---|---|---|---|
| Vol, veh/h | 1 | 341 | 55 |
| Conflicting Peds, #/hr | 0 | 0 | 0 |
| Sign Control | Free | Free | Free |
| RT Channelized | - | - | None |
| Storage Length | - | - | - |
| Veh in Median Storage, # | - | 0 | - |
| Grade, % | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 |
| Heavy Vehicles, % | 2 | 2 | 2 |
| Mvmt Flow | 1 | 359 | 58 |

| Major/Minor | Major2 | | |
|---|---|---|---|
| Conflicting Flow All | 238 | 0 | 0 |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Critical Hdwy | 4.14 | - | - |
| Critical Hdwy Stg 1 | - | - | - |
| Critical Hdwy Stg 2 | - | - | - |
| Follow-up Hdwy | 2.22 | - | - |
| Pot Cap-1 Maneuver | 1326 | - | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Platoon blocked, % | | - | - |
| Mov Cap-1 Maneuver | 1326 | - | - |
| Mov Cap-2 Maneuver | - | - | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |

| Approach | SB |
|---|---|
| HCM Control Delay, s | 0 |
| HCM LOS | |

| Minor Lane/Major Mvmt |
|---|



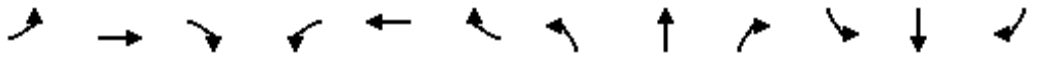
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 97 | 2 | 63 | 20 | 3 | 5 | 27 | 644 | 5 | 10 | 840 | 98 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 102 | 2 | 66 | 21 | 3 | 5 | 28 | 678 | 5 | 11 | 884 | 103 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 392 | 7 | 240 | 336 | 98 | 163 | 369 | 1834 | 820 | 484 | 1655 | 193 |
| Arrive On Green | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 |
| Sat Flow, veh/h | 1402 | 47 | 1544 | 1328 | 629 | 1049 | 568 | 3539 | 1583 | 755 | 3194 | 372 |
| Grp Volume(v), veh/h | 102 | 0 | 68 | 21 | 0 | 8 | 28 | 678 | 5 | 11 | 490 | 497 |
| Grp Sat Flow(s),veh/h/ln | 1402 | 0 | 1590 | 1328 | 0 | 1678 | 568 | 1770 | 1583 | 755 | 1770 | 1797 |
| Q Serve(g_s), s | 2.7 | 0.0 | 1.5 | 0.6 | 0.0 | 0.2 | 1.4 | 4.6 | 0.1 | 0.4 | 7.4 | 7.4 |
| Cycle Q Clear(g_c), s | 2.8 | 0.0 | 1.5 | 2.1 | 0.0 | 0.2 | 8.8 | 4.6 | 0.1 | 4.9 | 7.4 | 7.4 |
| Prop In Lane | 1.00 | | 0.97 | 1.00 | | 0.63 | 1.00 | | 1.00 | 1.00 | | 0.21 |
| Lane Grp Cap(c), veh/h | 392 | 0 | 247 | 336 | 0 | 261 | 369 | 1834 | 820 | 484 | 917 | 931 |
| V/C Ratio(X) | 0.26 | 0.00 | 0.28 | 0.06 | 0.00 | 0.03 | 0.08 | 0.37 | 0.01 | 0.02 | 0.53 | 0.53 |
| Avail Cap(c_a), veh/h | 736 | 0 | 638 | 662 | 0 | 673 | 369 | 1834 | 820 | 484 | 917 | 931 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 15.6 | 0.0 | 15.0 | 15.9 | 0.0 | 14.4 | 9.4 | 5.8 | 4.7 | 7.2 | 6.4 | 6.4 |
| Incr Delay (d2), s/veh | 0.3 | 0.0 | 0.6 | 0.1 | 0.0 | 0.0 | 0.4 | 0.6 | 0.0 | 0.1 | 2.2 | 2.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.1 | 0.0 | 0.7 | 0.2 | 0.0 | 0.1 | 0.3 | 2.3 | 0.0 | 0.1 | 4.1 | 4.2 |
| LnGrp Delay(d),s/veh | 15.9 | 0.0 | 15.6 | 16.0 | 0.0 | 14.4 | 9.8 | 6.3 | 4.7 | 7.3 | 8.7 | 8.6 |
| LnGrp LOS | B | | B | B | | B | A | A | A | A | A | A |
| Approach Vol, veh/h | | 170 | | | 29 | | | 711 | | | 998 | |
| Approach Delay, s/veh | | 15.8 | | | 15.5 | | | 6.5 | | | 8.6 | |
| Approach LOS | | B | | | B | | | A | | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 37.5 | | 12.5 | | 37.5 | | 12.5 |
| Change Period (Y+Rc), s | | * 6.8 | | * 6.3 | | * 6.8 | | * 6.3 |
| Max Green Setting (Gmax), s | | * 21 | | * 16 | | * 21 | | * 16 |
| Max Q Clear Time (g_c+I1), s | | 10.8 | | 4.8 | | 9.4 | | 4.1 |
| Green Ext Time (p_c), s | | 9.4 | | 1.1 | | 10.7 | | 1.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 8.6 |
| HCM 2010 LOS | A |

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 33 | 34 | 58 | 205 | 46 | 58 | 40 | 570 | 72 | 30 | 637 | 28 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 35 | 36 | 0 | 216 | 48 | 61 | 42 | 600 | 76 | 32 | 671 | 29 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 396 | 249 | 0 | 573 | 179 | 228 | 403 | 1364 | 610 | 418 | 1306 | 56 |
| Arrive On Green | 0.06 | 0.13 | 0.00 | 0.16 | 0.24 | 0.24 | 0.06 | 0.39 | 0.39 | 0.05 | 0.38 | 0.36 |
| Sat Flow, veh/h | 1774 | 1863 | 0 | 1774 | 747 | 949 | 1774 | 3539 | 1583 | 1774 | 3457 | 149 |
| Grp Volume(v), veh/h | 35 | 36 | 0 | 216 | 0 | 109 | 42 | 600 | 76 | 32 | 343 | 357 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1863 | 0 | 1774 | 0 | 1695 | 1774 | 1770 | 1583 | 1774 | 1770 | 1836 |
| Q Serve(g_s), s | 0.9 | 1.0 | 0.0 | 5.3 | 0.0 | 3.0 | 0.8 | 7.1 | 1.8 | 0.6 | 8.5 | 8.5 |
| Cycle Q Clear(g_c), s | 0.9 | 1.0 | 0.0 | 5.3 | 0.0 | 3.0 | 0.8 | 7.1 | 1.8 | 0.6 | 8.5 | 8.5 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.56 | 1.00 | | 1.00 | 1.00 | | 0.08 |
| Lane Grp Cap(c), veh/h | 396 | 249 | 0 | 573 | 0 | 407 | 403 | 1364 | 610 | 418 | 668 | 694 |
| V/C Ratio(X) | 0.09 | 0.14 | 0.00 | 0.38 | 0.00 | 0.27 | 0.10 | 0.44 | 0.12 | 0.08 | 0.51 | 0.51 |
| Avail Cap(c_a), veh/h | 549 | 612 | 0 | 973 | 0 | 973 | 547 | 1364 | 610 | 575 | 668 | 694 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 19.0 | 21.7 | 0.0 | 14.5 | 0.0 | 17.5 | 9.7 | 12.9 | 11.2 | 9.8 | 13.6 | 13.6 |
| Incr Delay (d2), s/veh | 0.1 | 0.3 | 0.0 | 0.4 | 0.0 | 0.3 | 0.1 | 1.0 | 0.4 | 0.1 | 2.8 | 2.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 0.5 | 0.0 | 2.6 | 0.0 | 1.4 | 0.4 | 3.6 | 0.8 | 0.3 | 4.6 | 4.8 |
| LnGrp Delay(d),s/veh | 19.1 | 21.9 | 0.0 | 15.0 | 0.0 | 17.8 | 9.8 | 13.9 | 11.7 | 9.8 | 16.4 | 16.4 |
| LnGrp LOS | B | C | | B | | B | A | B | B | A | B | B |
| Approach Vol, veh/h | | 71 | | | 325 | | | 718 | | | 732 | |
| Approach Delay, s/veh | | 20.5 | | | 15.9 | | | 13.4 | | | 16.1 | |
| Approach LOS | | C | | | B | | | B | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 5.0 | 56.0 | 11.1 | 12.9 | 5.4 | 55.5 | 5.1 | 18.9 |
| Change Period (Y+Rc), s | 3.0 | * 6.8 | 3.0 | * 6.3 | 3.0 | * 6.8 | 3.0 | * 6.3 |
| Max Green Setting (Gmax), s | 7.0 | * 20 | 20.9 | * 18 | 7.0 | * 20 | 7.0 | * 32 |
| Max Q Clear Time (g_c+I1), s | 2.6 | 9.1 | 7.3 | 3.0 | 2.8 | 10.5 | 2.9 | 5.0 |
| Green Ext Time (p_c), s | 0.0 | 9.7 | 0.9 | 1.5 | 0.0 | 8.6 | 0.0 | 2.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 15.2 |
| HCM 2010 LOS | B |

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.8 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 134 | 12 | 42 | 100 | 21 | 13 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | Free |
| Storage Length | - | - | - | - | 0 | 800 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 141 | 13 | 44 | 105 | 22 | 14 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 154 | 0 | 341 | - |
| Stage 1 | - | - | - | - | 147 | - |
| Stage 2 | - | - | - | - | 194 | - |
| Critical Hdwy | - | - | 4.12 | - | 6.42 | - |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | - | - | 2.218 | - | 3.518 | - |
| Pot Cap-1 Maneuver | - | - | 1426 | - | 655 | 0 |
| Stage 1 | - | - | - | - | 880 | 0 |
| Stage 2 | - | - | - | - | 839 | 0 |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1426 | - | 633 | - |
| Mov Cap-2 Maneuver | - | - | - | - | 633 | - |
| Stage 1 | - | - | - | - | 880 | - |
| Stage 2 | - | - | - | - | 811 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 2.2 | 10.9 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 633 | - | - | - | 1426 | - |
| HCM Lane V/C Ratio | 0.035 | - | - | - | 0.031 | - |
| HCM Control Delay (s) | 10.9 | 0 | - | - | 7.6 | 0 |
| HCM Lane LOS | B | A | - | - | A | A |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 0.1 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.1 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 29 | 117 | 119 | 38 | 86 | 20 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | Free |
| Storage Length | - | - | - | - | 0 | 800 |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 31 | 123 | 125 | 40 | 91 | 21 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 165 | 0 | - | 0 | 329 | - |
| Stage 1 | - | - | - | - | 145 | - |
| Stage 2 | - | - | - | - | 184 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | - |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | - |
| Pot Cap-1 Maneuver | 1413 | - | - | - | 665 | 0 |
| Stage 1 | - | - | - | - | 882 | 0 |
| Stage 2 | - | - | - | - | 848 | 0 |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1413 | - | - | - | 649 | - |
| Mov Cap-2 Maneuver | - | - | - | - | 649 | - |
| Stage 1 | - | - | - | - | 882 | - |
| Stage 2 | - | - | - | - | 828 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 1.5 | 0 | 11.4 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 | SBLn2 |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1413 | - | - | - | 649 | - |
| HCM Lane V/C Ratio | 0.022 | - | - | - | 0.139 | - |
| HCM Control Delay (s) | 7.6 | 0 | - | - | 11.4 | 0 |
| HCM Lane LOS | A | A | - | - | B | A |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 0.5 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.6 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 22 | 4 | 449 | 3 | 5 | 2 | 428 | 533 | 11 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free |
| RT Channelized | - | - | Free | - | - | None | - | - | None |
| Storage Length | - | - | 0 | - | - | - | 1500 | - | - |
| Veh in Median Storage, # | - | 1 | - | - | 1 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 23 | 4 | 473 | 3 | 5 | 2 | 451 | 561 | 12 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | |
|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1578 | 1868 | - | 1667 | 1873 | 286 | 393 | 0 | 0 |
| Stage 1 | 394 | 394 | - | 1468 | 1468 | - | - | - | - |
| Stage 2 | 1184 | 1474 | - | 199 | 405 | - | - | - | - |
| Critical Hdwy | 7.54 | 6.54 | - | 7.54 | 6.54 | 6.94 | 4.14 | - | - |
| Critical Hdwy Stg 1 | 6.54 | 5.54 | - | 6.54 | 5.54 | - | - | - | - |
| Critical Hdwy Stg 2 | 6.54 | 5.54 | - | 6.54 | 5.54 | - | - | - | - |
| Follow-up Hdwy | 3.52 | 4.02 | - | 3.52 | 4.02 | 3.32 | 2.22 | - | - |
| Pot Cap-1 Maneuver | 74 | 72 | 0 | 63 | 71 | 711 | 1162 | - | - |
| Stage 1 | 602 | 604 | 0 | 134 | 190 | - | - | - | - |
| Stage 2 | 201 | 189 | 0 | 784 | 597 | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - |
| Mov Cap-1 Maneuver | 49 | 44 | - | 42 | 43 | 711 | 1162 | - | - |
| Mov Cap-2 Maneuver | 92 | 94 | - | 70 | 77 | - | - | - | - |
| Stage 1 | 368 | 599 | - | 82 | 116 | - | - | - | - |
| Stage 2 | 117 | 116 | - | 772 | 592 | - | - | - | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 59.9 | 50.2 | 4.4 |
| HCM LOS | F | F | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | EBLn2 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1162 | - | - | 92 | - | 90 | 996 | - | - |
| HCM Lane V/C Ratio | 0.388 | - | - | 0.297 | - | 0.117 | 0.006 | - | - |
| HCM Control Delay (s) | 10 | - | - | 59.9 | 0 | 50.2 | 8.6 | 0 | - |
| HCM Lane LOS | B | - | - | F | A | F | A | A | - |
| HCM 95th %tile Q(veh) | 1.9 | - | - | 1.1 | - | 0.4 | 0 | - | - |

| Intersection | | | |
|---|---|---|---|
| Int Delay, s/veh | | | |

| Movement | SBL | SBT | SBR |
|---|---|---|---|
| Vol, veh/h | 6 | 351 | 22 |
| Conflicting Peds, #/hr | 0 | 0 | 0 |
| Sign Control | Free | Free | Free |
| RT Channelized | - | - | None |
| Storage Length | - | - | - |
| Veh in Median Storage, # | - | 0 | - |
| Grade, % | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 |
| Heavy Vehicles, % | 2 | 2 | 2 |
| Mvmt Flow | 6 | 369 | 23 |

| Major/Minor | Major2 | | |
|---|---|---|---|
| Conflicting Flow All | 573 | 0 | 0 |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Critical Hdwy | 4.14 | - | - |
| Critical Hdwy Stg 1 | - | - | - |
| Critical Hdwy Stg 2 | - | - | - |
| Follow-up Hdwy | 2.22 | - | - |
| Pot Cap-1 Maneuver | 996 | - | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Platoon blocked, % | | - | - |
| Mov Cap-1 Maneuver | 996 | - | - |
| Mov Cap-2 Maneuver | - | - | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |

| Approach | SB |
|---|---|
| HCM Control Delay, s | 0.1 |
| HCM LOS | |

| Minor Lane/Major Mvmt |
|---|

# HCM 2010 Signalized Intersection Summary
## 35: Hwy 26/27 & Carson Rd

17/08/2016

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 142 | 8 | 49 | 21 | 7 | 8 | 61 | 1098 | 17 | 8 | 819 | 112 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 149 | 8 | 52 | 22 | 7 | 8 | 64 | 1156 | 18 | 8 | 862 | 118 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 407 | 38 | 244 | 365 | 139 | 158 | 358 | 1796 | 804 | 303 | 1588 | 217 |
| Arrive On Green | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.51 | 0.51 | 0.51 | 0.51 | 0.51 | 0.51 |
| Sat Flow, veh/h | 1393 | 215 | 1400 | 1337 | 795 | 908 | 572 | 3539 | 1583 | 476 | 3129 | 428 |
| Grp Volume(v), veh/h | 149 | 0 | 60 | 22 | 0 | 15 | 64 | 1156 | 18 | 8 | 488 | 492 |
| Grp Sat Flow(s),veh/h/ln | 1393 | 0 | 1616 | 1337 | 0 | 1703 | 572 | 1770 | 1583 | 476 | 1770 | 1787 |
| Q Serve(g_s), s | 4.1 | 0.0 | 1.3 | 0.6 | 0.0 | 0.3 | 3.5 | 9.8 | 0.2 | 0.5 | 7.7 | 7.7 |
| Cycle Q Clear(g_c), s | 4.4 | 0.0 | 1.3 | 1.9 | 0.0 | 0.3 | 11.2 | 9.8 | 0.2 | 10.4 | 7.7 | 7.7 |
| Prop In Lane | 1.00 | | 0.87 | 1.00 | | 0.53 | 1.00 | | 1.00 | 1.00 | | 0.24 |
| Lane Grp Cap(c), veh/h | 407 | 0 | 282 | 365 | 0 | 297 | 358 | 1796 | 804 | 303 | 898 | 907 |
| V/C Ratio(X) | 0.37 | 0.00 | 0.21 | 0.06 | 0.00 | 0.05 | 0.18 | 0.64 | 0.02 | 0.03 | 0.54 | 0.54 |
| Avail Cap(c_a), veh/h | 706 | 0 | 628 | 652 | 0 | 662 | 358 | 1796 | 804 | 303 | 898 | 907 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 16.0 | 0.0 | 14.6 | 15.4 | 0.0 | 14.2 | 10.7 | 7.4 | 5.1 | 11.2 | 6.9 | 6.9 |
| Incr Delay (d2), s/veh | 0.5 | 0.0 | 0.4 | 0.1 | 0.0 | 0.1 | 1.1 | 1.8 | 0.1 | 0.2 | 2.4 | 2.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.6 | 0.0 | 0.6 | 0.2 | 0.0 | 0.1 | 0.7 | 5.1 | 0.1 | 0.1 | 4.2 | 4.3 |
| LnGrp Delay(d),s/veh | 16.5 | 0.0 | 15.0 | 15.5 | 0.0 | 14.2 | 11.8 | 9.2 | 5.1 | 11.4 | 9.2 | 9.2 |
| LnGrp LOS | B | | B | B | | B | B | A | A | B | A | A |
| Approach Vol, veh/h | | 209 | | | 37 | | | 1238 | | | 988 | |
| Approach Delay, s/veh | | 16.1 | | | 15.0 | | | 9.3 | | | 9.3 | |
| Approach LOS | | B | | | B | | | A | | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 36.5 | | 13.5 | | 36.5 | | 13.5 |
| Change Period (Y+Rc), s | | * 6.8 | | * 6.3 | | * 6.8 | | * 6.3 |
| Max Green Setting (Gmax), s | | * 21 | | * 16 | | * 21 | | * 16 |
| Max Q Clear Time (g_c+I1), s | | 13.2 | | 6.4 | | 12.4 | | 3.9 |
| Green Ext Time (p_c), s | | 7.5 | | 1.2 | | 8.4 | | 1.4 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 9.9 |
| HCM 2010 LOS | A |

**Notes**

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 39 | 73 | 65 | 128 | 51 | 47 | 74 | 878 | 255 | 80 | 706 | 29 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 41 | 77 | 0 | 135 | 54 | 49 | 78 | 924 | 268 | 84 | 743 | 31 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 416 | 260 | 0 | 478 | 180 | 163 | 426 | 1363 | 610 | 356 | 1341 | 56 |
| Arrive On Green | 0.06 | 0.14 | 0.00 | 0.12 | 0.20 | 0.20 | 0.08 | 0.38 | 0.38 | 0.08 | 0.39 | 0.37 |
| Sat Flow, veh/h | 1774 | 1863 | 0 | 1774 | 901 | 818 | 1774 | 3539 | 1583 | 1774 | 3462 | 144 |
| Grp Volume(v), veh/h | 41 | 77 | 0 | 135 | 0 | 103 | 78 | 924 | 268 | 84 | 380 | 394 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1863 | 0 | 1774 | 0 | 1718 | 1774 | 1770 | 1583 | 1774 | 1770 | 1837 |
| Q Serve(g_s), s | 1.1 | 2.1 | 0.0 | 3.2 | 0.0 | 2.8 | 1.4 | 12.1 | 7.0 | 1.5 | 9.3 | 9.3 |
| Cycle Q Clear(g_c), s | 1.1 | 2.1 | 0.0 | 3.2 | 0.0 | 2.8 | 1.4 | 12.1 | 7.0 | 1.5 | 9.3 | 9.3 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.48 | 1.00 | | 1.00 | 1.00 | | 0.08 |
| Lane Grp Cap(c), veh/h | 416 | 260 | 0 | 478 | 0 | 343 | 426 | 1363 | 610 | 356 | 686 | 712 |
| V/C Ratio(X) | 0.10 | 0.30 | 0.00 | 0.28 | 0.00 | 0.30 | 0.18 | 0.68 | 0.44 | 0.24 | 0.55 | 0.55 |
| Avail Cap(c_a), veh/h | 565 | 623 | 0 | 964 | 0 | 1005 | 537 | 1363 | 610 | 463 | 686 | 712 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 18.2 | 21.5 | 0.0 | 15.1 | 0.0 | 18.9 | 9.1 | 14.2 | 12.7 | 9.8 | 13.3 | 13.3 |
| Incr Delay (d2), s/veh | 0.1 | 0.6 | 0.0 | 0.3 | 0.0 | 0.5 | 0.2 | 2.7 | 2.3 | 0.3 | 3.2 | 3.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 1.1 | 0.0 | 1.6 | 0.0 | 1.4 | 0.7 | 6.3 | 3.4 | 0.7 | 5.1 | 5.3 |
| LnGrp Delay(d),s/veh | 18.3 | 22.1 | 0.0 | 15.4 | 0.0 | 19.4 | 9.4 | 17.0 | 14.9 | 10.1 | 16.5 | 16.4 |
| LnGrp LOS | B | C | | B | | B | A | B | B | B | B | B |
| Approach Vol, veh/h | | 118 | | | 238 | | | 1270 | | | 858 | |
| Approach Delay, s/veh | | 20.8 | | | 17.1 | | | 16.1 | | | 15.8 | |
| Approach LOS | | C | | | B | | | B | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 6.6 | 56.6 | 8.7 | 13.1 | 6.5 | 56.7 | 5.3 | 16.4 |
| Change Period (Y+Rc), s | 3.0 | * 6.8 | 3.0 | * 6.3 | 3.0 | * 6.8 | 3.0 | * 6.3 |
| Max Green Setting (Gmax), s | 7.0 | * 20 | 20.9 | * 18 | 7.0 | * 20 | 7.0 | * 32 |
| Max Q Clear Time (g_c+I1), s | 3.5 | 14.1 | 5.2 | 4.1 | 3.4 | 11.3 | 3.1 | 4.8 |
| Green Ext Time (p_c), s | 0.1 | 6.1 | 0.5 | 1.9 | 0.1 | 8.7 | 0.0 | 2.7 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 16.3 |
| HCM 2010 LOS | B |

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

# 2031 Total Traffic Volumes

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.3 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 362 | 537 | 92 | 347 | 44 | 35 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | Free |
| Storage Length | - | - | - | - | 0 | 800 |
| Veh in Median Storage, # | 0 | - | - | 0 | 1 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 381 | 565 | 97 | 365 | 46 | 37 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 946 | 0 | 1223 | - |
| Stage 1 | - | - | - | - | 664 | - |
| Stage 2 | - | - | - | - | 559 | - |
| Critical Hdwy | - | - | 4.12 | - | 6.42 | - |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | - | - | 2.218 | - | 3.518 | - |
| Pot Cap-1 Maneuver | - | - | 725 | - | 198 | 0 |
| Stage 1 | - | - | - | - | 512 | 0 |
| Stage 2 | - | - | - | - | 572 | 0 |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 725 | - | 165 | - |
| Mov Cap-2 Maneuver | - | - | - | - | 300 | - |
| Stage 1 | - | - | - | - | 512 | - |
| Stage 2 | - | - | - | - | 476 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 2.2 | 19.2 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 300 | - | - | - | 725 | - |
| HCM Lane V/C Ratio | 0.154 | - | - | - | 0.134 | - |
| HCM Control Delay (s) | 19.2 | 0 | - | - | 10.7 | 0 |
| HCM Lane LOS | C | A | - | - | B | A |
| HCM 95th %tile Q(veh) | 0.5 | - | - | - | 0.5 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.3 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 125 | 272 | 233 | 31 | 30 | 205 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | Free |
| Storage Length | - | - | - | - | 0 | 800 |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 132 | 286 | 245 | 33 | 32 | 216 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 278 | 0 | - | 0 | 811 | - |
| Stage 1 | - | - | - | - | 262 | - |
| Stage 2 | - | - | - | - | 549 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | - |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | - |
| Pot Cap-1 Maneuver | 1285 | - | - | - | 349 | 0 |
| Stage 1 | - | - | - | - | 782 | 0 |
| Stage 2 | - | - | - | - | 579 | 0 |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1285 | - | - | - | 306 | - |
| Mov Cap-2 Maneuver | - | - | - | - | 306 | - |
| Stage 1 | - | - | - | - | 782 | - |
| Stage 2 | - | - | - | - | 508 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 2.6 | 0 | 18.1 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 | SBLn2 |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1285 | - | - | - | 306 | - |
| HCM Lane V/C Ratio | 0.102 | - | - | - | 0.103 | - |
| HCM Control Delay (s) | 8.1 | 0 | - | - | 18.1 | 0 |
| HCM Lane LOS | A | A | - | - | C | A |
| HCM 95th %tile Q(veh) | 0.3 | - | - | - | 0.3 | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 264 | 2 | 350 | 20 | 3 | 14 | 117 | 1027 | 5 | 13 | 1246 | 165 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 278 | 2 | 368 | 21 | 3 | 15 | 123 | 1081 | 5 | 14 | 1312 | 174 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 1 | 2 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 438 | 2 | 438 | 140 | 45 | 223 | 217 | 2074 | 10 | 284 | 1530 | 202 |
| Arrive On Green | 0.08 | 0.28 | 0.28 | 0.16 | 0.16 | 0.16 | 0.05 | 0.57 | 0.57 | 0.49 | 0.49 | 0.49 |
| Sat Flow, veh/h | 1774 | 9 | 1576 | 1008 | 271 | 1353 | 1774 | 3613 | 17 | 517 | 3145 | 414 |
| Grp Volume(v), veh/h | 278 | 0 | 370 | 21 | 0 | 18 | 123 | 530 | 556 | 14 | 735 | 751 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1585 | 1008 | 0 | 1624 | 1774 | 1770 | 1860 | 517 | 1770 | 1790 |
| Q Serve(g_s), s | 7.0 | 0.0 | 19.5 | 1.8 | 0.0 | 0.8 | 2.9 | 16.1 | 16.1 | 1.5 | 32.3 | 32.9 |
| Cycle Q Clear(g_c), s | 7.0 | 0.0 | 19.5 | 11.2 | 0.0 | 0.8 | 2.9 | 16.1 | 16.1 | 9.8 | 32.3 | 32.9 |
| Prop In Lane | 1.00 | | 0.99 | 1.00 | | 0.83 | 1.00 | | 0.01 | 1.00 | | 0.23 |
| Lane Grp Cap(c), veh/h | 438 | 0 | 440 | 140 | 0 | 268 | 217 | 1016 | 1068 | 284 | 861 | 871 |
| V/C Ratio(X) | 0.64 | 0.00 | 0.84 | 0.15 | 0.00 | 0.07 | 0.57 | 0.52 | 0.52 | 0.05 | 0.85 | 0.86 |
| Avail Cap(c_a), veh/h | 438 | 0 | 467 | 157 | 0 | 295 | 262 | 1016 | 1068 | 284 | 861 | 871 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 29.6 | 0.0 | 30.1 | 40.1 | 0.0 | 31.2 | 18.9 | 11.5 | 11.5 | 16.8 | 20.0 | 20.1 |
| Incr Delay (d2), s/veh | 3.0 | 0.0 | 12.4 | 0.5 | 0.0 | 0.1 | 2.3 | 1.9 | 1.8 | 0.3 | 10.5 | 11.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.2 | 0.0 | 10.0 | 0.5 | 0.0 | 0.4 | 1.7 | 8.3 | 8.7 | 0.2 | 18.2 | 18.7 |
| LnGrp Delay(d),s/veh | 32.6 | 0.0 | 42.5 | 40.6 | 0.0 | 31.3 | 21.2 | 13.4 | 13.3 | 17.1 | 30.5 | 31.2 |
| LnGrp LOS | C | | D | D | | C | C | B | B | B | C | C |
| Approach Vol, veh/h | | 648 | | | 39 | | | 1209 | | | 1500 | |
| Approach Delay, s/veh | | 38.3 | | | 36.3 | | | 14.1 | | | 30.7 | |
| Approach LOS | | D | | | D | | | B | | | C | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | | 59.1 | | 30.9 | 7.8 | 51.4 | 10.0 | 20.9 |
| Change Period (Y+Rc), s | | * 6.8 | | * 6.3 | 3.0 | * 6.8 | 3.0 | * 6.3 |
| Max Green Setting (Gmax), s | | * 51 | | * 26 | 7.0 | * 41 | 7.0 | * 16 |
| Max Q Clear Time (g_c+I1), s | | 18.1 | | 21.5 | 4.9 | 34.9 | 9.0 | 13.2 |
| Green Ext Time (p_c), s | | 32.1 | | 2.1 | 0.1 | 5.9 | 0.0 | 1.3 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 26.3 |
| HCM 2010 LOS | C |

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

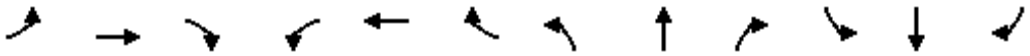
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 151 | 82 | 167 | 315 | 210 | 68 | 201 | 871 | 110 | 35 | 897 | 216 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 159 | 86 | 176 | 332 | 221 | 72 | 212 | 917 | 116 | 37 | 944 | 227 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 413 | 109 | 224 | 462 | 379 | 124 | 258 | 1420 | 635 | 266 | 1008 | 242 |
| Arrive On Green | 0.10 | 0.20 | 0.20 | 0.18 | 0.28 | 0.28 | 0.09 | 0.40 | 0.40 | 0.05 | 0.36 | 0.34 |
| Sat Flow, veh/h | 1774 | 547 | 1119 | 1774 | 1347 | 439 | 1774 | 3539 | 1583 | 1774 | 2832 | 680 |
| Grp Volume(v), veh/h | 159 | 0 | 262 | 332 | 0 | 293 | 212 | 917 | 116 | 37 | 589 | 582 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1665 | 1774 | 0 | 1785 | 1774 | 1770 | 1583 | 1774 | 1770 | 1743 |
| Q Serve(g_s), s | 6.1 | 0.0 | 13.2 | 12.1 | 0.0 | 12.5 | 6.4 | 18.5 | 4.2 | 1.1 | 28.4 | 28.5 |
| Cycle Q Clear(g_c), s | 6.1 | 0.0 | 13.2 | 12.1 | 0.0 | 12.5 | 6.4 | 18.5 | 4.2 | 1.1 | 28.4 | 28.5 |
| Prop In Lane | 1.00 | | 0.67 | 1.00 | | 0.25 | 1.00 | | 1.00 | 1.00 | | 0.39 |
| Lane Grp Cap(c), veh/h | 413 | 0 | 333 | 462 | 0 | 503 | 258 | 1420 | 635 | 266 | 630 | 620 |
| V/C Ratio(X) | 0.39 | 0.00 | 0.79 | 0.72 | 0.00 | 0.58 | 0.82 | 0.65 | 0.18 | 0.14 | 0.94 | 0.94 |
| Avail Cap(c_a), veh/h | 414 | 0 | 351 | 578 | 0 | 637 | 258 | 1420 | 635 | 347 | 630 | 620 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 23.9 | 0.0 | 33.5 | 21.0 | 0.0 | 27.3 | 20.3 | 21.4 | 17.1 | 17.4 | 27.5 | 27.7 |
| Incr Delay (d2), s/veh | 0.6 | 0.0 | 10.8 | 3.2 | 0.0 | 1.1 | 18.8 | 2.3 | 0.6 | 0.2 | 23.2 | 23.8 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.0 | 0.0 | 7.0 | 6.3 | 0.0 | 6.3 | 4.4 | 9.5 | 1.9 | 0.6 | 17.8 | 17.7 |
| LnGrp Delay(d),s/veh | 24.5 | 0.0 | 44.4 | 24.3 | 0.0 | 28.3 | 39.1 | 23.6 | 17.7 | 17.7 | 50.6 | 51.5 |
| LnGrp LOS | C | | D | C | | C | D | C | B | B | D | D |
| Approach Vol, veh/h | | 421 | | | 625 | | | 1245 | | | 1208 | |
| Approach Delay, s/veh | | 36.8 | | | 26.2 | | | 25.7 | | | 50.0 | |
| Approach LOS | | D | | | C | | | C | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 6.0 | 41.2 | 18.1 | 22.9 | 10.0 | 37.2 | 10.9 | 30.2 |
| Change Period (Y+Rc), s | 3.0 | * 6.8 | 3.0 | * 6.3 | 3.0 | * 6.8 | 3.0 | * 6.3 |
| Max Green Setting (Gmax), s | 7.0 | * 30 | 20.9 | * 18 | 7.0 | * 30 | 8.0 | * 31 |
| Max Q Clear Time (g_c+I1), s | 3.1 | 20.5 | 14.1 | 15.2 | 8.4 | 30.5 | 8.1 | 14.5 |
| Green Ext Time (p_c), s | 0.0 | 9.7 | 1.0 | 1.5 | 0.0 | 0.0 | 0.0 | 7.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 35.5 |
| HCM 2010 LOS | D |

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 19 | 8 | 452 | 2 | 24 | 1 | 605 | 508 | 10 | 1 | 716 | 99 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 6.0 | 6.0 | 4.0 | 6.0 | 6.0 | | 3.0 | 6.8 | | 6.8 | 6.8 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1852 | | 1770 | 3529 | | 1770 | 3475 | |
| Flt Permitted | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 0.18 | 1.00 | | 0.45 | 1.00 | |
| Satd. Flow (perm) | 1863 | 1863 | 1583 | 1863 | 1852 | | 328 | 3529 | | 835 | 3475 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 20 | 8 | 476 | 2 | 25 | 1 | 637 | 535 | 11 | 1 | 754 | 104 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 12 | 0 |
| Lane Group Flow (vph) | 20 | 8 | 476 | 2 | 25 | 0 | 637 | 545 | 0 | 1 | 846 | 0 |
| Turn Type | Perm | NA | Free | custom | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | Free | 8 | 8 | | 2 | | | 6 | | |
| Actuated Green, G (s) | 2.5 | 2.5 | 67.7 | 2.5 | 2.5 | | 52.4 | 52.4 | | 21.8 | 21.8 | |
| Effective Green, g (s) | 2.5 | 2.5 | 67.7 | 2.5 | 2.5 | | 52.4 | 52.4 | | 21.8 | 21.8 | |
| Actuated g/C Ratio | 0.04 | 0.04 | 1.00 | 0.04 | 0.04 | | 0.77 | 0.77 | | 0.32 | 0.32 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 3.0 | 6.8 | | 6.8 | 6.8 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 68 | 68 | 1583 | 68 | 68 | | 841 | 2731 | | 268 | 1118 | |
| v/s Ratio Prot | | 0.00 | | | | | c0.31 | 0.15 | | | 0.24 | |
| v/s Ratio Perm | 0.01 | | c0.30 | 0.00 | 0.01 | | c0.28 | | | 0.00 | | |
| v/c Ratio | 0.29 | 0.12 | 0.30 | 0.03 | 0.37 | | 0.76 | 0.20 | | 0.00 | 0.76 | |
| Uniform Delay, d1 | 31.7 | 31.5 | 0.0 | 31.4 | 31.8 | | 10.8 | 2.0 | | 15.6 | 20.6 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.4 | 0.8 | 0.5 | 0.2 | 3.4 | | 3.9 | 0.0 | | 0.0 | 3.0 | |
| Delay (s) | 34.1 | 32.3 | 0.5 | 31.6 | 35.2 | | 14.8 | 2.1 | | 15.6 | 23.6 | |
| Level of Service | C | C | A | C | D | | B | A | | B | C | |
| Approach Delay (s) | | 2.3 | | | 34.9 | | | 8.9 | | | 23.5 | |
| Approach LOS | | A | | | C | | | A | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 12.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.81 | | |
| Actuated Cycle Length (s) | 67.7 | Sum of lost time (s) | 15.8 |
| Intersection Capacity Utilization | 78.2% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.6 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 299 | 295 | 49 | 822 | 77 | 16 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | Free |
| Storage Length | - | - | - | - | 0 | 800 |
| Veh in Median Storage, # | 0 | - | - | 0 | 1 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 315 | 311 | 52 | 865 | 81 | 17 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 625 | 0 | 1438 | - |
| Stage 1 | - | - | - | - | 470 | - |
| Stage 2 | - | - | - | - | 968 | - |
| Critical Hdwy | - | - | 4.12 | - | 6.42 | - |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | - | - | 2.218 | - | 3.518 | - |
| Pot Cap-1 Maneuver | - | - | 956 | - | 147 | 0 |
| Stage 1 | - | - | - | - | 629 | 0 |
| Stage 2 | - | - | - | - | 368 | 0 |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 956 | - | 132 | - |
| Mov Cap-2 Maneuver | - | - | - | - | 249 | - |
| Stage 1 | - | - | - | - | 629 | - |
| Stage 2 | - | - | - | - | 329 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0.5 | 26.3 |
| HCM LOS | | | D |

| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 249 | - | - | - | 956 | - |
| HCM Lane V/C Ratio | 0.326 | - | - | - | 0.054 | - |
| HCM Control Delay (s) | 26.3 | 0 | - | - | 9 | 0 |
| HCM Lane LOS | D | A | - | - | A | A |
| HCM 95th %tile Q(veh) | 1.4 | - | - | - | 0.2 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.8 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 95 | 228 | 299 | 44 | 101 | 569 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | Free |
| Storage Length | - | - | - | - | 0 | 800 |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 100 | 240 | 315 | 46 | 106 | 599 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 361 | 0 | - | 0 | 778 | - |
| Stage 1 | - | - | - | - | 338 | - |
| Stage 2 | - | - | - | - | 440 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | - |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | - |
| Pot Cap-1 Maneuver | 1198 | - | - | - | 365 | 0 |
| Stage 1 | - | - | - | - | 722 | 0 |
| Stage 2 | - | - | - | - | 649 | 0 |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1198 | - | - | - | 330 | - |
| Mov Cap-2 Maneuver | - | - | - | - | 330 | - |
| Stage 1 | - | - | - | - | 722 | - |
| Stage 2 | - | - | - | - | 587 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 2.4 | 0 | 21 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 | SBLn2 |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1198 | - | - | - | 330 | - |
| HCM Lane V/C Ratio | 0.083 | - | - | - | 0.322 | - |
| HCM Control Delay (s) | 8.3 | 0 | - | - | 21 | 0 |
| HCM Lane LOS | A | A | - | - | C | A |
| HCM 95th %tile Q(veh) | 0.3 | - | - | - | 1.4 | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 232 | 8 | 203 | 21 | 7 | 16 | 329 | 1703 | 17 | 22 | 1420 | 269 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 244 | 8 | 214 | 22 | 7 | 17 | 346 | 1793 | 18 | 23 | 1495 | 283 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 1 | 2 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 280 | 10 | 277 | 112 | 45 | 109 | 361 | 2568 | 26 | 168 | 1563 | 290 |
| Arrive On Green | 0.06 | 0.18 | 0.18 | 0.09 | 0.09 | 0.09 | 0.17 | 0.72 | 0.72 | 0.52 | 0.52 | 0.52 |
| Sat Flow, veh/h | 1774 | 57 | 1535 | 1154 | 483 | 1173 | 1774 | 3590 | 36 | 258 | 2982 | 553 |
| Grp Volume(v), veh/h | 244 | 0 | 222 | 22 | 0 | 24 | 346 | 883 | 928 | 23 | 874 | 904 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1592 | 1154 | 0 | 1656 | 1774 | 1770 | 1856 | 258 | 1770 | 1765 |
| Q Serve(g_s), s | 8.0 | 0.0 | 16.7 | 2.3 | 0.0 | 1.7 | 19.7 | 35.6 | 35.7 | 7.0 | 58.3 | 62.7 |
| Cycle Q Clear(g_c), s | 8.0 | 0.0 | 16.7 | 8.0 | 0.0 | 1.7 | 19.7 | 35.6 | 35.7 | 18.7 | 58.3 | 62.7 |
| Prop In Lane | 1.00 | | 0.96 | 1.00 | | 0.71 | 1.00 | | 0.02 | 1.00 | | 0.31 |
| Lane Grp Cap(c), veh/h | 280 | 0 | 287 | 112 | 0 | 153 | 361 | 1266 | 1328 | 168 | 928 | 925 |
| V/C Ratio(X) | 0.87 | 0.00 | 0.77 | 0.20 | 0.00 | 0.16 | 0.96 | 0.70 | 0.70 | 0.14 | 0.94 | 0.98 |
| Avail Cap(c_a), veh/h | 280 | 0 | 344 | 153 | 0 | 212 | 361 | 1266 | 1328 | 168 | 928 | 925 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 52.4 | 0.0 | 49.0 | 58.1 | 0.0 | 52.4 | 43.1 | 10.1 | 10.2 | 22.3 | 28.1 | 29.1 |
| Incr Delay (d2), s/veh | 24.5 | 0.0 | 8.8 | 0.8 | 0.0 | 0.5 | 36.7 | 3.2 | 3.1 | 1.7 | 18.5 | 24.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.4 | 0.0 | 8.0 | 0.8 | 0.0 | 0.8 | 15.6 | 18.3 | 19.2 | 0.6 | 33.2 | 36.7 |
| LnGrp Delay(d),s/veh | 76.9 | 0.0 | 57.8 | 58.9 | 0.0 | 52.9 | 79.7 | 13.3 | 13.2 | 24.0 | 46.5 | 53.7 |
| LnGrp LOS | E | | E | E | | D | E | B | B | C | D | D |
| Approach Vol, veh/h | | 466 | | | 46 | | | 2157 | | | 1801 | |
| Approach Delay, s/veh | | 67.8 | | | 55.8 | | | 24.0 | | | 49.8 | |
| Approach LOS | | E | | | E | | | C | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | | 101.1 | | 28.9 | 24.0 | 77.1 | 11.0 | 17.9 |
| Change Period (Y+Rc), s | | * 6.8 | | * 6.3 | 3.0 | * 6.8 | 3.0 | * 6.3 |
| Max Green Setting (Gmax), s | | * 90 | | * 27 | 21.0 | * 66 | 8.0 | * 16 |
| Max Q Clear Time (g_c+I1), s | | 37.7 | | 18.7 | 21.7 | 64.7 | 10.0 | 10.0 |
| Green Ext Time (p_c), s | | 51.9 | | 2.1 | 0.0 | 1.1 | 0.0 | 1.6 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 39.3 |
| HCM 2010 LOS | D |

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

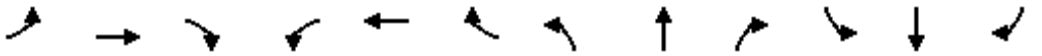
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 295 | 268 | 245 | 223 | 154 | 55 | 188 | 1264 | 401 | 93 | 1091 | 205 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 311 | 282 | 258 | 235 | 162 | 58 | 198 | 1331 | 422 | 98 | 1148 | 216 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 500 | 259 | 237 | 273 | 355 | 127 | 198 | 1507 | 674 | 166 | 1191 | 223 |
| Arrive On Green | 0.14 | 0.29 | 0.29 | 0.13 | 0.27 | 0.27 | 0.08 | 0.43 | 0.43 | 0.05 | 0.40 | 0.39 |
| Sat Flow, veh/h | 1774 | 897 | 821 | 1774 | 1311 | 469 | 1774 | 3539 | 1583 | 1774 | 2977 | 557 |
| Grp Volume(v), veh/h | 311 | 0 | 540 | 235 | 0 | 220 | 198 | 1331 | 422 | 98 | 680 | 684 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1718 | 1774 | 0 | 1780 | 1774 | 1770 | 1583 | 1774 | 1770 | 1764 |
| Q Serve(g_s), s | 17.1 | 0.0 | 40.7 | 14.1 | 0.0 | 14.5 | 11.0 | 48.7 | 29.4 | 4.5 | 52.7 | 53.4 |
| Cycle Q Clear(g_c), s | 17.1 | 0.0 | 40.7 | 14.1 | 0.0 | 14.5 | 11.0 | 48.7 | 29.4 | 4.5 | 52.7 | 53.4 |
| Prop In Lane | 1.00 | | 0.48 | 1.00 | | 0.26 | 1.00 | | 1.00 | 1.00 | | 0.32 |
| Lane Grp Cap(c), veh/h | 500 | 0 | 497 | 273 | 0 | 481 | 198 | 1507 | 674 | 166 | 708 | 706 |
| V/C Ratio(X) | 0.62 | 0.00 | 1.09 | 0.86 | 0.00 | 0.46 | 1.00 | 0.88 | 0.63 | 0.59 | 0.96 | 0.97 |
| Avail Cap(c_a), veh/h | 510 | 0 | 497 | 327 | 0 | 526 | 198 | 1507 | 674 | 174 | 708 | 706 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 29.2 | 0.0 | 50.0 | 40.0 | 0.0 | 42.7 | 41.8 | 37.2 | 31.6 | 32.3 | 41.1 | 41.5 |
| Incr Delay (d2), s/veh | 2.3 | 0.0 | 65.9 | 17.6 | 0.0 | 0.7 | 64.1 | 7.9 | 4.4 | 4.8 | 25.4 | 27.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 8.6 | 0.0 | 28.3 | 10.3 | 0.0 | 7.2 | 11.2 | 25.3 | 13.6 | 2.4 | 30.7 | 31.3 |
| LnGrp Delay(d),s/veh | 31.4 | 0.0 | 115.9 | 57.6 | 0.0 | 43.4 | 105.9 | 45.0 | 36.0 | 37.2 | 66.6 | 68.6 |
| LnGrp LOS | C | | F | E | | D | F | D | D | D | E | E |
| Approach Vol, veh/h | | 851 | | | 455 | | | 1951 | | | 1462 | |
| Approach Delay, s/veh | | 85.1 | | | 50.7 | | | 49.2 | | | 65.5 | |
| Approach LOS | | F | | | D | | | D | | | E | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 9.4 | 65.7 | 19.6 | 46.0 | 13.0 | 62.1 | 22.3 | 43.4 |
| Change Period (Y+Rc), s | 3.0 | * 6.8 | 3.0 | * 6.3 | 3.0 | * 6.8 | 3.0 | * 6.3 |
| Max Green Setting (Gmax), s | 7.0 | * 58 | 20.9 | * 40 | 10.0 | * 55 | 20.0 | * 41 |
| Max Q Clear Time (g_c+I1), s | 6.5 | 50.7 | 16.1 | 42.7 | 13.0 | 55.4 | 19.1 | 16.5 |
| Green Ext Time (p_c), s | 0.0 | 7.6 | 0.5 | 0.0 | 0.0 | 0.0 | 0.2 | 13.1 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 60.9 |
| HCM 2010 LOS | E |

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 58 | 24 | 582 | 3 | 17 | 2 | 514 | 1076 | 11 | 6 | 789 | 45 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 6.0 | 6.0 | 4.0 | 6.0 | 6.0 | | 3.0 | 6.8 | | 6.8 | 6.8 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1835 | | 1770 | 3534 | | 1770 | 3511 | |
| Flt Permitted | 0.77 | 1.00 | 1.00 | 0.77 | 1.00 | | 0.18 | 1.00 | | 0.25 | 1.00 | |
| Satd. Flow (perm) | 1433 | 1863 | 1583 | 1433 | 1835 | | 333 | 3534 | | 462 | 3511 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 61 | 25 | 613 | 3 | 18 | 2 | 541 | 1133 | 12 | 6 | 831 | 47 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 61 | 25 | 613 | 3 | 18 | 0 | 541 | 1144 | 0 | 6 | 873 | 0 |
| Turn Type | Perm | NA | Free | custom | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | Free | 8 | 8 | | 2 | | | 6 | | |
| Actuated Green, G (s) | 5.2 | 5.2 | 65.2 | 5.2 | 5.2 | | 47.2 | 47.2 | | 21.9 | 21.9 | |
| Effective Green, g (s) | 5.2 | 5.2 | 65.2 | 5.2 | 5.2 | | 47.2 | 47.2 | | 21.9 | 21.9 | |
| Actuated g/C Ratio | 0.08 | 0.08 | 1.00 | 0.08 | 0.08 | | 0.72 | 0.72 | | 0.34 | 0.34 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 3.0 | 6.8 | | 6.8 | 6.8 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 114 | 148 | 1583 | 114 | 146 | | 732 | 2558 | | 155 | 1179 | |
| v/s Ratio Prot | | 0.01 | | | | | c0.25 | 0.32 | | | 0.25 | |
| v/s Ratio Perm | 0.04 | | c0.39 | 0.00 | 0.01 | | c0.28 | | | 0.01 | | |
| v/c Ratio | 0.54 | 0.17 | 0.39 | 0.03 | 0.12 | | 0.74 | 0.45 | | 0.04 | 0.74 | |
| Uniform Delay, d1 | 28.8 | 28.0 | 0.0 | 27.7 | 27.9 | | 10.8 | 3.7 | | 14.6 | 19.1 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 4.8 | 0.5 | 0.7 | 0.1 | 0.4 | | 3.9 | 0.1 | | 0.1 | 2.5 | |
| Delay (s) | 33.6 | 28.5 | 0.7 | 27.8 | 28.3 | | 14.8 | 3.8 | | 14.7 | 21.7 | |
| Level of Service | C | C | A | C | C | | B | A | | B | C | |
| Approach Delay (s) | | 4.6 | | | 28.2 | | | 7.3 | | | 21.6 | |
| Approach LOS | | A | | | C | | | A | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 10.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.79 | | |
| Actuated Cycle Length (s) | 65.2 | Sum of lost time (s) | 15.8 |
| Intersection Capacity Utilization | 75.6% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# 2031 Total Traffic Volumes with Improvements

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 151 | 82 | 167 | 315 | 210 | 68 | 201 | 871 | 110 | 35 | 897 | 216 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 159 | 86 | 176 | 332 | 221 | 72 | 212 | 917 | 116 | 37 | 944 | 227 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 393 | 329 | 280 | 570 | 352 | 115 | 272 | 1463 | 655 | 278 | 1037 | 249 |
| Arrive On Green | 0.10 | 0.18 | 0.18 | 0.19 | 0.26 | 0.26 | 0.09 | 0.41 | 0.41 | 0.05 | 0.37 | 0.35 |
| Sat Flow, veh/h | 1774 | 1863 | 1583 | 1774 | 1347 | 439 | 1774 | 3539 | 1583 | 1774 | 2832 | 680 |
| Grp Volume(v), veh/h | 159 | 86 | 176 | 332 | 0 | 293 | 212 | 917 | 116 | 37 | 589 | 582 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1863 | 1583 | 1774 | 0 | 1785 | 1774 | 1770 | 1583 | 1774 | 1770 | 1743 |
| Q Serve(g_s), s | 6.1 | 3.4 | 8.8 | 12.1 | 0.0 | 12.4 | 6.0 | 17.6 | 4.0 | 1.1 | 27.2 | 27.3 |
| Cycle Q Clear(g_c), s | 6.1 | 3.4 | 8.8 | 12.1 | 0.0 | 12.4 | 6.0 | 17.6 | 4.0 | 1.1 | 27.2 | 27.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.25 | 1.00 | | 1.00 | 1.00 | | 0.39 |
| Lane Grp Cap(c), veh/h | 393 | 329 | 280 | 570 | 0 | 466 | 272 | 1463 | 655 | 278 | 648 | 638 |
| V/C Ratio(X) | 0.40 | 0.26 | 0.63 | 0.58 | 0.00 | 0.63 | 0.78 | 0.63 | 0.18 | 0.13 | 0.91 | 0.91 |
| Avail Cap(c_a), veh/h | 396 | 404 | 343 | 689 | 0 | 655 | 272 | 1463 | 655 | 363 | 648 | 638 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 24.6 | 30.5 | 32.7 | 20.0 | 0.0 | 28.0 | 19.3 | 19.9 | 15.9 | 16.3 | 25.9 | 26.1 |
| Incr Delay (d2), s/veh | 0.7 | 0.4 | 2.5 | 0.9 | 0.0 | 1.4 | 13.4 | 2.0 | 0.6 | 0.2 | 19.1 | 19.6 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.0 | 1.8 | 4.0 | 6.0 | 0.0 | 6.3 | 3.9 | 8.9 | 1.8 | 0.5 | 16.7 | 16.6 |
| LnGrp Delay(d),s/veh | 25.2 | 30.9 | 35.2 | 21.0 | 0.0 | 29.4 | 32.7 | 22.0 | 16.5 | 16.5 | 44.9 | 45.7 |
| LnGrp LOS | C | C | D | C | | C | C | C | B | B | D | D |
| Approach Vol, veh/h | | 421 | | | 625 | | | 1245 | | | 1208 | |
| Approach Delay, s/veh | | 30.6 | | | 24.9 | | | 23.3 | | | 44.4 | |
| Approach LOS | | C | | | C | | | C | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 5.9 | 41.3 | 18.1 | 20.5 | 10.0 | 37.2 | 10.9 | 27.7 |
| Change Period (Y+Rc), s | 3.0 | * 6.8 | 3.0 | * 6.3 | 3.0 | * 6.8 | 3.0 | * 6.3 |
| Max Green Setting (Gmax), s | 7.0 | * 30 | 20.9 | * 18 | 7.0 | * 30 | 8.0 | * 31 |
| Max Q Clear Time (g_c+I1), s | 3.1 | 19.6 | 14.1 | 10.8 | 8.0 | 29.3 | 8.1 | 14.4 |
| Green Ext Time (p_c), s | 0.0 | 10.6 | 1.0 | 3.3 | 0.0 | 1.1 | 0.0 | 6.3 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 31.7 |
| HCM 2010 LOS | C |

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 295 | 268 | 245 | 223 | 154 | 55 | 188 | 1264 | 401 | 93 | 1091 | 205 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 311 | 282 | 258 | 235 | 162 | 58 | 198 | 1331 | 422 | 98 | 1148 | 216 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 440 | 375 | 319 | 377 | 231 | 83 | 239 | 1573 | 704 | 206 | 1253 | 235 |
| Arrive On Green | 0.17 | 0.20 | 0.20 | 0.14 | 0.18 | 0.18 | 0.08 | 0.44 | 0.44 | 0.06 | 0.42 | 0.41 |
| Sat Flow, veh/h | 1774 | 1863 | 1583 | 1774 | 1311 | 469 | 1774 | 3539 | 1583 | 1774 | 2977 | 557 |
| Grp Volume(v), veh/h | 311 | 282 | 258 | 235 | 0 | 220 | 198 | 1331 | 422 | 98 | 680 | 684 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1863 | 1583 | 1774 | 0 | 1780 | 1774 | 1770 | 1583 | 1774 | 1770 | 1764 |
| Q Serve(g_s), s | 13.3 | 14.0 | 15.3 | 10.2 | 0.0 | 11.4 | 5.9 | 32.9 | 19.8 | 3.0 | 35.5 | 36.0 |
| Cycle Q Clear(g_c), s | 13.3 | 14.0 | 15.3 | 10.2 | 0.0 | 11.4 | 5.9 | 32.9 | 19.8 | 3.0 | 35.5 | 36.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.26 | 1.00 | | 1.00 | 1.00 | | 0.32 |
| Lane Grp Cap(c), veh/h | 440 | 375 | 319 | 377 | 0 | 314 | 239 | 1573 | 704 | 206 | 745 | 743 |
| V/C Ratio(X) | 0.71 | 0.75 | 0.81 | 0.62 | 0.00 | 0.70 | 0.83 | 0.85 | 0.60 | 0.47 | 0.91 | 0.92 |
| Avail Cap(c_a), veh/h | 451 | 375 | 319 | 520 | 0 | 428 | 239 | 1573 | 704 | 248 | 745 | 743 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 25.3 | 36.9 | 37.4 | 27.2 | 0.0 | 38.0 | 21.8 | 24.3 | 20.7 | 21.2 | 26.7 | 27.0 |
| Incr Delay (d2), s/veh | 4.9 | 8.3 | 14.5 | 1.7 | 0.0 | 3.1 | 20.7 | 5.8 | 3.8 | 1.7 | 17.5 | 18.6 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.0 | 8.1 | 8.0 | 5.1 | 0.0 | 5.9 | 4.2 | 17.2 | 9.4 | 1.5 | 20.8 | 21.3 |
| LnGrp Delay(d),s/veh | 30.2 | 45.2 | 51.9 | 28.9 | 0.0 | 41.1 | 42.5 | 30.1 | 24.4 | 22.8 | 44.3 | 45.6 |
| LnGrp LOS | C | D | D | C | | D | D | C | C | C | D | D |
| Approach Vol, veh/h | | 851 | | | 455 | | | 1951 | | | 1462 | |
| Approach Delay, s/veh | | 41.7 | | | 34.8 | | | 30.1 | | | 43.4 | |
| Approach LOS | | D | | | C | | | C | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 7.7 | 49.4 | 16.0 | 25.0 | 10.0 | 47.1 | 18.4 | 22.6 |
| Change Period (Y+Rc), s | 3.0 | * 6.8 | 3.0 | * 6.3 | 3.0 | * 6.8 | 3.0 | * 6.3 |
| Max Green Setting (Gmax), s | 7.0 | * 40 | 20.9 | * 18 | 7.0 | * 40 | 16.0 | * 23 |
| Max Q Clear Time (g_c+I1), s | 5.0 | 34.9 | 12.2 | 17.3 | 7.9 | 38.0 | 15.3 | 13.4 |
| Green Ext Time (p_c), s | 0.1 | 5.4 | 0.8 | 0.3 | 0.0 | 2.3 | 0.1 | 2.9 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 36.8 |
| HCM 2010 LOS | D |

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

# 2041 Total Traffic Volumes

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.9 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 202 | 428 | 297 | 34 | 33 | 430 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | Free |
| Storage Length | - | - | - | - | 0 | 800 |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 213 | 451 | 313 | 36 | 35 | 453 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 348 | 0 | - | 0 | 1207 | - |
| Stage 1 | - | - | - | - | 331 | - |
| Stage 2 | - | - | - | - | 876 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | - |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | - |
| Pot Cap-1 Maneuver | 1211 | - | - | - | 203 | 0 |
| Stage 1 | - | - | - | - | 728 | 0 |
| Stage 2 | - | - | - | - | 407 | 0 |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1211 | - | - | - | 155 | - |
| Mov Cap-2 Maneuver | - | - | - | - | 155 | - |
| Stage 1 | - | - | - | - | 728 | - |
| Stage 2 | - | - | - | - | 311 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 2.8 | 0 | 34.8 |
| HCM LOS | | | D |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 | SBLn2 |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1211 | - | - | - | 155 | - |
| HCM Lane V/C Ratio | 0.176 | - | - | - | 0.224 | - |
| HCM Control Delay (s) | 8.6 | 0 | - | - | 34.8 | 0 |
| HCM Lane LOS | A | A | - | - | D | A |
| HCM 95th %tile Q(veh) | 0.6 | - | - | - | 0.8 | - |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 592 | 1238 | 102 | 627 | 69 | 38 |
| Number | 4 | 14 | 3 | 8 | 5 | 12 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 623 | 0 | 107 | 660 | 73 | 0 |
| Adj No. of Lanes | 2 | 1 | 1 | 2 | 1 | 1 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 1433 | 641 | 367 | 1433 | 596 | 532 |
| Arrive On Green | 0.40 | 0.00 | 0.40 | 0.40 | 0.34 | 0.00 |
| Sat Flow, veh/h | 3632 | 1583 | 798 | 3632 | 1774 | 1583 |
| Grp Volume(v), veh/h | 623 | 0 | 107 | 660 | 73 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1770 | 1583 | 798 | 1770 | 1774 | 1583 |
| Q Serve(g_s), s | 6.3 | 0.0 | 5.5 | 6.7 | 1.4 | 0.0 |
| Cycle Q Clear(g_c), s | 6.3 | 0.0 | 11.8 | 6.7 | 1.4 | 0.0 |
| Prop In Lane | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 1433 | 641 | 367 | 1433 | 596 | 532 |
| V/C Ratio(X) | 0.43 | 0.00 | 0.29 | 0.46 | 0.12 | 0.00 |
| Avail Cap(c_a), veh/h | 1476 | 660 | 377 | 1476 | 596 | 532 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 10.6 | 0.0 | 14.9 | 10.8 | 11.4 | 0.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.0 | 0.4 | 0.2 | 0.4 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.1 | 0.0 | 1.3 | 3.3 | 0.8 | 0.0 |
| LnGrp Delay(d),s/veh | 10.8 | 0.0 | 15.3 | 11.0 | 11.8 | 0.0 |
| LnGrp LOS | B | | B | B | B | |
| Approach Vol, veh/h | 623 | | | 767 | 73 | |
| Approach Delay, s/veh | 10.8 | | | 11.6 | 11.8 | |
| Approach LOS | B | | | B | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | | | 8 |
| Phs Duration (G+Y+Rc), s | | 23.2 | | 26.8 | | | | 26.8 |
| Change Period (Y+Rc), s | | 6.0 | | * 6.8 | | | | * 6.8 |
| Max Green Setting (Gmax), s | | 16.6 | | * 21 | | | | * 21 |
| Max Q Clear Time (g_c+I1), s | | 3.4 | | 8.3 | | | | 13.8 |
| Green Ext Time (p_c), s | | 0.2 | | 10.7 | | | | 6.1 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 11.3 |
| HCM 2010 LOS | B |

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 281 | 2 | 378 | 20 | 3 | 14 | 126 | 1130 | 5 | 13 | 1426 | 182 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 296 | 2 | 398 | 21 | 3 | 15 | 133 | 1189 | 5 | 14 | 1501 | 192 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 1 | 2 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 450 | 2 | 452 | 126 | 48 | 238 | 182 | 2050 | 9 | 246 | 1507 | 191 |
| Arrive On Green | 0.08 | 0.29 | 0.29 | 0.18 | 0.18 | 0.18 | 0.06 | 0.57 | 0.57 | 0.48 | 0.48 | 0.48 |
| Sat Flow, veh/h | 1774 | 8 | 1577 | 981 | 271 | 1353 | 1774 | 3614 | 15 | 467 | 3162 | 400 |
| Grp Volume(v), veh/h | 296 | 0 | 400 | 21 | 0 | 18 | 133 | 582 | 612 | 14 | 832 | 861 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1585 | 981 | 0 | 1624 | 1774 | 1770 | 1860 | 467 | 1770 | 1792 |
| Q Serve(g_s), s | 7.0 | 0.0 | 21.6 | 1.9 | 0.0 | 0.8 | 3.2 | 19.0 | 19.1 | 1.8 | 41.7 | 42.8 |
| Cycle Q Clear(g_c), s | 7.0 | 0.0 | 21.6 | 13.5 | 0.0 | 0.8 | 3.2 | 19.0 | 19.1 | 12.7 | 41.7 | 42.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.83 | 1.00 | | 0.01 | 1.00 | | 0.22 |
| Lane Grp Cap(c), veh/h | 450 | 0 | 455 | 126 | 0 | 285 | 182 | 1003 | 1055 | 246 | 843 | 854 |
| V/C Ratio(X) | 0.66 | 0.00 | 0.88 | 0.17 | 0.00 | 0.06 | 0.73 | 0.58 | 0.58 | 0.06 | 0.99 | 1.01 |
| Avail Cap(c_a), veh/h | 450 | 0 | 459 | 128 | 0 | 289 | 219 | 1003 | 1055 | 246 | 843 | 854 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 29.9 | 0.0 | 30.5 | 41.7 | 0.0 | 30.8 | 20.7 | 12.5 | 12.5 | 19.3 | 23.2 | 23.5 |
| Incr Delay (d2), s/veh | 3.5 | 0.0 | 17.5 | 0.6 | 0.0 | 0.1 | 9.7 | 2.4 | 2.3 | 0.4 | 28.0 | 32.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.3 | 0.0 | 11.7 | 0.5 | 0.0 | 0.4 | 2.1 | 9.9 | 10.4 | 0.3 | 26.7 | 28.6 |
| LnGrp Delay(d),s/veh | 33.4 | 0.0 | 48.0 | 42.3 | 0.0 | 30.9 | 30.4 | 15.0 | 14.9 | 19.7 | 51.2 | 56.2 |
| LnGrp LOS | C | | D | D | | C | C | B | B | B | D | F |
| Approach Vol, veh/h | | 696 | | | 39 | | | 1327 | | | 1707 | |
| Approach Delay, s/veh | | 41.8 | | | 37.1 | | | 16.5 | | | 53.5 | |
| Approach LOS | | D | | | D | | | B | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | | 57.9 | | 32.1 | 8.1 | 49.8 | 10.0 | 22.1 |
| Change Period (Y+Rc), s | | * 6.8 | | * 6.3 | 3.0 | * 6.8 | 3.0 | * 6.3 |
| Max Green Setting (Gmax), s | | * 51 | | * 26 | 7.0 | * 41 | 7.0 | * 16 |
| Max Q Clear Time (g_c+I1), s | | 21.1 | | 23.6 | 5.2 | 44.8 | 9.0 | 15.5 |
| Green Ext Time (p_c), s | | 29.7 | | 1.2 | 0.1 | 0.0 | 0.0 | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 38.1 |
| HCM 2010 LOS | D |

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

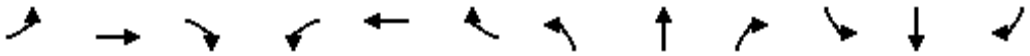
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 162 | 109 | 181 | 410 | 285 | 75 | 208 | 958 | 141 | 38 | 981 | 222 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 171 | 115 | 191 | 432 | 300 | 79 | 219 | 1008 | 148 | 40 | 1033 | 234 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 374 | 337 | 287 | 611 | 435 | 115 | 234 | 1362 | 609 | 228 | 985 | 222 |
| Arrive On Green | 0.10 | 0.18 | 0.18 | 0.22 | 0.31 | 0.31 | 0.09 | 0.38 | 0.38 | 0.05 | 0.34 | 0.33 |
| Sat Flow, veh/h | 1774 | 1863 | 1583 | 1774 | 1422 | 375 | 1774 | 3539 | 1583 | 1774 | 2870 | 648 |
| Grp Volume(v), veh/h | 171 | 115 | 191 | 432 | 0 | 379 | 219 | 1008 | 148 | 40 | 636 | 631 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1863 | 1583 | 1774 | 0 | 1797 | 1774 | 1770 | 1583 | 1774 | 1770 | 1748 |
| Q Serve(g_s), s | 7.0 | 4.9 | 10.3 | 16.9 | 0.0 | 17.0 | 7.1 | 22.4 | 5.8 | 1.3 | 31.4 | 31.4 |
| Cycle Q Clear(g_c), s | 7.0 | 4.9 | 10.3 | 16.9 | 0.0 | 17.0 | 7.1 | 22.4 | 5.8 | 1.3 | 31.4 | 31.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.21 | 1.00 | | 1.00 | 1.00 | | 0.37 |
| Lane Grp Cap(c), veh/h | 374 | 337 | 287 | 611 | 0 | 550 | 234 | 1362 | 609 | 228 | 607 | 600 |
| V/C Ratio(X) | 0.46 | 0.34 | 0.67 | 0.71 | 0.00 | 0.69 | 0.94 | 0.74 | 0.24 | 0.18 | 1.05 | 1.05 |
| Avail Cap(c_a), veh/h | 374 | 379 | 322 | 639 | 0 | 619 | 234 | 1362 | 609 | 302 | 607 | 600 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 26.5 | 32.7 | 34.9 | 20.4 | 0.0 | 27.9 | 22.1 | 24.2 | 19.1 | 19.5 | 30.0 | 30.2 |
| Incr Delay (d2), s/veh | 0.9 | 0.6 | 4.4 | 3.4 | 0.0 | 2.8 | 41.6 | 3.6 | 0.9 | 0.4 | 49.2 | 51.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.5 | 2.6 | 4.9 | 8.7 | 0.0 | 8.8 | 8.2 | 11.6 | 2.7 | 0.6 | 23.5 | 23.5 |
| LnGrp Delay(d),s/veh | 27.4 | 33.3 | 39.3 | 23.8 | 0.0 | 30.7 | 63.7 | 27.9 | 20.0 | 19.9 | 79.3 | 81.5 |
| LnGrp LOS | C | C | D | C | | C | E | C | C | B | F | F |
| Approach Vol, veh/h | | 477 | | | 811 | | | 1375 | | | 1307 | |
| Approach Delay, s/veh | | 33.6 | | | 27.0 | | | 32.7 | | | 78.5 | |
| Approach LOS | | C | | | C | | | C | | | E | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 6.2 | 41.0 | 22.4 | 21.9 | 10.0 | 37.2 | 11.0 | 33.3 |
| Change Period (Y+Rc), s | 3.0 | * 6.8 | 3.0 | * 6.3 | 3.0 | * 6.8 | 3.0 | * 6.3 |
| Max Green Setting (Gmax), s | 7.0 | * 30 | 20.9 | * 18 | 7.0 | * 30 | 8.0 | * 31 |
| Max Q Clear Time (g_c+I1), s | 3.3 | 24.4 | 18.9 | 12.3 | 9.1 | 33.4 | 9.0 | 19.0 |
| Green Ext Time (p_c), s | 0.0 | 5.9 | 0.5 | 3.3 | 0.0 | 0.0 | 0.0 | 6.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 46.7 |
| HCM 2010 LOS | D |

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 20 | 30 | 499 | 2 | 94 | 1 | 668 | 552 | 10 | 1 | 764 | 106 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 6.0 | 6.0 | 4.0 | 6.0 | 6.0 | | 3.0 | 6.8 | | 6.8 | 6.8 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1860 | | 1770 | 3529 | | 1770 | 3474 | |
| Flt Permitted | 0.69 | 1.00 | 1.00 | 0.74 | 1.00 | | 0.15 | 1.00 | | 0.43 | 1.00 | |
| Satd. Flow (perm) | 1290 | 1863 | 1583 | 1372 | 1860 | | 275 | 3529 | | 798 | 3474 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 21 | 32 | 525 | 2 | 99 | 1 | 703 | 581 | 11 | 1 | 804 | 112 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 12 | 0 |
| Lane Group Flow (vph) | 21 | 32 | 525 | 2 | 100 | 0 | 703 | 591 | 0 | 1 | 904 | 0 |
| Turn Type | Perm | NA | Free | custom | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | Free | 8 | 8 | | 2 | | | 6 | | |
| Actuated Green, G (s) | 8.0 | 8.0 | 79.9 | 8.0 | 8.0 | | 59.1 | 59.1 | | 24.1 | 24.1 | |
| Effective Green, g (s) | 8.0 | 8.0 | 79.9 | 8.0 | 8.0 | | 59.1 | 59.1 | | 24.1 | 24.1 | |
| Actuated g/C Ratio | 0.10 | 0.10 | 1.00 | 0.10 | 0.10 | | 0.74 | 0.74 | | 0.30 | 0.30 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 3.0 | 6.8 | | 6.8 | 6.8 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 129 | 186 | 1583 | 137 | 186 | | 802 | 2610 | | 240 | 1047 | |
| v/s Ratio Prot | | 0.02 | | | | | c0.35 | 0.17 | | | 0.26 | |
| v/s Ratio Perm | 0.02 | | c0.33 | 0.00 | 0.05 | | c0.30 | | | 0.00 | | |
| v/c Ratio | 0.16 | 0.17 | 0.33 | 0.01 | 0.54 | | 0.88 | 0.23 | | 0.00 | 0.86 | |
| Uniform Delay, d1 | 32.9 | 32.9 | 0.0 | 32.4 | 34.2 | | 16.6 | 3.3 | | 19.5 | 26.3 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.6 | 0.4 | 0.6 | 0.0 | 3.0 | | 10.6 | 0.0 | | 0.0 | 7.5 | |
| Delay (s) | 33.5 | 33.4 | 0.6 | 32.4 | 37.2 | | 27.2 | 3.3 | | 19.5 | 33.9 | |
| Level of Service | C | C | A | C | D | | C | A | | B | C | |
| Approach Delay (s) | | 3.6 | | | 37.1 | | | 16.3 | | | 33.9 | |
| Approach LOS | | A | | | D | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 20.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.87 | | |
| Actuated Cycle Length (s) | 79.9 | Sum of lost time (s) | 15.8 |
| Intersection Capacity Utilization | 83.3% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 189 | 126 | 394 | 177 | 40 | 672 |
| Number | 3 | 18 | 2 | 12 | 1 | 6 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 199 | 133 | 415 | 186 | 42 | 707 |
| Adj No. of Lanes | 1 | 1 | 2 | 0 | 1 | 2 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 394 | 351 | 1125 | 499 | 455 | 1668 |
| Arrive On Green | 0.22 | 0.22 | 0.47 | 0.47 | 0.47 | 0.47 |
| Sat Flow, veh/h | 1774 | 1583 | 2480 | 1058 | 815 | 3632 |
| Grp Volume(v), veh/h | 199 | 133 | 306 | 295 | 42 | 707 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1583 | 1770 | 1676 | 815 | 1770 |
| Q Serve(g_s), s | 4.4 | 3.2 | 4.9 | 5.0 | 1.5 | 5.8 |
| Cycle Q Clear(g_c), s | 4.4 | 3.2 | 4.9 | 5.0 | 6.5 | 5.8 |
| Prop In Lane | 1.00 | 1.00 | | 0.63 | 1.00 | |
| Lane Grp Cap(c), veh/h | 394 | 351 | 834 | 790 | 455 | 1668 |
| V/C Ratio(X) | 0.51 | 0.38 | 0.37 | 0.37 | 0.09 | 0.42 |
| Avail Cap(c_a), veh/h | 729 | 650 | 926 | 877 | 497 | 1853 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 15.1 | 14.6 | 7.5 | 7.5 | 9.6 | 7.7 |
| Incr Delay (d2), s/veh | 1.0 | 0.7 | 0.3 | 0.3 | 0.1 | 0.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.2 | 1.4 | 2.4 | 2.4 | 0.3 | 2.9 |
| LnGrp Delay(d),s/veh | 16.1 | 15.3 | 7.8 | 7.8 | 9.7 | 7.9 |
| LnGrp LOS | B | B | A | A | A | A |
| Approach Vol, veh/h | 332 | | 601 | | | 749 |
| Approach Delay, s/veh | 15.8 | | 7.8 | | | 8.0 |
| Approach LOS | B | | A | | | A |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 27.7 | | | | 27.7 | | 16.6 |
| Change Period (Y+Rc), s | | * 6.8 | | | | * 6.8 | | 6.8 |
| Max Green Setting (Gmax), s | | * 23 | | | | * 23 | | 18.2 |
| Max Q Clear Time (g_c+I1), s | | 7.0 | | | | 8.5 | | 6.4 |
| Green Ext Time (p_c), s | | 13.5 | | | | 12.3 | | 1.3 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 9.5 |
| HCM 2010 LOS | A |

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

| Intersection | |
|---|---|
| Int Delay, s/veh | 6.6 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 139 | 321 | 450 | 49 | 111 | 1230 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | Free |
| Storage Length | - | - | - | - | 0 | 800 |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 146 | 338 | 474 | 52 | 117 | 1295 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 525 | 0 | - | 0 | 1130 | - |
| Stage 1 | - | - | - | - | 499 | - |
| Stage 2 | - | - | - | - | 631 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | - |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | - |
| Pot Cap-1 Maneuver | 1042 | - | - | - | 225 | 0 |
| Stage 1 | - | - | - | - | 610 | 0 |
| Stage 2 | - | - | - | - | 530 | 0 |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1042 | - | - | - | 186 | - |
| Mov Cap-2 Maneuver | - | - | - | - | 186 | - |
| Stage 1 | - | - | - | - | 610 | - |
| Stage 2 | - | - | - | - | 439 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 2.7 | 0 | 52.4 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 | SBLn2 |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1042 | - | - | - | 186 | - |
| HCM Lane V/C Ratio | 0.14 | - | - | - | 0.628 | - |
| HCM Control Delay (s) | 9 | 0 | - | - | 52.4 | 0 |
| HCM Lane LOS | A | A | - | - | F | A |
| HCM 95th %tile Q(veh) | 0.5 | - | - | - | 3.6 | - |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 397 | 671 | 54 | 1629 | 145 | 17 |
| Number | 4 | 14 | 3 | 8 | 5 | 12 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 418 | 0 | 57 | 1715 | 153 | 0 |
| Adj No. of Lanes | 2 | 1 | 1 | 2 | 1 | 1 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 1840 | 823 | 559 | 1840 | 473 | 422 |
| Arrive On Green | 0.52 | 0.00 | 0.52 | 0.52 | 0.27 | 0.00 |
| Sat Flow, veh/h | 3632 | 1583 | 965 | 3632 | 1774 | 1583 |
| Grp Volume(v), veh/h | 418 | 0 | 57 | 1715 | 153 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1770 | 1583 | 965 | 1770 | 1774 | 1583 |
| Q Serve(g_s), s | 3.9 | 0.0 | 2.1 | 27.1 | 4.2 | 0.0 |
| Cycle Q Clear(g_c), s | 3.9 | 0.0 | 5.9 | 27.1 | 4.2 | 0.0 |
| Prop In Lane | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 1840 | 823 | 559 | 1840 | 473 | 422 |
| V/C Ratio(X) | 0.23 | 0.00 | 0.10 | 0.93 | 0.32 | 0.00 |
| Avail Cap(c_a), veh/h | 1841 | 824 | 560 | 1841 | 473 | 422 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 7.8 | 0.0 | 9.4 | 13.4 | 17.6 | 0.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 0.1 | 9.2 | 1.8 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.9 | 0.0 | 0.6 | 15.2 | 2.3 | 0.0 |
| LnGrp Delay(d),s/veh | 7.9 | 0.0 | 9.5 | 22.6 | 19.5 | 0.0 |
| LnGrp LOS | A | | A | C | B | |
| Approach Vol, veh/h | 418 | | | 1772 | 153 | |
| Approach Delay, s/veh | 7.9 | | | 22.2 | 19.5 | |
| Approach LOS | A | | | C | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | | | 8 |
| Phs Duration (G+Y+Rc), s | | 22.0 | | 38.0 | | | | 38.0 |
| Change Period (Y+Rc), s | | 6.0 | | * 6.8 | | | | * 6.8 |
| Max Green Setting (Gmax), s | | 16.0 | | * 31 | | | | * 31 |
| Max Q Clear Time (g_c+I1), s | | 6.2 | | 5.9 | | | | 29.1 |
| Green Ext Time (p_c), s | | 0.5 | | 24.6 | | | | 2.1 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 19.5 |
| HCM 2010 LOS | B |

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 240 | 8 | 218 | 21 | 7 | 16 | 355 | 1909 | 17 | 22 | 1562 | 284 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 253 | 8 | 229 | 22 | 7 | 17 | 374 | 2009 | 18 | 23 | 1644 | 299 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 1 | 2 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 285 | 10 | 284 | 100 | 47 | 114 | 350 | 2587 | 23 | 128 | 1595 | 282 |
| Arrive On Green | 0.07 | 0.18 | 0.18 | 0.10 | 0.10 | 0.10 | 0.17 | 0.72 | 0.72 | 0.53 | 0.53 | 0.53 |
| Sat Flow, veh/h | 1774 | 54 | 1538 | 1139 | 483 | 1173 | 1774 | 3595 | 32 | 209 | 3008 | 531 |
| Grp Volume(v), veh/h | 253 | 0 | 237 | 22 | 0 | 24 | 374 | 988 | 1039 | 23 | 947 | 996 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1591 | 1139 | 0 | 1656 | 1774 | 1770 | 1857 | 209 | 1770 | 1769 |
| Q Serve(g_s), s | 9.0 | 0.0 | 19.6 | 2.6 | 0.0 | 1.8 | 23.0 | 48.6 | 48.9 | 10.8 | 72.8 | 72.8 |
| Cycle Q Clear(g_c), s | 9.0 | 0.0 | 19.6 | 10.2 | 0.0 | 1.8 | 23.0 | 48.6 | 48.9 | 33.7 | 72.8 | 72.8 |
| Prop In Lane | 1.00 | | 0.97 | 1.00 | | 0.71 | 1.00 | | 0.02 | 1.00 | | 0.30 |
| Lane Grp Cap(c), veh/h | 285 | 0 | 294 | 100 | 0 | 161 | 350 | 1274 | 1337 | 128 | 939 | 938 |
| V/C Ratio(X) | 0.89 | 0.00 | 0.81 | 0.22 | 0.00 | 0.15 | 1.07 | 0.78 | 0.78 | 0.18 | 1.01 | 1.06 |
| Avail Cap(c_a), veh/h | 285 | 0 | 326 | 123 | 0 | 194 | 350 | 1274 | 1337 | 128 | 939 | 938 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 56.9 | 0.0 | 53.6 | 64.2 | 0.0 | 56.7 | 49.5 | 12.2 | 12.2 | 31.2 | 32.2 | 32.2 |
| Incr Delay (d2), s/veh | 26.9 | 0.0 | 12.7 | 1.1 | 0.0 | 0.4 | 67.8 | 4.7 | 4.5 | 3.0 | 31.5 | 47.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 10.6 | 0.0 | 9.7 | 0.8 | 0.0 | 0.9 | 19.8 | 25.0 | 26.5 | 0.7 | 43.7 | 47.8 |
| LnGrp Delay(d),s/veh | 83.8 | 0.0 | 66.3 | 65.3 | 0.0 | 57.2 | 117.3 | 16.9 | 16.7 | 34.3 | 63.8 | 79.4 |
| LnGrp LOS | F | | E | E | | E | F | B | B | C | F | F |
| Approach Vol, veh/h | | 490 | | | 46 | | | 2401 | | | 1966 | |
| Approach Delay, s/veh | | 75.3 | | | 61.1 | | | 32.4 | | | 71.4 | |
| Approach LOS | | E | | | E | | | C | | | E | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | | 108.3 | | 31.7 | 26.0 | 82.3 | 12.0 | 19.7 |
| Change Period (Y+Rc), s | | * 6.8 | | * 6.3 | 3.0 | * 6.8 | 3.0 | * 6.3 |
| Max Green Setting (Gmax), s | | * 99 | | * 28 | 23.0 | * 73 | 9.0 | * 16 |
| Max Q Clear Time (g_c+I1), s | | 50.9 | | 21.6 | 25.0 | 74.8 | 11.0 | 12.2 |
| Green Ext Time (p_c), s | | 47.8 | | 1.8 | 0.0 | 0.0 | 0.0 | 1.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 52.6 |
| HCM 2010 LOS | D |

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

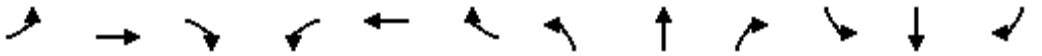
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 303 | 342 | 257 | 276 | 198 | 61 | 203 | 1381 | 497 | 103 | 1193 | 215 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 319 | 360 | 271 | 291 | 208 | 64 | 214 | 1454 | 523 | 108 | 1256 | 226 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 390 | 370 | 314 | 338 | 281 | 87 | 226 | 1653 | 739 | 180 | 1302 | 232 |
| Arrive On Green | 0.15 | 0.20 | 0.20 | 0.15 | 0.21 | 0.21 | 0.09 | 0.47 | 0.47 | 0.06 | 0.43 | 0.43 |
| Sat Flow, veh/h | 1774 | 1863 | 1583 | 1774 | 1368 | 421 | 1774 | 3539 | 1583 | 1774 | 3002 | 536 |
| Grp Volume(v), veh/h | 319 | 360 | 271 | 291 | 0 | 272 | 214 | 1454 | 523 | 108 | 736 | 746 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1863 | 1583 | 1774 | 0 | 1788 | 1774 | 1770 | 1583 | 1774 | 1770 | 1768 |
| Q Serve(g_s), s | 17.5 | 23.5 | 20.2 | 15.3 | 0.0 | 17.4 | 10.1 | 45.4 | 32.1 | 4.0 | 49.3 | 50.5 |
| Cycle Q Clear(g_c), s | 17.5 | 23.5 | 20.2 | 15.3 | 0.0 | 17.4 | 10.1 | 45.4 | 32.1 | 4.0 | 49.3 | 50.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.24 | 1.00 | | 1.00 | 1.00 | | 0.30 |
| Lane Grp Cap(c), veh/h | 390 | 370 | 314 | 338 | 0 | 368 | 226 | 1653 | 739 | 180 | 767 | 767 |
| V/C Ratio(X) | 0.82 | 0.97 | 0.86 | 0.86 | 0.00 | 0.74 | 0.95 | 0.88 | 0.71 | 0.60 | 0.96 | 0.97 |
| Avail Cap(c_a), veh/h | 390 | 370 | 314 | 382 | 0 | 408 | 226 | 1653 | 739 | 196 | 767 | 767 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 33.5 | 48.7 | 47.4 | 32.5 | 0.0 | 45.5 | 36.2 | 29.5 | 25.9 | 27.3 | 33.6 | 34.1 |
| Incr Delay (d2), s/veh | 12.9 | 39.7 | 21.0 | 16.4 | 0.0 | 6.3 | 45.4 | 7.0 | 5.6 | 4.3 | 24.0 | 26.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 9.9 | 16.2 | 10.7 | 9.0 | 0.0 | 9.3 | 10.0 | 23.6 | 15.1 | 2.2 | 29.0 | 30.3 |
| LnGrp Delay(d),s/veh | 46.3 | 88.4 | 68.4 | 48.9 | 0.0 | 51.8 | 81.6 | 36.5 | 31.6 | 31.6 | 57.5 | 60.6 |
| LnGrp LOS | D | F | E | D | | D | F | D | C | C | E | E |
| Approach Vol, veh/h | | 950 | | | 563 | | | 2191 | | | 1590 | |
| Approach Delay, s/veh | | 68.6 | | | 50.3 | | | 39.7 | | | 57.2 | |
| Approach LOS | | E | | | D | | | D | | | E | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 8.9 | 62.9 | 20.9 | 29.6 | 13.0 | 58.8 | 20.0 | 30.4 |
| Change Period (Y+Rc), s | 3.0 | * 6.8 | 3.0 | * 6.3 | 3.0 | * 6.8 | 3.0 | * 6.3 |
| Max Green Setting (Gmax), s | 7.0 | * 55 | 20.9 | * 23 | 10.0 | * 52 | 17.0 | * 27 |
| Max Q Clear Time (g_c+I1), s | 6.0 | 47.4 | 17.3 | 25.5 | 12.1 | 52.5 | 19.5 | 19.4 |
| Green Ext Time (p_c), s | 0.0 | 7.6 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 4.7 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 51.3 |
| HCM 2010 LOS | D |

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 61 | 90 | 642 | 3 | 54 | 2 | 590 | 1151 | 11 | 6 | 849 | 47 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 6.0 | 6.0 | 4.0 | 6.0 | 6.0 | | 3.0 | 6.8 | | 6.8 | 6.8 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1853 | | 1770 | 3534 | | 1770 | 3512 | |
| Flt Permitted | 0.72 | 1.00 | 1.00 | 0.70 | 1.00 | | 0.14 | 1.00 | | 0.23 | 1.00 | |
| Satd. Flow (perm) | 1338 | 1863 | 1583 | 1295 | 1853 | | 267 | 3534 | | 427 | 3512 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 64 | 95 | 676 | 3 | 57 | 2 | 621 | 1212 | 12 | 6 | 894 | 49 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 64 | 95 | 676 | 3 | 57 | 0 | 621 | 1223 | 0 | 6 | 939 | 0 |
| Turn Type | Perm | NA | Free | custom | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | Free | 8 | 8 | | 2 | | | 6 | | |
| Actuated Green, G (s) | 7.6 | 7.6 | 77.4 | 7.6 | 7.6 | | 57.0 | 57.0 | | 24.9 | 24.9 | |
| Effective Green, g (s) | 7.6 | 7.6 | 77.4 | 7.6 | 7.6 | | 57.0 | 57.0 | | 24.9 | 24.9 | |
| Actuated g/C Ratio | 0.10 | 0.10 | 1.00 | 0.10 | 0.10 | | 0.74 | 0.74 | | 0.32 | 0.32 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 3.0 | 6.8 | | 6.8 | 6.8 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 131 | 182 | 1583 | 127 | 181 | | 761 | 2602 | | 137 | 1129 | |
| v/s Ratio Prot | | 0.05 | | | | | c0.31 | 0.35 | | | 0.27 | |
| v/s Ratio Perm | 0.05 | | c0.43 | 0.00 | 0.03 | | c0.29 | | | 0.01 | | |
| v/c Ratio | 0.49 | 0.52 | 0.43 | 0.02 | 0.32 | | 0.82 | 0.47 | | 0.04 | 0.83 | |
| Uniform Delay, d1 | 33.1 | 33.2 | 0.0 | 31.5 | 32.5 | | 15.6 | 4.1 | | 18.1 | 24.3 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.9 | 2.7 | 0.8 | 0.1 | 1.0 | | 6.8 | 0.1 | | 0.1 | 5.4 | |
| Delay (s) | 35.9 | 35.9 | 0.8 | 31.6 | 33.5 | | 22.4 | 4.2 | | 18.2 | 29.7 | |
| Level of Service | D | D | A | C | C | | C | A | | B | C | |
| Approach Delay (s) | | 7.5 | | | 33.4 | | | 10.3 | | | 29.6 | |
| Approach LOS | | A | | | C | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 15.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.84 | | |
| Actuated Cycle Length (s) | 77.4 | Sum of lost time (s) | 15.8 |
| Intersection Capacity Utilization | 81.7% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# 2041 Total Traffic Volumes with Improvements

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 303 | 342 | 257 | 276 | 198 | 61 | 203 | 1381 | 497 | 103 | 1193 | 215 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 319 | 360 | 271 | 291 | 208 | 64 | 214 | 1454 | 523 | 108 | 1256 | 226 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 393 | 376 | 462 | 350 | 316 | 97 | 259 | 1578 | 953 | 184 | 1469 | 829 |
| Arrive On Green | 0.13 | 0.20 | 0.20 | 0.16 | 0.23 | 0.23 | 0.09 | 0.45 | 0.45 | 0.06 | 0.42 | 0.41 |
| Sat Flow, veh/h | 1774 | 1863 | 1583 | 1774 | 1368 | 421 | 1774 | 3539 | 1583 | 1774 | 3539 | 1583 |
| Grp Volume(v), veh/h | 319 | 360 | 271 | 291 | 0 | 272 | 214 | 1454 | 523 | 108 | 1256 | 226 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1863 | 1583 | 1774 | 0 | 1788 | 1774 | 1770 | 1583 | 1774 | 1770 | 1583 |
| Q Serve(g_s), s | 14.0 | 21.1 | 16.2 | 13.5 | 0.0 | 15.2 | 7.2 | 42.7 | 21.7 | 3.8 | 35.6 | 8.8 |
| Cycle Q Clear(g_c), s | 14.0 | 21.1 | 16.2 | 13.5 | 0.0 | 15.2 | 7.2 | 42.7 | 21.7 | 3.8 | 35.6 | 8.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.24 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 393 | 376 | 462 | 350 | 0 | 413 | 259 | 1578 | 953 | 184 | 1469 | 829 |
| V/C Ratio(X) | 0.81 | 0.96 | 0.59 | 0.83 | 0.00 | 0.66 | 0.83 | 0.92 | 0.55 | 0.59 | 0.85 | 0.27 |
| Avail Cap(c_a), veh/h | 393 | 376 | 462 | 425 | 0 | 485 | 259 | 1578 | 953 | 207 | 1469 | 829 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 33.0 | 43.7 | 33.4 | 28.4 | 0.0 | 38.5 | 23.8 | 28.8 | 13.1 | 25.4 | 29.3 | 14.6 |
| Incr Delay (d2), s/veh | 12.2 | 35.6 | 1.9 | 11.1 | 0.0 | 2.6 | 19.4 | 10.3 | 2.3 | 3.4 | 6.6 | 0.8 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.0 | 14.6 | 7.3 | 7.6 | 0.0 | 7.8 | 4.9 | 23.1 | 10.0 | 2.0 | 18.6 | 4.0 |
| LnGrp Delay(d),s/veh | 45.3 | 79.3 | 35.3 | 39.5 | 0.0 | 41.1 | 43.3 | 39.1 | 15.3 | 28.8 | 35.9 | 15.4 |
| LnGrp LOS | D | E | D | D | | D | D | D | B | C | D | B |
| Approach Vol, veh/h | | 950 | | | 563 | | | 2191 | | | 1590 | |
| Approach Delay, s/veh | | 55.3 | | | 40.3 | | | 33.9 | | | 32.5 | |
| Approach LOS | | E | | | D | | | C | | | C | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 8.6 | 55.1 | 19.3 | 27.6 | 12.0 | 51.7 | 16.0 | 30.9 |
| Change Period (Y+Rc), s | 3.0 | * 6.8 | 3.0 | * 6.3 | 3.0 | * 6.8 | 3.0 | * 6.3 |
| Max Green Setting (Gmax), s | 7.0 | * 47 | 20.9 | * 21 | 9.0 | * 45 | 13.0 | * 29 |
| Max Q Clear Time (g_c+I1), s | 5.8 | 44.7 | 15.5 | 23.1 | 9.2 | 37.6 | 16.0 | 17.2 |
| Green Ext Time (p_c), s | 0.0 | 2.2 | 0.7 | 0.0 | 0.0 | 7.3 | 0.0 | 7.3 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 38.0 |
| HCM 2010 LOS | D |

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 240 | 8 | 218 | 21 | 7 | 16 | 355 | 1909 | 17 | 22 | 1562 | 284 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 253 | 8 | 229 | 22 | 7 | 17 | 374 | 2009 | 18 | 23 | 1644 | 299 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 2 | 0 | 1 | 2 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 286 | 329 | 403 | 149 | 33 | 80 | 435 | 2499 | 22 | 135 | 1767 | 312 |
| Arrive On Green | 0.08 | 0.18 | 0.18 | 0.07 | 0.07 | 0.07 | 0.08 | 0.70 | 0.70 | 0.59 | 0.59 | 0.59 |
| Sat Flow, veh/h | 1774 | 1863 | 1583 | 1139 | 483 | 1173 | 3442 | 3595 | 32 | 209 | 3008 | 531 |
| Grp Volume(v), veh/h | 253 | 8 | 229 | 22 | 0 | 24 | 374 | 988 | 1039 | 23 | 947 | 996 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1863 | 1583 | 1139 | 0 | 1656 | 1721 | 1770 | 1857 | 209 | 1770 | 1769 |
| Q Serve(g_s), s | 8.0 | 0.4 | 12.9 | 1.9 | 0.0 | 1.4 | 6.0 | 39.3 | 39.5 | 8.7 | 48.4 | 54.2 |
| Cycle Q Clear(g_c), s | 8.0 | 0.4 | 12.9 | 1.9 | 0.0 | 1.4 | 6.0 | 39.3 | 39.5 | 37.3 | 48.4 | 54.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.71 | 1.00 | | 0.02 | 1.00 | | 0.30 |
| Lane Grp Cap(c), veh/h | 286 | 329 | 403 | 149 | 0 | 114 | 435 | 1230 | 1291 | 135 | 1040 | 1040 |
| V/C Ratio(X) | 0.89 | 0.02 | 0.57 | 0.15 | 0.00 | 0.21 | 0.86 | 0.80 | 0.81 | 0.17 | 0.91 | 0.96 |
| Avail Cap(c_a), veh/h | 286 | 493 | 543 | 249 | 0 | 260 | 436 | 1230 | 1291 | 135 | 1040 | 1040 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 43.0 | 34.7 | 33.1 | 45.1 | 0.0 | 44.9 | 30.4 | 10.7 | 10.8 | 27.5 | 18.6 | 19.9 |
| Incr Delay (d2), s/veh | 26.5 | 0.0 | 1.3 | 0.5 | 0.0 | 0.9 | 15.9 | 5.6 | 5.4 | 2.7 | 13.2 | 19.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 8.5 | 0.2 | 5.7 | 0.6 | 0.0 | 0.7 | 6.1 | 20.8 | 21.9 | 0.6 | 27.2 | 31.9 |
| LnGrp Delay(d),s/veh | 69.5 | 34.8 | 34.4 | 45.6 | 0.0 | 45.8 | 46.2 | 16.3 | 16.2 | 30.2 | 31.9 | 39.4 |
| LnGrp LOS | E | C | C | D | | D | D | B | B | C | C | D |
| Approach Vol, veh/h | | 490 | | | 46 | | | 2401 | | | 1966 | |
| Approach Delay, s/veh | | 52.5 | | | 45.7 | | | 20.9 | | | 35.7 | |
| Approach LOS | | D | | | D | | | C | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | | 86.7 | | 24.3 | 11.0 | 75.7 | 11.0 | 13.3 |
| Change Period (Y+Rc), s | | * 6.8 | | * 6.3 | 3.0 | * 6.8 | 3.0 | * 6.3 |
| Max Green Setting (Gmax), s | | * 71 | | * 27 | 8.0 | * 60 | 8.0 | * 16 |
| Max Q Clear Time (g_c+I1), s | | 41.5 | | 14.9 | 8.0 | 56.2 | 10.0 | 3.9 |
| Green Ext Time (p_c), s | | 29.3 | | 1.2 | 0.0 | 3.7 | 0.0 | 1.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 30.2 |
| HCM 2010 LOS | C |

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.5 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 139 | 321 | 450 | 49 | 111 | 1230 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | Free |
| Storage Length | 500 | - | - | - | 0 | 800 |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 146 | 338 | 474 | 52 | 117 | 1295 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 525 | 0 | - | 0 | 1130 | - |
| Stage 1 | - | - | - | - | 499 | - |
| Stage 2 | - | - | - | - | 631 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | - |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | - |
| Pot Cap-1 Maneuver | 1042 | - | - | - | 225 | 0 |
| Stage 1 | - | - | - | - | 610 | 0 |
| Stage 2 | - | - | - | - | 530 | 0 |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1042 | - | - | - | 193 | - |
| Mov Cap-2 Maneuver | - | - | - | - | 323 | - |
| Stage 1 | - | - | - | - | 610 | - |
| Stage 2 | - | - | - | - | 456 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 2.7 | 0 | 22.3 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 | SBLn2 |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1042 | - | - | - | 323 | - |
| HCM Lane V/C Ratio | 0.14 | - | - | - | 0.362 | - |
| HCM Control Delay (s) | 9 | - | - | - | 22.3 | 0 |
| HCM Lane LOS | A | - | - | - | C | A |
| HCM 95th %tile Q(veh) | 0.5 | - | - | - | 1.6 | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 162 | 109 | 181 | 410 | 285 | 75 | 208 | 958 | 141 | 38 | 981 | 222 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 171 | 115 | 191 | 432 | 300 | 79 | 219 | 1008 | 148 | 40 | 1033 | 234 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 406 | 353 | 455 | 639 | 439 | 116 | 267 | 1233 | 913 | 218 | 1058 | 608 |
| Arrive On Green | 0.11 | 0.19 | 0.19 | 0.23 | 0.31 | 0.31 | 0.10 | 0.35 | 0.35 | 0.05 | 0.30 | 0.29 |
| Sat Flow, veh/h | 1774 | 1863 | 1583 | 1774 | 1422 | 375 | 1774 | 3539 | 1583 | 1774 | 3539 | 1583 |
| Grp Volume(v), veh/h | 171 | 115 | 191 | 432 | 0 | 379 | 219 | 1008 | 148 | 40 | 1033 | 234 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1863 | 1583 | 1774 | 0 | 1797 | 1774 | 1770 | 1583 | 1774 | 1770 | 1583 |
| Q Serve(g_s), s | 6.1 | 4.4 | 8.0 | 14.6 | 0.0 | 15.1 | 6.6 | 21.2 | 3.6 | 1.2 | 23.6 | 8.7 |
| Cycle Q Clear(g_c), s | 6.1 | 4.4 | 8.0 | 14.6 | 0.0 | 15.1 | 6.6 | 21.2 | 3.6 | 1.2 | 23.6 | 8.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.21 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 406 | 353 | 455 | 639 | 0 | 554 | 267 | 1233 | 913 | 218 | 1058 | 608 |
| V/C Ratio(X) | 0.42 | 0.33 | 0.42 | 0.68 | 0.00 | 0.68 | 0.82 | 0.82 | 0.16 | 0.18 | 0.98 | 0.38 |
| Avail Cap(c_a), veh/h | 407 | 425 | 516 | 710 | 0 | 693 | 267 | 1233 | 913 | 305 | 1058 | 608 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 22.4 | 28.6 | 23.6 | 17.2 | 0.0 | 24.7 | 19.8 | 24.2 | 8.1 | 19.7 | 28.3 | 18.2 |
| Incr Delay (d2), s/veh | 0.7 | 0.5 | 0.6 | 2.2 | 0.0 | 2.0 | 18.3 | 6.1 | 0.4 | 0.4 | 22.5 | 1.8 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.0 | 2.3 | 3.5 | 7.5 | 0.0 | 7.8 | 4.6 | 11.3 | 1.6 | 0.6 | 14.8 | 4.1 |
| LnGrp Delay(d),s/veh | 23.1 | 29.1 | 24.2 | 19.4 | 0.0 | 26.7 | 38.1 | 30.3 | 8.4 | 20.1 | 50.8 | 20.0 |
| LnGrp LOS | C | C | C | B | | C | D | C | A | C | D | C |
| Approach Vol, veh/h | | 477 | | | 811 | | | 1375 | | | 1307 | |
| Approach Delay, s/veh | | 25.0 | | | 22.8 | | | 29.2 | | | 44.4 | |
| Approach LOS | | C | | | C | | | C | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 6.0 | 34.2 | 20.7 | 20.8 | 10.0 | 30.2 | 10.9 | 30.5 |
| Change Period (Y+Rc), s | 3.0 | * 6.8 | 3.0 | * 6.3 | 3.0 | * 6.8 | 3.0 | * 6.3 |
| Max Green Setting (Gmax), s | 7.0 | * 23 | 20.9 | * 18 | 7.0 | * 23 | 8.0 | * 31 |
| Max Q Clear Time (g_c+I1), s | 3.2 | 23.2 | 16.6 | 10.0 | 8.6 | 25.6 | 8.1 | 17.1 |
| Green Ext Time (p_c), s | 0.0 | 0.2 | 1.0 | 4.5 | 0.0 | 0.0 | 0.0 | 7.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 32.4 |
| HCM 2010 LOS | C |

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 281 | 2 | 378 | 20 | 3 | 14 | 126 | 1130 | 5 | 13 | 1426 | 182 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 296 | 2 | 398 | 21 | 3 | 15 | 133 | 1189 | 5 | 14 | 1501 | 192 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 2 | 0 | 1 | 2 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 418 | 490 | 504 | 228 | 40 | 200 | 374 | 2119 | 9 | 262 | 1570 | 198 |
| Arrive On Green | 0.08 | 0.26 | 0.26 | 0.15 | 0.15 | 0.15 | 0.06 | 0.59 | 0.59 | 0.50 | 0.50 | 0.50 |
| Sat Flow, veh/h | 1774 | 1863 | 1583 | 981 | 271 | 1353 | 3442 | 3614 | 15 | 467 | 3162 | 400 |
| Grp Volume(v), veh/h | 296 | 2 | 398 | 21 | 0 | 18 | 133 | 582 | 612 | 14 | 832 | 861 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1863 | 1583 | 981 | 0 | 1624 | 1721 | 1770 | 1860 | 467 | 1770 | 1792 |
| Q Serve(g_s), s | 7.0 | 0.1 | 19.9 | 1.6 | 0.0 | 0.8 | 1.5 | 17.6 | 17.6 | 1.7 | 38.8 | 40.4 |
| Cycle Q Clear(g_c), s | 7.0 | 0.1 | 19.9 | 1.6 | 0.0 | 0.8 | 1.5 | 17.6 | 17.6 | 11.5 | 38.8 | 40.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.83 | 1.00 | | 0.01 | 1.00 | | 0.22 |
| Lane Grp Cap(c), veh/h | 418 | 490 | 504 | 228 | 0 | 240 | 374 | 1037 | 1090 | 262 | 879 | 890 |
| V/C Ratio(X) | 0.71 | 0.00 | 0.79 | 0.09 | 0.00 | 0.08 | 0.36 | 0.56 | 0.56 | 0.05 | 0.95 | 0.97 |
| Avail Cap(c_a), veh/h | 418 | 558 | 562 | 264 | 0 | 299 | 461 | 1037 | 1090 | 262 | 879 | 890 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 30.9 | 23.6 | 27.0 | 32.2 | 0.0 | 31.9 | 19.7 | 11.1 | 11.1 | 17.0 | 20.8 | 21.2 |
| Incr Delay (d2), s/veh | 5.5 | 0.0 | 6.8 | 0.2 | 0.0 | 0.1 | 0.6 | 2.2 | 2.1 | 0.4 | 20.0 | 23.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.5 | 0.0 | 9.6 | 0.4 | 0.0 | 0.4 | 0.9 | 9.2 | 9.6 | 0.2 | 23.6 | 25.6 |
| LnGrp Delay(d),s/veh | 36.3 | 23.6 | 33.8 | 32.4 | 0.0 | 32.0 | 20.3 | 13.3 | 13.2 | 17.4 | 40.8 | 44.4 |
| LnGrp LOS | D | C | C | C | | C | C | B | B | B | D | D |
| Approach Vol, veh/h | | 696 | | | 39 | | | 1327 | | | 1707 | |
| Approach Delay, s/veh | | 34.8 | | | 32.2 | | | 13.9 | | | 42.4 | |
| Approach LOS | | C | | | C | | | B | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | | 60.9 | | 29.1 | 7.8 | 53.1 | 10.0 | 19.1 |
| Change Period (Y+Rc), s | | * 6.8 | | * 6.3 | 3.0 | * 6.8 | 3.0 | * 6.3 |
| Max Green Setting (Gmax), s | | * 51 | | * 26 | 7.0 | * 41 | 7.0 | * 16 |
| Max Q Clear Time (g_c+I1), s | | 19.6 | | 21.9 | 3.5 | 42.4 | 9.0 | 3.6 |
| Green Ext Time (p_c), s | | 31.1 | | 0.9 | 0.2 | 0.0 | 0.0 | 2.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 30.9 |
| HCM 2010 LOS | C |

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.4 |

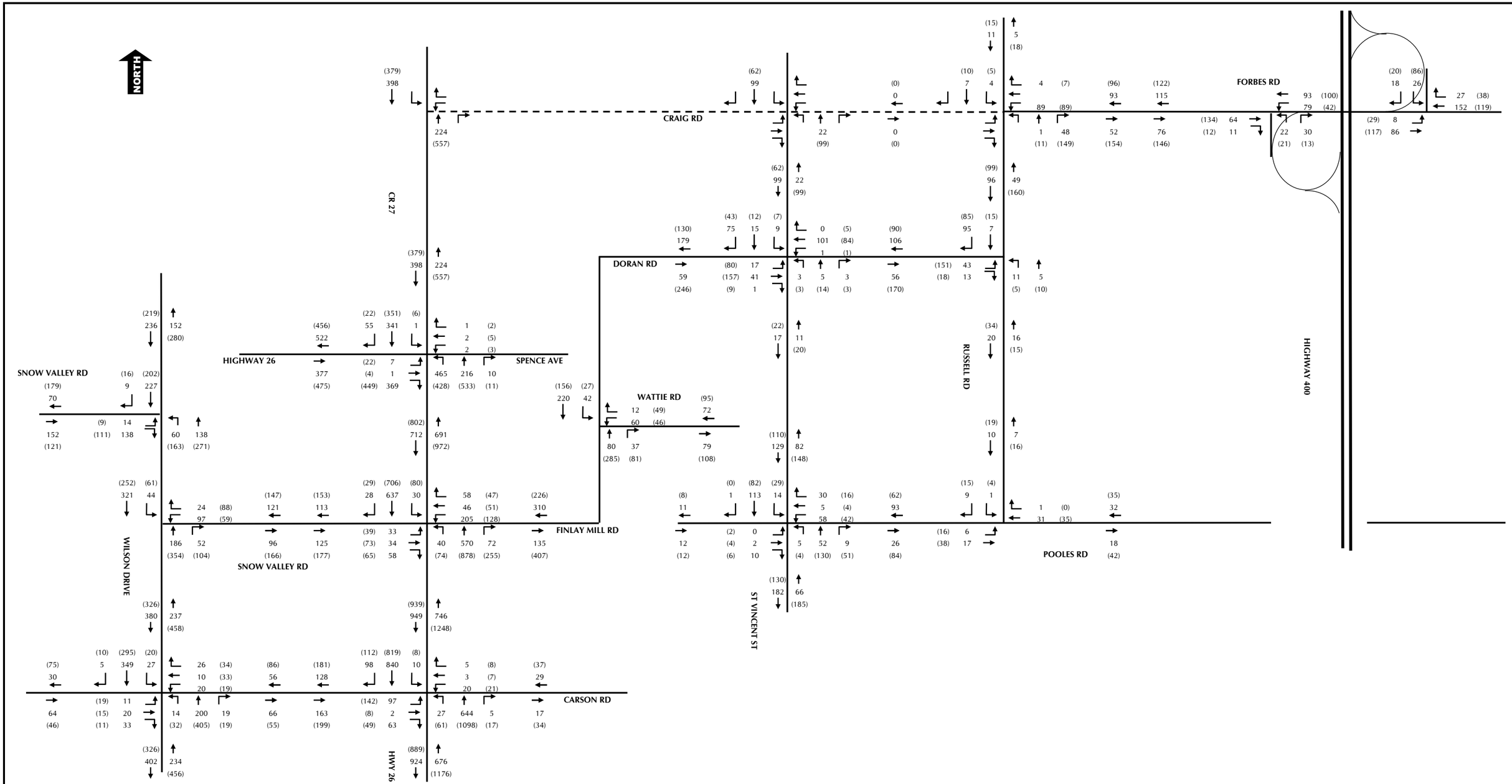
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 202 | 428 | 297 | 34 | 33 | 430 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | Free |
| Storage Length | 500 | - | - | - | 0 | 800 |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 213 | 451 | 313 | 36 | 35 | 453 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 348 | 0 | - | 0 | 1207 | - |
| Stage 1 | - | - | - | - | 331 | - |
| Stage 2 | - | - | - | - | 876 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | - |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | - |
| Pot Cap-1 Maneuver | 1211 | - | - | - | 203 | 0 |
| Stage 1 | - | - | - | - | 728 | 0 |
| Stage 2 | - | - | - | - | 407 | 0 |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1211 | - | - | - | 167 | - |
| Mov Cap-2 Maneuver | - | - | - | - | 270 | - |
| Stage 1 | - | - | - | - | 728 | - |
| Stage 2 | - | - | - | - | 335 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 2.8 | 0 | 20.3 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 | SBLn2 |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1211 | - | - | - | 270 | - |
| HCM Lane V/C Ratio | 0.176 | - | - | - | 0.129 | - |
| HCM Control Delay (s) | 8.6 | - | - | - | 20.3 | 0 |
| HCM Lane LOS | A | - | - | - | C | A |
| HCM 95th %tile Q(veh) | 0.6 | - | - | - | 0.4 | - |

# Appendix D
# 2015 EXISTING TRAFFIC

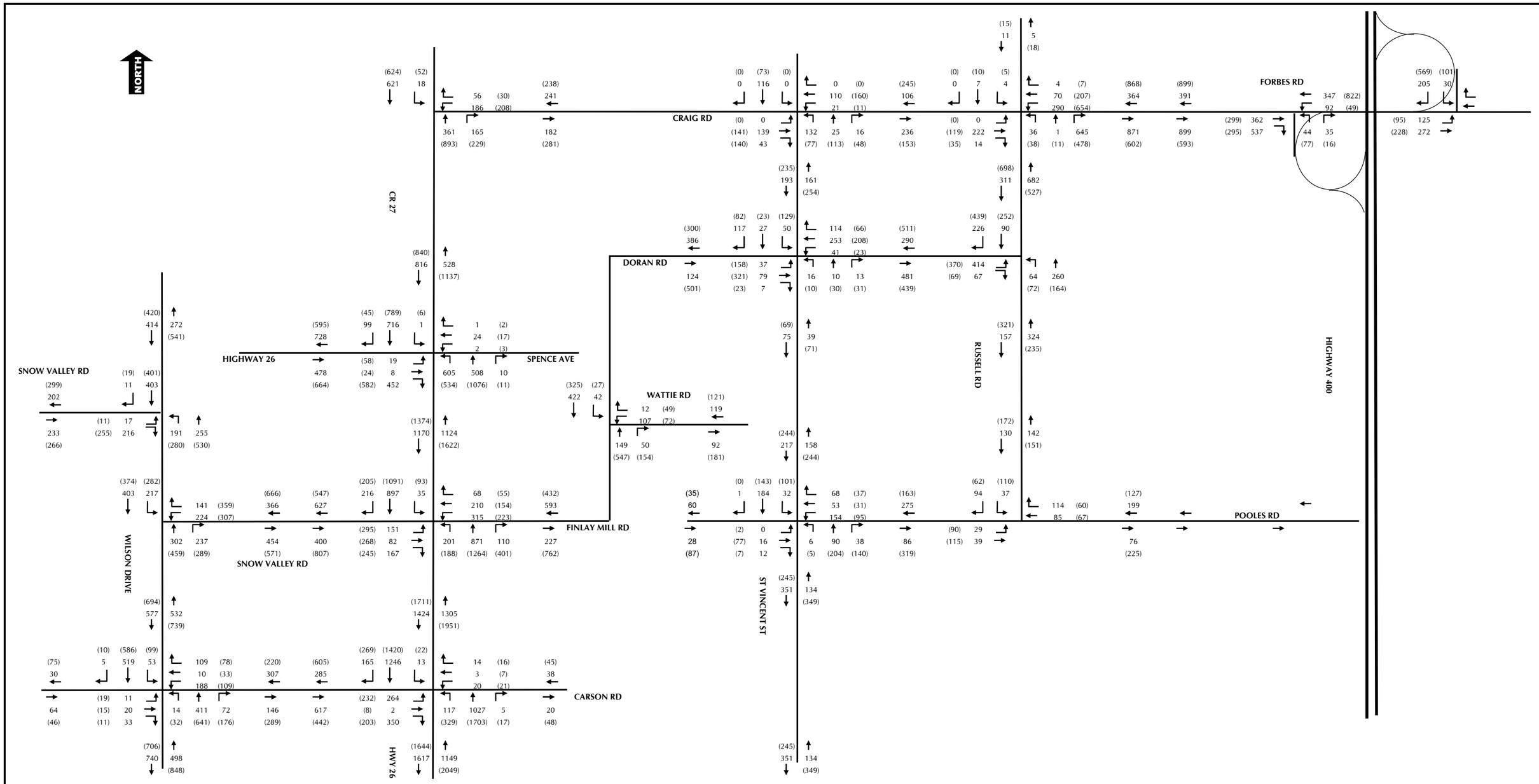



100 (100) AM (PM) peak hour

**Figure 2**
**Existing 2015 Traffic Volumes**
**Midhurst EA Phases 3 & 4**
**Township of Springwater**

Ainley Group — Consulting Engineers Planners

# APPENDIX E
# PROJECTED 2031 TOTAL TRAFFIC

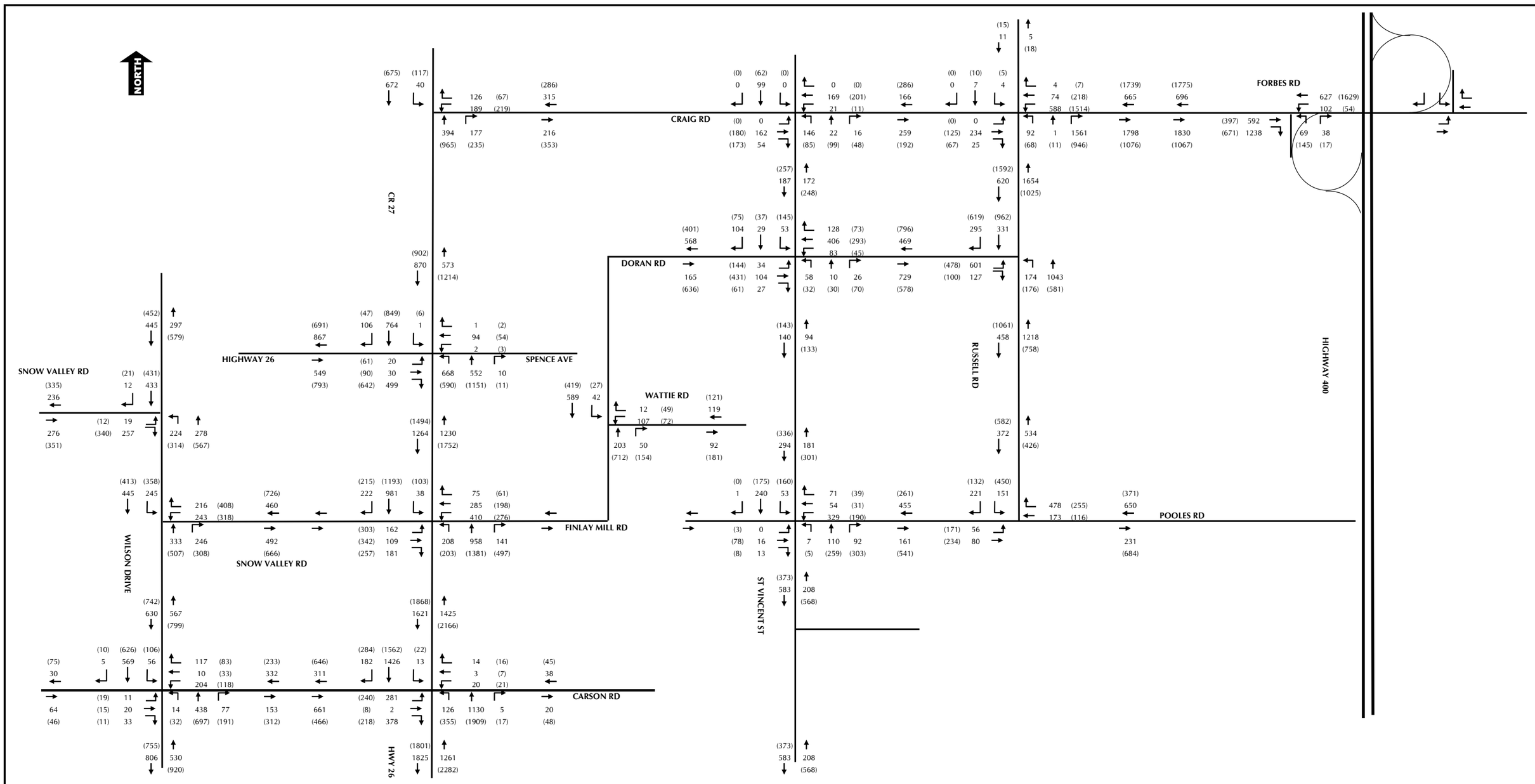



100 (100) AM (PM) peak hour

**Figure 11**
**2031 Total Traffic Volumes**
**Midhurst EA Phases 3 & 4**
**Township of Springwater**

Mainley GROUP CONSULTING ENGINEERS PLANNERS

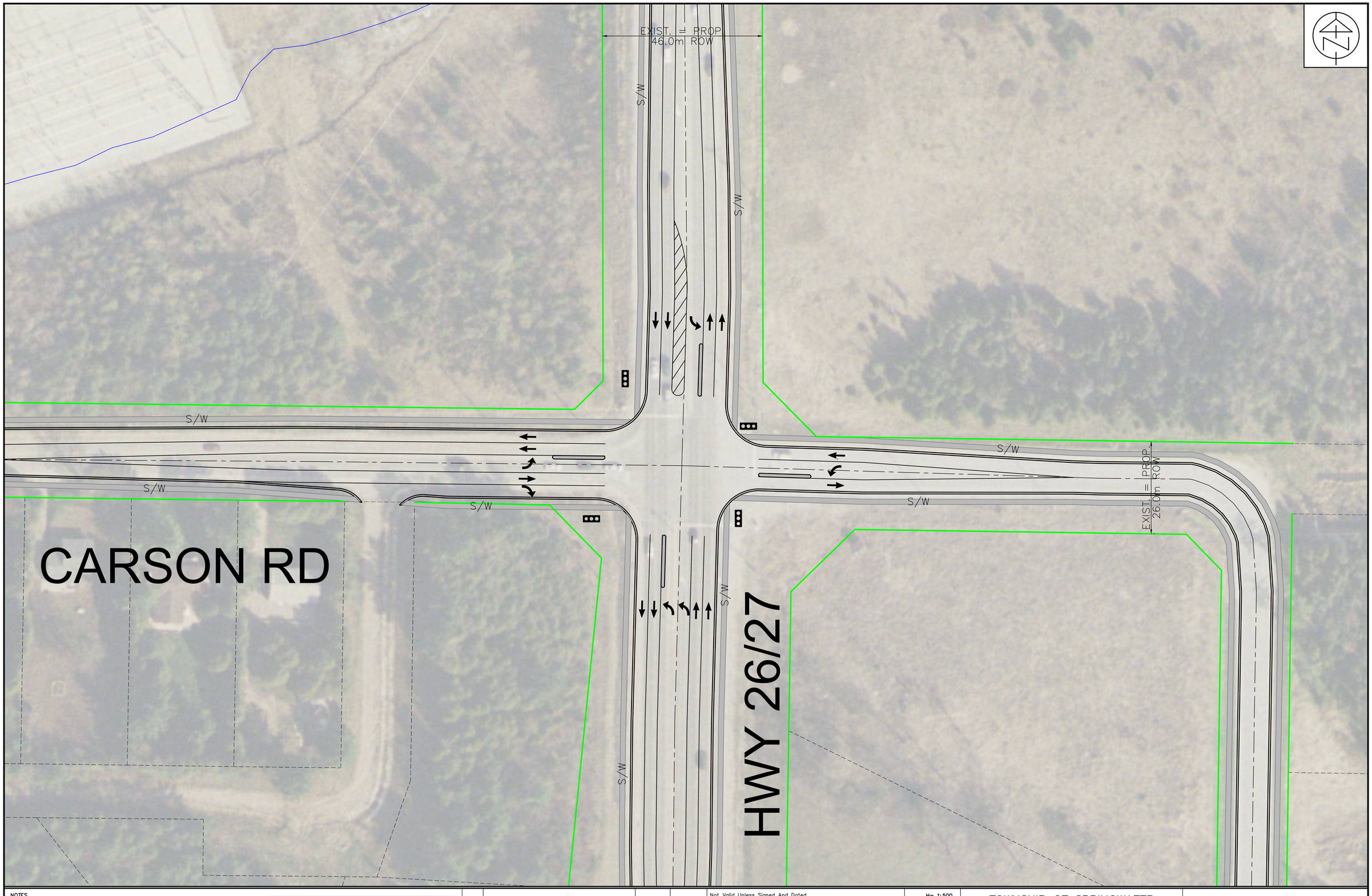
# APPENDIX F
# PROJECTED 2041 TOTAL TRAFFIC




100 (100) AM (PM) peak hour

**Figure 12**
**2041 Total Traffic Volumes**
**Midhurst EA Phases 3 & 4**
**Township of Springwater**

Mainley GROUP CONSULTING ENGINEERS PLANNERS




NOTES

**CONTRACT DRAWINGS**

*Contractor must verify all dimensions and be responsible for same. Any discrepancies must be reported to the Engineer before commencing work. Drawings are not to be scaled. Drawings may not be used for any purpose other than that stipulated in the contract agreement between the owner/client and the Engineer without the express written consent of Ainley & Associates Limited. Use of these drawings by any party for any other purpose is subject to the following caution.*

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| | |
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| SCALE: | H= 1:500<br>V= N/A |
| DESIGN: | |
| DRAWN: | |
| CHECKED: | |
| DATE: | MAY/16 |

# TOWNSHIP OF SPRINGWATER
## MIDHURST PHASING PLAN
## CRAIG ROAD OPTIONS
**MIDHURST, ON**

CARSON ROAD – HIGHWAY 26/27

Ainley GROUP
CONSULTING ENGINEERS PLANNERS

CONTRACT No. 113027 | DWG. No. 113027 – 4–2

NOTES

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PRELIMINARY

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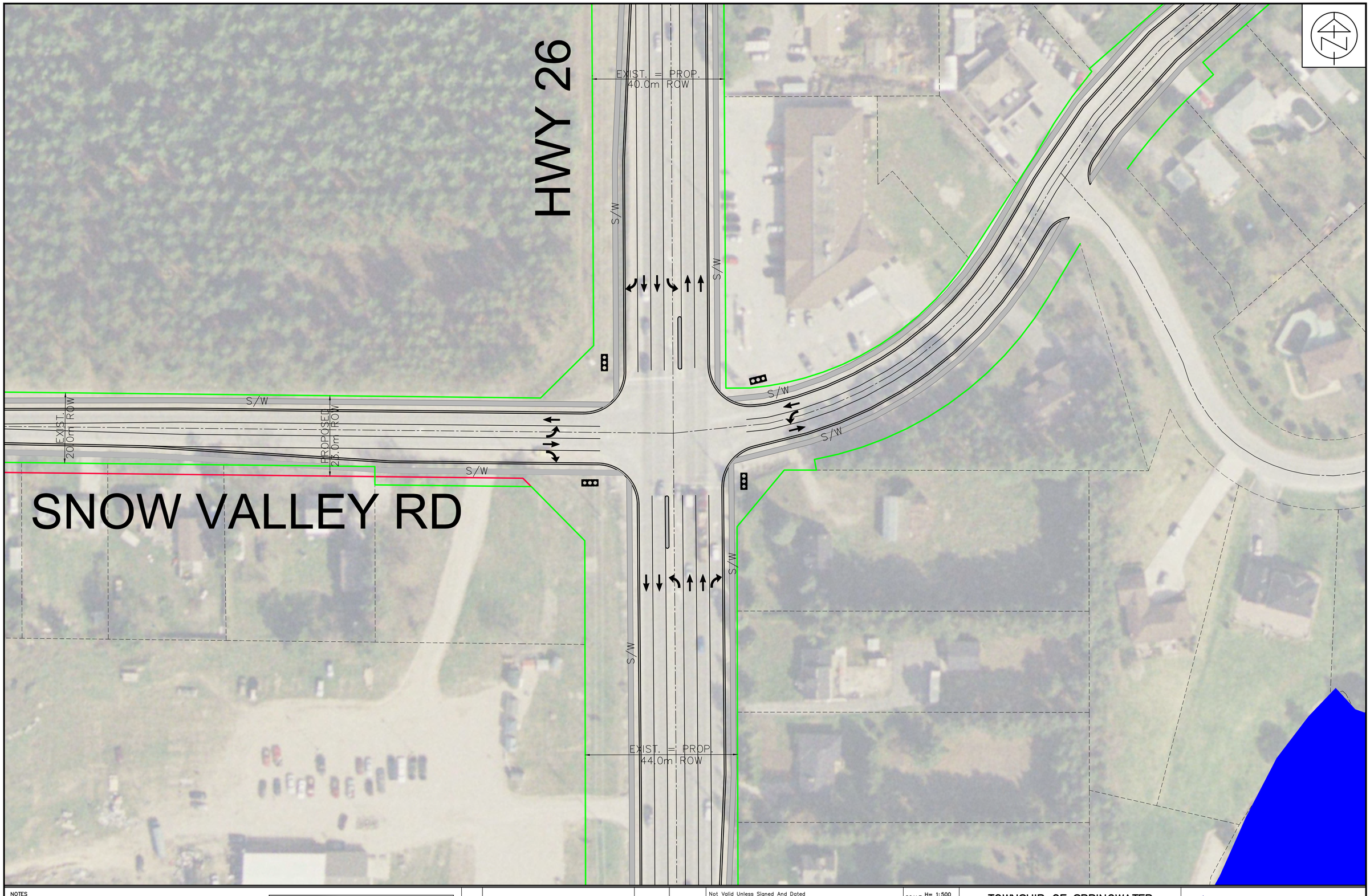
| SCALE: | H= 1:500<br>V= N/A |
| DESIGN: | |
| DRAWN: | |
| CHECKED: | |
| DATE: | MAY/16 |

# TOWNSHIP OF SPRINGWATER
## MIDHURST PHASING PLAN
## CRAIG ROAD OPTIONS
**MIDHURST, ON**

COUNTRY RD 27 – HIGHWAY 26

Ainley GROUP
CONSULTING ENGINEERS PLANNERS

CONTRACT No. 113027 | DWG. No. 113027 – 4–2




NOTES

**CONTRACT DRAWINGS**
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Not Valid Unless Signed And Dated

PRELIMINARY

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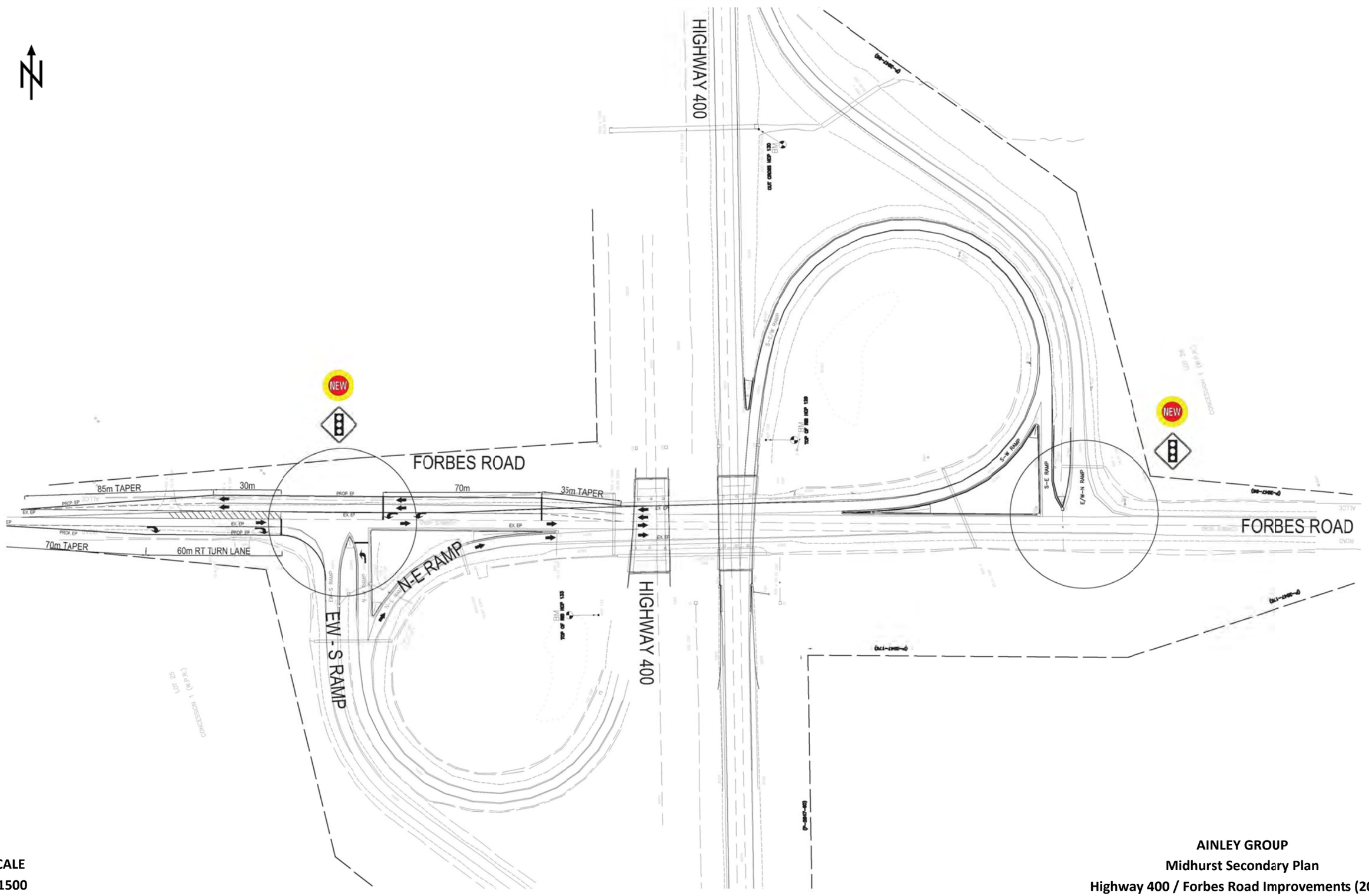
|---|---|
| SCALE: | H= 1:500 V= N/A |
| DESIGN: | |
| DRAWN: | |
| CHECKED: | |
| DATE: | MAY/16 |

# TOWNSHIP OF SPRINGWATER
# MIDHURST PHASING PLAN
# CRAIG ROAD OPTIONS
## MIDHURST, ON

SNOW VALLEY ROAD – HIGHWAY 26/27

Ainley GROUP
CONSULTING ENGINEERS PLANNERS

CONTRACT No. 113027 | DWG. No. 113027 – 4–2




**SCALE**
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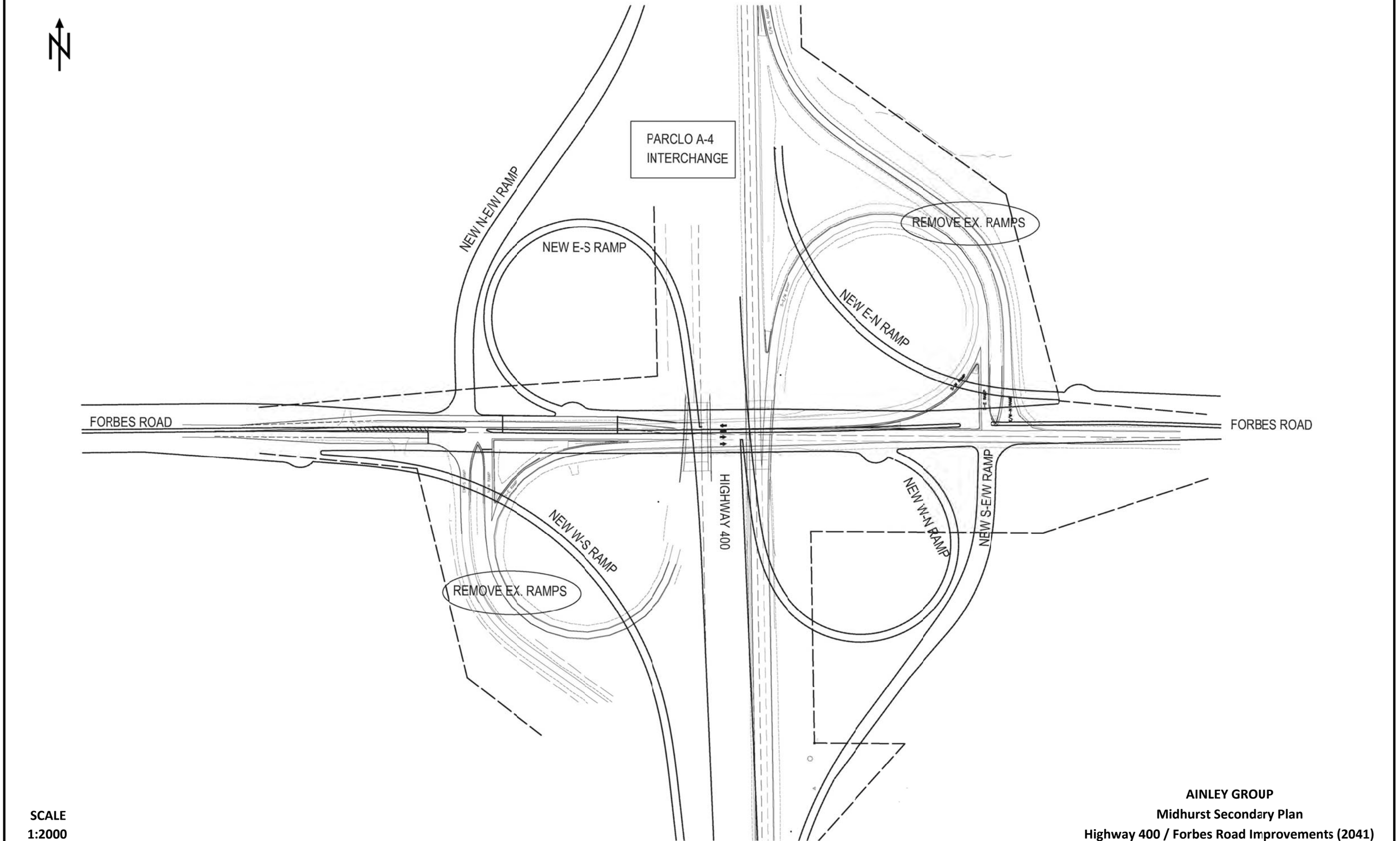
**AINLEY GROUP**
**Midhurst Secondary Plan**
**Highway 400 / Forbes Road Improvements (2031)**




**SCALE**
**1:2000**

**AINLEY GROUP**
**Midhurst Secondary Plan**
**Highway 400 / Forbes Road Improvements (2041)**

## Joe Mullan

**From:** Dorton, Peter (MTO) <Peter.Dorton@ontario.ca>
**Sent:** Wednesday, October 18, 2017 2:26 PM
**To:** Joe Mullan
**Cc:** Steve Fournier; Heather Coleman; brent.spagnol@springwater.ca; Meile, Christian (Christian.Meile@simcoe.ca); Vandenberg, Robert (MTO); Uddin, Zaka (MTO); Diczki, Tarita (MTO); Janke, Aaron (MTO); Aurini, Shawn (MTO); Tai, Arthur (MTO); Hao, Jiang Yang (MTO)
**Subject:** FW: Township of Springwater, Midhurst Secondary Plan - Hwy 400 / Forbes Road Interchange Analysis
**Attachments:** Midhurst 2041 Total PM Revised on Oct 10.syn; Hwy 26 at Spence Ave(Simcoe Rd 27).pdf; Figure 3.pdf

Joe:

We've completed our review of your July 12, 2017 circulation and offer the following comments:

We have noted the following discrepancies in the traffic volumes, trip generation rates and LOS values:

Figure 11, Total traffic volumes 2031

- Hwy 26/Spence Ave: the NBL pm traffic counts should be 514, not 534
- Hwy 400/Forbes Rd NB off ramp: the WBT and WBR traffic counts are not shown

Figure 12, Total traffic volumes 2041

- Hwy 400/Forbes Rd: NB off ramp traffic counts are not shown. Please show these on existing IC configuration and on Parclo A-4 configuration (per schematic)

Table 6, 2031 Intersection operations

- Hwy 400/Forbes Rd SB off ramp: AM NBL LOS should be C instead of E

Table 8, 2041 Intersection operations

- Hwy 26/Carson Rd SB: AM overall LOS should be D instead of C
  AM SBT LOS should be D instead of C
  AM overall LOS should be E instead of D

Table 4, Trip generation rates used are slightly lower than ITE trip generation manual.

| Land Use Code | Report (AM) | Report (PM) | ITE Trip Generation Manual (AM) | ITE Trip Generation Manual (PM) |
|---|---|---|---|---|
| Single family detached units (210) | 0.62 | 0.697 | 0.75 | 1.00 |
| Residential Condo/Townhouse Units (230) | -- | -- | 0.44 | 0.52 |
| General Light Industrial (110) | 0.3 | 0.31 | 0.44 | 0.42 |
| Shopping Center (820) | 0.8 | 3.75 | 0.96 | 3.71 |

While the analysis in the report should be updated to reflect the above comments, please address also the following:

- P. 4, 2nd paragraph, there is mention of existing warrant for signals at Hwy 26 / CR27. Please see attached the latest traffic counts taken on March 4, 2017 by MTO, including signal warrants showing that signals are not warranted under the current traffic conditions. We have also reviewed the 5 year collision history for this intersection and could not identify any collision pattern that could be prevented if signals were in place. Please provide projected signal warrants for 2031 and 2041 to see if signals will become warranted in the future.

- P. 5 / Growth from Midhurst developments: there is reference to a Figure 3. We did not see this figure in the TIS, and ask that you confirm that the reference is to Exhibit 3 (attached) from Aecom's memo dated Apr 26/16.

- P. 8 / Sec. 7 / Future Road Network: please confirm if road authorities have confirmed these will all be constructed within time frames noted.

- P.9: proposed new Craig Rd. extension out to CR27 is said to be opened by either 2018 or 2025 (not clear). Is this a local or County road, and has Simcoe County agreed to this new intersection being opened at CR27 by either 2018 or 2025?

- There is also mention of new St. Vincent St. connection between Belmont Cr. and Park Trail by 2025; please provide a plan to show where this is.

- P. 9 / Sec. 8 / 2031 Operations: signal at west ramp terminal of Hwy 400/Forbes IC said to be required, but this is also a recommendation for 2041 (on P.11 / Sec. 9). The schematic provided for 2031 at the IC shows both ramp terminals signalised in 2031. Please provide projected signal warrants to demonstrate signals will be warranted at both ramp terminals.

- P. 13: need for EB to NB LTL on Forbes at NB off-ramp (east ramp terminal) is mentioned twice. Please provide the LTL warrant analysis.

- P.15 / Conclusion: 2015 Horizon recommends signal at Hwy 26 / CR27; year 2015 recommendations are no longer appropriate. Please see comments above pertaining to signal warrants at this intersection.

- P. 15 Conclusions, recommended second NBLTL (double LTL) on Hwy 26/ @ Carson Rd. The analysis has the following discrepancies:
    - The NBLTL has 95th %-ile queue length of more than 153m, but the storage length is only 100m.
    - NB double left turn lane has only one receiving lane on Carson Rd west approach instead of 3 lanes. The 3rd lane is typically required to accommodate the truck turning radius if there is a high percentage of heavy vehicles.

  We've revised the Hwy 26/Carson Rd (2041) PM Total analysis (attached) keeping one NBLTL and reducing the cycle length to 110 sec from 140 sec and the result shows an improvement in the LOS of all the moves except that of the SB direction. Please revisit analysis and recommendation for the NB double LTL.

- 2031: the only recommendation is for EB RTL on Snow Valley Rd. at Hwy 26. Why is there no mention of the signals at Forbes IC shown in the 2031 schematic?

- 2041: please provide clarification on if 2041 recommendations may be required sooner. The signal recommendations for the IC seem 10 years late, as they are shown in 2031 schematic.

- There is no reference in the TIS to the schematic for 2041 showing a Parclo A-4 IC at Hwy 400 / Forbes Rd.. Please confirm how this requirement was determined, and note that the Township, as proponent, will be required to undertake an EA Study for reconfigured interchange.

Additional Comments on Schematics:

Highway 400 / Forbes Rd.:

- Please confirm the posted and design speed of Forbes through the interchange, and provide a Design Criteria table showing existing, standard, proposed.

- Is an EB LTL required at the east ramp terminal?

- If yes, does the Ramp N-E merge lane need to be extended beyond the left turn lane?

- The lane balancing/drops/tapers/curves at the west ramp terminal are all “compressed”.

- Consider moving west the entrance near to the west terminal intersection.

With respect to the 3 intersections on Highway 26:

- General:
    - Provide dimensions (storage, parallel, taper) radii, posted (and design) speeds, intersection skews, etc. for all roads.

- Carson/Hwy 26:
    - Existing the building in the SE quadrant is missing; aerials look to old.
    - Why has the existing NB RTL been removed?

- Snow Valley/Hwy 26:
    - Consider closing the southerly plaza entrance in the NE quadrant.
    - There is a new SB RTL shown, but is not identified in the TIS.
    - Please clarify what the red lines represent.

- CR 27/Hwy 26
    - Design is for signalized condition, but as noted earlier confirmation on need for signals is required.
    - LTL on west approach looks to be on curve; tangential approach would be needed for signals.
    - Show the existing WB RTL to the commuter parking lot in the NW quadrant.

Finally, please confirm that this TIS, including schematics, has been shared with and reviewed by Simcoe County.

Please feel free to contact me if you have any questions.

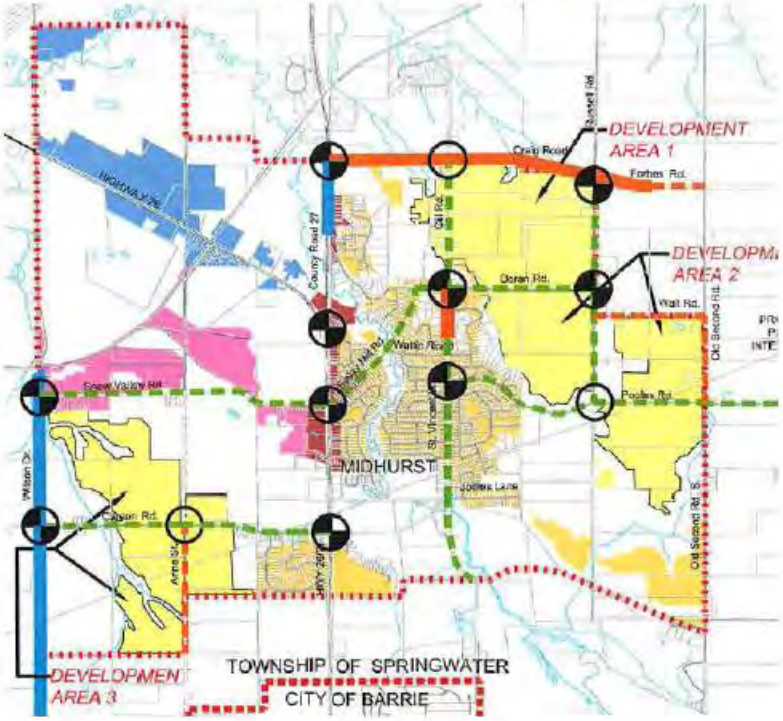
Thanks,
Peter Dorton
Senior Project Manager
MTO Central Region Engineering Office
Corridor Management Section
159 Sir William Hearst Ave., 7th Floor
Toronto, ON  M3M 0B7
Ph: 416-235-4280
Fx: 416-235-4267
Email: peter.dorton@ontario.ca

**Future Traffic Forecast**

The secondary plan for the, shown in **Exhibit 3**, consists of the following areas:

- Development Area 1 on the northeast corner: the area is located west of Russell road and bounded by Criag Road on the north and Doran Road on the south side
- Development Area 2 on the east: the area is located on both sides of Russell road and bounded on the north by Doran Road and Walt Road
- Development Area 3 on the southwest corner: the area is conccentrated around the intersection of Carson Road and Anne street
- Employment/Mixed Use Area (shown in pink and brown) on the west side: the area is around Snow Valley Road and Highway 26

**Exhibit 3 – Midhurst Development (Midhurst Transportation Master Plan)**



Ontario

# INTERSECTION LAYOUT SHEET

Date: 2017-03-04 Day: Tuesday Request # 156 Observer(s) Video

Gretch Code (LHRS O/S): 0256200000 Ramp # _____

Hwy # 26 Location Hwy 26 & Bayfield St. - Simcoe RD 27 - Spence Ave

Reg/Mun Midhurst Town/City _____

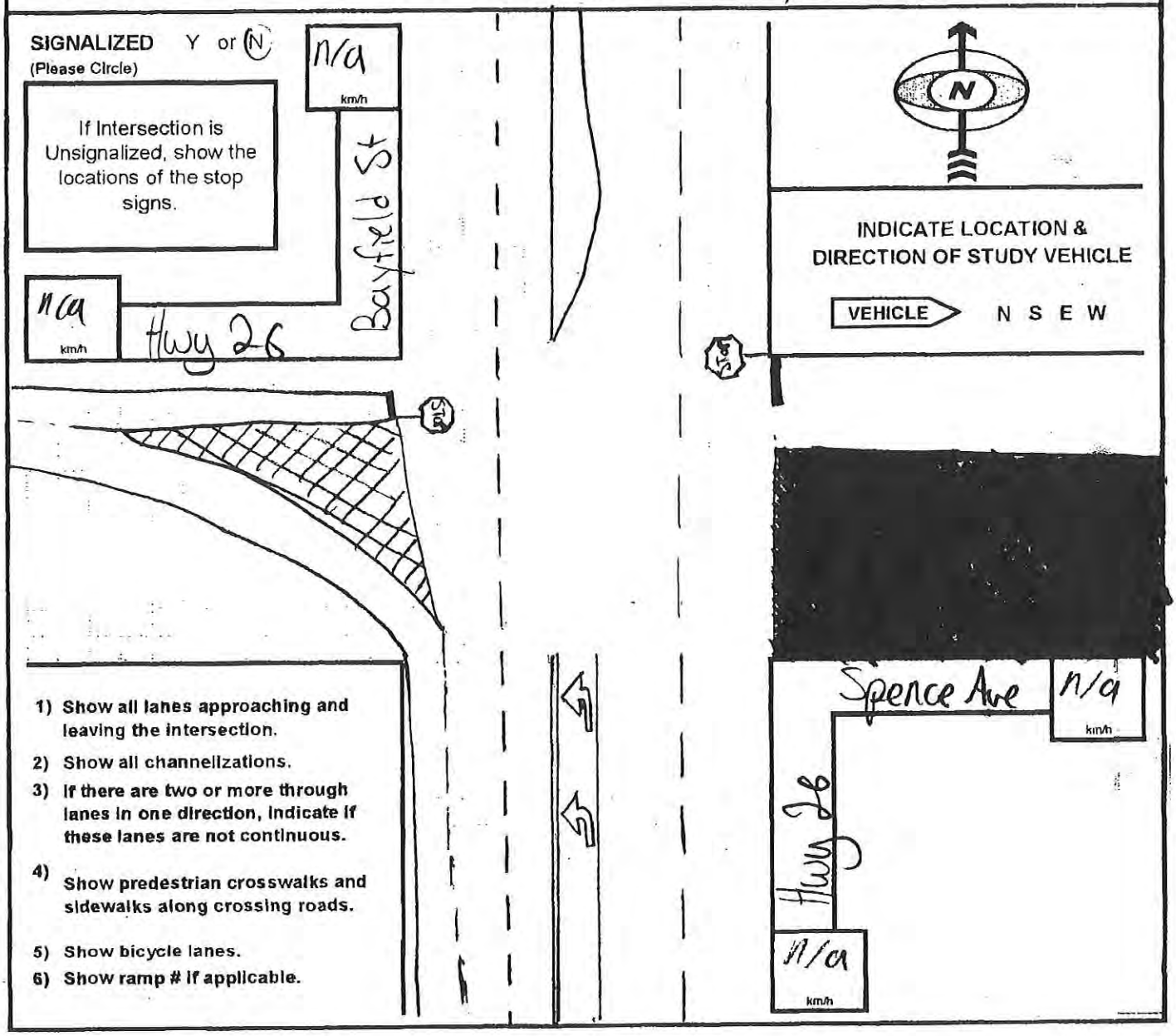
Comments _____

Segment 1 - AM or PM (Please Circle **ONE**) Weather Rain / Cloudy

| DATASETS |
|---|
| For office use only: |
| Edit File: |
| AM Peak: |
| PM Peak: |
| Processed by: |

**SIGNALIZED** Y or (N)
(Please Circle)

If Intersection is Unsignalized, show the locations of the stop signs.



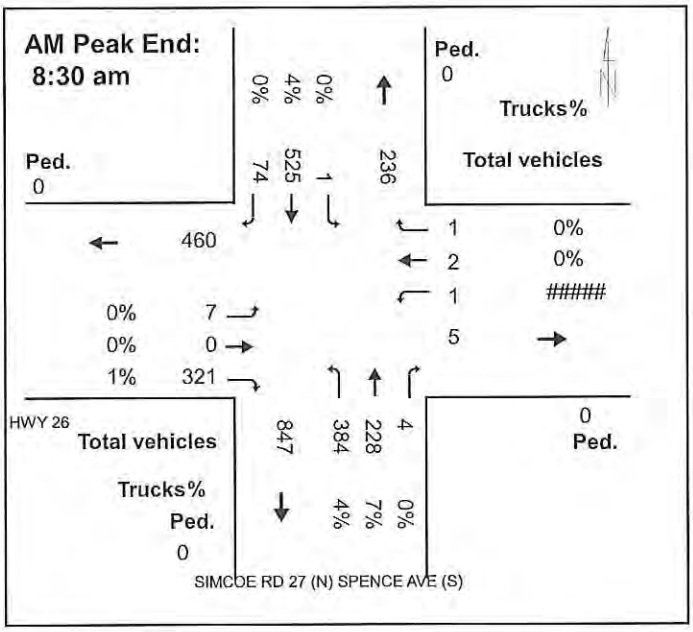

1) Show all lanes approaching and leaving the intersection.
2) Show all channelizations.
3) If there are two or more through lanes in one direction, indicate if these lanes are not continuous.
4) Show predestrian crosswalks and sidewalks along crossing roads.
5) Show bicycle lanes.
6) Show ramp # if applicable.

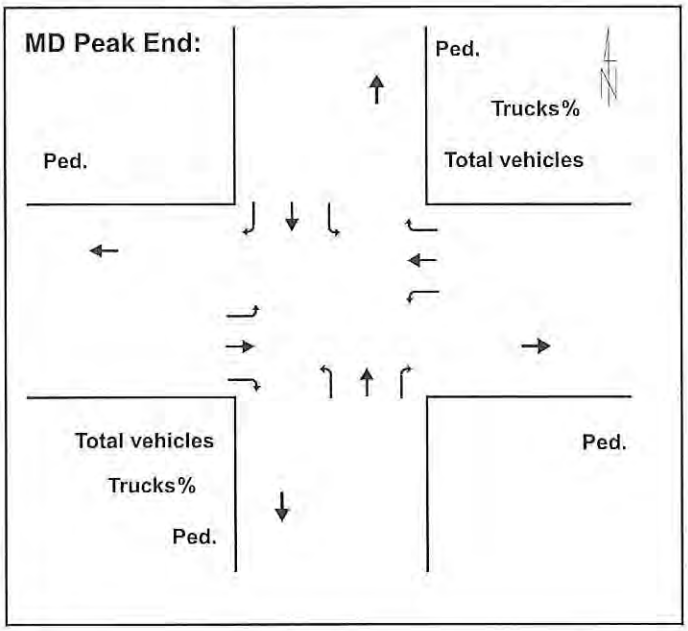
Ontario

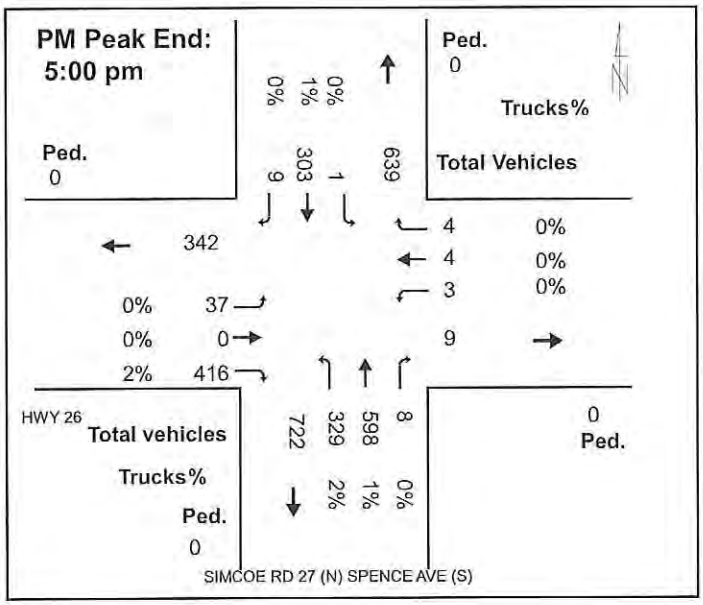
# HWY 26 @ SIMCOE RD 27 (N) SPENCE AVE (S)

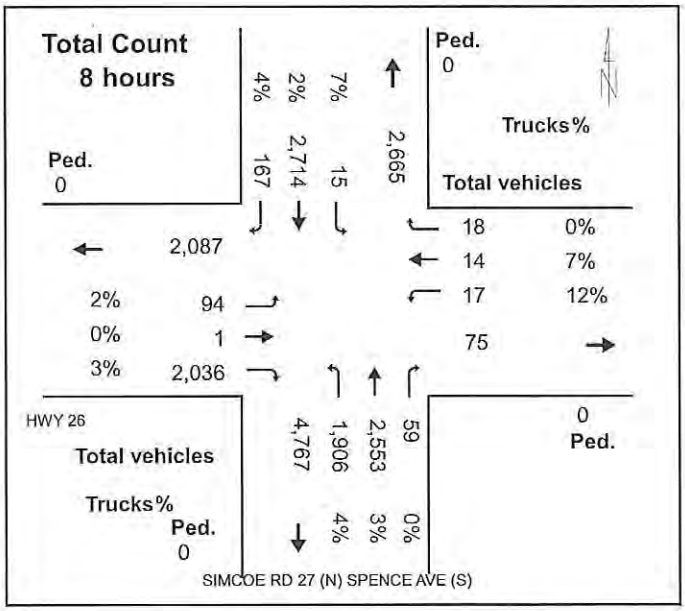
Central

**Intersection ID:256200000** **Count Day: Tuesday** **Count Date: 07-Mar-2017**



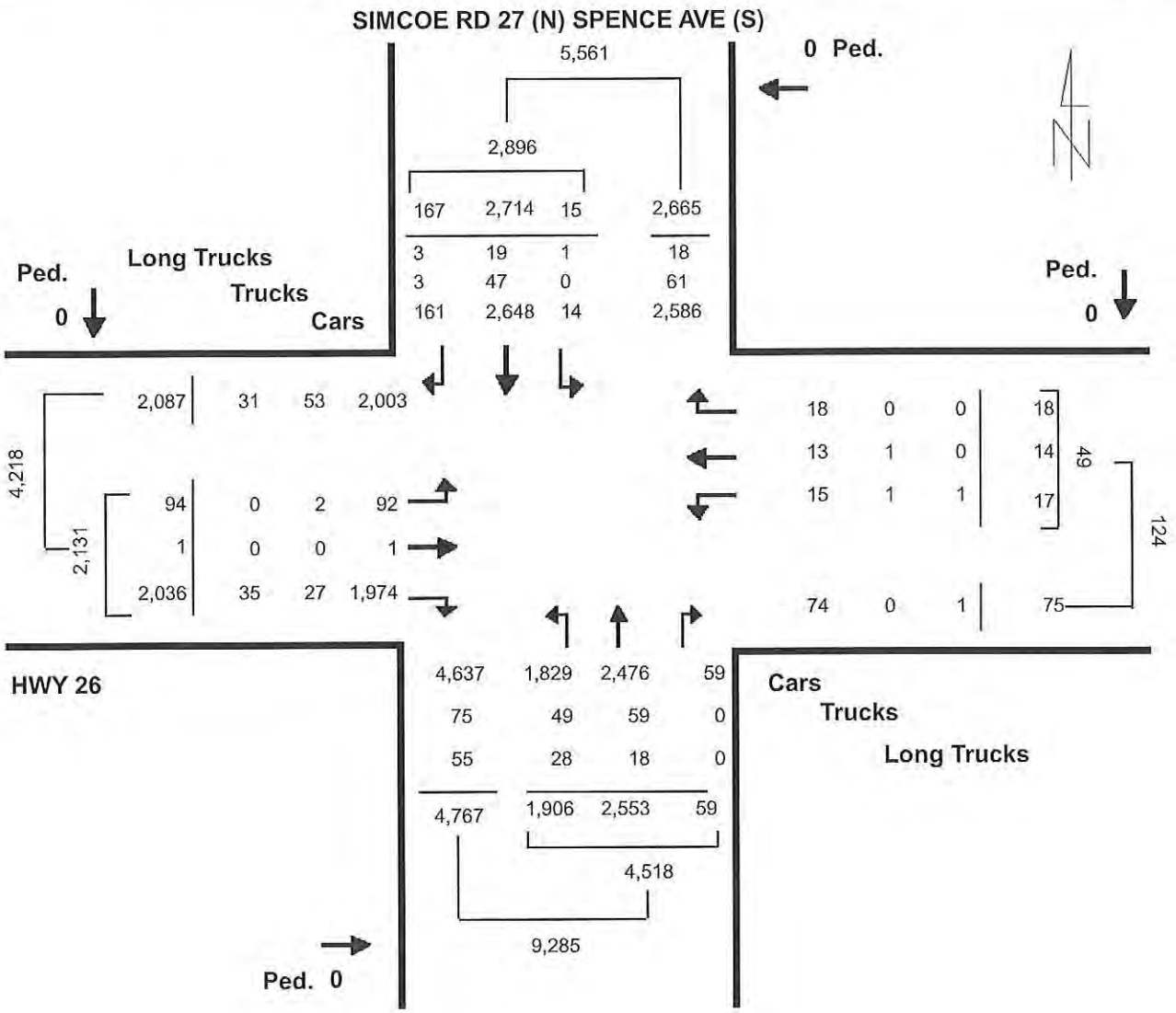
Traffic Engineering Software

# COUNT TOTAL

## HWY 26 @ SIMCOE RD 27 (N) SPENCE AVE (S)

**Central**

**Intersection ID:256200000** **Date: 07-Mar-2017**



# 15 MIN REPORT

**Intersection ID:256200000** **HWY 26 @ SIMCOE RD 27 (N) SPENCE AVE (S)** **Municipality: Central** **Date: 07-Mar-2017**

| Time | NORTH APPROACH | | | | | | | | | | EAST APPROACH | | | | | | | | | | SOUTH APPROACH | | | | | | | | | | WEST APPROACH | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cars | | | Trucks | | | Heavies | | | Ped | Cars | | | Trucks | | | Heavies | | | Ped | Cars | | | Trucks | | | Heavies | | | Ped | Cars | | | Trucks | | | Heavies | | | Ped | |
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | | |
| Period1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6:15 | 0 | 65 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 109 |
| 6:30 | 0 | 81 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 14 | 1 | 1 | 2 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 26 | 0 | 0 | 0 | 0 | 2 | 0 | 156 |
| 6:45 | 0 | 65 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 16 | 0 | 1 | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 0 | 0 | 1 | 0 | 141 |
| 7:00 | 1 | 64 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 25 | 0 | 1 | 6 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 | 2 | 0 | 165 |
| 7:15 | 0 | 84 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 42 | 46 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 45 | 0 | 0 | 0 | 0 | 1 | 0 | 228 |
| 7:30 | 0 | 112 | 6 | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 47 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 74 | 0 | 0 | 2 | 0 | 0 | 1 | 296 |
| 7:45 | 1 | 147 | 8 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 49 | 47 | 0 | 2 | 2 | 0 | 3 | 1 | 0 | 0 | 1 | 0 | 87 | 0 | 0 | 1 | 0 | 0 | 0 | 352 |
| 8:00 | 0 | 136 | 13 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 73 | 68 | 2 | 3 | 3 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 76 | 0 | 0 | 1 | 0 | 0 | 1 | 388 |
| 8:15 | 0 | 121 | 20 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 106 | 47 | 0 | 0 | 3 | 0 | 1 | 2 | 0 | 0 | 3 | 0 | 83 | 0 | 0 | 0 | 0 | 0 | 1 | 395 |
| 8:30 | 0 | 98 | 33 | 0 | 5 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 140 | 50 | 2 | 5 | 4 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 71 | 0 | 0 | 0 | 0 | 0 | 0 | 413 |
| 8:45 | 1 | 112 | 10 | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 54 | 56 | 6 | 2 | 5 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 81 | 0 | 0 | 2 | 0 | 0 | 1 | 339 |
| 9:00 | 1 | 94 | 7 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 54 | 50 | 4 | 7 | 6 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 71 | 0 | 0 | 0 | 0 | 0 | 4 | 307 |
| 9:15 | 2 | 129 | 6 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 42 | 61 | 1 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 61 | 0 | 0 | 1 | 0 | 0 | 0 | 325 |
| 9:30 | 0 | 109 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 44 | 2 | 2 | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 61 | 0 | 0 | 2 | 0 | 0 | 3 | 273 |
| 9:45 | 1 | 100 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 55 | 51 | 1 | 2 | 10 | 0 | 1 | 1 | 0 | 0 | 3 | 0 | 55 | 0 | 0 | 3 | 0 | 0 | 3 | 289 |
| 10:00 | 1 | 65 | 5 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 32 | 46 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 67 | 1 | 0 | 1 | 0 | 0 | 1 | 234 |
| Period2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15:15 | 0 | 58 | 2 | 0 | 4 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 59 | 85 | 1 | 0 | 1 | 0 | 3 | 1 | 0 | 0 | 3 | 0 | 58 | 0 | 0 | 0 | 0 | 0 | 0 | 278 |
| 15:30 | 0 | 64 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 62 | 111 | 1 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 8 | 0 | 64 | 1 | 0 | 2 | 0 | 0 | 1 | 325 |
| 15:45 | 1 | 75 | 3 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 81 | 103 | 5 | 1 | 1 | 0 | 3 | 0 | 0 | 0 | 3 | 0 | 56 | 0 | 0 | 1 | 0 | 0 | 2 | 343 |
| 16:00 | 1 | 81 | 0 | 0 | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 63 | 109 | 4 | 1 | 1 | 0 | 1 | 2 | 0 | 0 | 4 | 0 | 66 | 0 | 0 | 1 | 0 | 0 | 1 | 340 |
| 16:15 | 0 | 74 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 82 | 139 | 4 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 8 | 0 | 88 | 0 | 0 | 0 | 0 | 0 | 3 | 410 |
| 16:30 | 1 | 71 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 75 | 140 | 3 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 8 | 0 | 99 | 0 | 0 | 0 | 0 | 0 | 1 | 408 |
| 16:45 | 0 | 82 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 83 | 147 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 14 | 0 | 144 | 0 | 0 | 1 | 0 | 0 | 1 | 479 |
| 17:00 | 0 | 74 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 83 | 166 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 7 | 0 | 78 | 0 | 0 | 1 | 0 | 0 | 0 | 415 |
| 17:15 | 0 | 68 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 99 | 156 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 3 | 0 | 68 | 0 | 0 | 1 | 0 | 0 | 1 | 404 |
| 17:30 | 0 | 81 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 111 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 63 | 0 | 0 | 2 | 0 | 0 | 0 | 320 |
| 17:45 | 1 | 88 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 60 | 106 | 4 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 59 | 0 | 0 | 3 | 0 | 0 | 0 | 326 |
| 18:00 | 1 | 54 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 123 | 8 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 54 | 0 | 0 | 0 | 0 | 0 | 0 | 286 |
| 18:15 | 1 | 49 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 53 | 94 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 43 | 0 | 0 | 1 | 0 | 0 | 0 | 251 |
| 18:30 | 0 | 62 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 | 73 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 0 | 0 | 0 | 1 | 209 |
| 18:45 | 0 | 52 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 38 | 74 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 1 | 200 |
| 19:00 | 0 | 33 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 | 58 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 36 | 0 | 0 | 1 | 0 | 0 | 2 | 190 |

# Ministry of Transportation - Traffic Signal Warrants

Municipality: Central
Intersection: HWY 26 @ SIMCOE RD 27 (N) SPENCE AVE (S)
Major Road: SIMCOE RD 27 (N) SPENCE AVE (S)
Direction: North-South
Minor Road: HWY 26

**Warrant 1 - Minimum Vehicular Volume**

**A - All Approaches**

| | Min. Req. | Min. Req. | 7:00 | 8:00 | 9:00 | 10:00 | 16:00 | 17:00 | 18:00 | 19:00 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Volume | 600 | 480 | 465 | 975 | 1140 | 863 | 1034 | 1296 | 1085 | 700 | 7558 |
| Warrant % | 100 | 80 | 78 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 778 |

**Controlling Sectional %** 97%

**B - Minor Street Both Approaches**

| | Min. Req. | Min. Req. | 7:00 | 8:00 | 9:00 | 10:00 | 16:00 | 17:00 | 18:00 | 19:00 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Volume | 120 | 96 | 1 | 9 | 14 | 17 | 28 | 48 | 14 | 13 | 144 |
| Warrant % | 100 | 80 | 1 | 8 | 12 | 14 | 23 | 40 | 12 | 11 | 121 |

**Controlling Sectional %** 15%

**WARRANT 1 HAS BEEN SATISFIED** 15%

**Warrant 2 - Delay To Cross Traffic**

**A - Major Street Both Approaches**

| | Min. Req. | Min. Req. | 7:00 | 8:00 | 9:00 | 10:00 | 16:00 | 17:00 | 18:00 | 19:00 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Volume | 600 | 480 | 464 | 966 | 1126 | 846 | 1006 | 1248 | 1071 | 687 | 7414 |
| Warrant % | 100 | 80 | 77 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 777 |

**Controlling Sectional %** 97%

**B - Traffic Crossing Major Street**

| | Min. Req. | Min. Req. | 7:00 | 8:00 | 9:00 | 10:00 | 16:00 | 17:00 | 18:00 | 19:00 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Volume | 50 | 40 | 1 | 116 | 199 | 13 | 27 | 44 | 11 | 9 | 420 |
| Warrant % | 100 | 80 | 2 | 100 | 100 | 26 | 54 | 80 | 22 | 18 | 402 |

**Controlling Sectional %** 50%

**WARRANT 2 HAS BEEN SATISFIED** 50%

**Warrant 3 - Accident Experience**

**A** Reportable accident within a 12 month period averaged over 36 consecutive months susceptible to correction by a traffic signal was ..... 0

Based on the minimum warrant value of 5 this section has been satisfied ..... 0%

**B** Adequate trial of less restrictive remedies requirement was satisfied ..... 100%

**C** Either Warrant #1 or #2 being satisfied by at least 80% was satisfied ..... 0%

**WARRANT 3 HAS BEEN SATISFIED** 0%

**Warrant 4 - Combination Warrant**

Warrant 1 satisfied 80% or more ..... 0%

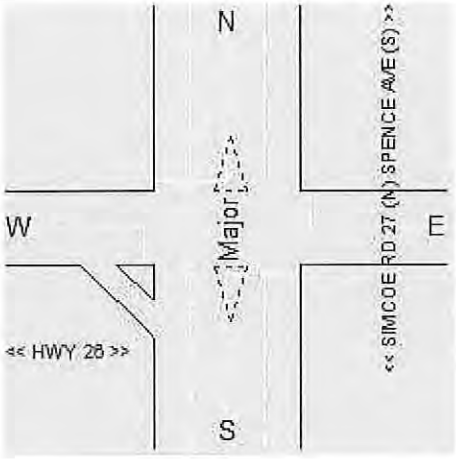
Warrant 2 satisfied 80% or more ..... 0%

Warrant 3 satisfied 80% or more ..... 0%

**WARRANT 4 HAS BEEN SATISFIED** 0%

## CONCLUSION: TRAFFIC SIGNALS ARE NOT WARRANTED

# Traffic Signal Warrant Parameter Summary




| | |
|---|---|
| Configuration | Cross |
| Flow Condition | Free |
| No. of Lanes on Major | 2 or more |
| No. of Collisions | 0 |
| Count Date | Mar 07, 2017 |

| Approach >> | North | East | South | West |
|---|---|---|---|---|
| AADT Factor Used | n/a | n/a | n/a | n/a |
| AADT Factor Kind | n/a | n/a | n/a | n/a |
| Traffic Pattern | n/a | n/a | n/a | n/a |
| Default Pattern? | n/a | n/a | n/a | n/a |
| Right Turn Channel? | No | No | No | Yes |
| Major / Minor | Major | Minor | Major | Minor |

# Bicycle Count Form

Location: HWY 26 & BAYFIELD ST - SIMCOE RD 27 - SPENCE AVE
Site ID: 0256200000
Count Date: 03/07/2017

| Time | APPROACH | | | |
|---|---|---|---|---|
| | North | East | South | West |
| 06:00 to 06:15 | | | | |
| 06:15 to 06:30 | | | | |
| 06:30 to 06:45 | | | | |
| 06:45 to 07:00 | | | | |
| 07:00 to 07:15 | | | | |
| 07:15 to 07:30 | | | | |
| 07:30 to 07:45 | | | | |
| 07:45 to 08:00 | | | | |
| 08:00 to 08:15 | | | | |
| 08:15 to 08:30 | | | | |
| 08:30 to 08:45 | | | | |
| 08:45 to 09:00 | | | | |
| 09:00 to 09:15 | | | | |
| 09:15 to 09:30 | | | | |
| 09:30 to 09:45 | | | | |
| 09:45 to 10:00 | | | | |
| 10:00 to 10:15 | | | | |
| 10:15 to 10:30 | | | | |
| 10:30 to 10:45 | | | | |
| 10:45 to 11:00 | | | | |
| 11:00 to 11:15 | | | | |
| 11:15 to 11:30 | | | | |
| 11:30 to 11:45 | | | | |
| 11:45 to 12:00 | | | | |
| 12:00 to 12:15 | | | | |
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| 12:30 to 12:45 | | | | |
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| 14:45 to 15:00 | | | | |
| 15:00 to 15:15 | | | | |
| 15:15 to 15:30 | | | | |
| 15:30 to 15:45 | | | | |
| 15:45 to 16:00 | | | | |
| 16:00 to 16:15 | | | | |
| 16:15 to 16:30 | | | | |
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| 19:45 to 20:00 | | | | |

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June 5, 2018 File #113027

**"BY EMAIL"**

MTO Central Region Engineering Office
Corridor Management Section
159 Sir William Hearst Avenue, 7th Floor
Toronto, Ontario
M3M 0B7

Attn: **Mr. Peter Dorton**
**Senior Project Manager**

Ref: **Township of Springwater,**
**Midhurst Class EA**
**Response to MTO Comments**

Dear Mr. Dorton:

We provide the following answers to questions received from the MTO, in an e-mail of October 18, 2017, regarding the Midhurst Secondary Plan Operational Analysis Memorandum of June 12, 2017. For ease of reference we have repeated the original question (shown in blue italics) followed by our response.

1. *Figure 11, Total traffic volumes 2031*
   *Hwy 26/Spence Ave: the NBL pm traffic counts should be 514, not 534*
   *Hwy 400/Forbes Rd NB off ramp: the WBT and WBR traffic counts are not shown*

The Operational Analysis Memorandum (OAM) has been updated to correct this. The cells in question were accidentally formatted for a text colour that did not print. With regards to the left turn volume at Hwy 26 and Spencer the difference is immaterial.

2. *Figure 12, Total traffic volumes 2041*
   *Hwy 400/Forbes Rd: NB off ramp traffic counts are not shown. Please show these on existing IC configuration and on Parclo A-4 configuration (per schematic).*

The OAM has been updated to correct this. The cells in question were accidentally formatted for a text colour that did not print.

3. *Table 6, 2031 Intersection operations*
   *Hwy 400/Forbes Rd SB off ramp: AM NBL LOS should be C instead of E*

Agreed, as per the Appendix C Operational Analysis, the LOS is B and the delay is 19.2 seconds not 35.1 seconds. The OAM has been updated.

4. *Table 8, 2041 Intersection operations*
   *Hwy 26/Carson Rd SB: AM overall LOS should be D instead of C*
   *AM SBT LOS should be D instead of C*
   *AM overall LOS should be E instead of D*

Agreed, there were several LOS values that were transposed incorrectly. We have revised the Table. Table 8 reflects LOS prior to the proposed improvements.

5. *Table 4, Trip generation rates used are slightly lower than ITE trip generation manual.*

| Land Use Code | Report | | ITE Trip Generation Manual | |
|---|---|---|---|---|
| | (AM) | (PM) | (AM) | (PM) |
| Single family detached units (210) | 0.62 | 0.697 | 0.75 | 1.00 |
| Residential Condo/Townhouse Units (230) | -- | -- | 0.44 | 0.52 |
| General Light Industrial (110) | 0.3 | 0.31 | 0.44 | 0.42 |
| Shopping Center (820) | .08 | 3.75 | 0.96 | 3.71 |

We did not apply the "Average Rate" listed under land use 210. Because of the sample size (8,208 units) we used the Fitted Curve Equation. For the PM peak hour this is Ln(T) = 0.901 Ln(X) + 0.527 where T is Trip ends and X is the number of single family dwellings. For 8208 units this generates 5696 trips or approximately 0.69 trips per dwelling but used 0.77 as conservative. The same was applied to the townhouse rate with the assumption they made up 23 % of the total units and then applied a 5% internal trip reduction. The 0.67 is the resulting average. We have attached a summary of the trip generation calculations to Appendix A.

For land use 110 the PM peak equation based on employees is T = 0.286(X) + 58.028 where X is number of employees estimated at approximately 2655 in employment lands #1. This estimates the trip ends at 817 or 0.31 trips per employee.

The same method was used for the AM peak.

6. P. 4, 2nd paragraph, there is mention of existing warrant for signals at Hwy 26 / CR27. Please see attached the latest traffic counts taken on March 4, 2017 by MTO, including signal warrants showing that signals are not warranted under the current traffic conditions. We have also reviewed the 5-year collision history for this intersection and could not identify any collision pattern that could be prevented if signals were in place. Please provide projected signal warrants for 2031 and 2041 to see if signals will become warranted in the future.

Analysis was based on data initially developed by BA Group in 2008. However, the analysis has been redone for the more recent 2017 traffic counts provided by MTO and these show that signalization warrants for existing traffic is not met. Traffic signal warrants for the 2031 traffic projections with the Phase 1 development in place do fulfill the traffic signal warrants. The report has been revised accordingly.

7. P. 5 / Growth from Midhurst developments: there is reference to a Figure 3. We did not see this figure in the TIS, and ask that you confirm that the reference is to Exhibit 3 (attached) from Aecom's memo dated Apr 26/16.

We have attached Figure 7.4.1 to Appendix A. It is similar to Aecom's Exhibit 3.

8. P. 8 / Sec. 7 / Future Road Network: please confirm if road authorities have confirmed these will all be constructed within time frames noted.

We have had discussions with the County of Simcoe and the Township of Springwater regarding the proposed road improvements identified. With regard to the proposed timelines identified in the OAM and overall ESR, these were "estimates" of when the various stages of development would proceed in the future, which may or may not be accurate. However, we can confirm that the Township and the

County are on board with requiring the identified improvements be completed when the corresponding stage of development proceeds.

9. *P.9: proposed new Craig Rd. extension out to CR27 is said to be opened by either 2018 or 2025 (not clear). Is this a local or County Road, and has Simcoe County agreed to this new intersection being opened at CR27 by either 2018 or 2025?*

We have had discussions with the County of Simcoe regarding the proposed Craig Road, including its connection to CR27. Currently Forbes Rd. between Hwy 400 and Russell Rd. is a Township road; however, during the discussions between the County and the Township it was acknowledged by both parties that Craig Road (Hwy 400 to CR27) should be a County Road and that further discussions should take place regarding when and how this should happen.

With regard to the timing for Craig Rd. Extension it is intended that Craig Road be constructed in conjunction with Phase 1 Stage 1 of development in the Doran Road area.

10. There is also mention of new St. Vincent St. connection between Belmont Cr. And Park Trail by 2025; please provide a plan to show where this is.

St. Vincent currently dead ends just north of Belmont Cr. and it is proposed to extend it approximately 280 metres northly, through an unopened road allowance, to connect with St. Vincent, south of Doran Road, at Park Trail.

11. *P. 9 / Sec. 8 / 2031 Operations: signal at west ramp terminal of Hwy 400/Forbes IC said to be required, but this is also a recommendation for 2041 (on P.11 / Sec. 9). The schematic provided for 2031 at the IC shows both ramp terminals signalised in 2031. Please provide projected signal warrants to demonstrate signals will be warranted at both ramp terminals.*

12. *P. 13: need for EB to NB LTL on Forbes at NB off-ramp (east ramp terminal) is mentioned twice. Please provide the LTL warrant analysis.*

Left Turn Lane Warrant Analysis is now provided in Appendix G. Left turn lane warrants are not met for the NB nor SB off ramp in 2031. Traffic signals are warranted for the SB Off Ramp by 2041 for the 2041 traffic projections. An eastbound left turn lane is warranted for the NB Off Ramp by 2041. It is assumed that the Phase 2 Development will occur between 2031 and 2041 but at this time approval has only been given to Phase 1. If Phase 2 proceeds the Highway 400 / Forbes Road intersection needs to be monitored to identify the required timing of the off ramp intersection improvements. Once the improvements are provided the LOS for the 2041 build out traffic is very good but there are constraints on the length of the left turn lanes to be provided with the ramps at their current offset from Highway 400. Prior to commencing development of Phase 2 the Municipality is committed to undertaking a Municipal Class Environmental Assessment with inclusion of MTO requirements. This may identify the need to increasing the ramp offset or considerable alteration of the interchange as a whole. Considering the long time interval and non-status of Phase 2, starting the Municipal Class EA process towards the latter half of Phase 1 provides an opportunity to measure, test and refine the assumptions on traffic growth and distribution for the proposed development.

13. P.15 / Conclusion: 2015 Horizon recommends signal at Hwy 26 / CR27; year 2015 recommendations are no longer appropriate. Please see comments above pertaining to signal warrants at this intersection.

Acknowledged, refer to revised analysis in comment 6 summary. Signalization is required before 2031 to accommodate Phase 1 development, but is not warranted for existing traffic.

14. P. 15 Conclusions, recommended second NBLTL (double LTL) on Hwy 26/ @ Carson Rd. The analysis has the following discrepancies:
    - The NBLTL has 95th %-ile queue length of more than 153m, but the storage length is only 100m.

Storage lengths can be adjusted during detailed design using more up to date traffic data available at that time. As a rough approximation using Table B7-5 for a cycle length of 140 seconds and 355 movements one gets an average arrival rate per cycle of 14 vehicles which is 20 vehicles or less for 95% confidence level and with 60% in one lane that is a storage requirement of 12 vehicles or approximately 90 metres.

- *NB double left turn lane has only one receiving lane on Carson Rd west approach instead of 3 lanes. The 3rd lane is typically required to accommodate the truck turning radius if there is a high percentage of heavy vehicles.*

Carson Road has been provided with two westbound lanes to receive the two northbound left turn lanes. Median position and lane widths can be reviewed at detailed design and adjusted as necessary.

*We've revised the Hwy 26/Carson Rd (2041) PM Total analysis (attached) keeping one NBLTL and reducing the cycle length to 110 sec from 140 sec and the result shows an improvement in the LOS of all the moves except that of the SB direction. Please revisit analysis and recommendation for the NB double LTL.*

We did run an analysis with one northbound left turn lane but found the LOS to be very poor on several movements. In our opinion the added left turn lane is advantageous and provides more efficient time assignment to the heavy north-south movements.

15. *2031: the only recommendation is for EB RTL on Snow Valley Rd. at Hwy 26. Why is there no mention of the signals at Forbes IC shown in the 2031 schematic?*

The 2031 recommended improvements (for intersections involving Hwy 26 or Hwy 400) are the EB RTL on Snow Valley Road, and the addition of a NB Protected Left on Hwy 26 at Carson Road. No improvements are proposed at the Hwy 400 Off Ramps on Forbes Road. The schematic of Forbes IC has been revised. The Figure was simply a representation of proposed ramps to convey a sense of the area required for possible long term improvements beyond 2031.

16. 2041: please provide clarification on if 2041 recommendations may be required sooner. The signal recommendations for the IC seem 10 years late, as they are shown in 2031 schematic.

The operational analysis shows that for the 2031 traffic projections (5,000 residential units) the Hwy 400 Ramps at Forbes Road operate well, in their current configuration. The 2041 recommendations include the proposed Phase 2 development lands which were appealed by MMAH in 2012 and are still in front of the OMB (i.e. not yet approved). We acknowledge that if Phase 2 proceeds after 2031 it will require improvements as a minimum to the Hwy 400 ramps. We have proposed that the remedy may be a re-arrangement of the ramps or it may be a complete revision of the interchange. However, we suggest that trying to define the details of those improvements this far in advance is impractical and we acknowledge that the Township would have to undertake EA Study prior to the approval of Phase 2 to clearly define the required works. We also acknowledge that the cost is to be borne by Township/County Development Charges.

It should be noted that the Township currently has included $6,000,000 for the interchange ramp works associated with the future Phase 2 works.

17. There is no reference in the TIS to the schematic for 2041 showing a Parclo A-4 IC at Hwy 400 / Forbes Rd. Please confirm how this requirement was determined, and note that the Township, as proponent, will be required to undertake an EA Study for reconfigured interchange.

See the response to the previous question.

*Additional Comments on Schematics:*
*Highway 400 / Forbes Rd.:*

18. *Please confirm the posted and design speed of Forbes through the interchange, and provide a Design Criteria table showing existing, standard, proposed.*

It is proposed that the speed limit between County Road 27 and Russell Road and on Forbes Road between Russell Road and Old Second Road be 60km/hr. If the lands immediately adjacent to that portion of the road are developed at some time in the future then the posted speed will be dropped to 50 km/hr. For the segment from Old Second Road to east of Highway 400 interchange the posted speed is 80 km/hr. We would recommend that the zone through the interchange ramp terminals be reduced to 60 km/hr but detailed design is to be completed following a Municipal Class EA process.

19. Is an EB LTL required at the east ramp terminal?

Our analysis indicates that an eastbound to northbound left turn lane at the east ramp terminal is required by the 2041 horizon not the 2031 horizon.

If yes, does the Ramp N-E merge lane need to be extended beyond the left turn lane?

We suggest that it would need to be extended and the merge condition dealt with after the left turn movement is done. The drivers making this left will typically be coming from further west. Those in the merge lane have just come from Hwy 400 south and very few of those will be trying to turn left onto the northbound ramp. By extending the merge lane beyond that left turn point means only one maneuver at a time is dealt with.

20. The lane balancing/drops/tapers/curves at the west ramp terminal are all "compressed".

See the response to item 16.

21. *Consider moving west the entrance near to the west terminal intersection.*

Acknowledged, this can be addressed during detailed design. As noted previously the ramp offset may be one possible solution determined in a Municipal Class EA or it may determine that more extensive improvements are required. We suggest that the process is best commenced once we see how Phase 1 progresses and how our traffic model assumptions match actual traffic growth during Phase 1 development.

*With respect to the 3 intersections on Highway 26:*
*General:*

22. *Provide dimensions (storage, parallel, taper) radii, posted (and design) speeds, intersection skews, etc. for all roads.*

On the updated schematics we have included a Table with that information and identified proposed taper and parallel segment widths.

*23. Carson/Hwy 26:*

- *Existing the building in the SE quadrant is missing; aerials look to old.*
- *Why has the existing NB RTL been removed?*

The aerial photography has been updated. The deletion of the right turn lane is based on the very low number of right turn movements. The 2041 PM peak projection is 17. The right turn lane was deleted as a partial balance to the addition of a second left turn lane.

*24. Snow Valley/Hwy 26:*

- *Consider closing the southerly plaza entrance in the NE quadrant.*
- *There is a new SB RTL shown, but is not identified in the TIS.*
- *Please clarify what the red lines represent.*

The existing plaza is operating under an approved Site Plan. However, your comments are acknowledged and perhaps the southerly entrance can be modified to a right in right out only access during detailed design.

The additional SB RTL is identified in Appendix B Operational Analysis for the "2041 with improvements analysis" and the improvement is included as one of the requirements between Tables 8 and 9 of the Operational Analysis Memo. The red lines show the proposed 23 m ROW.

*25. CR 27/Hwy 26*

- *Design is for signalized condition, but as noted earlier confirmation on need for signals is required.*

Our reference to signal warrants were based on previous findings by BA Group. We accept the analysis provided by MTO using April 2017 traffic data and have revised our summary.

*26. LTL on west approach looks to be on curve; tangential approach would be needed for signals.*

The alignment follows the existing alignment. Refinement of the alignment can be undertaken in detailed design.

*27. Show the existing WB RTL to the commuter parking lot in the NW quadrant.*

Schematic has been revised

*28. Finally, please confirm that this TIS, including schematics, has been shared with and reviewed by Simcoe County.*

We confirm that we have had discussions with the County of Simcoe regarding the road improvements and particularly where they relate to County Road and that the OAM has been submitted to the County.

If you have any questions on the above, please do not hesitate to contact our office.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

Steve Fournier P. Eng.
Senior Project Engineer

*S:\113027\Steve's ESR DRAFT\Correspondance County and MTO Summary\RESPONSE TO MTO QUESTIONS\MTO Response Attachments May 2018\Midhurst - Response to MTO Comments (Jun 5 2018).docx*

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November 9, 2018

File #113027

**"BY EMAIL"**

MTO Central Region Engineering Office
Corridor Management Section
159 Sir William Hearst Avenue, 7th Floor
Toronto, Ontario
M3M 0B7

Attn: **Mr. Peter Dorton**
**Senior Project Manager**

Ref: **Township of Springwater,**
**Midhurst Class EA**
**Response to MTO Comments**

Dear Mr. Dorton:

We provide the following answers to the questions in your September 17, 2018 email regarding the Midhurst Class EA and in particular the Traffic Operational Analysis Memorandum of May 30, 2018. For ease of reference we have repeated the original question (shown in blue) followed by our response.

1. *Appendix B includes 5 figures (Figure B1 – B5), which illustrate the distribution of site generated traffic from individual development zones, but the report does not present a figure to indicate the overall total trips produced by the entire secondary plan. Please provide the figure.*

   Appendix E contained total traffic volume (background + development traffic) for the horizon year 2031 and Appendix F provides that information for the horizon year 2041. We have attached the Schematics for the Total 2041 traffic (Trip Gen. and Traffic Projections). It includes sheets for the various development areas, existing traffic, background traffic growth and the first three sheets contain the Trip Generation summary

2. *The summary of trip generation calculations is not appended in Appendix A (ref comment # 5).*

   See the attached summary table (first three sheets in attached Trip Gen. and Traffic Projections).

3. *Appendix H - Hwy 26/CR27 intersection; there are discrepancies in the traffic volumes used for signal warrant calculations. For instance, in justification 1, traffic volumes under 'Hour 1 and 8' should be 465 and 700 instead of 863 and 1033 respectively.*

   We have re-run the analysis and attached a copy. The conclusion is unchanged.

4. *The trip generation calculations summary in Appendix 'A' has fonts so small that makes it illegible. Please provide in a format that can be easily read.*

   See the attached Excel Spreadsheet (first three sheets titled Trip Gen).

5. *While we agree in principle to the improvements suggested in the report, we have the following few comments for your consideration:*

   a) *Hwy 26/CR 27/Spence Ave intersection – The report recommends traffic signals at the intersection in 2031 horizon. Please note the operations at the intersection will be monitored, and signals shall only be installed when the warrants are met. As per ministry policy, consideration will also be given to the option of converting the intersection to a roundabout.*

      Acknowledged. The analysis in the ESR identifies that the warrant for signalization is not met for existing traffic. Using the traffic projections and assumed development schedules it is anticipated that signals will be warranted by 2031. As time and development progress, traffic growth will be monitored at this and other locations. Improvements may be advanced or delayed as required by actual traffic measurement. We did review the possibility of a roundabout at this location but found the grade of the north approach and, commercial access points along the east side, problematic, however we acknowledge that the option of installing traffic signals or a roundabout will be re-evaluated by the ministry in the future.

   b) *Hwy 26/Carson Rd intersection – double northbound left turn lane on Hwy 26 is recommended; the ministry discourages dual LT lanes due to associated safety issues. We have run a SYNCHRO analysis (copy attached), which demonstrates that the intersection will operate satisfactorily with a single left turn lane in 2041 with the addition of a SBRT lane since the southbound right turn volumes are very high (284 v/h) and warrant an exclusive lane.*

      We acknowledge the analysis you have provided and will update the ESR to note that this should be analyzed further in conjunction with the ministry at the detailed design stage, however we would like to keep the protected northbound left phase as was included in our original design.

   c) *Hwy 400/Forbes Rd Ramp Terminal intersections – the schematic provided for 2031 does not comply with geometric design standards. The additional lanes recommended at the west terminal are of substandard lengths. The WBLT lane cannot be accommodated due to the insufficient offset distance between the intersection and the bridge. To accommodate additional lanes, widening of the underpass structure may be required, or alternatively there may be a need to accelerate consideration of a Parclo A-4 interchange configuration. Also, with signalization of the ramp terminal intersections, removal of the right turn channels may be required.*

      Acknowledged

   d) *In future, when undertaking the detail design for highway improvements, please conduct a feasibility review to accommodate active transportation at the Hwy 400/Forbes Rd IC and other highway intersections.*

      Acknowledged.

6. *We did not see any cost estimates for the highway improvements in the information provided, including the ESR or Open House materials. Please acknowledge that all highway improvements noted as required to accommodate secondary plan development will undertake at the Township's expense (recognizing that these should be recovered from the developer groups).*

The ESR provided preliminary cost estimates for the various improvements in Table 7.6.6-1. Copy attached. The last Open House presentation material provided a general summary of road improvement costs by phase on board #13 with a total rounded to $137,300,000. With regard to the construction costs, Section 7.6.6 of the ESR states that "The cost of road improvements will be borne by the developers through Development Charges".

7. *We recommend and request that the Township endorse in principle the need for the Township and MTO to enter into a legal agreement whereby the Township agrees to fund, design and construct the recommended highway improvements in the timelines / horizon years noted, including updating the Traffic Operational Analysis every 5 years to confirm that the timelines / horizon years noted remain applicable (i.e. we can consider revisions to schedules for highway improvement works if supported by updated traffic analysis). I will then draft an agreement for the Township to review.*

   Acknowledged; however given that this is still at the Class EA stage, we propose to update Section 7.6.6 of the ESR to state *"The cost of road improvements will be borne by the developers through Development Charges. Further in advance of the identified highway improvements associated with MTO controlled roads, proceeding the Township will enter into a legal agreement with the MTO (and possibly Simcoe County) regarding the funding for the proposed highway improvements within the specified timelines. In addition, the Township will update the Traffic Operational Analysis every five (5) years to confirm that the timelines/horizon years noted remain applicable."*

8. *Finally, with respect to proposed servicing to support secondary plan development, any proposed works within and/or crossing highway rights-of-way will require MTO Encroachment permit approvals. We would suggest that preliminary design proposals be shared with this office early in the planning process, to ensure acceptability in principle prior to undertaking any detail design work.*

   Acknowledged.

If you have any questions on the above, please do not hesitate to contact our office.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

Steve Fournier P. Eng.
Senior Project Engineer

*S:\113027\Response to MTO Nov 9, 2018.docx*

## Table 7.6.6-1 – Opinion of Cost of Transportation Improvements

| Phase | Stage | Street Name | From | To | Intersections | Approx. Length (km) | No. of Proposed Lanes | Urban or Rural | Active Transportation Lanes | Existing R.O.W. Width | Proposed R.O.W. Width | Required Property Acquisition (Sqm.) | Asphalt Platform Width | Total Boulevard Width | Sidewalk or Multi Use Trail | Comments | Cost Per Metre for Construction | Feature Comments | Cost for Feature | Total Estimated Construction Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phase 1 | | Finlay Mill Road | Hwy 26 | Wattie Road | | 0.85 | 3 | Urban | NO | 20 | 20 | 0 | 10.5 | 4.25 | 2 - 1.5m each side | No room for Active Transportation lanes | $3,900 | Bridge at Finlay Mills and Wattie and Retaining Walls | $2,109,300 | $5,424,300 |
| | | Finlay Mill Road | Wattie Road | Doran Road | | 0.60 | 2 | Urban | NO | 20 | 20 | 0 | 11 | 4 | 2 - 1.5m each side | No room for Active Transportation lanes | $3,800 | | $0 | $2,280,000 |
| | | Snow Valley Road | Wilson Drive | Hwy 26 | | 2.80 | 2 | Rural | 2 -2.0m each | 20 | 26 | 16800 | 12.5 | 3.75 | Paved Shoulder | County Road | $2,800 | Hydro Relocation for Overhead Transformers on Snowvalley Road | $1,560,000 | $9,400,000 |
| | | Doran Road | Finlay Mill Road | West limit of Draft Plans | | 0.75 | 2 | Urban | 2 - 1.5m each | varies | varies | Given by Dev | 11 | | 2 - 1.5m each side | Need various widenings | $3,900 | Retaining Walls | $136,500 | $3,061,500 |
| | | Gill Road | Doran Road | North limit of Draft Plan | | 0.85 | 2 | Urban | 2 - 1.5m each | 20 - 21.5 | 23 | 2550 | 11 | min. 4.0 | 2 - 1.5m each side | 1.5m widening from Alliance | $3,900 | | $0 | $3,315,000 |
| | | Gill Road | North Limit of Draft Plan | Craig Road | | 0.40 | 2 | Rural | 2 - 2.0m each | 20 | 23 | 1200 | 11 | 4.5 | NO | Ganaraska Trail | $2,700 | | $0 | $1,080,000 |
| | 1 | Carson Road | Anne Street | West of Glenbrook Drive | 2 Subdivision Entrances | 0.70 | 2 | Urban | 2 - 1.5m each | 20 - 28 | 28 | Given by Dev | 11 | | 1.5m on South side | Carson Trail Sub. on North side | $3,900 | | $0 | $2,730,000 |
| | | Carson Road | West of Glenbrook Drive | Hwy 26 | | 0.70 | 2 - 5 | Urban | 2 - 1.5m each | 20 - 27 | 40 | 14000 | 11.0 - 20.5 | | 1.5m on South side | Open ditch on North side | $3,800 | | $0 | $2,660,000 |
| | | | | | Carson Road - Wilson Drive | | | | | | | | | | | | $500,000 | | | $500,000 |
| | | | | | Carson Road - Hwy 26 | | | | | | | | | | | | $2,000,000 | | | $2,000,000 |
| | | | | | Finlay Mill - Wattie Road | | | | | | | | | | | | $250,000 | | | $250,000 |
| | | | | | Finlay Mill -HWY 26/27 | | | | | | | | | | | | $400,000 | | | $400,000 |
| | | | | | Gill Road - Doran Road | | | | | | | | | | | | $250,000 | | | $250,000 |
| | | | | | HWY 26 - HWY 27 | | | | | | | | | | | | $750,000 | | | $750,000 |
| | | | | | | **7.65** | | | | | | | | | | | | | | **$34,100,800** |
| | | St. Vincent Street | Doran Road | Belmont Crescent link | | 0.50 | 2 | Urban | 2 - 1.5m each | 20 - 30 | 20 | 0 | 11 | min. 4.0 | 2 - 1.5m each side | Opening of unopened road allowance | $4,000 | Retaining Walls | $201,500 | $2,201,500 |
| | | St. Vincent Street | Belmont Crescent | Willow Creek Bridge | | 1.70 | 2 | Urban | 2 - 1.5m each | 20 | 20 | 0 | 11 | 4.0 | 2 - 1.5m each side | | $4,000 | | $0 | $6,800,000 |
| | 2 | Carson Road | Wilson Drive | Black Creek | | 0.60 | 2 | Rural | 2 - 1.5m each | 20 | 20 | 0 | 11 | 4.5 | Paved Shoulder | | $4,200 | Culvert For Carson Road at Black Cre | $1,560,000 | $4,080,000 |
| | | Carson Road | Black Creek | Anne Street | 4 Subdivision Entrances | 0.80 | 2 - 3 | Urban | 2 - 1.5m each | 36 | 36 | Given by Dev | 11 - 13.5 | min. 4.0 | 2 - 1.5m each side | | $2,400 | | $0 | $1,920,000 |
| | | | | | HWY 400 - Forbes Rd. | | | | | | | | | | | | $1,000,000 | | | $1,000,000 |
| | | | | | | **3.60** | | | | | | | | | | | | | | **$16,001,500** |
| | | Forbes Road | Russell Road | Old Second Road South | | 1.10 | 2 | Rural | 2 - 2.0m each | 20 - 30 | 30 | 0 | 12.5 | 3.75 | Paved Shoulder | Interim scenario | $3,400 | | $0 | $3,740,000 |
| | | St. Vincent Street | Willow Creek bridge | City of Barrie Limits | | 1.70 | 2 | Rural | 2 - 2.0m each | 20 | 20 | 0 | 11 | 4.5 | ? | Possible MUT on East side | $2,700 | | $0 | $4,590,000 |
| | | Anne Street | Carson Road | South limit of Draft Plans | | 0.65 | 2 | Urban | 2 - 1.5m each | 26 | 26 | Given by Dev | 11 | 7.0 | 2 - 1.5m each side | | $2,700 | Retaining Walls | $390,000 | $2,145,000 |
| | 3 | Anne Street | South limit of Draft Plans | City of Barrie Limits | | 1.25 | 2 | Rural | 2 - 2.0m each | 20 | 20 | 0 | 11 | 4.5 | Paved Shoulder | | $2,700 | | $0 | $3,375,000 |
| | | Wilson Drive | City of Barrie limits | Snow Valley Road | | 3.80 | 4 | Rural | 2 -2.0m each | 26 | 40 | 53200 | 17 | | | County Road | $3,000 | | $0 | $11,400,000 |
| | | Russell Road (Interim) | Pooles Road | Forbes Road | | 1.00 | 2 | Rural | 2 -2.0m each | 20 | 20 | 0 | 11 | | | | $300 | | $0 | $300,000 |
| | | | | | Craig Rd. - County Rd 27 | | | | | | | | | | | | $1,500,000 | | | $1,500,000 |
| | | | | | | **9.50** | | | | | | | | | | | | | | **$27,050,000** |
| | | Doran Road | West limit of Draft Plans | Russell Road | | 1.40 | 2 - 3 | Urban | 2 - 1.5m each | 29.5 | 30 | Given by Dev | 11 - 13.5 | min. 4.0 | 2 - 1.5m each side | | $3,800 | | $0 | $5,320,000 |
| | 4 | | | | 4 Subdivision Entrances | | | | | | | | | | | | | | | $0 |
| | | | | | | **1.40** | | | | | | | | | | | | | | **$5,320,000** |
| | | Forbes Road (interim) | Old Second Road South | Hwy 400 | | 1.20 | 2 | Rural | NO | 20 | 40 | 24000 | 12.5 | 3.75 | | | $200 | | $0 | $240,000 |
| | | Pooles Road | St. Vincent Street | Silverwood Crescent | | 0.75 | 2 | Urban | 2 - 1.5m each | 17 - 20 | 20 | 2250 | 11 | max. 4.0 | 2 - 1.5m each side | Need various widenings (also Midves) | $3,800 | | $0 | $2,850,000 |
| | | Pooles Road | Silverwood Crescent | Russell Road | | 0.75 | 2 | Rural | 2 - 1.5m each | 10 | 23 | 9750 | 11 | | | | $2,500 | Retaining Walls | $91,000 | $1,966,000 |
| | 5 | Russell Road | Pooles Road | Walt Road | 3 Subdivision Entrances | 0.60 | 2 | Urban | 2 - 1.5m each | 20 - 28 | 28 | 4800 | 11 | min. 4.0 | 1.5m on West side | 8m widening on Geranium Draft Plan | $3,700 | | $0 | $2,220,000 |
| | | Russell Road | Walt Road | Forbes Road | | 0.50 | 4 | Urban | 2 - 1.5m each | 26 | 26 | 0 | 18 | | | | $3,900 | | $0 | $1,950,000 |
| | | | | | Russell Rd. - Walt Rd. | | | | | | | | | | | | | | | $0 |
| | | | | | Pooles Rd. - St. Vincent | | | | | | | | | | | | | | | $0 |
| | | | | | | **3.8** | | | | | | | | | | | | | | **$9,226,000** |
| | | | | PHASE 1 LENGTH | | **25.95** | | | | | | | | | | | | | | **$91,698,300** |
| Phase 2 | | Forbes Road | Russell Road | Hwy 400 | | 2.3 | 4 | Rural | 2-2.0m each | 40 | | | 19 | | | Ultimate scenario | $2,500 | | $0 | $5,750,000 |
| | 1 | | | | Russell Road - Forbes Road | | | | | | | | | | | | | | $800,000 | $800,000 |
| | | | | | Russell Road - Doran Road | | | | | | | | | | | | | | | $350,000 |
| | | | | | | | | | | | | | | | | | | | | |
| | | Walt Road | Old Second Rd. | Russell Rd | | 1.1 | 2 | Urban | 2-2.0m each | 20 | | | 11 | | | | $3,700 | | $0 | $4,070,000 |
| | 2 | | | | Pooles Road - Russell Road | | | | | | | | | | | | | | $300,000 | |
| | | | | | | | | | | | | | | | | | | | | |
| | | Old 2nd Road South | Walt Rd. | Pooles Rd. | | 1.2 | 2 | Rural | 2-2.0m each | 20 | | | 11.5 | | | | $2,500 | | $0 | $3,000,000 |
| | 3 | Pooles Road | Old Second Rd | Russell Rd. | | 1.1 | 2 | Rural | 2-2.0m each | 20 | | | 11.5 | | | | $2,500 | | $0 | $2,750,000 |
| | | | | | Hwy 400 - Forbes Road | | | | | | | | | | | | | | $6,000,000 | $6,000,000 |
| | | | | PHASE 2 LENGTH | | **5.7** | | | | | | | | | | | | | | **$22,720,000** |
| **SUB-Total Phase 1 & 2** | | | | | | | | | | | | | | | | | | | | **$114,418,300** |
| **Contingency Allowance (5%)** | | | | | | | | | | | | | | | | | | | | **$5,700,000** |
| **Engineering (15%)** | | | | | | | | | | | | | | | | | | | | **$17,200,000** |
| **TOTAL PHASE 1 & 2 (Excl HST)** | | | | | | | | | | | | | | | | | | | | **$137,318,300** |

Note: This excludes the costs associated Craig Road Extension (Russell Rd to Cty Rd 27), as these costs are within the Township Wide Development Charges

Ainley GROUP CONSULTING ENGINEERS PLANNERS

# TRAFFIC SIGNAL WARRANT

| | | | | |
|---|---|---|---|---|
| Analyst | Lilly Chen | Jurisdiction/Date | Springwater | 24 Jan 2018 |
| Agency or Company | Ainley Group | East-West Street | Highway 26/Spence Ave | |
| Analysis Period | 2017 | North-South Street | Highway 26/CR 27 | |
| Flow Conditions | Free flow (rural) | Major Street | North-South | |
| T Intersection | No | Approach Lanes per Direction | 2 | |
| | | Hours of Traffic Volume Data | 8 hours | |
| Other Notes | existing road configuration | | | |

| Hour Ending | Hour 1 7:00 | Hour 2 8:00 | Hour 3 9:00 | Hour 4 10:00 | Hour 5 16:00 | Hour 6 17:00 | Hour 7 18:00 | Hour 8 19:00 | AM + PM 4 |
|---|---|---|---|---|---|---|---|---|---|
| **MAJOR STREET** | | | | | | | | | |
| Northbound right | 1 | 4 | 12 | 4 | 11 | 8 | 13 | 6 | |
| thru | 83 | 220 | 223 | 216 | 415 | 598 | 499 | 299 | |
| left | 90 | 218 | 372 | 188 | 277 | 329 | 257 | 175 | |
| Southbound right | 12 | 30 | 71 | 19 | 9 | 9 | 7 | 10 | |
| thru | 277 | 493 | 446 | 415 | 292 | 303 | 292 | 196 | |
| left | 1 | 1 | 2 | 4 | 2 | 1 | 3 | 1 | |
| **MINOR STREET** | | | | | | | | | |
| Eastbound right | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| thru | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| left | 1 | 5 | 11 | 9 | 19 | 37 | 7 | 5 | |
| Westbound right | 0 | 1 | 1 | 4 | 1 | 4 | 3 | 4 | |
| thru | 0 | 1 | 2 | 2 | 2 | 4 | 2 | 1 | |
| left | 0 | 1 | 0 | 2 | 5 | 3 | 2 | 3 | |
| **PEDESTRIANS** | | | | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| crossing MAJOR street | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| delayed pedestrians | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| crossing MINOR street | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| **APPROACH VOLUMES** | | | | | | | | | |
| major | 464 | 966 | 1126 | 846 | 1006 | 1248 | 1071 | 687 | |
| minor | 1 | 9 | 14 | 17 | 27 | 48 | 14 | 13 | |
| TOTAL | 465 | 975 | 1140 | 863 | 1033 | 1296 | 1085 | 700 | |
| **CROSSING VOLUMES** | | | | | | | | | |
| TOTAL | 1 | 7 | 199 | 13 | 26 | 44 | 11 | 9 | |
| note 1 | 1 | 6 | 11 | 11 | 24 | 40 | 9 | 8 | |
| note 2 | 0 | 1 | 2 | 2 | 2 | 4 | 2 | 1 | |
| note 3 | 0 | 0 | 186 | 0 | 0 | 0 | 0 | 0 | |
| 3a | no | yes | yes | yes | yes | yes | yes | yes | |
| 3b | no | no | yes | no | no | no | no | no | |
| note 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| note 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

**NOTES**

Traffic crossing MAJOR street defined as:

note 1: Left turns from both minor street approaches

note 2: The heaviest through volume from the minor street

note 3: 50% of the heavier left turn movement from the major street when both of the following are met:

3a: the left turn volume > 120

3b: the left turn volume + opposing volume > 720

note 4: Pedestrians crossing the major street

note 5: Pedestrians experiencing delays of 10 seconds or more in crossing the major street

**ACCIDENT HISTORY**

Reportable accidents over the past 36 months susceptible to correction by a traffic signal. -

## JUSTIFICATION 1 - MINIMUM VEHICLE VOLUME

| JUSTIFICATION | GUIDANCE | HOUR ENDING | | | | | | | | No. of hours with compliance | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Hour 1 | Hour 2 | Hour 3 | Hour 4 | Hour 5 | Hour 6 | Hour 7 | Hour 8 | 100% | 80% + | |
| 1A | TOTAL TRAFFIC VOLUME ENTERING INTERSECTION (vph) (2 way Total) | 465 | 975 | 1140 | 863 | 1033 | 1296 | 1085 | 700 | 100% | 80% + | Average Compliance |
| | COMPLIANCE % VOL x 100 / 480 (1 lane approach on main road) OR VOL x 100 / 600 (2 or more lane approach on main road) | 78% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 7 | 7 | 97% |
| 1B | TRAFFIC VOLUME ON MINOR STREET | 17 | 9 | 14 | 17 | 27 | 48 | 14 | 27 | 100% | 80% + | Average Compliance |
| | COMPLIANCE % VOL x 100 / 120 (full intersection) OR VOL x 100 / 180 (tee intersection) | 14% | 8% | 12% | 14% | 23% | 40% | 12% | 23% | 0 | 0 | 18% |
| (FREE FLOW) | | **BOTH 1A AND 1B 100% FULFILLED EACH OF 8 HOURS** | | | | | | | | | | **NO** |
| **SIGNAL JUSTIFICATION 1:** | | **LESSER OF 1A OR 1B AT LEAST 80% FULFILLED EACH OF 8 HOURS** | | | | | | | | | | **NO** |

## JUSTIFICATION 2 - DELAY TO CROSS TRAFFIC

| JUSTIFICATION | GUIDANCE | HOUR ENDING | | | | | | | | No. of hours with compliance | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Hour 1 | Hour 2 | Hour 3 | Hour 4 | Hour 5 | Hour 6 | Hour 7 | Hour 8 | 100% | 80% + | |
| 2A | MAIN ROAD TRAFFIC VOLUME (vph) (2 way Total) | 1006 | 966 | 1126 | 846 | 1006 | 1248 | 1071 | 1006 | 100% | 80% + | Average Compliance |
| | COMPLIANCE % VOL x 100 / 480 (1 lane approach on main road) OR VOL x 100 / 600 (2 or more lane approach on main road) | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 8 | 8 | 100% |

| 2B | CROSSING TRAFFIC VOLUME (vph) (2 way Total) | 13 | 7 | 199 | 13 | 26 | 44 | 11 | 26 | 100% | 80% + | Average Compliance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | COMPLIANCE % VOL x 100 / 50 | 26% | 14% | 100% | 26% | 52% | 88% | 22% | 52% | 1 | 2 | 48% |

| | | |
|---|---|---|
| (FREE FLOW) | BOTH 2A AND 2B 100% FULFILLED EACH OF 8 HOURS | NO |
| SIGNAL JUSTIFICATION 2: | LESSER OF 2A OR 2B AT LEAST 80% FULFILLED EACH OF 8 HOURS | NO |

## JUSTIFICATION 3 - VOLUME/DELAY COMBINATION JUSTIFICATION

| JUSTIFICATION SATISFIED 80% OR MORE | | Two Justifications Satisfied 80% or more |
|---|---|---|
| Justificatior - Minimum Vehicle Volume | NO | |
| Justificatior - Delay to Cross Traffic | NO | NO |

## JUSTIFICATION 4 - MINIMUM FOUR-HOUR VEHICLE VOLUME

## JUSTIFICATION 5 - COLLISION EXPERIENCE

| | Warrant Value | Number of Collisions | % Fulfillment |
|---|---|---|---|
| A. Reportable collisions over 36 consecutive months susceptible to correction by a traffic signal. | 15 | - | - |
| B. Adequate trial of less restrictive remedies has failed to reduce collision frequency. | ☐ YES | ☑ NO | 0% |

| | | |
|---|---|---|
| SIGNAL JUSTIFICATION 5: | BOTH OF 3A, 3B FULFILLED TO 100%? | ☐ ☐ NO |
| | BOTH OF 3A, 3B FULFILLED TO 80%? | NO |

## JUSTIFICATION 6 - PEDESTRIAN VOLUME AND DELAY

| | | | | | | |
|---|---|---|---|---|---|---|
| | NET 8 HOUR PEDESTRIAN VOLUME AT CROSSIN | 0 | NET 8 HOUR VEHICULAR VOLUME ON STREET BE | 7557 | | |
| 6A PED VOLUME | 8 Hr Veh. Vol. | Net 8 Hour Pedestrian Volume | | | | |
| | | < 200 | 200 - 275 | 276 - 475 | 476 - 1000 | > 1000 |
| | < 1440 | | | | | |
| | 1440 - 2600 | | | | | |
| | 2601 - 7000 | | | | | |
| | > 7000 | Not Justified | | | | |

| | | | | |
|---|---|---|---|---|
| | NET 8 HOUR VOLUME OF TOTAL PEDESTRIANS | 0 | NET 8 HOUR VOLUME OF DELAYED PEDESTRIANS | 0 |
| 6B PED DELAY | Net Total 8 Hour Vol. of | Net Total 8 Hour Volume of Delayed Pedestrians | | |
| | | < 75 | 75 - 130 | > 130 |
| | < 200 | Not Justified | | |
| | 200 - 300 | | | |
| | > 300 | | | |

| | | |
|---|---|---|
| SIGNAL JUSTIFICATION 6: | BOTH JUSTIFICATION 5A AND JUSTIFICATI | NO |

## JUSTIFCATION SUMMARY

| | | |
|---|---|---|
| OVERALL | AT LEAST ONE JUSTIFICATION (1 - 5) MET? | NO |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 240 | 8 | 218 | 21 | 7 | 16 | 355 | 1909 | 17 | 22 | 1562 | 284 |
| Future Volume (veh/h) | 240 | 8 | 218 | 21 | 7 | 16 | 355 | 1909 | 17 | 22 | 1562 | 284 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 253 | 8 | 229 | 22 | 7 | 17 | 374 | 2009 | 18 | 23 | 1644 | 299 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 0 | 1 | 2 | 1 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 247 | 288 | 489 | 138 | 31 | 75 | 374 | 2611 | 23 | 144 | 1927 | 862 |
| Arrive On Green | 0.06 | 0.15 | 0.15 | 0.06 | 0.06 | 0.06 | 0.15 | 0.73 | 0.73 | 0.54 | 0.54 | 0.54 |
| Sat Flow, veh/h | 1774 | 1863 | 1583 | 1139 | 483 | 1173 | 1774 | 3595 | 32 | 209 | 3539 | 1583 |
| Grp Volume(v), veh/h | 253 | 8 | 229 | 22 | 0 | 24 | 374 | 988 | 1039 | 23 | 1644 | 299 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1863 | 1583 | 1139 | 0 | 1656 | 1774 | 1770 | 1857 | 209 | 1770 | 1583 |
| Q Serve(g_s), s | 7.0 | 0.4 | 12.9 | 2.0 | 0.0 | 1.5 | 17.0 | 38.0 | 38.3 | 8.5 | 43.5 | 11.7 |
| Cycle Q Clear(g_c), s | 7.0 | 0.4 | 12.9 | 2.0 | 0.0 | 1.5 | 17.0 | 38.0 | 38.3 | 26.7 | 43.5 | 11.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.71 | 1.00 | | 0.02 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 247 | 288 | 489 | 138 | 0 | 105 | 374 | 1285 | 1349 | 144 | 1927 | 862 |
| V/C Ratio(X) | 1.02 | 0.03 | 0.47 | 0.16 | 0.00 | 0.23 | 1.00 | 0.77 | 0.77 | 0.16 | 0.85 | 0.35 |
| Avail Cap(c_a), veh/h | 247 | 440 | 619 | 231 | 0 | 241 | 374 | 1285 | 1349 | 144 | 1927 | 862 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 48.5 | 39.5 | 30.7 | 49.2 | 0.0 | 48.9 | 35.2 | 9.3 | 9.4 | 23.9 | 21.3 | 14.1 |
| Incr Delay (d2), s/veh | 63.4 | 0.0 | 0.7 | 0.5 | 0.0 | 1.1 | 46.9 | 4.5 | 4.3 | 2.3 | 5.0 | 1.1 |
| Initial Q Delay(d3),s/veh | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.4 | 0.2 | 5.7 | 0.7 | 0.0 | 0.7 | 16.2 | 19.7 | 21.0 | 0.6 | 22.4 | 5.3 |
| LnGrp Delay(d),s/veh | 112.0 | 39.5 | 31.4 | 49.7 | 0.0 | 50.0 | 82.1 | 13.8 | 13.7 | 26.2 | 26.3 | 15.2 |
| LnGrp LOS | F | D | C | D | | D | F | B | B | C | C | B |
| Approach Vol, veh/h | | 490 | | | 46 | | | 2401 | | | 1966 | |
| Approach Delay, s/veh | | 73.2 | | | 49.9 | | | 24.4 | | | 24.6 | |
| Approach LOS | | E | | | D | | | C | | | C | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | | 86.7 | | 23.3 | 20.0 | 66.7 | 10.0 | 13.3 |
| Change Period (Y+Rc), s | | * 6.8 | | * 6.3 | 3.0 | * 6.8 | 3.0 | * 6.3 |
| Max Green Setting (Gmax), s | | * 71 | | * 26 | 17.0 | * 51 | 7.0 | * 16 |
| Max Q Clear Time (g_c+I1), s | | 40.3 | | 14.9 | 19.0 | 45.5 | 9.0 | 4.0 |
| Green Ext Time (p_c), s | | 29.8 | | 0.9 | 0.0 | 5.3 | 0.0 | 0.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 29.6 |
| HCM 2010 LOS | C |

Notes

**Midhurst EA Phases 3 & 4** **TRIP ESTIMATES**

**113027-311**

| | | | | | PEAK HOUR OF ADJACENT STREET | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **TRIP RATES** | | | | AM Peak Hour (7-9 AM) | | | PM Peak Hour (4-6 PM) | | | Saturday Peak | | |
| | ITE Land Use Category | ITE Code | Variable | | in | out | total | in | out | total | in | out | total |
| | general light industrial | 110 | employees | | 0.25 | 0.05 | 0.3 | 0.07 | 0.24 | 0.31 | | | |
| | industrial park | 130 | acres | | 7.10 | 1.45 | 8.55 | 1.86 | 6.98 | 8.84 | | | |
| | single family detached | 210 | dwelling units | | 0.18 | 0.53 | 0.70 | 0.49 | 0.28 | 0.77 | | | |
| | apartment | 220 | dwelling units | | 0.10 | 0.41 | 0.51 | 0.40 | 0.22 | 0.62 | 0.26 | 0.26 | 0.52 |
| | residential condo/townhouse | 230 | dwelling units | | 0.06 | 0.29 | 0.35 | 0.29 | 0.14 | 0.43 | | | |
| | combined single and townhouse | 225 | dwelling units | | 0.15 | 0.47 | 0.62 | 0.443 | 0.254 | 0.70 | | | |
| | low-rise condo/townhouse | 231 | dwelling units | | 0.17 | 0.50 | 0.67 | 0.45 | 0.33 | 0.78 | | | |
| | high-rise residential condo/towns (3+ floors) | 232 | dwelling units | | 0.06 | 0.28 | 0.34 | 0.24 | 0.14 | 0.38 | | | |
| | mobile home park | 240 | dwelling units | | 0.09 | 0.35 | 0.44 | 0.37 | 0.22 | 0.59 | | | |
| | recreational homes | 260 | dwelling units | | 0.11 | 0.05 | 0.16 | 0.11 | 0.15 | 0.26 | | | |
| | hotel | 310 | rooms | | 0.34 | 0.22 | 0.56 | 0.31 | 0.28 | 0.59 | | | |
| | resort hotel | 330 | rooms | | 0.22 | 0.09 | 0.31 | 0.18 | 0.24 | 0.42 | | | |
| | water slide park | 414 | parking spaces | | 0.20 | 0.08 | 0.28 | 0.06 | 0.22 | 0.28 | | | |
| | multipurpose recreational facility | 435 | 1000 sq.ft. GFA | | | | | 0.06 | 0.11 | 0.17 | | | |
| | casino/video lottery establishment | 473 | 1000 sq.ft. GFA | | 3.76 | 2.95 | 6.72 | 7.52 | 5.91 | 13.43 | | | |
| | recreational community centre | 495 | 1000 sq.ft. GFA | | 0.99 | 0.63 | 1.62 | 0.54 | 0.91 | 1.45 | | | |
| | general office building | 710 | 1000 sq.ft. GFA | | 1.36 | 0.19 | 1.55 | 0.25 | 1.24 | 1.49 | | | |
| | business park | 770 | acres | | 16.03 | 2.83 | 18.86 | 3.37 | 13.47 | 16.84 | | | |
| | specialty retail centre | 814 | 1000 sq.ft. GFA | | 0.55 | 0.35 | 0.90 | 1.19 | 1.52 | 2.71 | | | |
| | shopping Centre | 820 | 1000 sq.ft. GFA | | 0.49 | 0.31 | 0.8 | 1.84 | 1.91 | 3.75 | 2.54 | 2.35 | 4.89 |
| | discount supermarket | 854 | 1000 sq.ft. GFA | | 1.59 | 1.15 | 2.74 | 4.45 | 4.45 | 8.9 | | | |
| | home improvement superstore | 862 | 1000 sq.ft. GFA | | 0.72 | 0.54 | 1.26 | 1.14 | 1.23 | 2.37 | | | |
| | drive-in bank | 912 | 1000 sq.ft. GFA | | 6.92 | 5.43 | 12.35 | 12.91 | 12.91 | 25.82 | | | |
| | high turnover (sit-down) restaurant | 932 | 1000 sq.ft. GFA | | 5.99 | 5.53 | 11.52 | 6.58 | 4.57 | 11.15 | 7.46 | 6.61 | 14.07 |
| | gasoline/service station | 944 | Fueling Positions | | 6.20 | 5.96 | 12.16 | 6.94 | 6.94 | 13.87 | | | |
| | gasoline/service station with convenience market | 945 | 1000 sq.ft. GFA | | 40.44 | 38.86 | 79.3 | 48.54 | 48.54 | 97.08 | | | |

| | | | | | | PEAK HOUR OF ADJACENT STREET | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **TRIP GENERATION** | ITE Code | Proposed | | | AM Peak Hour (7-9 AM) | | | PM Peak Hour (4-6 PM) | | | | | |
| | Proposed Land Use | Employed | Size | Variable | | in | out | total | in | out | total | | | |
| Carson | combined single and townhouse | 225 | 2909 | dwelling units | | 435 | 1381 | 1816 | 1289 | 739 | 2028 | 756 | 756 | 1513 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 5% | | -22 | -69 | -91 | -64 | -37 | -101 | | | |
| | | | | | | 414 | 1312 | 1726 | 1225 | 702 | 1927 | | | |
| Doran North | | combined single and townhouse | 225 | 1440 | dwelling units | 216 | 684 | 899 | 638 | 366 | 1004 | 374 | 374 | 749 |
| Doran South | | combined single and townhouse | 225 | 3859 | dwelling units | 578 | 1832 | 2410 | 1710 | 980 | 2690 | | | |
| | | | | 8208 | | 1207 | 3828 | 5034 | 3573 | 2048 | 5621 | 1131 | 1131 | 2261 |
| Employment #1 | | general light industrial | 110 | 2655 | employees | 661 | 135 | 797 | 173 | 650 | 823 | | | |
| | | | | 5% | | -33 | -7 | -40 | -9 | -33 | -41 | | | |
| | | | | | | 628 | 129 | 757 | 164 | 618 | 782 | | | |
| Employment #2 | | general light industrial | 110 | 475 | employees | 118 | 24 | 143 | 31 | 116 | 147 | | | |
| | | shopping Centre | 820 | 495 | 1000 sq.ft. GFA | 242 | 154 | 396 | 910 | 947 | 1856 | | | |
| | | | | | subtotal | 360 | 179 | 539 | 940 | 1063 | 2004 | | | |
| | | | | 5% | | -18 | -9 | -27 | -47 | -53 | -100 | | | |
| | | | by-pass | 25% | | -60 | -39 | -99 | -227 | -237 | -464 | | | |
| | | | | | | 281 | 131 | 413 | 666 | 773 | 1439 | | | |
| | | | | | total | 2116 | 4087 | 6204 | 4403 | 3439 | 7842 | | | |
| | 2018 | | | | | | | | | | | | | |
| Carson | | | 225 | 848 | | 127 | 403 | 529 | 376 | 215 | 591 | | | |
| | | | | 5% | | -6 | -20 | -26 | -19 | -11 | -30 | | | |
| | | | | | | 121 | 382 | 503 | 357 | 205 | 562 | | | |
| Doran North | | | 225 | 232 | | 35 | 110 | 145 | 103 | 59 | 162 | | | |
| | 2022 | | | | | | | | | | | | | |
| Carson | | | 225 | 1767 | | 264 | 839 | 1103 | 783 | 449 | 1232 | | | |
| | | | | 5% | | -13 | -42 | -55 | -39 | -22 | -62 | | | |
| | | | | | | 251 | 797 | 1048 | 744 | 426 | 1170 | | | |
| Doran North | | | 225 | 529 | | 79 | 251 | 330 | 234 | 134 | 369 | | | |
| | 2025 | | | | | | | | | | | | | |
| Carson | | | 225 | 2354 | | 352 | 1118 | 1470 | 1043 | 598 | 1641 | | | |
| | | | | 5% | | -18 | -56 | -73 | -52 | -30 | -82 | | | |
| | | | | | | 335 | 1062 | 1396 | 991 | 568 | 1559 | | | |
| Doran North | | | 225 | 820 | | 123 | 389 | 512 | 363 | 208 | 572 | | | |
| | 2027 | | | | | | | | | | | | | |
| Carson | | | 225 | 2623 | | 393 | 1245 | 1638 | 1162 | 666 | 1829 | | | |
| | | | | 5% | | -20 | -62 | -82 | -58 | -33 | -91 | | | |
| | | | | | | 373 | 1183 | 1556 | 1104 | 633 | 1737 | | | |
| Doran North | | | 225 | 1227 | | 184 | 583 | 766 | 544 | 312 | 855 | | | |
| | 2031 | | | | | | | | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Carson | | 225 | 2650 | 397 | 1258 | 1655 | 1174 | 673 | 1848 |
| | | | 5% | -20 | -63 | -83 | -59 | -34 | -92 |
| | | | | 377 | 1195 | 1572 | 1116 | 639 | 1755 |
| Doran North | | 225 | 1440 | 216 | 684 | 899 | 638 | 366 | 1004 |
| Doran South | | 225 | 910 | 136 | 432 | 568 | 403 | 231 | 634 |
| | | | | 1638 | 2571 | 4209 | 2987 | 2627 | 5615 |
| | 2034 | | | | | | | | |
| Carson | | 225 | 2909 | 435 | 1381 | 1816 | 1289 | 739 | 2028 |
| | | | 5% | -22 | -69 | -91 | -64 | -37 | -101 |
| | | | | 414 | 1312 | 1726 | 1225 | 702 | 1927 |
| Doran North | | 225 | 1440 | 216 | 684 | 899 | 638 | 366 | 1004 |
| Doran South | | 225 | 1660 | 248 | 788 | 1037 | 736 | 422 | 1157 |
| | 2036 | | | | | | | | |
| Carson | | 225 | 2909 | 435 | 1381 | 1816 | 1289 | 739 | 2028 |
| | | | 5% | -22 | -69 | -91 | -64 | -37 | -101 |
| | | | | 414 | 1312 | 1726 | 1225 | 702 | 1927 |
| Doran North | | 225 | 1440 | 216 | 684 | 899 | 638 | 366 | 1004 |
| Doran South | | 225 | 2410 | 361 | 1144 | 1505 | 1068 | 612 | 1680 |
| | 2039 | | | | | | | | |
| Carson | | 225 | 2909 | 435 | 1381 | 1816 | 1289 | 739 | 2028 |
| | | | 5% | -22 | -69 | -91 | -64 | -37 | -101 |
| | | | | 414 | 1312 | 1726 | 1225 | 702 | 1927 |
| Doran North | | 225 | 1440 | 216 | 684 | 899 | 638 | 366 | 1004 |
| Doran South | | 225 | 3135 | 469 | 1488 | 1957 | 1389 | 796 | 2186 |
| | | | | | | | | | |
| Jodies Lane | | 210 | 62 | 11 | 33 | 43 | 30 | 18 | 48 |

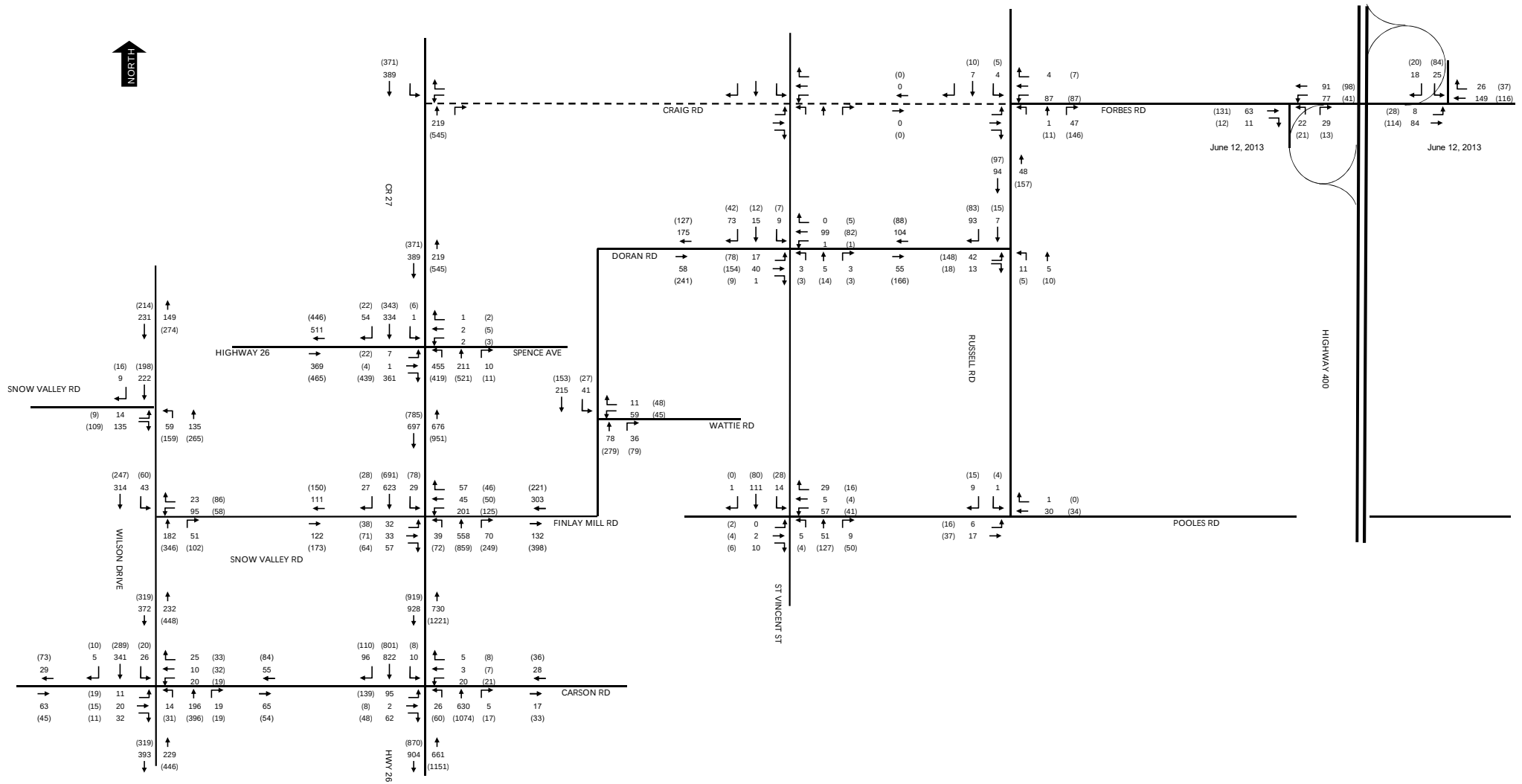


**Figure x**

Traffic Counts

Midhurst EA Phases 3 & 4

Township of Springwater

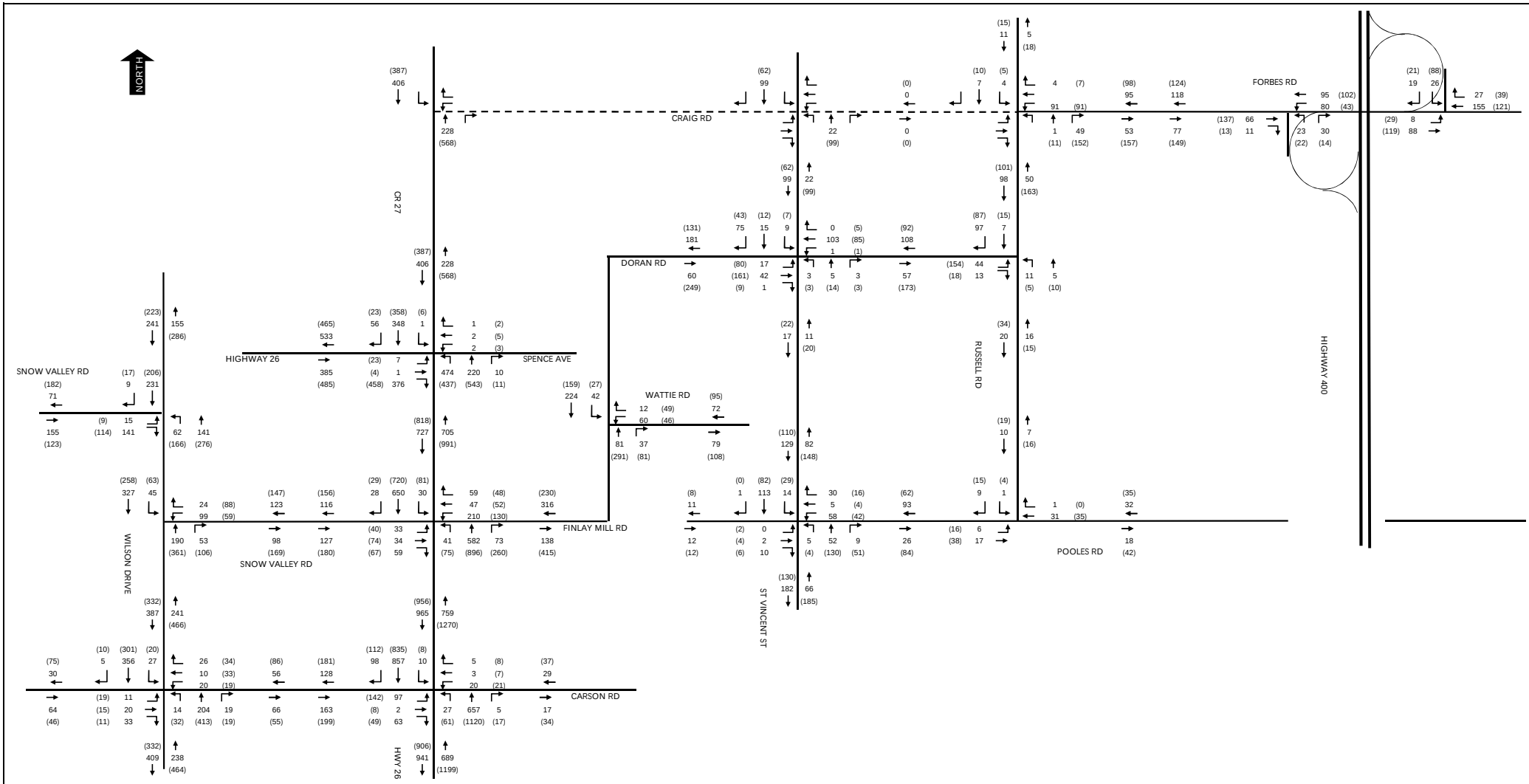


Figure X
2017 Background Traffic Volumes
Midhurst EA Phases 3 & 4
Township of Springwater

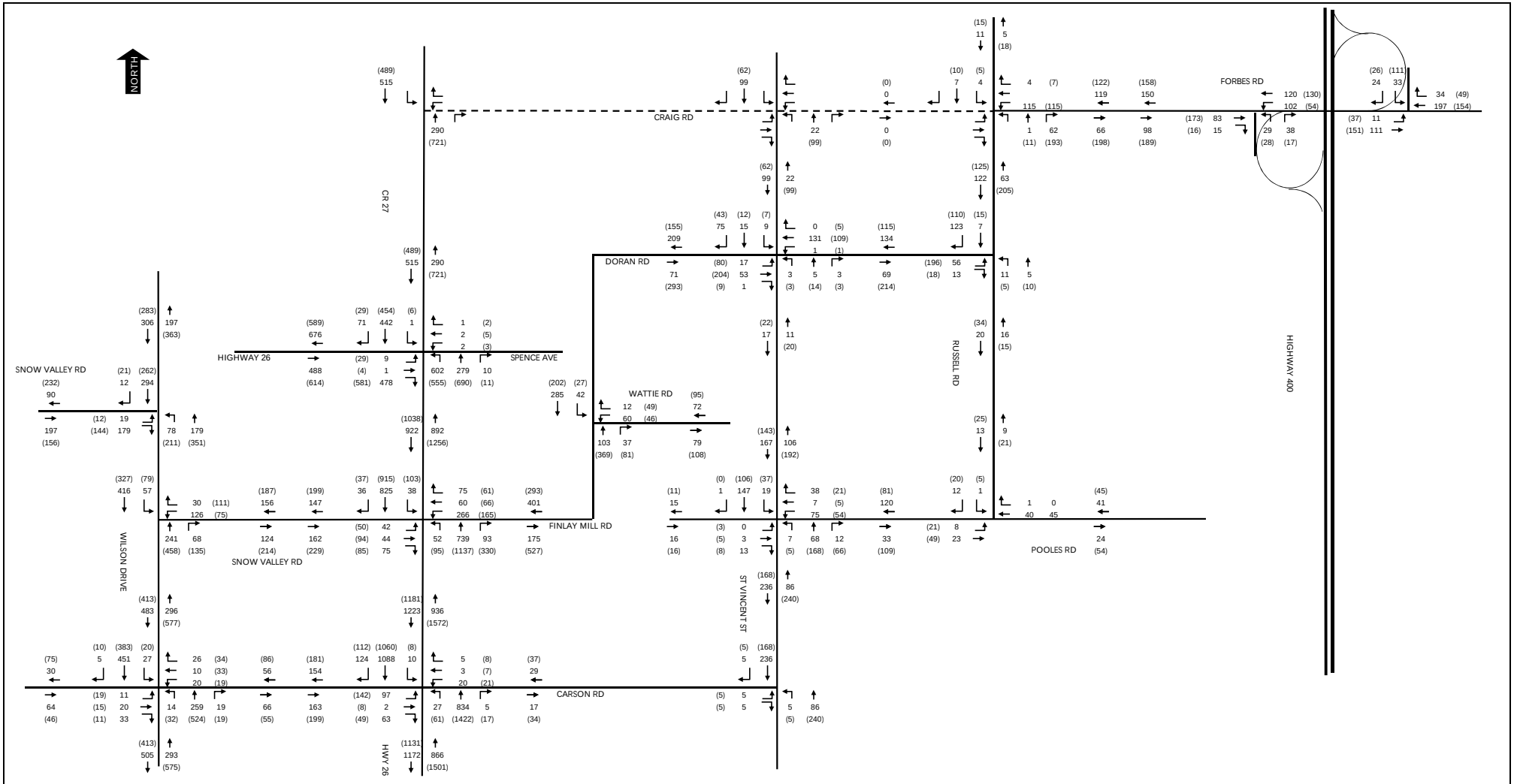


Figure 4

2041 Background Traffic Volumes

Midhurst EA Phases 3 & 4

Township of Springwater

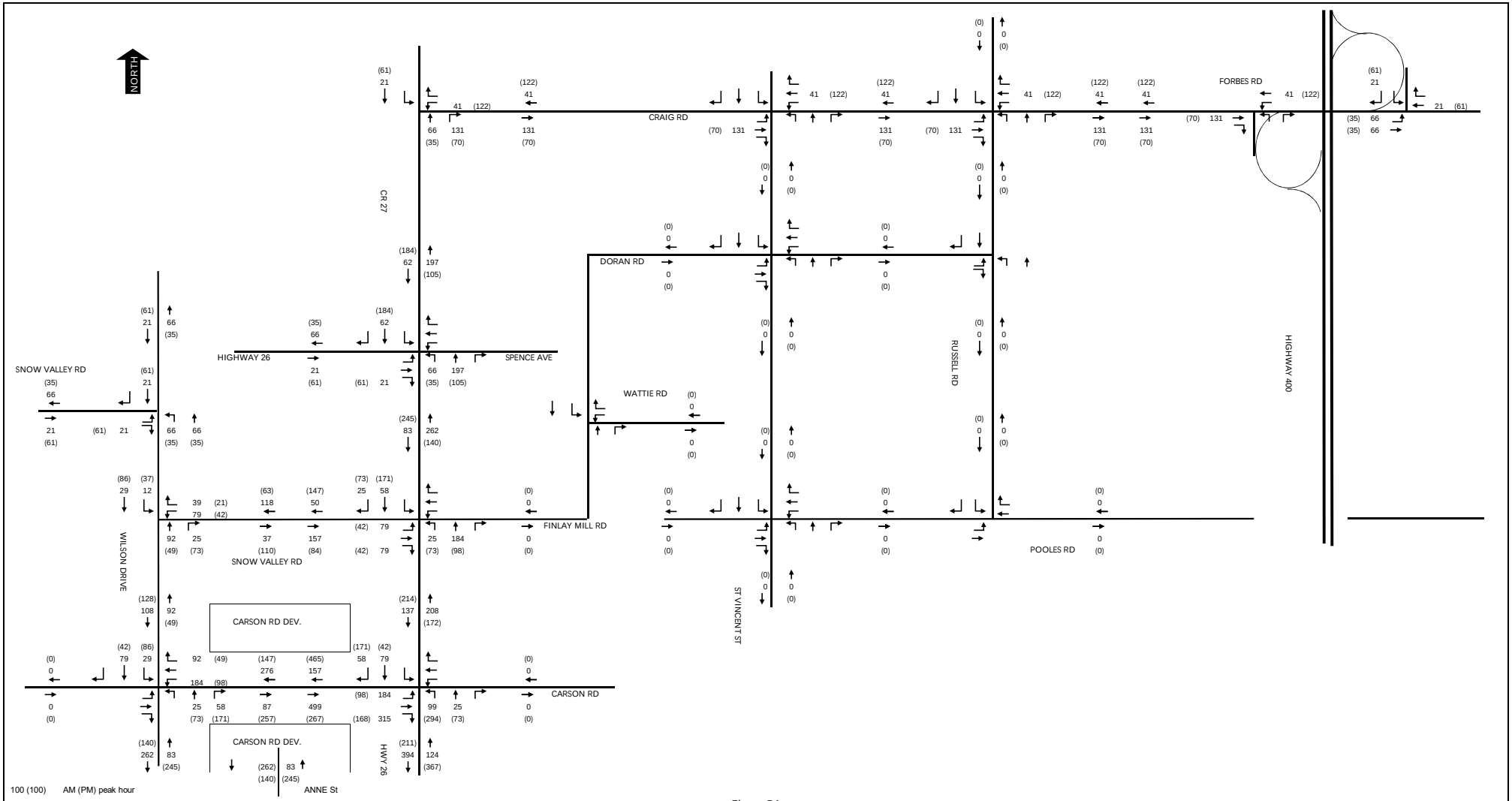


Figure B1

Carson Road Development Generated Traffic Volumes - Without Anne Street Connection

Midhurst EA Phases 3 & 4

Township of Springwater

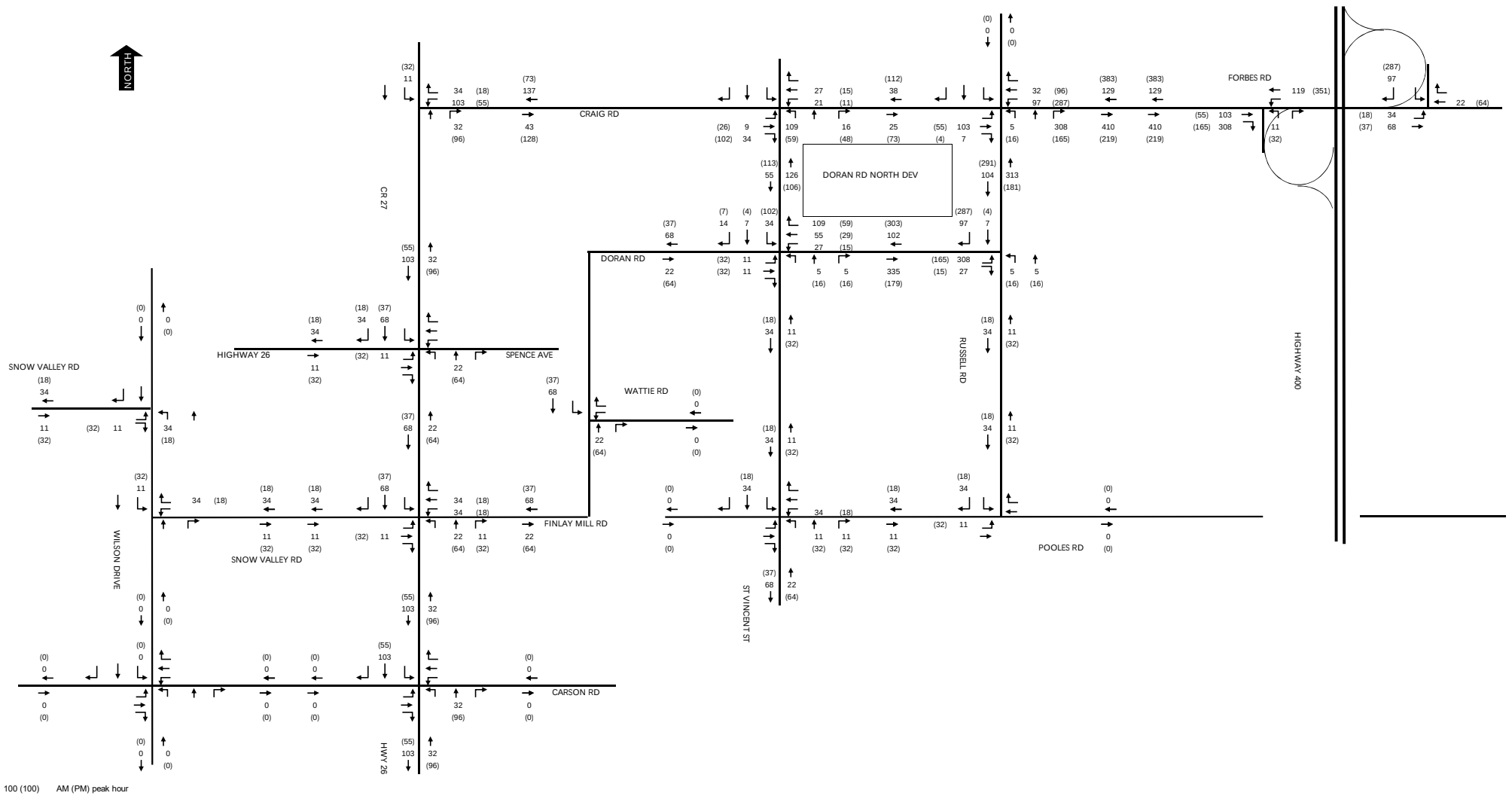


Figure B2

Doran Road North Development Generated Traffic Volumes

Midhurst EA Phases 3 & 4

Township of Springwater

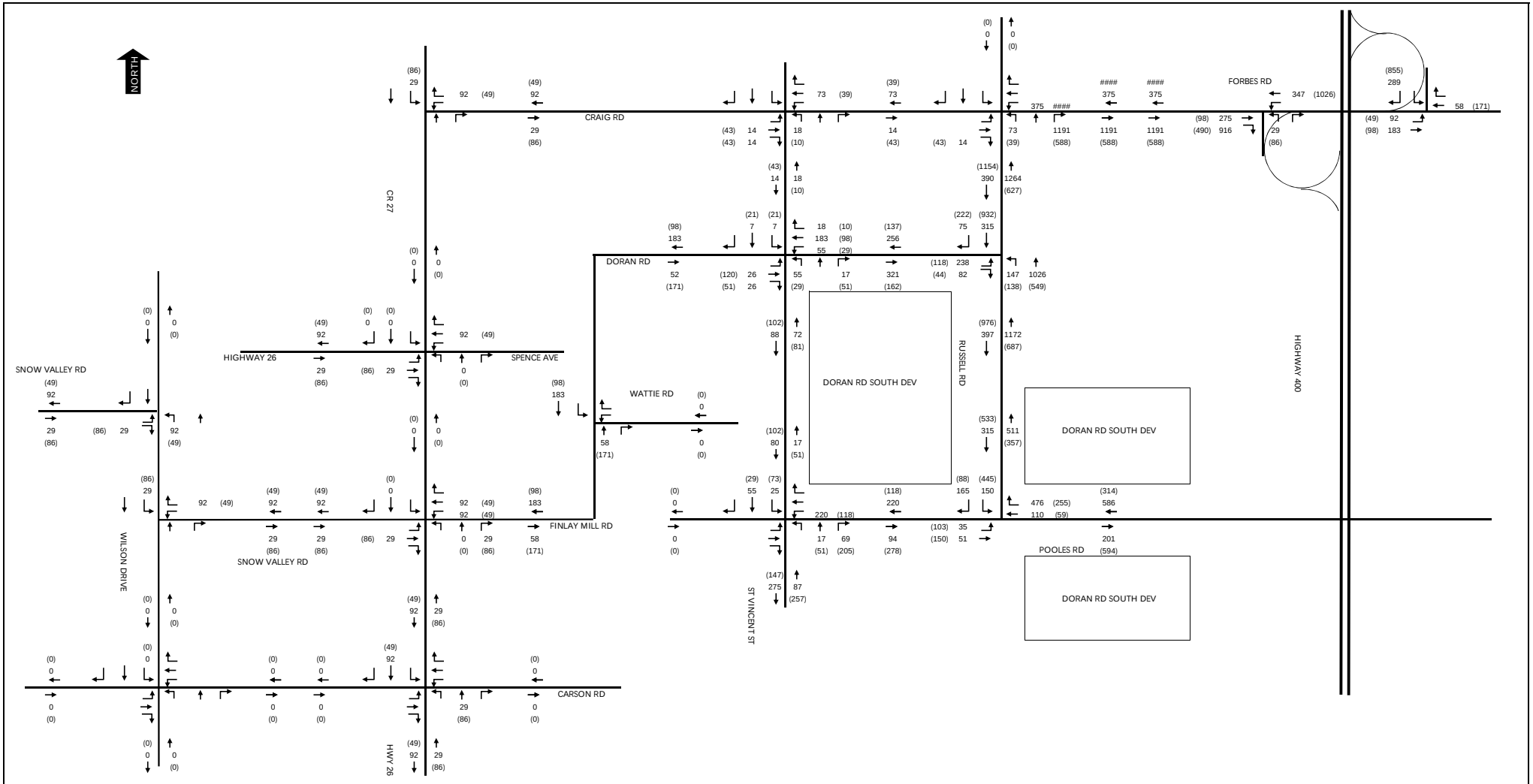


Figure B3

Doran Road South Development Generated Traffic Volumes

Midhurst EA Phases 3 & 4

Township of Springwater

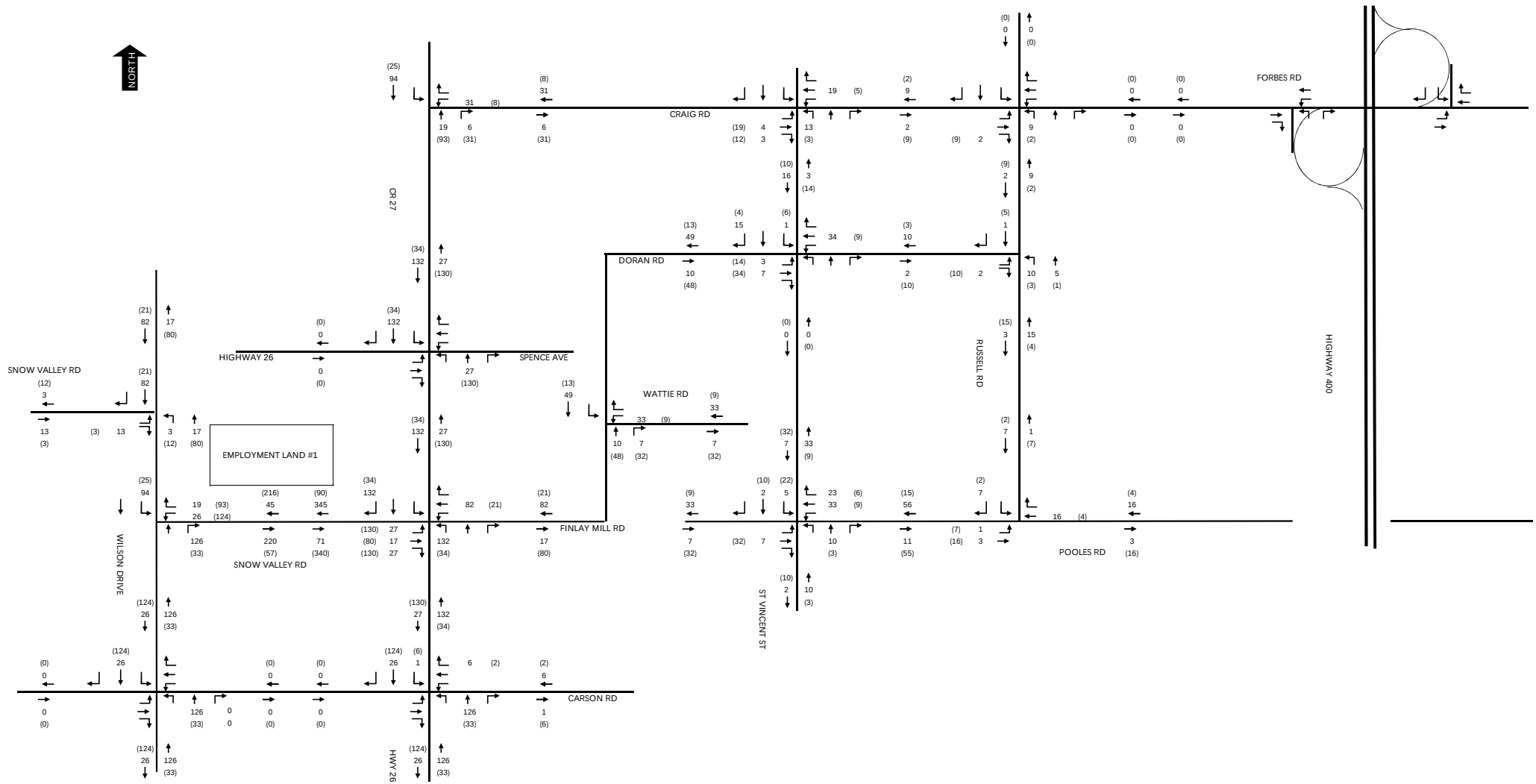


Figure B4

Employment Land #1 Development Generated Traffic Volumes

Midhurst EA Phases 3 & 4

Township of Springwater

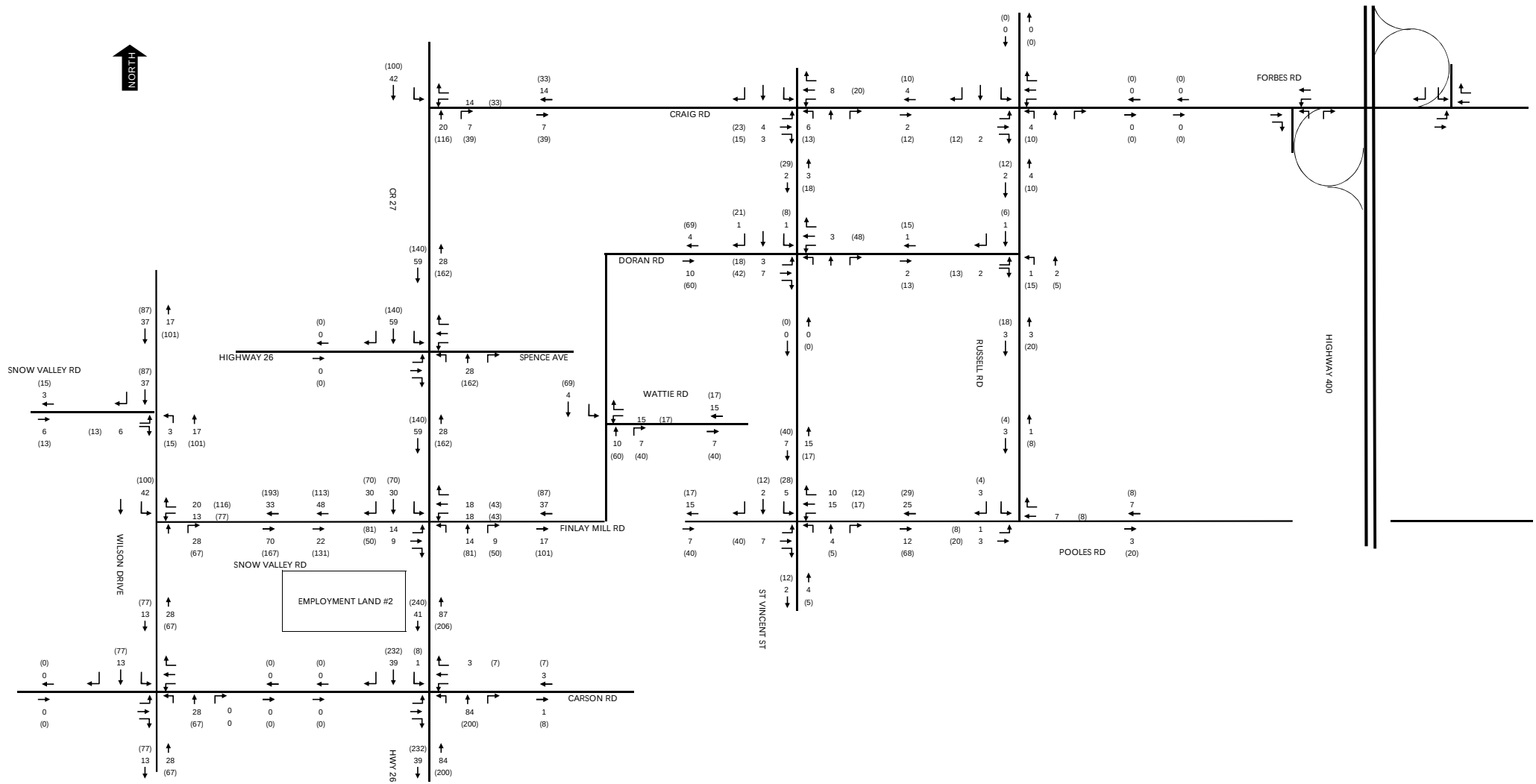


Figure B5

Employment Land #2 Development Generated Traffic Volumes

Midhurst EA Phases 3 & 4

Township of Springwater

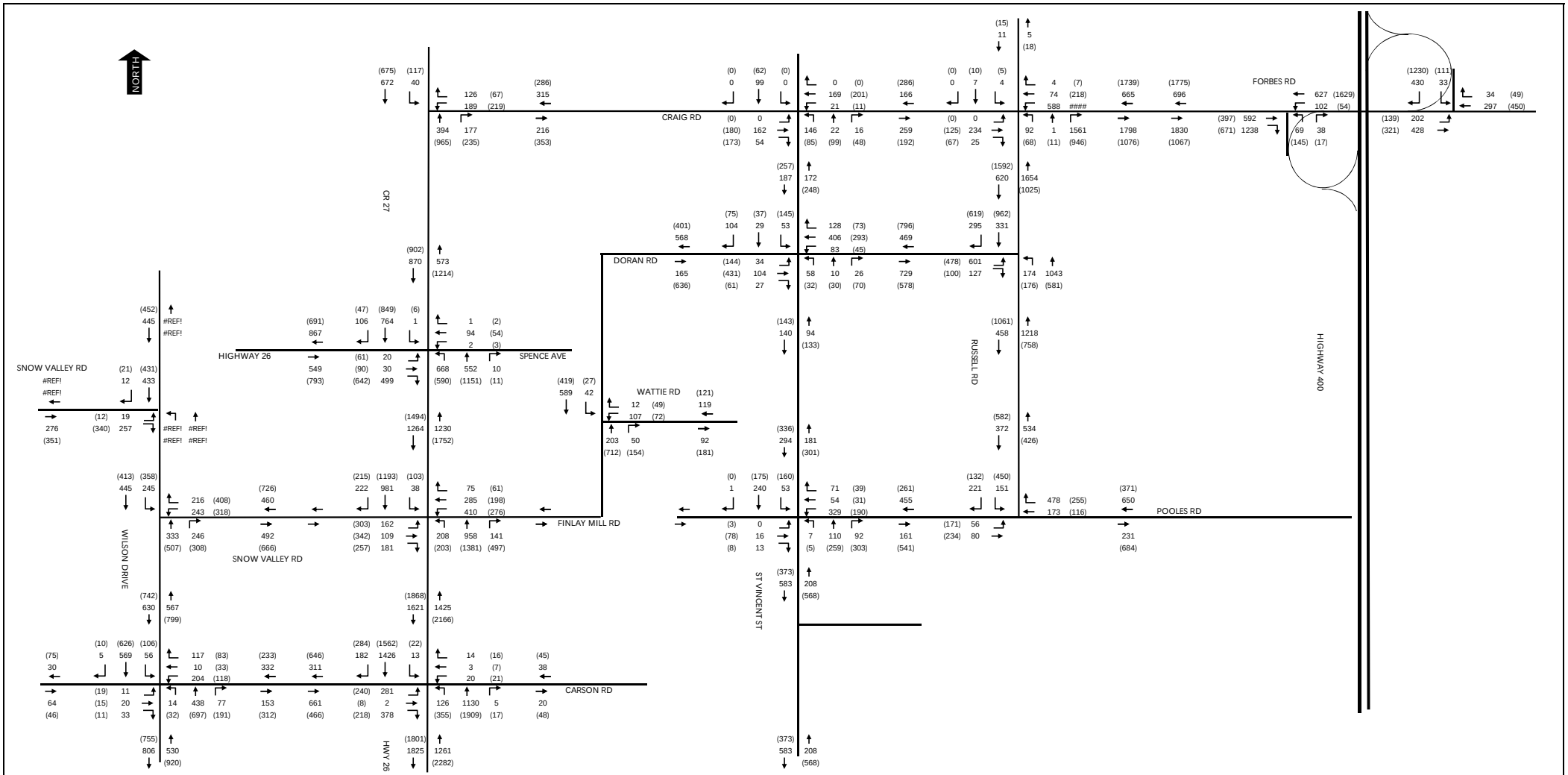


Figure 12
2041 Total Traffic Volumes
Midhurst EA Phases 3 & 4
Township of Springwater

Ainley & Associates Limited
550 Welham Road, Barrie, Ontario, L4N 8Z7
Tel: (705) 726-3371
E-mail barrie@ainleygroup.com

April 7, 2020

File #113027

**"By Email"**

MTO Central Region Engineering Office
Corridor Management Section
159 Sir William Hearst Avenue, 7th Floor
Toronto, Ontario
M3M 0B7

Attn: **Mr. Peter Dorton**
**Senior Project Manager**

Ref: **Township of Springwater,**
**Midhurst Class EA**
**Response to MTO Comments**

Dear Mr. Dorton:

We provide the following responses to the questions in your e-mail of March 4, 2020 and January 29, 2019. We apologise for the delay in responding to the Jan. 2019 email; however, subsequent to publishing the Draft Environmental Study Report (ESR) for Public comment in June 2018, five (5) Part II Orders Requests were submitted to the MECP and we were waiting for those to be resolved by the Minister, unfortunately this took longer than anticipated. However, now that Minister Yurek of the MECP has issued their decision denying the five (5) Part II Orders Requests which were submitted, we have proceeded to update and finalize the ESR for the Midhurst Class EA, along with responding to your comments.

For ease of refence we have repeated the portion of the comments from your last email (shown in blue) followed by our response. Please note that the page numbers referenced in the following sections are referring to the Final ESR, which may be slightly different than the Draft version that was published in June 2018.

1. *…we recommend that a final report be submitted incorporating the improvements identified in the Conclusions as being attributable to Secondary Plan development (with the exception that the northbound double LTL is not required at Hwy 26 / Carson Rd.).*

   We acknowledge discussions with your office regarding signal analysis that indicated that suitable LOS could be achieved without the Double Left Turn Lane which we had included in our earlier analysis. Reference to the double left turn lane for the northbound to westbound movement have been deleted from the proposed 2041 improvements for the intersection of Hwy 26 and Carson Road.

   In addition, the following wording has been added to the Recommended Transportation Improvements section of the Executive Summary of the ESR:

   "A complete list of recommended transportation improvements attributable to the development of the Midhurst Secondary Plan is included in Section 7.6."

2. *We would further suggest that the Conclusions for the Hwy 400 / Forbes Rd. IC be revised to identify that additional works may be required…*

The following wording has been added to the Recommended Transportation Improvements section of the Executive Summary and to Section 7.6 of the ESR:

"It should be noted that in conjunction with the Upgrade for the Hwy. 400 & Forbes Road Interchange, as part of Phase 2 Stage 3, (By or before 2041) a re-evaluation of the proposed improvements will be undertaken in conjunction with the MTO."

3. *The final report should confirm that 5 year updates will be undertaken to confirm the timing and extent of improvements recommended…*

Text has been added to the 2031 and 2041 traffic projection section and in the Summary of Improvement section for each of those horizons. In particular Section 7.5.3 on Page 101 of the ESR has been updated to note:

"Operational analysis and traffic growth should be reassessed on a five-year basis to confirm assumptions on traffic growth development progress and trip distribution are accurate and revise improvement scheduling as necessary."

In addition, Section 7.6, on Page 109 of the ESR, has been updated to note:

"Traffic projections for 10- and 20-year horizons are only approximations and should be checked with 5-year updates or more frequently based on development stages to confirm assumptions on traffic growth and development progress are accurate and the proposed improvement type and schedule are appropriate."

4. *While we acknowledge that Development Charges are intended to fund the improvements, MTO is not party to the collection of such funds, and the ESR should note that the legal agreements will be between the municipality and MTO.*

Text in the Introduction of the Traffic Section on page 62 of the ESR after describing some Schedule "C" EA projects has been updated to state:

"In addition to some projects requiring a Schedule "C" EA any projects involving roads or intersections within the jurisdiction of the MTO will require the Municipality and/or the County of Simcoe (depending upon who has local jurisdiction) to enter into a legal agreements with the MTO regarding encroachment on the MTO and obtain permission to undertake the proposed highway improvements within the specified timelines. Any proposed works within and/or crossing highway rights-of-way will also require MTO Encroachment permits."

The text in Section 7.6.6 of the ESR page 117 has been updated to state:

"The cost of the road improvements will be borne by Developers and funded through Development Charges. Further, in advance of the identified highway improvements associated with MTO controlled roads proceeding, the Township and/or the County of Simcoe (depending upon who has local jurisdiction) will enter into a legal Agreement(s) with the MTO regarding the funding for the proposed highway improvements within specified timelines. In addition, the Township will update the Traffic Operational Analysis every five (5) years to confirm that the timelines/horizon years noted remain applicable."

5. *How were the cost estimates developed? The cost for Hwy 26 improvements appear too low…*

   The basic road costs were developed from the ground up, by staff with extensive Municipal Road reconstruction experience, on a cost per metre basis, for the various road cross-sections such as two-lane rural, two-lane urban, four-lane urban with or without additional widening for Active Transportation and/or sidewalks. In addition, key features on each section of road such as a bridge, signalized intersection or roundabout were estimated as an approximate lump sum cost. The estimated cost per metre along with the estimates for any key features are included in Table 7.6.6.1 on page 120 for the ESR. The various road segments were reviewed, and, in several instances, additional costs were applied to address specific constraints such as topography challenges, property requirements and extraordinary utility requirements. For items such as manholes, catchbasins, street lighting or boulevard trees an industry spacing was assumed and the unit price per unit divided by the spacing and applied as a per metre cost.

6. *In addition, are the proposed estimates in today's dollars? If the recommended improvements should be considered for 2031 or 2041 horizon years, has inflation been considered, or has a factor been added to account for the increase in construction costs 12 to 22 years from now?*

   *More detailed cost estimates would assist in ensuring that adequate developer charges can be collected by the Township to pay for the future highway work.*

   The estimates were prepared in 2018 dollars to be consistent with the cost estimates prepared for the Water & Wastewater infrastructure. However, it is acknowledged that in the future these estimates will need, at minimum, to be increased using the annual construction index, along with more detailed construction estimates being prepared at the Preliminary and Detailed Design stages for each specific segment of infrastructure, prior to proceeding to construction.

If you have any questions on the above, please do not hesitate to contact our office.
Yours truly,

**AINLEY & ASSOCIATES LIMITED**

Steve Fournier P. Eng.
Senior Project Engineer

*S:\113027\Response to MTO Apr 07, 2020.docx*

## Joe Mullan

**From:** Dorton, Peter (MTO) <Peter.Dorton@ontario.ca>
**Sent:** Friday, May 1, 2020 3:50 PM
**To:** Steve Fournier, P.Eng.
**Cc:** Joe Mullan; Brent Spagnol - Springwater Township; Heather Coleman; 'Meile, Christian'; Shen, Rey (MTO); MacKinnon, John (MTO); Munro, Janice (MTO); Janke, Aaron (MTO); Uddin, Zaka (MTO); Diczki, Tarita (MTO); Mac, Frank (MTO); Vandenberg, Robert (MTO); Akhtar, Usman (MTO); Iannacito, Phil (MTO); Woo, Douglas
**Subject:** Fw: Midhurst Secondary Plan EA Ph 3 and 4, Traffic
**Attachments:** 113027 Midhurst Class EA - Response to MTO (Apr 7 2020).pdf

Steve:

Thanks for the response letter.

The approaches proposed to address our comments look to be acceptable, although we remain concerned that additional work is not being proposed now to update the highway cost estimates, especially at the Hwy 400 / Forbes Rd. IC. Also, as there are numerous references to our comments being addressed in the final ESR, please share the final ESR with us.

Thanks,
Peter Dorton
Senior Project Manager
Highway Corridor Management Section – Central Region
Ministry of Transportation
159 Sir William Hearst Avenue, 7th Floor
Toronto, ON M3M 0B7
Tel. (416) 235 - 4280
E-Mail: peter.dorton@ontario.ca
Web: www.mto.gov.on.ca/english/engineering/management/corridor

---

**From:** Steve Fournier, P.Eng. <fournier@ainleygroup.com>
**Sent:** April 9, 2020 8:50 AM
**To:** Dorton, Peter (MTO) <Peter.Dorton@ontario.ca>
**Cc:** 'Joe Mullan' <mullan@ainleygroup.com>
**Subject:** RE: Midhurst Secondary Plan EA Ph 3 and 4, Traffic

**CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.**

Mr. Dorton

We attach our response to your e-mail of March 4 and previous comments of January 2019. We trust the response provided is satisfactory, if you have any questions please call e-mail us.

Regards,

Steve Fournier, P.Eng.

Senior Engineer

www.ainleygroup.com
Tel: (705) 726-3371 Ext. 249
Cell: (705) 794-0555

***CAUTION:*** *The information contained in and/or attached to this transmission is solely for the use of the intended recipient. Any copying, distribution or use by others, without the express written consent of the Ainley Group, is strictly prohibited. The recipient is responsible for confirming the accuracy and completeness of the information with the originator. Please advise the sender if you believe this message has been received by you in error.*

**From:** Dorton, Peter (MTO) [mailto:Peter.Dorton@ontario.ca]
**Sent:** Wednesday, March 04, 2020 3:13 PM
**To:** Steve Fournier, P.Eng.
**Cc:** 'Joe Mullan'; brent.spagnol@springwater.ca; heather.coleman@springwater.ca; 'Meile, Christian'; Shen, Rey (MTO); MacKinnon, John (MTO); Munro, Janice (MTO); Janke, Aaron (MTO); Uddin, Zaka (MTO); Diczki, Tarita (MTO); Mac, Frank (MTO); Vandenberg, Robert (MTO); 'Hao, Jiang Yang (MTO)'; Van Voorst, John (MTO); Fischer, Linda (MTO)
**Subject:** RE: Midhurst Secondary Plan EA Ph 3 and 4, Traffic

Hi Steve:

Could you please confirm when we can expect a response to the below comments provided on January 29, 2019.

Thanks,
Peter D.

**From:** Dorton, Peter (MTO)
**Sent:** January 29, 2019 4:26 PM
**To:** 'Steve Fournier, P.Eng.' <fournier@ainleygroup.com>
**Cc:** 'Joe Mullan' <mullan@ainleygroup.com>; brent.spagnol@springwater.ca; heather.coleman@springwater.ca; 'Meile, Christian' <Christian.Meile@simcoe.ca>; Shen, Rey (MTO) <Rey.Shen@ontario.ca>; MacKinnon, John (MTO) <John.MacKinnon@ontario.ca>; Munro, Janice (MTO) <Janice.Munro@ontario.ca>; Janke, Aaron (MTO) <Aaron.Janke@ontario.ca>; Uddin, Zaka (MTO) <Zaka.Uddin@ontario.ca>; Diczki, Tarita (MTO) <Tarita.Diczki@ontario.ca>; Mac, Frank (MTO) <Frank.Mac@ontario.ca>; Vandenberg, Robert (MTO) <Robert.Vandenberg@ontario.ca>; Hao, Jiang Yang (MTO) <JiangYang.Hao@ontario.ca>; Van Voorst, John (MTO) <John.VanVoorst@ontario.ca>; Sieradzki, Susan (MTO) <Susan.Sieradzki@ontario.ca>
**Subject:** RE: Midhurst Secondary Plan EA Ph 3 and 4, Traffic

Hi Steve:

Thanks for the response letter.

While the responses provided are generally acceptable, we recommend that a final report be submitted incorporating the improvements identified in the Conclusions as being attributable to Secondary Plan development (with the exception that the northbound double LTL is not required at Hwy 26 / Carson Rd.). We would further suggest that the Conclusions for the Hwy 400 / Forbes Rd. IC be revised to identify that additional works may be required, as per the comments provided under Responses 5(c) and (d).

# APPENDIX 'CC'

## Notice of Completion

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, Ontario L9Y 4J5
Tel: (705) 445-3451 • Fax: (705) 445-0968
E-mail: collingwood@ainleygroup.com

May 31, 2018 File No. 113027

Ref: **Township of Springwater**
**Class Environmental Assessment (Phase 4)**
**Midhurst Water, Wastewater and Transportation**
**Notice of Completion of Environmental Study Report & Open House**

Dear Sir or Madam:

Further to the Notice of Study Commencement issued April 25, 2013, the Township of Springwater has proceeded with a Schedule "C" Class Environmental Assessment planning process to identify and assess servicing options (water, wastewater and transportation) to accommodate the proposed Midhurst Secondary Plan.

A draft Environmental Study Report (ESR) has been prepared for public review and as such the enclosed "Notice of Completion of Environmental Study Report (ESR)" is being advertised in the local newspapers and on the Township website starting on May 31, 2018.

In conjunction with the draft Environmental Study Report being placed in the public record, the Township will be hosting an Open House on Monday June 18, 2018 at Snow Valley Resort. The purpose of this Open House is to provide an overview of the material within the draft Environmental Study Report.

Should you have any questions or comments in relation to the attached Notice, please do not hesitate to contact the undersigned.

Sincerely,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P.Eng.
President and CEO

Encl.
c.c Heather Coleman, Director of Public Works, Township of Springwater

S:\113027\Communication Plan\Notice of Completion May 2018).docx

# The Township of Springwater
# Midhurst Water, Wastewater & Transportation
# Class Environmental Assessment (Phase 4)
# Notice of Completion of Environment Study Report (ESR) & Open House

The Township of Springwater is continuing with Phase 4 of the Class Environmental Assessment (Class EA) Planning Process to determine the specific water, wastewater and transportation infrastructure requirements to accommodate the future growth within the Midhurst Secondary Plan, in accordance with the "Midhurst Master Plan – Phase 1 & 2 - Water, Wastewater & Transportation, dated July 2009." The Master Plan, which is available on the Township's website at www.springwater.ca/msp_ea, identified the infrastructure that will be required and also concluded that Phases 3 and 4 of the Class EA process needed to be completed.

Phase 4 of the Class EA process will follow the planning and design process for Schedule 'C' projects as described in the Municipal Class Environmental Assessment Document (October 2000 as amended in 2007, 2011 & 2015), published by the Municipal Engineer's Association. However, in order to augment the Class EA process, the Township has determined that a Phase 4 Public Open House should be held during the 30-day public review period.

The draft Environmental Study Report (ESR) has been completed and by this Notice, is being placed in the public record for review and comment. Subject to comments received as a result of this Notice (and Open House) and the receipt of necessary approvals, the Township intends to proceed with the design and construction of the identified servicing infrastructure including:

- New water system(s) to service the proposed growth within the Midhurst Secondary Plan including new wells, water treatment facility, high lift pumps or booster stations, water storage reservoirs and distribution systems including transmission mains;
- New Wastewater Treatment & Collection System (including sanitary collection systems, pump stations, treatment plant and effluent outfall) to service the proposed growth within the Midhurst Secondary Plan with the capability of servicing the existing Midhurst area, if required;
- Upgrading/Reconstruction of existing roads and intersections throughout the existing community;
- Construction of a new Craig Road (2 lanes) from County Rd. 27 to Russel Road including a direct connection to Forbes Road; and
- Upgrading of the Forbes Road and Highway 400 Interchange.

The Environmental Study Report will be available on **June 19, 2018** on the Township website at www.springwater.ca/msp_ea, along with a hard copy being available at the Township of Springwater Municipal Office:

During the formal 30-day public review, an Open House has been arranged for **6:00pm to 9:00pm on Monday June 18, 2018** at Snow Valley Resort (2632 Vespra Valley Road). The purpose of this Open House is to provide an overview of the material within the Environmental Study Report. This Open House will predominantly be an informal drop in format and Display Boards will be available with representatives of the Project Team to answer individual questions in a one-on-one format, relating to the proposed Water, Wastewater & Transportation Infrastructure. A formal presentation will be made between **7:30pm to 8:00pm** followed by a question and answer period. However, if you have specific questions you are encouraged to attend the earlier drop in format which will provide a better opportunity to have meaningful dialogue with the project team.

If you have any outstanding concerns about this project, please address them to the following individuals prior to July 19, 2018:

Ms. Heather Coleman
Director of Public Works
Township of Springwater
2231 Nursery Road, Minesing ON, L9X 1A8
Email: midhurst.classea@springwater.ca

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Pky, Collingwood, ON, L9Y 4J5
Email: midhurst.classea@ainleygroup.com

If concerns regarding this project cannot be resolved in discussion with the Township, the person with the concern(s) may request that the Minister of the Environment and Climate Change (MOECC) order a change in the project status and require a higher level of assessment under an Individual Environmental Assessment process (referred to as a Part II Order). Detailed reasons must be provided in support of the request. Copies of the request must be sent to:

Ministry of the Environment and Climate Change
77 Wellesley Street, West
11th Floor, Ferguson Block
Toronto, ON M7A 2T5

Ministry of the Environment and Climate Change
Environmental Approvals Branch
135 Clair Avenue West,
1st Floor, Toronto, ON M4V 1P5

Ms. Heather Coleman
Director of Public Works
Township of Springwater
2231 Nursery Road,
Minesing ON, L9X 1A8

If no requests are received by July 19, 2018, the Township may proceed to carry out design and construction of the project as presented in the planning documentation.

Please note that all personal information included in a Part II Order submission – such as name, address, telephone number and property location – is collected, maintained and disclosed by the Ministry of the Environment and Climate Change for the purpose of transparency and consultation. The information is collected under the authority of the Environmental Assessment Act or is collected and maintained for the purpose of creating a record that is available to the general public as described in s.37 of the Freedom of Information and Protection of Privacy Act. Personal information you submit will become part of a public record that is available to the general public unless you request that your personal information remain confidential. For more information, please contact the Ministry's Freedom of Information and Privacy Coordinator at 416-327-1434.

This notice issued on May 31, 2018.

| Title | First Name | Last Name | Title1 | Agency | Department | Address 1 | Address 2 | City, Prov. | Postal Code | |
|---|---|---|---|---|---|---|---|---|---|---|
| Mr. | Rob | Dobos | Manager, Environmental Assessment Section | Environment Canada | | 867 Lakeshore Road | Box 5050 | Burlington, ON | L7R 4A6 | |
| Ms. | Cindy | Hood | District Manager | Ministry of Environment & Climate Change (Barrie District) | | 54 Cedar Pointe Drive | Unit 1201 | Barrie, ON | L4N 5R7 | |
| Ms. | Chunmei | Liu | Environmental Resource Planner & EA Coordinator - Air, Pesticides and Environmental. Planner (***Barrie, Orillia & Simcoe***) | Ministry of Environment and Climate Change (Central Region) | | 5775 Yonge Street | 8th Floor | Toronto, ON | M2M 4J1 | |
| Mr. | Peter | Dorton | Senior Project Manager | Ministry of Transportation | Corridor Management Section | 159 Sir William Hearst Ave. | Bldg. D, 7th Floor | Toronto, ON | M3M 0B7 | |
| Mr. | Shawn | Carey | District Manager | Ministry of Natural Resources & Forestry (Midhurst District) | | 2284 Nursery Road | | Midhurst, ON | L9X 1N8 | |
| Ms. | Kim | Benner | District Planner | Ministry of Natural Resources & Forestry | | 2284 Nursery Road | | Midhurst, ON | L9X 1N8 | |
| | | | Park Planner | Ontario Parks | | 451 Arrowhead Park Road | | Huntsville, ON | P1H 2J4 | |
| | Scott | Thomas | Superintendent | Bass Lake Provincial Park | | 2540 Bass Lake, Sideroad E | Box 2178 | Orillia, ON | L3V 6H2 | |
| | | | Assistant Park Superintendent | Bass Lake Provincial Park | | 2540 Bass Lake, Sideroad E | Box 2178 | Orillia, ON | L3V 6H2 | |
| Ms. | Carol | Neumann | Rural Planner | Ministry of Agriculture Food & Rural Affairs | | 6484 Wellington Road 7 | Unit 10 | Elora, ON | N0B 1S0 | |
| | | | Rural Planner | Ministry of Agriculture Food & Rural Affairs | | R.R.#3, 95 Dundas St. | | Brighton, ON | K0K 1H0 | |
| Ms. | Alejandra | Gonzalez | Senior Planner | Ministry of Municipal Affairs & Housing | | 777 Bay Street | 13th Floor | Toronto, ON | M5G 2E5 | Alejandra.Gonzalez@ontario.ca |
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Sarah Brooks

From: Barb Bell
Sent: Wednesday, May 30, 2018 10:38 AM
To: 'usc-cau@aadnc-aandc.gc.ca'
Subject: Notice of Completion & Open House
Attachments: Letter and Notice of Completion.pdf

Consultation and Accommodation Unit
Aboriginal Affairs and Northern Development Canada

Township of Springwater
Class Environmental Assessment (Phase 4)
Midhurst Water, Wastewater and Transportation
Notice of Completion of Environmental Study Report & Open House

Regards,

Barb Bell
Administrative Assistant
Ainley
www.ainleygroup.com
Tel: (705) 445-3460 Ext. 125

***CAUTION:*** *The information contained in and/or attached to this transmission is solely for the use of the intended recipient. Any copying, distribution or use by others, without the express written consent of the Ainley Group, is strictly prohibited. The recipient is responsible for confirming the accuracy and completeness of the information with the originator. Please advise the sender if you believe this message has been received by you in error.*

Sarah Brooks

From: Barb Bell
Sent: Wednesday, May 30, 2018 10:56 AM
To: allio34@hotmail.com
Subject: Notice of Completion & Open House
Attachments: Letter and Notice of Completion.pdf

Ms. Allison Graham

Please find attached:
Township of Springwater
Class Environmental Assessment (Phase 4)
Midhurst Water, Wastewater and Transportation
Notice of Completion of Environmental Study Report & Open House

Regards,

Barb Bell
Administrative Assistant
Ainley
www.ainleygroup.com
Tel: (705) 445-3460 Ext. 125

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Sarah Brooks

From: Barb Bell
Sent: Wednesday, May 30, 2018 10:51 AM
To: 'amtkachenko@aol.com'
Subject: Notice of Completion & Open House
Attachments: Letter and Notice of Completion.pdf

Mr. Tkachenko

Please find attached:
Township of Springwater
Class Environmental Assessment (Phase 4)
Midhurst Water, Wastewater and Transportation
Notice of Completion of Environmental Study Report & Open House

Regards,

Barb Bell
Administrative Assistant
Ainley
www.ainleygroup.com
Tel: (705) 445-3460 Ext. 125

***CAUTION:*** *The information contained in and/or attached to this transmission is solely for the use of the intended recipient. Any copying, distribution or use by others, without the express written consent of the Ainley Group, is strictly prohibited. The recipient is responsible for confirming the accuracy and completeness of the information with the originator. Please advise the sender if you believe this message has been received by you in error.*

Sarah Brooks

From: postmaster@apotex.com
To: 'aduncan@apotex.com'
Sent: Wednesday, May 30, 2018 11:21 AM
Subject: Undeliverable: Notice of Completion and Open House

## Delivery has failed to these recipients or groups:

'aduncan@apotex.com' (aduncan@apotex.com)
The e-mail address you entered couldn't be found. Check the address and try resending the message. If the problem continues, please contact your helpdesk.

Diagnostic information for administrators:

Generating server: apotex.com

aduncan@apotex.com
#550 5.1.1 RESOLVER.ADR.RecipNotFound; not found ##

Original message headers:

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From: Barb Bell <bell@ainleygroup.com>
To: "'aduncan@apotex.com'" <aduncan@apotex.com>
Subject: Notice of Completion and Open House
Thread-Topic: Notice of Completion and Open House
Thread-Index: AdP4KaEvezDM5JLERdmq4gb4VKb+Zg==
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xZ9uT4J47hkaM/XEW0oQ6iRQpPjXdzCNwiCUaBoDjTGE00ArAfPwyW+DkQpj29OlEuUdv/jynEKe/QHFlTTs1WkeL
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1;YTXPR0101MB1165;6:tnF/+E41hdZqgNeXaOMrZ7DFWdeEvnni4nOLSwtu9cQAVJnPjbvh3TIFVWYQyk8W+aD5C
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ni
X-MS-Exchange-CrossTenant-OriginalArrivalTime: 30 May 2018 15:20:30.0629
 (UTC)

X-MS-Exchange-CrossTenant-Network-Message-Id: 33988ef5-d7bf-4e9c-5c8b-08d5c640e157
X-MS-Exchange-CrossTenant-Id: 6ab8c3f8-6287-441e-b3e8-cfe768cc3c6c
X-MS-Exchange-CrossTenant-FromEntityHeader: Internet
X-MS-Exchange-Transport-CrossTenantHeadersStamped: YTXPR0101MB1165
X-OrganizationHeadersPreserved: YTXPR0101MB1165.CANPRD01.PROD.OUTLOOK.COM
X-OriginatorOrg: Apotexinc.onmicrosoft.com
X-CrossPremisesHeadersPromoted: TORCASP1.apotex.ca
X-CrossPremisesHeadersFiltered: TORCASP1.apotex.ca

Sarah Brooks

From: Barb Bell
Sent: Wednesday, May 30, 2018 11:20 AM
To: 'aduncan@apotex.com'
Subject: Notice of Completion and Open House
Attachments: Letter and Notice of Completion.pdf

Mr. Andy Duncan

Please find attached:
Township of Springwater
Class Environmental Assessment (Phase 4)
Midhurst Water, Wastewater and Transportation
Notice of Completion of Environmental Study Report & Open House

Regards,

Barb Bell
Administrative Assistant
Ainley
www.ainleygroup.com
Tel: (705) 445-3460 Ext. 125

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Sarah Brooks

From: Barb Bell
Sent: Wednesday, May 30, 2018 10:49 AM
To: 'sharpe.family@sympatico.ca'
Subject: Notice of Completion & Open House
Attachments: Letter and Notice of Completion.pdf

Ms. Anne Learn Sharpe

Please find attached:
Township of Springwater
Class Environmental Assessment (Phase 4)
Midhurst Water, Wastewater and Transportation
Notice of Completion of Environmental Study Report & Open House

Regards,

Barb Bell
Administrative Assistant
Ainley
www.ainleygroup.com
Tel: (705) 445-3460 Ext. 125

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Sarah Brooks

From: Barb Bell
Sent: Wednesday, May 30, 2018 10:44 AM
To: 'kutcherbw@golden.net'
Subject: Notice of Completion and Open House
Attachments: Letter and Notice of Completion.pdf

Ms. Barb Kutcher

Please find attached:
Township of Springwater
Class Environmental Assessment (Phase 4)
Midhurst Water, Wastewater and Transportation
Notice of Completion of Environmental Study Report & Open House

Regards,

Barb Bell
Administrative Assistant
Ainley
www.ainleygroup.com
Tel: (705) 445-3460 Ext. 125

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Sarah Brooks

From: Barb Bell
Sent: Wednesday, May 30, 2018 10:36 AM
To: veronica.mcleod@coo.org
Subject: Notice of Completion & Open House
Attachments: Letter and Notice of Completion.pdf

Ms. Veronica McLeod
Executive Assistant to Ontario Regional Chief
Chiefs of Ontario

Township of Springwater
Class Environmental Assessment (Phase 4)
Midhurst Water, Wastewater and Transportation
Notice of Completion of Environmental Study Report & Open House

Regards,

Barb Bell
Administrative Assistant
Ainley
www.ainleygroup.com
Tel: (705) 445-3460 Ext. 125

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Sarah Brooks

| | |
|---|---|
| From: | Barb Bell |
| Sent: | Wednesday, May 30, 2018 10:31 AM |
| To: | municipalnotices@enbridge.com |
| Subject: | Notice of Completion & Open House |
| Attachments: | Letter and Notice of Completion.pdf |

Enbridge:

Please find attached a letter and a Notice of Completion for:

Township of Springwater
Class Environmental Assessment (Phase 4)
Midhurst Water, Wastewater and Transportation
Notice of Completion of Environmental Study Report & Open House

Regards,

Barb Bell
Administrative Assistant
Ainley
www.ainleygroup.com
Tel: (705) 445-3460 Ext. 125

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Sarah Brooks

From: Barb Bell
Sent: Wednesday, May 30, 2018 10:54 AM
To: suttonmobile@hotmail.ca
Subject: Notice of Completion & Open House
Attachments: Letter and Notice of Completion.pdf

Mr. Gary Sutton

Please find attached:
Township of Springwater
Class Environmental Assessment (Phase 4)
Midhurst Water, Wastewater and Transportation
Notice of Completion of Environmental Study Report & Open House

Regards,

Barb Bell
Administrative Assistant
Ainley
www.ainleygroup.com
Tel: (705) 445-3460 Ext. 125

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Sarah Brooks

From: Barb Bell
Sent: Wednesday, May 30, 2018 10:46 AM
To: 'gmgreenall@rogers.com'
Subject: Notice of Completion and Open House
Attachments: Letter and Notice of Completion.pdf

Mr. Gary Greenall

Please find attached:
Township of Springwater
Class Environmental Assessment (Phase 4)
Midhurst Water, Wastewater and Transportation
Notice of Completion of Environmental Study Report & Open House

Regards,

Barb Bell
Administrative Assistant
Ainley
www.ainleygroup.com
Tel: (705) 445-3460 Ext. 125

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Sarah Brooks

From: Barb Bell
Sent: Wednesday, May 30, 2018 10:52 AM
To: 'gwtodd@rogers.com'
Subject: Notice of Completion & Open House
Attachments: Letter and Notice of Completion.pdf

Mr. George Todd

Please find attached:
Township of Springwater
Class Environmental Assessment (Phase 4)
Midhurst Water, Wastewater and Transportation
Notice of Completion of Environmental Study Report & Open House

Regards,

Barb Bell
Administrative Assistant
Ainley
www.ainleygroup.com
Tel: (705) 445-3460 Ext. 125

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Sarah Brooks

From: Barb Bell
Sent: Wednesday, May 30, 2018 10:46 AM
To: 'h.hutton@rogers.com'
Subject: Notice of Completion and Open House
Attachments: Letter and Notice of Completion.pdf

Ms. Helen Hutton

Please find attached:
Township of Springwater
Class Environmental Assessment (Phase 4)
Midhurst Water, Wastewater and Transportation
Notice of Completion of Environmental Study Report & Open House

Regards,

Barb Bell
Administrative Assistant
Ainley
www.ainleygroup.com
Tel: (705) 445-3460 Ext. 125

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Sarah Brooks

From: Barb Bell
Sent: Wednesday, May 30, 2018 10:55 AM
To: Henry_Rachfalowski@manulife.com
Subject: Notice of Completion & Open House
Attachments: Letter and Notice of Completion.pdf

Mr. Henry A Rachfalowski

Please find attached:
Township of Springwater
Class Environmental Assessment (Phase 4)
Midhurst Water, Wastewater and Transportation
Notice of Completion of Environmental Study Report & Open House

Regards,

Barb Bell
Administrative Assistant
Ainley
www.ainleygroup.com
Tel: (705) 445-3460 Ext. 125

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Sarah Brooks

From: Barb Bell
Sent: Wednesday, May 30, 2018 10:50 AM
To: 'coryjean@rogers.com'
Subject: Notice of Completion and Open House
Attachments: Letter and Notice of Completion.pdf

Ms. Jean Oostrom

Please find attached:
Township of Springwater
Class Environmental Assessment (Phase 4)
Midhurst Water, Wastewater and Transportation
Notice of Completion of Environmental Study Report & Open House

Regards,

Barb Bell
Administrative Assistant
Ainley
www.ainleygroup.com
Tel: (705) 445-3460 Ext. 125

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Sarah Brooks

From: Barb Bell
Sent: Friday, June 01, 2018 10:45 AM
To: michael.sullivan@hydroone.com
Subject: Notice of Completion & Open House
Attachments: Letter and Notice of Completion.pdf

Mr. Mike Sullivan
Senior Network Management Officer
Hydro One Networks Inc.

Township of Springwater
Class Environmental Assessment (Phase 4)
Midhurst Water, Wastewater and Transportation
Notice of Completion of Environmental Study Report & Open House

Regards,

Barb Bell
Administrative Assistant
Ainley
www.ainleygroup.com
Tel: (705) 445-3460 Ext. 125

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Sarah Brooks

| | |
|---|---|
| From: | Barb Bell |
| Sent: | Wednesday, May 30, 2018 10:39 AM |
| To: | 'reagle@ocwa.ca' |
| Subject: | Notice of Completion & Open House |
| Attachments: | Letter and Notice of Completion.pdf |

Mr. Richard Eagle
Ontario Clean Water Agency

Please find attached:
Township of Springwater
Class Environmental Assessment (Phase 4)
Midhurst Water, Wastewater and Transportation
Notice of Completion of Environmental Study Report & Open House

Regards,

Barb Bell
Administrative Assistant
Ainley
www.ainleygroup.com
Tel: (705) 445-3460 Ext. 125

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Sarah Brooks

From: postmaster@mail.ohsc.com
To: richard.shannon@hydroone.com
Sent: Friday, June 01, 2018 10:40 AM
Subject: Undeliverable: Notice of Completion & Open House

## Delivery has failed to these recipients or groups:

richard.shannon@hydroone.com (richard.shannon@hydroone.com)
The email address you entered couldn't be found. Please check the recipient's email address and try to resend the message. If the problem continues, please contact your helpdesk.

Diagnostic information for administrators:

Generating server: 1101MILP.corp.hydroone.com

richard.shannon@hydroone.com
Remote Server returned '550 5.1.1 RESOLVER.ADR.RecipNotFound; not found'

Original message headers:

```
Received: from 1104MILP.corp.hydroone.com (142.10.25.77) by
 1101MILP.corp.hydroone.com (142.10.25.71) with Microsoft SMTP Server (TLS) id
 15.0.1367.3; Fri, 1 Jun 2018 10:40:05 -0400
Received: from mail2.hydroone.com (142.10.25.252) by smtp.hydroone.com
 (142.10.25.77) with Microsoft SMTP Server (TLS) id 15.0.1367.3 via Frontend
 Transport; Fri, 1 Jun 2018 10:40:05 -0400
Received: from NAM02-CY1-obe.outbound.protection.outlook.com (mail-
cys01nam02on0091.outbound.protection.outlook.com [104.47.37.91]) by mail2.hydroone.com
with smtp
        (TLS: TLSv1/SSLv3,256bits,ECDHE-RSA-AES256-SHA384)
         id 1995_4f2f_293643d4_cd60_4676_8179_adcd2e6ca44e;
        Fri, 01 Jun 2018 10:40:03 -0400
DKIM-Signature: v=1; a=rsa-sha256; c=relaxed/relaxed;
 d=ainleygroup.onmicrosoft.com; s=selector1-ainleygroup-com;
 h=From:Date:Subject:Message-ID:Content-Type:MIME-Version:X-MS-Exchange-SenderADCheck;
 bh=9deLlE3GeA9LE0b5UWn9fv7Ka0g7IykVGQJnMZklH6M=;

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Received: from DM5PR08MB3338.namprd08.prod.outlook.com (10.164.153.164) by
 DM5PR08MB3612.namprd08.prod.outlook.com (10.164.155.18) with Microsoft SMTP
 Server (version=TLS1_2, cipher=TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA384_P256) id
 15.20.797.11; Fri, 1 Jun 2018 14:39:57 +0000
Received: from DM5PR08MB3338.namprd08.prod.outlook.com
 ([fe80::24d7:36d8:b87d:90c3]) by DM5PR08MB3338.namprd08.prod.outlook.com
 ([fe80::24d7:36d8:b87d:90c3%13]) with mapi id 15.20.0797.020; Fri, 1 Jun 2018
```

```
 14:39:57 +0000
From: Barb Bell <bell@ainleygroup.com>
To: "richard.shannon@hydroone.com" <richard.shannon@hydroone.com>
Subject: Notice of Completion & Open House
Thread-Topic: Notice of Completion & Open House
Thread-Index: AdP5tjp9owhBz5pVTpu3QpTH8PM9Zg==
Date: Fri, 1 Jun 2018 14:39:57 +0000
Message-ID:
<DM5PR08MB3338744BE3AC8C5F310A9C59DB620@DM5PR08MB3338.namprd08.prod.outlook.com>
Accept-Language: en-CA, en-US
Content-Language: en-US
X-MS-Has-Attach: yes
X-MS-TNEF-Correlator:
authentication-results: spf=none (sender IP is )
 smtp.mailfrom=bell@ainleygroup.com;
x-originating-ip: [207.107.159.254]
x-ms-publictraffictype: Email
x-microsoft-exchange-diagnostics:
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x-microsoft-antispam:
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x-exchange-antispam-report-test: UriScan:(28532068793085)(21748063052155);
x-ms-exchange-senderadcheck: 1
x-exchange-antispam-report-cfa-test:
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045)(2016111802025)(20161123564045)(20161123558120)(20161123560045)(6072148)(6043046)(201
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x-forefront-prvs: 0690E5FF22
x-forefront-antispam-report:
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(199004)(9686003)(2351001)(3660700001)(2900100001)(10710500007)(186003)(25786009)(2906002
)(68736007)(97736004)(99936001)(5630700001)(66066001)(5250100002)(6916009)(3280700002)(99
286004)(486006)(7110500001)(5660300001)(476003)(316002)(106356001)(478600001)(74316002)(6
506007)(2420400007)(8936002)(8676002)(59450400001)(102836004)(81156014)(26005)(7696005)(5
5016002)(733005)(54896002)(6306002)(54556002)(6116002)(81166006)(5890100001)(7736002)(643
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amprd08.prod.outlook.com;FPR:;SPF:None;LANG:en;PTR:InfoNoRecords;MX:1;A:1;
received-spf: None (protection.outlook.com: ainleygroup.com does not designate
 permitted sender hosts)
x-microsoft-antispam-message-info:
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Ge30HAVXNdcVCq
spamdiagnosticoutput: 1:99
spamdiagnosticmetadata: NSPM
Content-Type: multipart/mixed;
        boundary="_006_DM5PR08MB3338744BE3AC8C5F310A9C59DB620DM5PR08MB3338namp_"
MIME-Version: 1.0
X-MS-Office365-Filtering-Correlation-Id: 3d8d3ed0-a728-4189-6552-08d5c7cd8c09
X-MS-Exchange-CrossTenant-Network-Message-Id: 3d8d3ed0-a728-4189-6552-08d5c7cd8c09
X-MS-Exchange-CrossTenant-originalarrivaltime: 01 Jun 2018 14:39:57.2879
```

(UTC)
X-MS-Exchange-CrossTenant-fromentityheader: Hosted
X-MS-Exchange-CrossTenant-id: 35a867e4-bbab-417d-ac8b-5827b0dab5de
X-MS-Exchange-Transport-CrossTenantHeadersStamped: DM5PR08MB3612
X-NAI-Spam-Flag: NO
X-NAI-Spam-Level:
X-NAI-Spam-Threshold: 4.8
X-NAI-Spam-Score: 0.6
X-NAI-Spam-Version: 2.3.0.9418 : core <6299> : inlines <6674> : streams
 <1788433> : uri <2650865>
Return-Path: bell@ainleygroup.com

Sarah Brooks

From: Barb Bell
Sent: Friday, June 01, 2018 10:40 AM
To: richard.shannon@hydroone.com
Subject: Notice of Completion & Open House
Attachments: Letter and Notice of Completion.pdf

Richard Shannon,

Please find attached:
Township of Springwater
Class Environmental Assessment (Phase 4)
Midhurst Water, Wastewater and Transportation
Notice of Completion of Environmental Study Report & Open House

Regards,

Barb Bell
Administrative Assistant
Ainley
www.ainleygroup.com
Tel: (705) 445-3460 Ext. 125

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Sarah Brooks

From: Barb Bell
Sent: Wednesday, May 30, 2018 10:48 AM
To: 'skirsch@bellnet.ca'
Subject: Notice of Completion & Open House
Attachments: Letter and Notice of Completion.pdf

Mr. Stan Kirsch

Please find attached:
Township of Springwater
Class Environmental Assessment (Phase 4)
Midhurst Water, Wastewater and Transportation
Notice of Completion of Environmental Study Report & Open House

Regards,

Barb Bell
Administrative Assistant
Ainley
www.ainleygroup.com
Tel: (705) 445-3460 Ext. 125

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Sarah Brooks

From: Barb Bell
Sent: Wednesday, May 30, 2018 10:41 AM
To: 'vimalp@geraniumcorporation.com'
Subject: Notice of Completion and Open House
Attachments: Letter and Notice of Completion.pdf

Vimal Patel
Geranium

Please find attached:
Township of Springwater
Class Environmental Assessment (Phase 4)
Midhurst Water, Wastewater and Transportation
Notice of Completion of Environmental Study Report & Open House

Regards,

Barb Bell
Administrative Assistant
Ainley
www.ainleygroup.com
Tel: (705) 445-3460 Ext. 125

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# APPENDIX 'DD'

## Post Notice of Completion Comments And Responses (Part II Order Requests)

**Ministry of the Environment, Conservation and Parks**

Environmental Assessment and Permissions Branch

135 St. Clair Avenue West
1st Floor
Toronto ON M4V 1P5
Tel.: 416.314.8001
Fax: 416.314.8452

**Ministère de l'Environnement, de la Protection de la nature et des Parcs**

Direction des évaluations et des permissions environnementales

135, avenue St. Clair Ouest
Rez-de-chaussée
Toronto ON M4V 1P5
Tél. : 416 314.8001
Téléc. : 416 314.8452

Ontario

September 19, 2018

Heather Coleman
Director of Public Works
Township of Springwater
2231 Nursery Road
Minesing, ON L9X 1A8

Dear Ms. Coleman:

The Ministry of the Environment, Conservation and Parks has received five Part II Order requests asking that the Township of Springwater be required to prepare an individual environmental assessment (EA) under the *Environmental Assessment Act* for the proposed Midhurst Water, Wastewater & Transportation Class Environmental Assessment (Phase 4).

I understand that the Project is currently being planned by the Township in accordance with the master planning procedures of the Municipal Engineers Association's Municipal Class Environmental Assessment (Class EA). The Class EA is a planning process under the act that proponents must follow for projects of this type in order to be able to proceed with the project under the act. Despite this process, proponents may be required to prepare an individual EA in response to requests from the public. Unless the requests are withdrawn, MECP staff will review the requests and forward a recommendation for a decision to the Minister.

In order to evaluate the request, the MECP is requesting the following information from the Township:

- A hard copy and electronic copy of the Environmental Study Report for our records.
- Responses to the issues and concerns raised in the request in Table A (attached):
    - A description of Township's actions in following the Class EA for the Project as it relates to the requesters' issues and concerns (including the written account of discussions referred to above, if applicable); and,
    - A detailed description, with any supporting documentation, of how these issues and concerns:
        - have been addressed through the Report;
        - will be addressed through the implementation of the Project;
        - will be addressed through additional commitments; and/or,

        - will be addressed through other legislation or approvals required for the Project.
- Other information requested by the MECP in Table B (attached):
    - Statements of where information can be found within the Report; and,
    - Description of any relevant information that is not captured by the Report.
        - A record of Indigenous consultation that was undertaken during the planning process for this Project, and not included in the Report.
- A map of the requesters in relation to the Project area.

Please send copies of the Report as soon as possible. The Township is requested to **submit Tables A and B by October 5, 2018.** Proponents who provide comprehensive information within the deadline generally minimize potential delays to their project schedule. The quality of the information submitted may also have a direct impact on the timeline of the review.

Please note that the information you provide to this branch will form a part of the public record on this matter required to be maintained pursuant to section 30 of the act. This information will be made available to any person upon request.

Subsequent to receiving this information, the MECP is open to holding a meeting with the Township to discuss the Project and the information provided in Tables A and B. If you would like to have such a meeting, please contact me to arrange a date and time within two weeks of receiving this letter.

Thank you for your assistance in the ministry's review of the Part II Order request. If you have any further questions, please contact me directly at 416-314-0286 or at callee.robinson@ontario.ca.

Sincerely,

Callee Robinson

Callee Robinson
Project Evaluator, Project Review Unit
Environmental Assessment and Permissions Branch

c: Joe Mullan, Ainley & Associates Limited

EA File No. 18077
Midhurst Water, Wastewater, & Transportation Class Environmental Assessment

Ministry of the Environment, Conservation and Parks

Office of the Minister

777 Bay Street, 5th Floor
Toronto ON M7A 2J3
Tel.: 416-314-6790

Ministère de l'Environnement, de la Protection de la nature et des Parcs

Bureau du ministre

777, rue Bay, 5e étage
Toronto (Ontario) M7A 2J3
Tél. : 416.314.6790

Ontario

357-2019-859

NOV 2 0 2019

Sandy Buxton and David Strachan
Midhurst Ratepayers' Association
[redacted]

Dear Sandy Buxton and David Strachan:

Thank you for your interest in the Midhurst Water, Wastewater, and Transportation Master Plan Class Environmental Assessment (Master Plan) as proposed by the Township of Springwater (Township). I welcome your comments on this Master Plan.

On September 17, 2018, you requested that the Township be required to prepare an individual environmental assessment for the projects contained within the Midhurst Water, Wastewater, and Transportation Master Plan. I am taking this opportunity to inform you that I have decided that elevating the project to an individual environmental assessment is not required.

In making this decision, I have given careful consideration to the Master Plan documentation, the provisions of the Municipal Class Environmental Assessment, the issues raised in your request, and relevant matters to be considered in subsection 16(4) of the Environmental Assessment Act.

Despite my not requiring an individual environmental assessment be prepared, in reviewing the requests and the Master Plan documentation, I have decided to impose conditions with respect to the projects in the Master Plan regarding species at risk, source water protection, and air quality impacts. These conditions are outlined in the attached letter to the Township.

I am satisfied that the issues raised in the Part II Order requests can be addressed by the work that is required to be carried out as a result of the conditions I have imposed and through additional permitting and approvals.

With this decision having been made, the Township can now proceed with the projects in the Master Plan subject to the conditions I have imposed, and any permits or approvals that are required. The Township must ensure it implements the projects in the manner they were developed and designed, as set out in the Master Plan

documentation, and inclusive of all mitigating measures, and environmental and other provisions therein.

Again, I would like to thank you both for participating in the Municipal Class Environmental Assessment process and for bringing your concerns to my attention.

Sincerely,

Jeff Yurek
Minister of the Environment, Conservation and Parks

Attachment

c: Heather Coleman, Director of Public Works, Township of Springwater

Lydia Bojeczko, MPP Liaison & Strategic Communications Advisor, Ministry of the Environment Conservation and Parks

EA File No. 18077 – Midhurst Water, Wastewater, and Transportation Master Plan Class Environmental Assessment

**Ministry of the Environment, Conservation and Parks**

Environmental Assessment and Permissions Branch
*135 St. Clair Avenue West*
*1st Floor*
*Toronto ON M4V 1P5*
Phone: 416.314.8001
Fax: 416.314.8452

**Ministère de l'Environnement, de la Protection de la nature et des Parcs**

Direction des évaluations et des permissions environnementales
*135, avenue St. Clair Ouest*
*Rez-de-chaussée*
*Toronto (Ontario) M4V 1P5*
Tél: 416 314-8001
Téléc: 416 314-8452

Ontario

357-2018-1010

September 19, 2018

[redacted]

Dear Ms. Bowman

Thank you for your September 18, 2018 correspondence to the Minister of the Environment, Conservation and Parks in which you request that the Township of Springwater be required to prepare an individual environmental assessment (EA) under the *Environmental Assessment Act* (Act) for the proposed Midhurst Water, Wastewater, & Transportation Class Environmental Assessment (Project). I am pleased to respond on behalf of the Minister.

It is the understanding of the Ministry of the Environment, Conservation and Parks that the Project is being planned under the master plan procedures of the Municipal Engineers Association's Municipal Class Environmental Assessment (Class EA). The Class EA is an approved planning process that proponents must follow for projects of this type in order to obtain authorization to proceed with the project under the act. Despite this process, the Class EA includes a provision whereby any member of the public who has unresolved concerns with a proposed project can request that the Minister require the proponent of the project to prepare an individual EA. The Minister's requirement to prepare an individual EA is referred to by the Class EA as a Part II Order.

Staff at the ministry will review the issues and concerns you have cited as reasons for which an individual EA should be prepared. Your request will be forwarded to the Township. The Township will be directed to review your request and to provide any Project documentation and other information necessary to assist the ministry in its review of your request. This information will be considered by the Minister when making

a decision about the request. Where required, ministry technical staff and staff at other agencies may also review the matter.

On the basis of this review and other matters required to be considered by the Minister under the act, the Minister will make a final decision whether or not to require that an individual EA be prepared by the Township. You will be notified in writing of the Minister's decision once it has been made.

I would like to note that, as with all Part II Order requests, the Environmental Assessment and Permissions Branch maintains a public file that is available for viewing by any member of the public upon request. Personal and other information in your letter such as name, address, and telephone number and your concerns with this Project will form a part of the public record on this matter required to be maintained pursuant to section 30 of the act. If you wish this information to be excluded from the public file, this Branch must be advised. Notwithstanding the above, this information may still be obtained by members of the public if the ministry is required to disclose it under the *Freedom of Information and Protection of Privacy Act*.

Thank you for taking the time to share your concerns with this Project.

If you have any questions about the ministry's review of your request, please contact Callee Robinson, Project Evaluator for this Project, directly at 416-314-0286 or at callee.robinson@ontario.ca.

Yours sincerely,

Kristina Rudzki
Supervisor, Project Review Unit
Environmental Assessment and Permissions Branch

c: Heather Coleman, Director of Public Works
Township of Springwater

EA File No. 18077
Midhurst Water, Wastewater, and Transportation Class Environmental Assessment (Phase 4)

**Ministry of the Environment, Conservation and Parks**

Environmental Assessment and Permissions Branch
*135 St. Clair Avenue West*
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Tél: 416 314-8001
Téléc: 416 314-8452

Ontario

357-2018-901

September 19, 2018

Allison Graham
[redacted]

Dear Ms. Graham:

Thank you for your September 10, 2018 correspondence to the Minister of the Environment, Conservation and Parks in which you request that the Township of Springwater be required to prepare an individual environmental assessment (EA) under the *Environmental Assessment Act* (Act) for the proposed Midhurst Water, Wastewater, & Transportation Class Environmental Assessment (Project). I am pleased to respond on behalf of the Minister.

It is the understanding of the Ministry of the Environment, Conservation and Parks that the Project is being planned under the master plan procedures of the Municipal Engineers Association's Municipal Class Environmental Assessment (Class EA). The Class EA is an approved planning process that proponents must follow for projects of this type in order to obtain authorization to proceed with the project under the act. Despite this process, the Class EA includes a provision whereby any member of the public who has unresolved concerns with a proposed project can request that the Minister require the proponent of the project to prepare an individual EA. The Minister's requirement to prepare an individual EA is referred to by the Class EA as a Part II Order.

Staff at the ministry will review the issues and concerns you have cited as reasons for which an individual EA should be prepared. Your request will be forwarded to the Township. The Township will be directed to review your request and to provide any Project documentation and other information necessary to assist the ministry in its review of your request. This information will be considered by the Minister when making a decision about the request. Where required, ministry technical staff and staff at other agencies may also review the matter.

On the basis of this review and other matters required to be considered by the Minister under the act, the Minister will make a final decision whether or not to require that an individual EA be prepared by the Township. You will be notified in writing of the Minister's decision once it has been made.

I would like to note that, as with all Part II Order requests, the Environmental Assessment and Permissions Branch maintains a public file that is available for viewing by any member of the public upon request. Personal and other information in your letter such as name, address, and telephone number and your concerns with this Project will form a part of the public record on this matter required to be maintained pursuant to section 30 of the act. If you wish this information to be excluded from the public file, this Branch must be advised. Notwithstanding the above, this information may still be obtained by members of the public if the ministry is required to disclose it under the *Freedom of Information and Protection of Privacy Act*.

Thank you for taking the time to share your concerns with this Project.

If you have any questions about the ministry's review of your request, please contact Callee Robinson, Project Evaluator for this Project, directly at 416-314-0286 or at callee.robinson@ontario.ca.

Yours sincerely,

Kristina Rudzki
Supervisor, Project Review Unit
Environmental Assessment and Permissions Branch

c: Heather Coleman, Director of Public Works
Township of Springwater

EA File No. 18077
Midhurst Water, Wastewater, and Transportation Class Environmental Assessment (Phase 4)

**Ministry of the Environment, Conservation and Parks**

Environmental Assessment and Permissions Branch
*135 St. Clair Avenue West*
*1st Floor*
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Fax: 416.314.8452

**Ministère de l'Environnement, de la Protection de la nature et des Parcs**

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Ontario

357-2018-1014

September 19, 2018

Daniel B. Artenosi
Overland LLP
[redacted]

Dear Mr. Artenosi,

Thank you for your September 18, 2018 correspondence to the Minister of the Environment, Conservation and Parks in which you request, on behalf of Carson Trail Estates Inc., that the Township of Springwater be required to prepare an individual environmental assessment (EA) under the *Environmental Assessment Act* (Act) for the proposed Midhurst Water, Wastewater, & Transportation Class Environmental Assessment (Project). I am pleased to respond on behalf of the Minister.

It is the understanding of the Ministry of the Environment, Conservation and Parks that the Project is being planned under the master plan procedures of the Municipal Engineers Association's Municipal Class Environmental Assessment (Class EA). The Class EA is an approved planning process that proponents must follow for projects of this type in order to obtain authorization to proceed with the project under the act. Despite this process, the Class EA includes a provision whereby any member of the public who has unresolved concerns with a proposed project can request that the Minister require the proponent of the project to prepare an individual EA. The Minister's requirement to prepare an individual EA is referred to by the Class EA as a Part II Order.

Staff at the ministry will review the issues and concerns you have cited as reasons for which an individual EA should be prepared. Your request will be forwarded to the Township. The Township will be directed to review your request and to provide any Project documentation and other information necessary to assist the ministry in its review of your request. This information will be considered by the Minister when making a decision about the request. Where required, ministry technical staff and staff at other agencies may also review the matter.

On the basis of this review and other matters required to be considered by the Minister under the act, the Minister will make a final decision whether or not to require that an individual EA be prepared by the Township. You will be notified in writing of the Minister's decision once it has been made.

I would like to note that, as with all Part II Order requests, the Environmental Assessment and Permissions Branch maintains a public file that is available for viewing by any member of the public upon request. Personal and other information in your letter such as name, address, and telephone number and your concerns with this Project will form a part of the public record on this matter required to be maintained pursuant to section 30 of the act. If you wish this information to be excluded from the public file, this Branch must be advised. Notwithstanding the above, this information may still be obtained by members of the public if the ministry is required to disclose it under the *Freedom of Information and Protection of Privacy Act*.

Thank you for taking the time to share your concerns with this Project.

If you have any questions about the ministry's review of your request, please contact Callee Robinson, Project Evaluator for this Project, directly at 416-314-0286 or at callee.robinson@ontario.ca.

Yours sincerely,

Kristina Rudzki
Supervisor, Project Review Unit
Environmental Assessment and Permissions Branch

c: Heather Coleman, Director of Public Works
Township of Springwater

EA File No. 18077
Midhurst Water, Wastewater, and Transportation Class Environmental Assessment (Phase 4)

**Ministry of the Environment, Conservation and Parks**

Environmental Assessment and Permissions Branch
*135 St. Clair Avenue West*
*1st Floor*
*Toronto ON M4V 1P5*
Phone: 416.314.8001
Fax: 416.314.8452

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*Rez-de-chaussée*
*Toronto (Ontario) M4V 1P5*
Tél: 416 314-8001
Téléc: 416 314-8452

Ontario

357-2018-1011

September 19, 2018

James Feehely
[redacted]

Dear Mr. Feehely,

Thank you for your September 18, 2018 correspondence to the Minister of the Environment, Conservation and Parks in which you request, on behalf of the Estate of Marie Louise Frankcom, that the Township of Springwater be required to prepare an individual environmental assessment (EA) under the *Environmental Assessment Act* (Act) for the proposed Midhurst Water, Wastewater, & Transportation Class Environmental Assessment (Project). I am pleased to respond on behalf of the Minister.

It is the understanding of the Ministry of the Environment, Conservation and Parks that the Project is being planned under the master plan procedures of the Municipal Engineers Association's Municipal Class Environmental Assessment (Class EA). The Class EA is an approved planning process that proponents must follow for projects of this type in order to obtain authorization to proceed with the project under the act. Despite this process, the Class EA includes a provision whereby any member of the public who has unresolved concerns with a proposed project can request that the Minister require the proponent of the project to prepare an individual EA. The Minister's requirement to prepare an individual EA is referred to by the Class EA as a Part II Order.

Staff at the ministry will review the issues and concerns you have cited as reasons for which an individual EA should be prepared. Your request will be forwarded to the Township. The Township will be directed to review your request and to provide any Project documentation and other information necessary to assist the ministry in its review of your request. This information will be considered by the Minister when making a decision about the request. Where required, ministry technical staff and staff at other agencies may also review the matter.

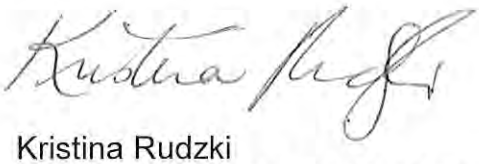
On the basis of this review and other matters required to be considered by the Minister under the act, the Minister will make a final decision whether or not to require that an individual EA be prepared by the Township. You will be notified in writing of the Minister's decision once it has been made.

I would like to note that, as with all Part II Order requests, the Environmental Assessment and Permissions Branch maintains a public file that is available for viewing by any member of the public upon request. Personal and other information in your letter such as name, address, and telephone number and your concerns with this Project will form a part of the public record on this matter required to be maintained pursuant to section 30 of the act. If you wish this information to be excluded from the public file, this Branch must be advised. Notwithstanding the above, this information may still be obtained by members of the public if the ministry is required to disclose it under the *Freedom of Information and Protection of Privacy Act*.

Thank you for taking the time to share your concerns with this Project.

If you have any questions about the ministry's review of your request, please contact Callee Robinson, Project Evaluator for this Project, directly at 416-314-0286 or at callee.robinson@ontario.ca.

Yours sincerely,



Kristina Rudzki
Supervisor, Project Review Unit
Environmental Assessment and Permissions Branch

c: Heather Coleman, Director of Public Works
Township of Springwater

The Estate of Marie Louise Frankcom
c/o S. Kirsch, authorized agent
skirsch@bellnet.ca

EA File No. 18077
Midhurst Water, Wastewater, and Transportation Class Environmental Assessment (Phase 4)

## Reid Mitchell

**From:** Joe Mullan <mullan@ainleygroup.com>
**Sent:** October-31-18 11:37 AM
**To:** Robinson, Callee (MECP)
**Cc:** Heather Coleman; Reid Mitchell ; Brent Spagnol
**Subject:** RE: Midhurst Class EA - Environmental Study Report
**Attachments:** Midhusrt Secondary Plan Lands.pdf

**Hi Callee:**

Further to our telephone discussion earlier this week here is an update I received from the Township regarding developments within Midhurst Secondary Plan that were or are at the LPAT:

The appeals relative to Carson Trail and Frankcom have been withdrawn by the Province over their respective properties as a result of the settlement that was reached between the two property owners (Carson Trail, Frankcom) and the County who allocated 50% of their requested population.

**Frankcom** –Appeals of the Midhurst Secondary Plan were launched by the Ministry and Frankcom. Both were resolved through the settlement for population allocation with the County.

The appeals were withdrawn by both the Ministry and Frankcom as a result.

**Carson Trail** – An Appeal of the Midhurst Secondary Plan was launched by the Ministry only and was resolved through the settlement for population allocation with the County.

Ministry withdrew its appeal as a result. However, appeals with LPAT are pending with respect their plan of subdivision and ZBA applications.

The Ministry has maintained its appeal over lands outside of the initial 300 hectares subject to population allocations. I have attached a map which shows where the lands are.

Any development applications that are **not within the 300 hectares** referenced in the attached map or **not within the hatched area** remain under the Ministry's appeal.

I trust that this is of assistance.

Regards,

J. A. Mullan, P.Eng.
President & CEO

Ainley

www.ainleygroup.com
Tel: (705) 445-3451 Ext. 126
Cell: (705) 718-7230

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**From:** Robinson, Callee (MECP) <Callee.Robinson@ontario.ca>
**Sent:** Monday, October 29, 2018 11:33 AM
**To:** Joe Mullan <mullan@ainleygroup.com>

**Cc:** Heather Coleman <heather.coleman@springwater.ca>; Reid Mitchell <mitchell@ainleygroup.com>
**Subject:** RE: Midhurst Class EA - Environmental Study Report

Thanks Joe.

Given the complexity of the project, I think it would be very beneficial for you to come in and discuss the project in person.

Perhaps the week of November 19th?

If you have some time today, I'd also like to discuss the Midhurst Secondary Plan and get an understanding of which projects are currently being appealed at the LPAT.

Thanks,

**Callee Robinson** | Project Evaluator
Project Review Unit | Environmental Assessment and Permissions Branch
Ministry of the Environment, Conservation and Parks
416-314-0286

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If you have any accommodation needs or require communication supports or alternate formats, please let me know.
Si vous avez des besoins en matière d'adaptation, ou si vous nécessitez des aides à la communication ou des médias substituts, veuillez me le faire savoir.

---

**From:** Joe Mullan [mailto:mullan@ainleygroup.com]
**Sent:** October-29-18 10:29 AM
**To:** Robinson, Callee (MECP)
**Cc:** Heather Coleman; Reid Mitchell
**Subject:** Midhurst Class EA - Environmental Study Report

**Hi Calle:**

In response to the five (5) Part II Order Requests that were received relating to the ESR for the Midhurst Class EA, we attach the following documentation:

1. Completed Table "B";
2. Completed Table "A" related to the Allison Graham Part II Order Request;
3. Completed Table "A" related to the Carson Trails Estate Part II Order Request. Please note that we have not commented on the follow-up letter from Daniel Artenosi dated Oct 15, 2018; however we are in discussions with the Township and their legal counsel and may provide additional comments in the near future;
4. Completed Table "A" related to the Frankcom Estate Part II Order Request. Regarding this file, did the Ministry receive a response to the Oct. 3, 2018 clarification letter to Mr. Feehely?
5. Completed Table "A" related to the Michele Bowman Part II Order Request;
6. Completed Table "A" related to the Midhurst Ratepayers Association (MRA) Part II Order Request.

Should you have any questions relating to this information, please do not hesitate to contact me. In addition, we would happy to meet with the Ministry staff to review and discuss the items, if it would be beneficial to the Ministry.

Regards,

J. A. Mullan, P.Eng.
President & CEO

Ainley

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**From:** Robinson, Callee (MECP) <Callee.Robinson@ontario.ca>
**Sent:** Wednesday, September 19, 2018 3:22 PM
**To:** Joe Mullan <mullan@ainleygroup.com>; Heather Coleman <heather.coleman@springwater.ca>
**Cc:** Reid Mitchell <mitchell@ainleygroup.com>; Liu, Chunmei (MECP) <Chunmei.Liu@ontario.ca>
**Subject:** RE: Midhurst Class EA - Environmental Study Report

Hi Heather and Joe,

Please see the attached letter detailing the information the ministry requires to support our review of the Part II Order requests. The letter requests that all information be submitted by Friday October 5th, 2018. If you require additional time, just let me know.

Please don't hesitate to contact me if you have any questions.

Thanks,

**Callee Robinson** | Project Evaluator
Project Review Unit | Environmental Assessment and Permissions Branch
Ministry of the Environment, Conservation and Parks
416-314-0286

Please consider the environment before printing this email.

If you have any accommodation needs or require communication supports or alternate formats, please let me know.
Si vous avez des besoins en matière d'adaptation, ou si vous nécessitez des aides à la communication ou des médias substituts, veuillez me le faire savoir.

**From:** Liu, Chunmei (MECP)
**Sent:** September-19-18 2:02 PM
**To:** Joe Mullan; Robinson, Callee (MECP)
**Cc:** Heather Coleman; Reid Mitchell
**Subject:** RE: Midhurst Class EA - Environmental Study Report
**Importance:** High

Good afternoon Joe,

Callee Robinson as the Project Evaluator will respond your inquiry directly. Since there are Part II Orders for this project, the ministry's Environmental Assessment and Permissions Branch will lead the review of PIIOs and provide comments to the proponent directly.

Best regards,

*Chunmei Liu* | Environmental Resource Planner | Environmental Assessment Coordinator |Central Region, Ontario
Ministry of the Environment, Conservation and Parks
5775 Yonge Street, 8th Flr | Toronto, Ontario M2M 4J1
Tel: 416-326-4886 | Fax: 416-325-6347 | Email: Chunmei.Liu@ontario.ca | Website: http://www.ene.gov.on.ca/

---

**From:** Joe Mullan [mailto:mullan@ainleygroup.com]
**Sent:** September-19-18 1:52 PM
**To:** Liu, Chunmei (MECP)
**Cc:** Heather Coleman; Reid Mitchell
**Subject:** Midhurst Class EA - Environmental Study Report

**Hi Chunmei:**

The "Notice of Completion" associated with the Environmental Study Report for the Midhurst Class EA (Water, Wastewater & Transportation) was issued on Jun. 15, 2018 (see attached) and the 90-day public review period ended @ 4pm on Sept. 18, 2018.

During the aforementioned public review period, we received five (5) Requests for a Part II Order associated with this Class EA, from the following individuals/groups:

1. Allison Graham;
2. Carson Trails Estate;
3. Frankcom Estate ;
4. Michele Bowman;
5. Midhurst Ratepayers Association (MRA)

Would you please confirm that these were the only Requests received during the public review period.

Regards,

J. A. Mullan, P.Eng.
President & CEO

Ainley

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Tel: (705) 445-3451 Ext. 126
Cell: (705) 718-7230

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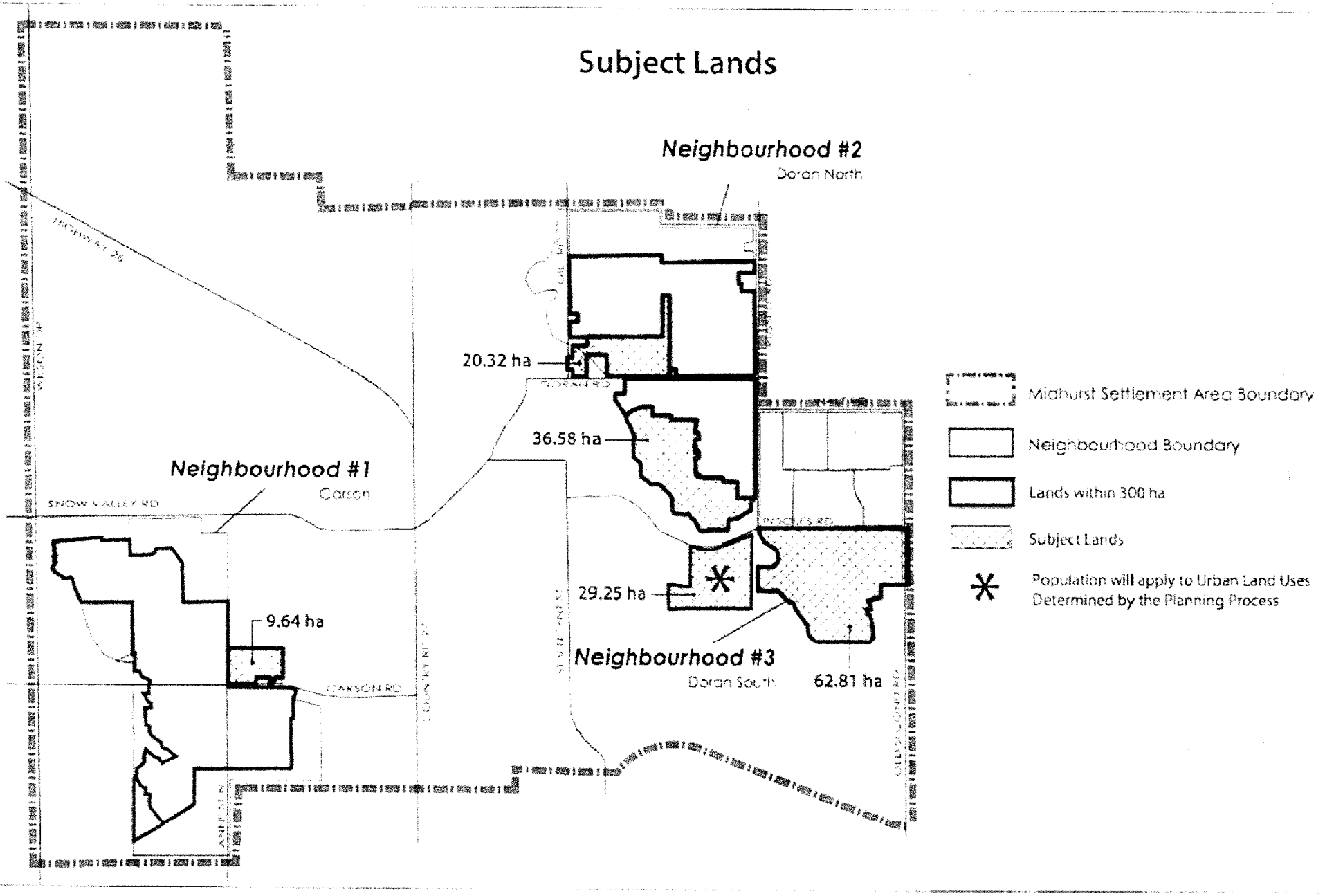
# Subject Lands



# TABLE B – PROPONENT RESPONSE TO PART II ORDER REQUESTS

| | |
|---|---|
| **PROPONENT:** | **Township of Springwater** |
| **PROJECT TITLE:** | **Midhurst Phase 3 & 4 Class EA (Water, Wastewater & Transportation)** |
| **PROJECT LOCATION:** | **Midhurst Secondary Plan Area – Township of Springwater, ON** |

| Required Information | Response or Attachments |
|---|---|
| **Consultation Record**<br>**Please provide a brief summary of each type of consultation (e.g. PIC, stakeholder meetings, and notices) and the date it occurred for the following groups.**<br>• **Public;**<br>• **Agency; and**<br>• **Indigenous (Please indicate what communities were contacted and how you identified who to contact).**<br><br>**If provided in the EA documentation, summarize here and provide exact reference location in the EA documentation.** | A comprehensive Communication Plan containing the names of 100 interested parties, local residents, Agencies and Indigenous Groups was developed for the Notice of Commencement for Phase 3 of this Project which was published in April 2013 (Appendix X of ESR). The Communication Plan was developed based on comments received from the publication of the Master Plan Report (July 2009). The Plan was updated prior to the Phase 3 PIC (held on October 18, 2016 Appendix Y of ESR) and included approximately 170 interested parties at that time, including local residents, Review Agencies and Indigenous Groups. Following the MOECC review of the draft ESR, comments were received in April 2018 (Appendix CC of ESR) and a response letter was provided to the MOECC (dated June 5, 2018) (Appendix CC of ESR). Subsequently, a Notice of Completion was published in the local newspaper (twice) and copies were provided to all names on the Communication Plan (Appendix DD of ESR). The Proponent held an Open House on June 18, 2018 for the purpose of explaining the Recommended Solution(s) and to provide information on the MOECC review as well as previously identified "hot point" concerns raised by members of the public. The Proponent also extended the required public review period from the normal 30 days to 90 days in order to provide more than sufficient time for the public to review the ESR and to provide comment. The public review period began on Tuesday June 19, 2018 and ended on Tuesday September 18, 2018. During the 90 day review, the MOECC was renamed the Ministry of the Environment, Conservation and Parks (MECP).<br><br>In addition to the Communication Plan, a Residents Liaison Group was formed at the commencement of Phase 3 and meetings were held throughout Phase 3 with that group. This ensured that the public were continually aware of the details of the proposed project.<br><br>Resident Liaison meetings were held on the following dates:<br><br>2015 – Mar 5, May 7, July 2, Sept 9, and Nov 5<br>2016 – Jan 14, Mar 10, May 12, Oct 13 and Dec 8<br>2018 – Jun 12<br><br>Meetings were also held with MOECC (October 22, 2014) and the NVCA (March 6, 2017) during the Phase 3 planning process.<br><br>Additionally, a Special Township of Springwater Council Meeting was held on March 8, 2017 to provide members of the public and other interested parties an opportunity to provide additional comments. |

# TABLE B – PROPONENT RESPONSE TO PART II ORDER REQUESTS

| Required Information | Response or Attachments |
|---|---|
| | The PIC (October 18, 2016) (Appendix Y of ESR) was held as a "drop-in" format followed by a formal presentation. The purpose of the PIC and the presentation was to present the Phase 3 Solutions for the provision of water supply and treatment, wastewater collection and treatment and transportation upgrades to service the Midhurst Secondary Plan area. The formal presentation was followed by a question and answer session.<br><br>Background Reports were posted on the Township Web site throughout the Phase 3 planning process.<br><br>The list of Indigenous Group contacts was based on numerous resources including ATRIS and previously completed Class EA's in Simcoe County. The following Indigenous Groups were contacted:<br><br>• Aamjiwnaang First Nation<br>• Alderville First Nation<br>• Aundeck-Omni Kaning<br>• Beausoleil First Nation<br>• Chiefs of Ontario<br>• Chippewas of Georgian Island<br>• Chippewas of Rama First Nation<br>• Chippewas of Kettle and Stony Point<br>• Chippewas of Nawash First Nation<br>• Chippewas of the Thames First Nation<br>• Curve Lake First Nation<br>• Georgian Bay Metis Council<br>• Hiawatha First Nation<br>• Huron Wendat Council<br>• Metis Nations of Ontario<br>• Metis Consultation Unit<br>• M'Chigeeng First Nation<br>• Mississaugas of Alderville First Nation<br>• Mississaugas of Scugog Island<br>• Mississaugas of New Credit<br>• Mohawks of Akwesasne<br>• Mohawks of the Bay of Quinte<br>• Moose Deer Point First Nation<br>• Ojibways of Hiawatha First Nation<br>• Saugeen First Nation<br>• Sheguiandah First Nation<br>• Six Nations of the Grand River<br>• Wahta Mohawk<br>• Walpole First Nation |

# TABLE B – PROPONENT RESPONSE TO PART II ORDER REQUESTS

| Required Information | Response or Attachments |
|---|---|
| | • Wasauksing First Nation<br>• Williams Treaty First Nations<br>• Zhiibaahaasing First Nation<br><br>Prior to the commencement of the 90-day public review period, we contacted each of the First Nations contacts. Contact was made by telephone or email. Memos were prepared for each contact. As a result of this effort to consult with First Nations groups, no replies were received. |
| **Source Protection**<br>**Information to support how proponent has considered source water protection including:**<br>• **Source Protection Area;**<br>• **Potential drinking water threats,**<br>• **If the project is located in an Intake Protection Zone (IPZs) or Well Head Protection Areas (WHPA);**<br>• **Comment from the conservation authorities (Please attach a copy of these comments or provide the exact location reference within the EA documentation) and;**<br>• **A brief summary of mitigation measures for salt, if applicable (e.g., road projects).** | The issue of Source Water Protection was identified in the June 2015 Hydrogeological Study (Golder Associates) (Appendix J of the Draft ESR). That Study noted:<br><br>"The hydrogeological assessment has addressed source water protection through the development of well capture zones (eventual wellhead protection area) paired with existing aquifer vulnerability mapping. The assessment indicates that the water supply system has a low vulnerability to surficial contaminants and causes minimal interference to surrounding municipal wells. The modelling analysis conducted in this study provides the foundation for meeting the Technical Rules: Assessment Report requirements as governed by the Clean Water Act, 2006. An Assessment Report will ultimately be prepared by the South Georgian Bay Lake Simcoe source protection committee."<br><br>It is noted that all of the proposed future wells well be located on private lands with sufficient buffer zones to provide source water protection.<br><br>The MOECC reviewed the Hydrogeological Study and noted that the issue of source water protection will be reviewed as part of the future submissions for Permits To Take Water.<br><br>Mitigation measures are outlined in the ESR – Appendices W, Z and T8 |
| **Climate Change**<br>**Information summarizing how mitigation or resiliency measures for the effects of climate change (example: frequent or severe weather events (e.g., IDF curves), greenhouse gases (modeling for greenhouse gases), air quality components) on or from the Project was considered during the environmental assessment process (https://www.ontario.ca/page/considering-climate-change-environmental-assessment-process). If assessed in the EA documentation, summarize here and provide exact location reference in the EA documentation.** | During the detailed design stage for transportation improvements we will ensure that hydrological/hydraulic calculations will be completed to the requirements of the NVCA and MECP regarding climate change directives relating to increased severe weather events.<br><br>Active transportation routes will be provided as part of the final design of the proposed new residential developments.<br><br>In addition, the impacts of climate change will be considered during the design of water supply and distribution works and wastewater collection and treatment works,<br><br>Sections on Climate Change are included in the ESR (5.7.3 and 6.8). |

# TABLE B – PROPONENT RESPONSE TO PART II ORDER REQUESTS

| Required Information | Response or Attachments |
|---|---|
| **Species at Risk**<br>**Species in a project area subject to *Endangered Species Act*, O. Reg. 242/08 and any applicable permits required. Any proposed mitigation measures or compensation should be described along with consultation (if any) with the Ministry of Natural Resources and Forestry.**<br><br>• **Please provide all relevant correspondence between MNRF (If this is found within the EA documentation please specify the reference location).** | All of the proposed water supply, water storage and water treatment projects will be located within the development lands except for wells TW 34 and OW 29. Those two wells will be located on lands currently owned by the Township. Therefore, no permits are required with respect to the Endangered Species Act.<br><br>All proposed watermains will be either along existing road allowances or along future road allowances within the developments except for the watermain from wells TW34 and OW 29 which will be along an easement for a small portion of the alignment. Therefore, a permit will be required.<br><br>All of the proposed wastewater collection and treatment projects will be located within development lands or along existing road allowances. Therefore, no permits are required with respect to the Endangered Species Act.<br><br>Most of the proposed transportation improvements will be within existing road allowances except for the occasional road widening and the proposed extension of Craig Road. Therefore, no permits are required with respect to the Endangered Species Act except for the proposed widenings and the Craig Road extension project. A Natural Heritage review of the proposed widenings and the Craig Road extension alignment will be undertaken prior to final design and based on the Studies, applications for a Permit under the Endangered Species Act will be processed.<br><br>Over the course of the Midhurst Class EA planning process, we have contacted the MNRF at each of the required contact points including the April 2013 Notice of Commencement, the Phase 3 Notice of PIC dated September 2016 and the June 2018 Notice of Completion. Throughout the completion of the Class EA, no comments have been received from the MNRF. However, it is acknowledged that Permits will be required with respect to the Endangered Species Act. |
| **Cumulative Effects**<br>**Information summarizing how the project considered cumulative effects. Description of how current and future policy/planning/environmental assessment works in the area were considered by the proponent as part of the assessment of the proposed project. If assessed in the EA documentation, summarize here and provide exact location in the EA documentation.** | The current Class EA looks at all aspects of servicing the Midhurst Secondary Plan and therefore, no other current or future policy/planning/environmental assessment works were considered.<br><br>Future servicing of other, adjacent developments (beyond the limits of the Midhurst Secondary Plan) will undergo Class EAs as required and have not been considered by the Proponent for the Midhurst Class EA. |
| **Archaeological Assessment**<br>**Archaeological Assessment work required to demonstrate no impacts on archaeological resources and/or cultural heritage resources, built heritage resources and other related issues that may be identified in the requests.** | Archeological Assessments were undertaken as part of the Secondary Plan and were included in the Master Plan Phase 1 and 2 Documentation dated July 2009. The Reports are as follows:<br><br>Phase 1 and 2 Report – Development Area 1 (Midhurst Rose Alliance Inc.)<br>- Stage 1-2 Archaeological Assessment – Maple Lane Estates, January 2007 by Archaeological Assessments Ltd. (found no archaeological resources) |

# TABLE B – PROPONENT RESPONSE TO PART II ORDER REQUESTS

| Required Information | Response or Attachments |
|---|---|
| • **Were the Ministry of Tourism, Culture and Sport contacted?**<br>• **Please provide any relevant correspondence.** | - Stage 1-2 Archaeological Assessment – Meadows of Midhurst, January 2007 by Archaeological Assessments Ltd. (found no archaeological resources)<br>- Stage 1-2 Archaeological Assessment – Johns Subdivision, January 2007 by Archaeological Assessments Ltd. (found no archaeological resources)<br>- Stage 1-2 Archaeological Assessment – 154 Doran Road, December 2007 by Archeoworks Inc. (area H1 should be protected or some additional investigation should be carried out)<br><br><u>Phase 1 and 2 Report – Development Areas 1 and 2 (Geranium lands)</u><br>- Stage 1 Archaeological – Carson Neighbourhood, May 2008 by Amick Consultants Limited (high archaeological potential, Stage 2 assessment recommended)<br>- Stage 1 Archaeological – Doran Neighbourhood, May 2008 by Amick Consultants Limited (high archaeological potential, Stage 2 assessment recommended and Stage 3 test excavations will be required on the Coutts site)<br>- Archaeological Report on the Anten Mills well site – 1053 Coughlin Road, Oct, 2008 by Amick Consultants Limited (high potential for archaeological resources of first nations origin, Stage 2 assessment recommended)<br>- Archaeological Report on the Russell Road well site – Road Allowance Concessions 2 and 3, Oct, 2008 by Amick Consultants Limited (high potential for archaeological resources of first nations origin, Stage 2 assessment recommended)<br><br>In addition, a Stage 1 assessment was undertaken for the proposed extension of Craig Road. That Report is included in the ESR and notes an elevated potential for recovery of archaeological materials – Stage 2 assessment required to confirm recommended road alignment.<br><br>The Ministry of Tourism, Culture and Sport was contacted throughout the Class EA planning process including delivery of all Notices. As a result of these Notices, no responses were received other than to acknowledge receipt of the Studies and to advise the Proponent of the need for future Stage 2 assessment of the Craig Road alignment. |
| **<u>Class EA Process</u>**<br>**Please provide the following information:**<br>• **Was the MECP regional office contacted?**<br>• **What points/stages during the Class EA process were they contacted (please provide dates)?**<br>• **Please provide any correspondence or comments received.** | Cindy Hood, District Manager of the MECP District Office in Barrie has been on the distribution list for all Notices related to this Project. This includes all Notices issued during the Master Plan and all Notices issued during Phase 3 and 4. Therefore, the District Office received the following Notices:<br><br><u>Master Plan</u><br>Notice of Commencement – June 10, 2008<br>PIC – August 15, 2008<br>Notice of Completion of Master Plan – July 9, 2009<br><br><u>Phase 3</u><br>Notice of Commencement – April 2013 (Appendix X of ESR)<br>PIC – October 18, 2016 (Appendix Y of ESR) |

# TABLE B – PROPONENT RESPONSE TO PART II ORDER REQUESTS

| Required Information | Response or Attachments |
|---|---|
| | Phase 4<br>Notice of Completion of draft ESR – June 2018 (Appendix DD of ESR)<br><br>No comments were received from the District Office as a result of these Notices. |
| **Timing Considerations**<br>**Please provide the following information:**<br>• **The total cost of the proposed Project?**<br>• **Budget allocation?**<br>• **Construction timing widow?**<br>• **Will construction be a phased approach?**<br>• **When is construction anticipated to be completed?**<br>• **External funding? Any deadlines that need to be met for this funding?** | • Total estimated capital cost of project is $325 million.<br>• All costs will be borne by the Midhurst Developers Group except for the Craig Road Extension which will be funded by Township wide Development Charges.<br>• Construction of the infrastructure is anticipated to start in 2020.<br>• The infrastructure will be phased in conjunction with the development of the Midhurst Secondary Plan, which is anticipated to take approximately 15 years.<br>• No external funding. |

## Joe Mullan

**From:** Joe Mullan
**Sent:** Monday, June 18, 2018 12:02 PM
**To:** David Strachan
**Cc:** Robert Brindley
**Subject:** RE: "Supplementary Hydrologic Modeling, January 2017..."

**Hi David:**

It turns out that we put in two copies of the same Golder Report into the ESR, rather the two separate reports which have very similar titles.

The drop box link that I circulated previously (and shown below) contains the updated Appendix J (pages 363 to 402 within Volume 3 of 5).

https://www.dropbox.com/sh/ae2kx02rb3s1r9k/AAA1BkZwa0SmYOt14tAvDlQga?dl=0

The Township website will be updated later today in advance of the formal commenting period starting tomorrow.

Regards,

J. A. Mullan, P.Eng.
President & CEO
Ainley
www.ainleygroup.com
Tel: (705) 445-3451 Ext. 126
Cell: (705) 718-7230

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**From:** Robert Brindley [mailto:Robert.Brindley@springwater.ca]
**Sent:** Monday, June 18, 2018 7:44 AM
**To:** David Strachan <davidistrachan@yahoo.com>
**Cc:** Joe Mullan <mullan@ainleygroup.com>
**Subject:** RE: "Supplementary Hydrologic Modeling, January 2017..."

Hi David,

I will ask Joe to respond through this email.

In the future please forward request directly to Joe for a quicker turn-around.

Thank you,

Robert Brindley
Chief Administrative Officer

Township of Springwater
2231 Nursery Road
Minesing, ON  L9X 1A8
P. 705-728-4784 Ext. 2041
F. 705-728-6957

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**From:** David Strachan [mailto:davidistrachan@yahoo.com]
**Sent:** June 15, 2018 3:54 PM
**To:** Robert Brindley <Robert.Brindley@springwater.ca>
**Cc:** Bill French <Bill.French@springwater.ca>; Sandy Buxton <s.buxton@rogers.com>; Margaret Prophet <teljeur6@hotmail.com>; Spek Family <spek.family@gmail.com>
**Subject:** "Supplementary Hydrologic Modeling, January 2017..."

Hi Robert

We have a question:

On page 4 of the MOECC comments letter of April 30, 2018, under 2.3 Water supply, MOECC refers to the hydrogeological study by Golder (*Midhurst Water Supply Exploration Program, June 2016*) and also to the above mentioned *"Supplementary Hydrologic Modeling, January 2017…"* also by Golder.

We were able to fine the first one (which appears to be repeated twice, or even three times), but not the second one.

Please advise where we can locate the report entitled *"Supplementary Hydrologic Modeling, January 2017 …"*

Many thanks

David Strachan

## Joe Mullan

**From:** Joe Mullan
**Sent:** Tuesday, July 10, 2018 4:19 PM
**To:** David Strachan
**Cc:** Robert Brindley; Reid Mitchell
**Subject:** RE: Having difficulty locating documents referred to by MOECC.

**Hi David:**

I was out of the office last week and therefore unable to respond to you any sooner. With regard to your queries about the two Golder documents we provide the following response:

The Golder information "…groundwater modelling work (March 2015)" referenced in the MOECC letter, has been updated and included within the Golder reports in the current ESR, specifically within Volume 3 – Part 1 (as per the Township website) and starts on page 291 of this volume. This report is entitled "Report on Carson and Doran Neighbourhoods Proposed Water Supply Groundwater Modelling" dated May 2018 and forms part of the overall Hydrogeological Study by Golder.

The Golder information "…subsequent hydrogeological modelling work (January 2017)" referenced in the MOECC letter, has been included within the Golder reports in the current ESR, specifically within Volume 3 – Part 1 (as per the Township website) and starts on page 363 of this volume. The report is entitled "Report on Carson and Doran Neighbourhoods Water Supply – Midhurst Secondary Plan: Supplementary Hydrologic Modelling." dated May 2018 and forms part of the overall Hydrogeological Study by Golder.

Hopefully this answers your questions.

Regards,

J. A. Mullan, P.Eng.
President & CEO
Ainley
www.ainleygroup.com
Tel: (705) 445-3451 Ext. 126
Cell: (705) 718-7230

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**From:** David Strachan [mailto:davidistrachan@yahoo.com]
**Sent:** Sunday, July 1, 2018 11:33 AM
**To:** Joe Mullan <mullan@ainleygroup.com>
**Subject:** Having difficulty locating documents referred to by MOECC.

Hi Joe

I wonder if you would kindly steer me to the following documents mentioned in the MOECC comments, if they are in your drop-box, or perhaps send them to me if not.

"The **groundwater modelling work (March 2015)** attached to the hydrogeological study report and the **subsequent hydrological modeling work (January 2017)** imply some impact to stream baseflows under full build out scenarios".

I am just having too much difficulty trying to find them.

Many thanks

David Strachan

## Joe Mullan

**From:** Joe Mullan
**Sent:** Thursday, August 23, 2018 8:42 AM
**To:** 'David Strachan'
**Cc:** Heather Coleman; Robert Brindley
**Subject:** RE: Well pumping tests

**Hi David:**

Hopefully your summer has been going well. Here is the answer to your questions. Sorry for the delay in responding and yes it was due to my vacations.

1. *Where did they put 7.2 million litres of water?*

   Water was piped to the roadside ditch on the Old 2nd South. The water then flowed along the roadside ditch to a natural drainage course.

2. *Similarly where did they put the water during the other tests?*

   Water was pumped to roadside or natural ditches in the other pumping tests. At all of the tests water was pumped in irrigation pipe to an appropriate discharge location.

3. *Were there any witnesses to these significant tests?*

   The tests were conducted by a licensed water well contractor who had two staff on site throughout the tests. These individuals were responsible for monitoring the water levels in the wells, the flow rate from the well, and the discharge water location. Golder staff conducted inspections, at least on a daily basis, during the various pumping tests.

Regards,

J. A. Mullan, P.Eng.
President & CEO
Ainley
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**From:** David Strachan <davidistrachan@yahoo.com>
**Sent:** Tuesday, August 7, 2018 9:13 AM
**To:** Joe Mullan <mullan@ainleygroup.com>
**Subject:** Well pumping tests

Hi Joe

We have a question that is puzzling us. (Maybe we missed some information somewhere). The question concerns the well pumping tests at various wells.

The Golder report of May 2018, provides the results of water flow testing for the various wells. For example item 4.2.1 describes the construction of well TW21 close to Old Second Road South and item 4.2.2 provides the results.

The report states that, "A 72-hour pumping test was also conducted from July 31 to August 3, 2014 at a rate of 27.8 L/s". This represents pumping approximately 7.2 million litres of water out of TW21.

The question is, where did they put 7.2 million litres of water? Similarly where did they put the water during the other tests? Were there any witnesses to these significant tests?

Thanking you in the meantime.

David Strachan

**Ministry of the Environment, Conservation and Parks**

Environmental Assessment and Permissions Branch
*135 St. Clair Avenue West*
*1st Floor*
*Toronto ON M4V 1P5*
Phone: 416.314.8001
Fax: 416.314.8452

**Ministère de l'Environnement, de la Protection de la nature et des Parcs**

Direction des évaluations et des permissions environnementales
*135, avenue St. Clair Ouest*
*Rez-de-chaussée*
*Toronto (Ontario) M4V 1P5*
Tél: 416 314-8001
Téléc: 416 314-8452

Ontario

357-2018-1003

September 19, 2018

Sandy Buxton and David Strachan
Midhurst Ratepayers' Association
[redacted]

Dear Sandy Buxton and David Strachan,

Thank you for your September 17, 2018 correspondence to the Minister of the Environment, Conservation and Parks in which you request that the Township of Springwater be required to prepare an individual environmental assessment (EA) under the *Environmental Assessment Act* (Act) for the proposed Midhurst Water, Wastewater, & Transportation Class Environmental Assessment (Project). I am pleased to respond on behalf of the Minister.

It is the understanding of the Ministry of the Environment, Conservation and Parks that the Project is being planned under the master plan procedures of the Municipal Engineers Association's Municipal Class Environmental Assessment (Class EA). The Class EA is an approved planning process that proponents must follow for projects of this type in order to obtain authorization to proceed with the project under the act. Despite this process, the Class EA includes a provision whereby any member of the public who has unresolved concerns with a proposed project can request that the Minister require the proponent of the project to prepare an individual EA. The Minister's requirement to prepare an individual EA is referred to by the Class EA as a Part II Order.

Staff at the ministry will review the issues and concerns you have cited as reasons for which an individual EA should be prepared. Your request will be forwarded to the Township. The Township will be directed to review your request and to provide any Project documentation and other information necessary to assist the ministry in its review of your request. This information will be considered by the Minister when making a decision about the request. Where required, ministry technical staff and staff at other agencies may also review the matter.

On the basis of this review and other matters required to be considered by the Minister under the act, the Minister will make a final decision whether or not to require that an individual EA be prepared by the Township. You will be notified in writing of the Minister's decision once it has been made.

I would like to note that, as with all Part II Order requests, the Environmental Assessment and Permissions Branch maintains a public file that is available for viewing by any member of the public upon request. Personal and other information in your letter such as name, address, and telephone number and your concerns with this Project will form a part of the public record on this matter required to be maintained pursuant to section 30 of the act. If you wish this information to be excluded from the public file, this Branch must be advised. Notwithstanding the above, this information may still be obtained by members of the public if the ministry is required to disclose it under the *Freedom of Information and Protection of Privacy Act*.

Thank you for taking the time to share your concerns with this Project.

If you have any questions about the ministry's review of your request, please contact Callee Robinson, Project Evaluator for this Project, directly at 416-314-0286 or at callee.robinson@ontario.ca.

Yours sincerely,

Kristina Rudzki
Supervisor, Project Review Unit
Environmental Assessment and Permissions Branch

c: Heather Coleman, Director of Public Works
Township of Springwater

EA File No. 18077
Midhurst Water, Wastewater, and Transportation Class Environmental Assessment (Phase 4)

Midhurst Ratepayers' Association

[redacted]*munity"*

September 17, 2018

Hon. Rod Phillips, Minister for the Environment, Conservation and Parks

Re: Part II Order request concerning the EA for
Midhurst Secondary Plan - Springwater Township, Simcoe County

Dear Minister Phillips,

Thank you for the opportunity to summit our Part II Order request, which outlines what we consider to be the most serious issues.

The attached documentation represents only a fraction of the evidence we have collected. It shows that the Midhurst Secondary Plan (MSP) is unnecessary, illegal and environmentally damaging.

It also provides a glimpse of the political manoeuvring that went on during the previous government's tenure, which resulted in the infamous *"Special Rule*" just to favour a particular group of developers. This ministerial order turned a blind eye to the egregious development of a new city, the size of Orillia, in one of rural Ontario's most environmentally sensitive areas.

We are hopeful that our new government will bring the strong leadership needed to ensure all development proposals, including this one, comply with the *Provincial Policy Statement,* which was introduced in 1996 by a previous PC government.

We will be unavailable until October 9, at which time we will be happy to answer questions and/or provide any additional information in person or by email.

We appreciate your consideration of our appeal.

Yours sincerely,

Sandy Buxton, MRA President
David Strachan, MRA Treasurer and Past-President

P.S. For comments regarding the existing *Environmental Assessment*, we refer to the ministry by its previous name, MOECC.

[redacted]

Ontario Ministry of the Environment and Climate Change

# Part II Order Request

## General Information and Instructions

### General

Anyone who has outstanding environmental issues that have not been addressed through the Class Environmental Assessment process can request the Minister of the Environment and Climate Change to make an order under Part II of the Environmental Assessment Act. This is known as requesting a Part II Order.

A Part II Order request should be submitted after the proponent has issued the Notice of Completion for a Class Environmental Assessment for a project. The request should be submitted within the review period/comment period outlined in the Notice of Completion.

The Ministry recommends that you follow the process set out below before submitting a Part II Order request:

- Participate in the consultation opportunities provided to the public within the Class Environmental Assessment process
- Engage in discussions with the proponent to try to address and resolve your concerns

A Part II Order request should not be submitted for the sole purpose of delaying, stopping, or frustrating the planning and implementation of an undertaking proceeding under a Class Environmental Assessment process. The Minister may consider the efforts of the requester to resolve the concerns directly with the proponent when deciding whether to make an order.

Questions regarding the completion and submission of this form should be directed to a Customer Service representative at the Client Services and Permissions Branch at 416-314-8001 or 1-800-461-6290.

## Step 1 - Get the Facts

- Class Environmental Assessments are used for projects that the Ministry of the Environment and Climate Change considers routine, with predictable and manageable effects on the environment.
- A Part II Order request will not stop a project from proceeding. The Minister has four options when deciding a Part II Order request:
  - To request mediation between you and the proponent to help address your concerns before making a decision
  - To deny the request
  - To deny the request but require the proponent to fulfill additional conditions before the project can proceed, such as further studies or more public consultation
  - To require the proponent to conduct a higher review of the project through an Individual Environmental Assessment; this happens only in rare and exceptional cases.
- Key factors that the Minister may consider when looking at a Part II Order request are:
  - whether the project has the potential to pose significant adverse effects on the environment
  - how the project is significantly different from other projects in its class
  - whether the process for the Class Environment Assessment was adequate.

To learn more about Class Environmental Assessments visit https://www.ontario.ca/page/class-environmental-assessments-approved-class-ea-information.

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## Step 2 – Statement of Participation

[X] I have raised my concerns with the project proponent

Describe how and when you raised your concerns with the proponent and the proponent's response

*We have been in constant dialogue with the Township, its consultant and the Province since 2008 when we first learned of the proposed Midhurst Secondary Plan. Extracts from our file of correspondence and involvement is attached as Appendix 7.4.*

[X] I was unable to have my concerns resolved by the project proponent

Describe what concerns remain outstanding and why these concerns could not be resolved through discussions with the proponent.

*We have both legal and environmental concerns as described in the attached Part II order request. As will be seen, these can only be resolved by Ministerial intervention.*

[X] My unresolved concerns relate to:

- [X] potential environment impacts
- [X] how the project is significantly different from other projects in its class
- [X] the adequacy of the process for the Class Environment Assessment
- [X] other (specify)

Describe

*All of the above apply. The Midhurst Secondary Plan never complied with Provincial laws, plans and policies and, as will be seen, it is environmentally unsound. The Class Environmental Assessment is inadequate for the magnitude and complexity of this development, especially as it is located in such an environmentally sensitive and unique area.*

[X] The proponent has issued the Notice of Completion for the project

[X] This request is being made within the review/comment period outlined in that notice

*2018 / 06 / 19* (Start Date (yyyy/mm/dd)) to *2018 / 09 / 18* (End Date (yyyy/mm/dd))

[X] I hereby declare that, to the best of my knowledge, the information contained in this form and the information submitted in support of this form is complete and accurate.

| Last Name | First Name | Date (yyyy/mm/dd) |
|---|---|---|
| *Buxton* | *Sandy* | *2018 / 09 / 17* |

With all Part II Order requests, the Ministry maintains a public file that is available for viewing by any member of the public upon request. Personal and other information from your request, such as name, address, and telephone number and your concerns with the project will form part of the public record. If you wish for your information to be excluded from the public file, you can advise the Ministry by checking the box in the declaration below. Even if you request that your information be excluded, your contact information may still be obtained by members of the public if the Ministry is required to disclose the information under the *Freedom of Information and Protection of Privacy Act*.

[ ] Please exclude my personal information from the public file (select if you wish to be excluded).

## Step 3 – Provide Identifying Information

If you are certain making a Part II Order Request is the right approach for you, complete the following information:

Requester Name

| Last Name | First Name |
|---|---|
| *Buxton* | *Sandy* |

Requester Type

[ ] Individual

[X] On behalf of Person/Group (specify) *Midhurst Ratepayers' Association*

[ ] Other (specify)

**Current Address**

| Unit Number | Street Number | Street Name | PO Box |
|---|---|---|---|
| | [redacted] | [redacted] | |

| City/Town | Province | Country | Postal Code |
|---|---|---|---|
| [redacted] | [redacted] | [redacted] | [redacted] |

| Concession | Rural Route |
|---|---|
| | |

| Telephone Number | Fax Number | Email Address (if available) |
|---|---|---|
| [redacted] | | [redacted] |

Name of proposed Project (as it appears on the Notice of Completion if available)

*Midhurst Water, Wastewater & Transportation Class Environmental Assessment (Phase 4)*

Name of Proponent (as it appears on the Notice of Completion if available)

*Township of Springwater*

## Step 4 – Making Your Request

By submitting this form, you are requesting a Part II Order by the Minister.

Confirm what outcome you are seeking from the Minister by making this request.

I want the Minister to:

☐ Refer the matter to mediation to help me and the proponent address my concerns

☒ Impose additional conditions before the project can proceed

Describe what conditions you think would be appropriate and how they would address your concerns.

*A high level and intensive review, culminating in Ministerial Zoning Order or equivalent, or at the very least an Individual Environmental Assessment.*

☒ To require the proponent to conduct a higher review of the project through an Individual Environmental Assessment

Describe how an Individual Environmental Assessment would address your concerns in a way that the Class Environmental Assessment does not:

*An Individual Environmental Assessment, with its significantly more comprehensive and intensive field studies, is the only way to reliably determine the environmental feasibility of the Midhurst Secondary Plan.*

If applicable, provide any other relevant information related to this request you would like to share.

*The Plan to build this new city is an enormous project. We are requesting that MOECP exercise all due diligence in its review of the attached material. The many complex issues are political, legal, environmental and/or financial.*

## Step 5 – Submitting Your Request

Please send the completed form and any supporting information you would like to provide to all three of the following:

Minister
Ministry of the Environment and Climate Change
Ferguson Block, 77 Wellesley St. W, 11th Floor
Toronto ON M7A 2T5
Fax: 416-314-8452
Minister.MOECC@ontario.ca

Director, Environmental Assessment and Permissions Branch
Ministry of the Environment and Climate Change
135 St. Clair Ave W, 1st Floor
Toronto ON M4V 1P5
MOECCpermissions@ontario.ca

Project Proponent
The email or mailing address for the project proponent can be found on the Notice of Completion for the project.

| Step 6 – Attachments | |
|---|---|
| **Description** | **File name** |
| 1. Covering letter | Covering letter |
| 2. EA Part II Order Request form | EA Part II Order form |
| 3. MRA Issues - Sections 1 to 8 | MRA Issues |
| 4. Appendices 1 to 3: IGAP / Resumes / Northey presentation | Appendices 1, 2.1, 2.2, 3.1, 3.3 and 3.4 |
| 5. Appendix 3.2 Northey presentation audio | Appendix 3.2 |
| 6. Appendix 4 MPP Garfield Dunlop address | Appendix 4 |
| 7. Appendix 5 Lotimer presentation & OGS report | Appendices 5.1, 5.2, 5.3 and 5.4 |
| 8. Appendix 6 NVC "Forest Change / HED | Appendices 6.1, 6.2, 6.3, 6.4, and 6.5 |
| 9. Appendix 7 Drainage / NVCA / Fiscal / MRA History | Appendices 7.1, 7.2. 7.3 and 7.4 |

The above 24 files are to be sent in 6 e-mails as follows:

| | | |
|---|---|---|
| E mail 1 | Covering Letter; Part II Order Form; MRA Issues | - 3 files |
| E mail 2 | Appendices 1, 2.1, 2.2, 3.1, 3.3 and 3.4 | - 6 files |
| E mail 3 | Appendix 3.2 | - 1 file |
| E mail 4 | Appendices 4, 5.1, 5.2, 5.3 and 5.4 | - 5 files |
| E mail 5 | Appendices 6.1, 6.2, 6.3, 6.4 and 6.5 | - 5 files |
| E mail 6 | Appendices 7.1, 7.2, 7.3, and 7.4 | - 4 files |

# Part II Order Request

*concerning the*

**Environmental Study Report**

*for the*

**Midhurst Secondary Plan**

*by*

**Midhurst Ratepayers' Association**

*September 18, 2018*

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**Part II Order form**

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## **1.** INTRODUCTION

The proposal to build a new city the size of Orillia from scratch on lands where the only water source is groundwater, and the only receptor for the effluent from 30,000 people is a small, slow-moving creek, requires an unusual amount of scrutiny. In addition to concerns about the availability of an adequate supply of source water, one must also consider the effects on the environment of discharging such a huge amount of treated effluent into the local creek. Finally, there is the impact on the quality of life of and financial burden on the residents - current and future.

It is also appropriate to question the need for such a huge residential undertaking in an area like Midhurst, so far from any major industrial or commercial demand for housing. The pie graph in *Appendix 1*, is taken from the extensive IGAP reports of 2005/2006. It clearly shows that, in 2006, there was more than enough land already approved for development to meet the Province's 2031 population target for Simcoe County of 667,000. As Midhurst is very close to Barrie and Barrie is on-track to meet its provincial target of another 70,000 people by 2031, it is obvious that there is no need for yet another large development, especially in an unserviced rural area less than 1 km north of Barrie and 30 minutes southwest of Orillia.

The Midhurst Secondary Plan (MSP) was adopted in 2008 by Springwater Township, despite contravening the clear objectives of the *2005 Places to Grow Act*, the *2005 Provincial Policy Statement*, the *2006 Intergovernmental Action Plan* for Simcoe County and the 2006 *Growth Plan for the Greater Golden Horseshoe*. It is well-known that these plans were intended to protect agricultural and natural heritage lands and, as quoted in the Growth Plan, to "direct growth to built-up areas where the capacity exists to best accommodate the expected population and employment growth." The aforementioned bedrock plans resulted from numerous multimillion dollar studies of population trends, housing needs, best infrastructure practices and environmental and financial sustainability. Nevertheless, in 2012, a ministerial order - the so called "Special Rule" - was created to allow, not mandate, the non-compliant Midhurst Secondary Plan to proceed.

The Midhurst Ratepayers' Association (MRA) has been active for many years. It was incorporated in March 2009 to more effectively represent the interests of the residents of Midhurst. Over the years, we have participated in many planning, environmental and council meetings to add to and share our knowledge of urban development in rural Ontario at large and, specifically, in Midhurst. We have had continuous dialogue with the Township's consultant Ainley and Associates Limited and the developers directly, in small and large meetings, by mail and by actively participating in the Township's Residents Liaison Group, which was established for the MSP process.

As well, we have continuously educated and lobbied local residents and the broader public on the issues at hand. In fact, we collected 1,476 signatures against the MSP from Midhurst itself [pop. 3,500]. And nearly 46,000 people have signed our online petition to stop the MSP. We have benefitted from the influence, advice and patronage of several well-known Canadians, including Margaret Atwood, Maude Barlow and David Crombie.

We have serious concerns about the projected traffic, air quality and other issues which would be caused by the MSP. Our resources, however, are such that we have chosen here to focus on what we consider to be the most fundamental issues - legality and water. In this regard, we have benefitted from the expertise and experience of MRA's legal counsel, renowned environmental lawyer Rod Northey of Gowlings WLG and hydrogeologist Tim Lotimer FGC. P. Geo. (*See Appendix 2).*

Specifically our concerns are:

- The non-compliance of the EA with Provincial laws and policies.
- the availability over time of the amount of groundwater required to service this mega-development.
- the long-term effects on residents of Midhurst and Oro-Medonte; farmers; Willow Creek; and the Minesing Wetlands of drawing the proposed 19 million litres of water per day from the deep aquifers under Midhurst and discharging the resulting sewage effluent into downstream Willow Creek close to the unique and fragile Minesing Wetlands.

2. NON-COMPLIANCE WITH PROVINCIAL LAWS, PLANS & POLICIES

It is essential to recognise that the Provincial Policy Statement 2014 (PPS) is legally the most senior policy which must be adhered to in environmental matters. Other key Provincial planning laws and policies such as the Places to Grow Act (2005) and the Planning Act, R.S.O 1990, while important, must defer to the PPS in any conflict regarding the primacy of the environment, public health and public safety.

**Key Quotes:**

- **Planning Act - Section 3 (5)**

*A decision of the council of a municipality ….a minister of the Crown and a ministry, board, commission or agency of the government in respect of the exercise of any authority that affects a planning matter,*

*(a) shall be consistent with the policy statements …. that are in effect on the date of the decision and*

*(b) shall conform with the provincial plans that are in effect on that date, or at least shall not conflict with them as the case may be. 2006, c. 23, s. 5*

- Provincial Policy Statement 2014

1. 1. 1 - *Healthy, liveable and safe communities are sustained by:*

*c) Avoiding development and land use patterns which may cause environmental or public health and safety concerns*

- Places to Grow Act 2005

14 (4) *Despite any Act, but subject to a regulation made under clause 18 (1) (b), c) or (d), if there is a conflict between a direction in a growth plan and a direction in a plan or policy that is mentioned in subsection (5) with respect to a matter relating to the natural environment or human health, the direction that provides more protection to the natural environment or human health prevails.*

14 (5) T*he plans and policies to which subsection (4) refers are*

*(a) a policy statement issued under section 3 of the Planning Act*

Eminent environmental lawyer, Rod Northey, lays this out unequivocally and succinctly in his presentation to Springwater Council [May 2017]. *See Appendix 3 which contains his oral presentation, slides and draft by-law.*

The MSP's Environmental Assessment [EA] does not meet this standard and is therefore non-compliant.

Note that the PPS has been around a long time - 22 years. In fact, it was the Progressive Conservative government which introduced it in 1996. Section 2.1.1 stated, "*Prime agricultural areas will be protected for agriculture".* Clearly, the PC government was well aware of the need to protect agriculture, natural heritage and water resources. In keeping with this philosophy, they followed with the *Oak Ridges Moraine Conservation Act ( 2001),* which recognised the importance of a key natural resource to the overall health of southern Ontario. Subsequent iterations of the PPS in 2005 and 2014 strengthened its environmental protections and supremacy as relentless development pressure increased.

*Appendix 3.4* provides a comprehensive list of violations in the MSP which ignores Provincial law and core policies.

See also MPP Garfield Dunlop's comments regarding the MSP in the Ontario Legislature *(Appendix 4)*.

## 3. SOURCE WATER

The MRA continues to have grave concerns about the quantity of source water required for this mega- development – 10,000 housing units at full buildout – and its potentially serious impacts on:

- the many private wells already in Midhurst
- the coldwater Willow Creek fishery upstream of the sewage treatment plant
- Willow Creek's short distance between the sewage treatment plant and the ecologically unique and internationally renowned Minesing Wetlands, a biologically diverse habitat for many threatened and endangered flora and fauna.
- the amount of groundwater available for the Minesing Wetlands due to large-scale water-takings "upstream" for the new "city" and the impact on the shallower wells.
- home owners, farms and businesses located within the *future extended* Well Head Protection Areas (WHPAs), yet outside the area serviced by the water-takings. The WHPAs must be enlarged in proportion to the projected water-takings.
- the sustainability of the groundwater supply considering that this large-scale groundwater-taking will be the largest ever in Simcoe County.

The proponent's consultants have relied extensively on models which lack the reliability of extensive field-measured data, which is required for such a massive housing development, one set in a unique and ecologically sensitive location.

They have not incorporated recent Ontario Geological Survey (OGS) findings, which dispute their claim that the shallower aquifers currently servicing Midhurst and the Minesing Wetlands are hydraulically separate from the deeper aquifers which will service the proposed development.

Their field testing has been insufficient for the magnitude of the proposed water-taking; and they have relied on extrapolations from it to make questionable projections.

They contradict themselves as to whether the proposed groundwater extraction will or won't affect the amount of groundwater reaching Willow Creek upstream of the sewage treatment plant.

Some clarifying notes:

a. Throughout MOECC's response to the Draft ESR, one finds comments referencing the questionable, or inadequate, or preliminary nature of the findings presented by the proponent. MOECC repeatedly states that more studies will be, or will likely be, required at the Permit To Take Water (PTTW) or Environmental Compliance Approvals (ECA) stages.

b. Golder undertook NO field monitoring of stream flow etc. This is not the norm when a large groundwater-taking is required. Note that Waterloo and Halton Regions both insisted on this practice as due diligence when assessing the water impacts of large-scale developments. With no field monitoring, it is impossible to confirm the predictions made from models. This is a very risky approach.

c. New wells for the development were only tested *individually* and for a brief period. There was no combined testing of the *11 new wells* for a time sufficiently lengthy to show reliably the impact on the shallower wells, which currently supply Willow Creek and the Minesing Wetlands.

d. Golder's updated groundwater model (Jan. 2017) affirms our contention that the proposed water-taking will result in a reduced flow of groundwater into Willow Creek and the Minesing Wetlands approximately equal to the amount of water pumped from the aquifers. Yet, their earlier study states that the proposed groundwater-taking will NOT mean a corresponding drop in Willow Creek. How reliable are models as the major tool when they can produce conflicting results?

e. Models can be flawed: the quality of data produced is directly related to the quality of the model itself and any tweakings it may have received. Or as has often been said of software: "garbage in, garbage out". The track record of using large-scale groundwater models to predict stream flow reductions does not inspire confidence.

f. Well Head Protection Areas (WHPA) will have to be extended well beyond Springwater boundaries due to the enormous volume of proposed groundwater-taking. This means residents, farmers, and businesses in Oro-Medonte – not serviced by the proposed water-taking - may well be negatively impacted. They may face land use restrictions.

g. Large-scale groundwater pumping often negatively affects private wells. That issue needs to be fully explored now to prevent lawsuits to the township later, should these wells be affected by the immense drawdown. Note that even the inadequate, individual pumping tests of the deep aquifers showed drawdown in the shallow aquifers. It is reasonable to conclude that ALL wells within the zone of influence may be affected.

h. How much groundwater loss is acceptable for a healthy, but sensitive coldwater fishery and other valuable ecological features in both Willow Creek and the Minesing Wetlands? Golder and the MOECC have different views on the acceptable percentage. We contend that, with severe weather changes in recent years causing much longer and more frequent droughts, and more intense, more sustained rainstorms and floods, the extreme fluctuations will only increase to the detriment of our natural heritage.

i. Models designed for Source Water Protection purposes are unsuitable for deeper aquifers. They are not designed to accurately determine with sufficient spatial range the effects of wells from deep aquifers on sensitive ecological features such as Willow Creek and the Minesing Wetlands.

j. The geological model and the numerical groundwater flow models cannot deliver an accurate assessment of the situation because the recent findings of the OGS, which show a complex stratigraphy under Midhurst, have been ignored. In other words, they are not up to date. The most recent OGS results must be incorporated to draw accurate conclusions.

k. The presence of nitrate in the deeper aquifers proves that they are connected to the shallow aquifers due to infiltration and/or recharge. When land use categories have changed in other areas e.g. Waterloo Region and Oxford County, it has been shown that the contamination may take decades to be eliminated.

l. the proposed new water supply for Midhurst will be larger than the groundwater used by Midland, Penetanguishene and Elmvale *COMBINED.* In fact, this will be *the LARGEST municipal drinking water system relying solely on groundwater in all of Simcoe County*. Note that Barrie and Alliston have to use a combined surface water/groundwater system because they found there wasn't enough groundwater to service and sustain growth.

In summary, the above supports our contention that:

- there is insufficient sustainable groundwater for current users, traditional village growth and the proposed city of 30,000 over the long-term as stipulated in the MSP *and*
- the effects of such massive new groundwater-takings on our local environment and natural heritage - Willow Creek, Minesing Wetlands, their flora and fauna - are not negligible *and*
- much more intensive study is needed now, not later, to answer these seminal issues *and*

- it is irresponsible to postpone answering such far-reaching and elemental questions about source water until the WTTP phase, when some disturbance of the natural environment will already have occurred *and*
- the financial and environmental costs of not doing so could be catastrophic.

*See Appendix 5*

- *5.1 expert hydrogeologist TIM LOTIMER's presentation to Council and residents (March 2017)*
- *5.2 Lotimer's comments on Golder's response*
- *5.3 Lotimer's comments on MOECC's comments on the Draft ESR.*

## 4. WATER VOLUME IN WILLOW CREEK AND THE MINESING WETLANDS

### Summary of Key Points

- Currently, shallow aquifers 1 and 2 supply groundwater to Willow Creek in addition to servicing Midhurst's private wells.
- The groundwater in deeper aquifers 3 and 4, now proposed to be pumped from 11 wells to supply the new Midhurst "city", currently discharges *directly* into the Minesing Wetlands.
- None of these aquifers flows into Nottawasaga Bay.
- All this groundwater sustains the ecological health of both Willow Creek and the Minesing Wetlands.
- the most recent Ontario Geological Study reports (Mulligan 2017) of this area show a complicated stratigraphy in the area of Aquifers 1, 2, 3 and 4 This confirms that the shallow and deeper wells are connected; therefore, pumping wells from the deeper aquifers of 3 and 4 will cause drawdown in the shallower wells of 1 and 2 on which Willow Creek depends for its cold, clean groundwater.
- the proposed diversion of groundwater from 3 and 4 to service up to 30,000 people *AND* the flow interruption from 1 and 2 to Willow Creek upstream of the WTTP, due to such a mammoth groundwater-taking from a complex and hydraulically connected aquifer/aquatard system, will combine to upset this delicate ecological balance.
- Hutchison's May 18, 2018 report quotes increased modelled baseflow losses of 9.6% in August. More details follow.

## 4.1 Willow Creek

To service the 30,000 people expected to occupy the MSP area at full build-out, the proponent proposes to build a large Wastewater Treatment Plant (WWTP) at the corner of Snow Valley Road and Wilson Road and to pipe the treated effluent to a discharge point near Highway 26 and Golf Course Road. This WWTP, at full build-out, will discharge 143L/s into Willow Creek (Hutchinson, Willow Creek Assimilative Capacity Study, May 2018) some 4Km upstream of the Minesing Swamp. This translates into 12 million litres per day, equivalent to 8 Olympic- sized swimming pools, every day of the year. This effluent will be pumped through roughly 5 km of pipe before being released into the slow-moving and shallow Willow Creek. See attached photographs.

Water levels of Willow Creek fluctuate wildly depending on such un-controllable weather factors as extended dry spells, heavy spring run-off and flash floods.

*(Photo Sept. 9, 2018)*

Proposed effluent discharge site within Willow Creek just upstream from the Minesing Wetlands in summer. The depth of the creek in this picture is roughly 13” at its centre.

## 4.2 Willow Creek water flow - conflicting reports and threats to wildlife

Golder Associates' reports describe four aquifers running under the Midhurst area: A1, A2, A3 and A4. Aquifers A1 and A2 are described as shallow aquifers from which local residential wells derive their water. These aquifers provide cold water to Willow Creek.

The proponent proposes to tap into the deeper aquifers A3 and A4 for their new developments, *on the assumption* that these are separated from the upper aquifers by impermeable soil structures.

References supporting their assumption follow:

a) Golder Associates Hydrogeological Study - Midhurst Water Supply, May 18, 2018, Appendix J, Section 3.3 Groundwater Recharge and Flow, states;

*"The valleys of Willow Creek and Matheson Creek are right bank tributaries to the Nottawasaga River. These streams receive discharge from Aquifers A1 and A2 along their length, while Aquifers A3 and A4 remain confined and ultimately discharge to Nottawasaga Bay".*

b) In Golder's criticism of the Lotimer report, Golder explains that A1 and A2 are isolated from A3 and A4 as follows:

*"Slide 6 shows the drawdown cone for Aquifer 3, however, almost all of the private wells in the area are completed within shallower Aquifer A1 or Aquifer A2, which is hydraulically separated from direct drawdown from wells operating in Aquifer A3 or A4."*

However, according to Hutchinson in Section 5 of its "7Q20 Flow and Ecological Low Flow Assessment*," there is connection between these aquifers, "The municipal servicing of water to the Midhurst Secondary Plan Area (SPA) will draw water from regional aquifers A3 and A4. There is some connection between these aquifers and the shallow aquifers A2 and A1 that provide groundwater to local area creeks which support cold water fisheries".*

This means that the upper aquifers are *not* isolated from the deeper aquifers, as had been claimed by Golder and water taking from A3 and A4 would result in some loss of water in A1 and A2, as well as affecting the volume of water flowing into Willow Creek.

In its response to concerns from Midhurst resident and hydrogeology student Michael Thorn, (his letter of March 7, 2017, see Appendix BB of the ESR), Hutchinson wrote, *"Mr. Thorn has raised concerns that “any reductions in the base flow/ground water*

*discharge could have several major ecological consequences."* Mr. Thorn was referencing the Golder (2016) prediction *"that groundwater taking for the Midhurst Secondary Plan Area "may lead to maximum losses of 8.7% in the late summer (August) baseflow to Willow Creek in the area of Midhurst and that assessment of risk on the basis of a proportional reduction in baseflow may not be protective of cold water fisheries".*

Just this year, Hutchinson submitted a report to Ainley which *increased* the modelled baseflow losses to *9.6%* in August, as quoted below:

*"Modelling completed by Golder established that monthly volumetric baseflow losses as a result of proposed Midhurst Secondary Plan Area pumping at full build out are estimated to range from 985 m3/day in Willow Creek at Midhurst in August to 2595 m3/day in April, while percent losses range from 2.5% in Matheson Creek in February to 9.6% in Willow Creek at Midhurst in August (Golder 2016). Modelled baseflow losses are less than the maximum loss guidelines presented in peer-reviewed and regulator-based literature, indicating no threats to aquatic life related to the water takings".*

Golder claims that this is acceptable. *MOECC disagrees*.

The following is a quote form MOECC's comments of April 18, 2018:

*"The groundwater modeling work (March 2015) attached to the hydrogeological study report and the subsequent hydrological modeling work (January 2017), imply some impact to stream baseflows under full build out scenarios. In these reports, the evaluation of potential effects on surface waters is largely based on model predictions which indicated that the long term, cumulative effect of the taking on baseflow in Willow Creek would be no more than 10%. The reports suggest that this amount of baseflow loss would be insignificant. The ministry does not agree that a 10% loss in baseflow would be insignificant. The modeling results and how they should be interpreted may need to be revisited. Experience has shown that predictions of streamflow losses in specific reaches based on these kinds of large scale modeling may be inaccurate. The uncertainties are often larger than the predicted effects and prediction results could change significantly by altering model input parameters (many of which also have very large uncertainties). Therefore, while the modeling may be useful in developing an understanding of general trends in groundwater level that may develop over extended use, results should not be relied upon to provide quantitative estimates of potential baseflow reductions and should not be used as the basis to determine if the proposed water taking is acceptable or not (from a surface water perspective). The ministry also strongly disagrees with the comments in the various documents that up to 20% reduction in the amount of groundwater contribution to a cold water stream would be considered acceptable. This is variously reported as an MNRF and/or Fisheries and*

*Oceans Canada (DFO) threshold, but the sources for this are not provided. It is recommended that the discussions on modeling results be revised".*

*[Underlines and bold added by MRA]*

One must also keep in mind that the Doran Road location is some 6 to 7km upstream from the WWTP so the reduced volume in the creek will have plenty of time to warm up under the summer sun before being diluted by effluent from the plant. This could have serious consequences for fish and other wildlife in the creek.

Willow Creek is home to a a coldwater brown trout fishery, thanks to the groundwater seepage from aquifers A1 and A2, which mitigates seasonal water temperature changes throughout the year. When Willow Creek becomes shallower from groundwater loss due to pumping A3 and A4, these conditions will change. Temperature balancing provided by groundwater will be sharply reduced. Willow Creek's environmental value as a coldwater fishery must not be diminished.

Discrepancies in the proponent's reports and the severe consequences of making a mistake, leave plenty of room to question the accuracy of the predicted effects of water-taking on the wildlife of Willow Creek and the Minesing Wetlands.

## 4.3 Aquifers A3 and A4 and their potential to increase flooding in MSP

There are conflicting views as to the discharge points for aquifers A3 and A4.

In paragraph 2.3 ii of its comments on Ainley's ESR, MOECC quotes the Golder report as follows: *"The target regional aquifers are believed to discharge directly into the Nottawasaga Bay (e.g. see section 3.3 of the June 2016 report in Appendix J).*

Also, in Golder's comments on Lotimer's Slide 11 they state:
*"The groundwater flow lines shown on drawing (Slide 11) neglect to recognize the regional groundwater movement, which includes flow under the Minesing Wetland with ultimate discharge to Georgian Bay and the thick confining layer (Lake Algonquin varves) over the aquifers in the Minesing Wetland basin".*

It is important to note that Lotimer disagrees completely with the view that A3/A4 discharge directly into Notawassaga Bay. His presentation as well as recent OGS studies, show that all four aquifers naturally flow into the Minesing Wetlands.

The proposal to vastly increase the volume of water being drawn from A3 for the new development, will have the following severe consequences:

- It will further deprive the wetlands of a source of cold groundwater needed to sustain its health.
- The diversion of this cold groundwater from A3, through the new homes and WWTP into Willow Creek, will increase it's temperature.
- The cold, clean groundwater currently flowing into the wetlands, will be replaced by warmer water laced with treated effluent and flowing from a *different* upstream source.
- This is tantamount to pumping water from its downstream outflow point in the wetlands to a point *upstream* in Willow Creek - a point *already the source of flooding*. This will add 12 million litres of water per day, every day of the year, exacerbating the chronic springtime flooding in the area where the creek enters the wetlands. (See Section 6, "Flooding and Drainage").

Interestingly, the proponent's contention that A3/A4 flow under the Minesing Wetlands and directly into Nottawasaga Bay, would further exacerbate flooding. Rather than diverting water from *within* the wetlands back upstream into the creek, it would be *adding* much more water to the Minesing Wetlands system - water which according to them, would have bypassed the wetlands altogether.

The conflicting views described above - even among the proponent's consultants - clearly demonstrates that a PTTW should not even be contemplated until the feasibility of such a huge project in this area is fully assessed.

Also, as the Ontario Geological Survey is currently conducting a hydrogeological mapping project of south and central Simcoe County, it is important to take into consideration the results of their ongoing field studies before pursuing any further action on the MSP. *Appendix 5.4*

## 4.4 Minesing Wetlands

The Minesing Wetlands is a Ramsar boreal wetland. The Ramsar Convention (United Nations) developed a List of Wetlands of International Importance, which list is defined as being for *"the conservation and sustainable use of wetlands, recognising the fundamental ecological functions of wetlands and their economic, cultural, scientific and recreational value".* It is renowned for its biodiversity and ranks on a par with the Florida everglades.

It is also a Class 1 provincially significant wetland, an area of natural and scientific interest; and is southern Ontario's largest and most diverse wetland. It is home to a wide range of sensitive, threatened and endangered plants, trees and animals which benefit from its diverse ecology.

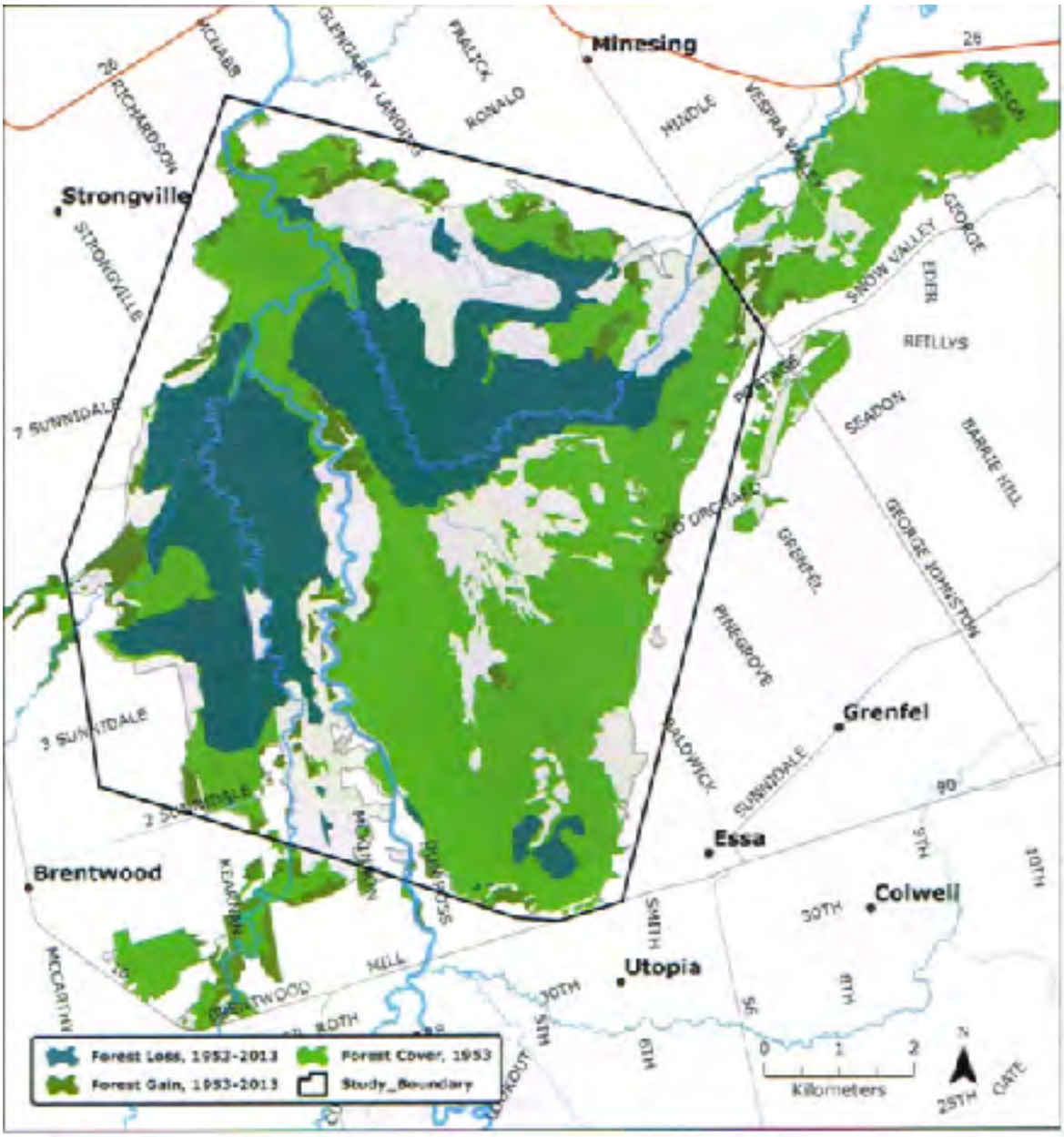
According to the NVCA, "The marsh complex where the creek and the effluent would enter into the Minesing Wetlands supports a number of significant fish and wildlife functions including:

- Northern pike spawning/rearing/adult habitat
- Spawning habitat for unique population of wetland spawning walleye
- Habitat for painted turtle and snapping turtle (special concern)
- Significant staging/stopover habitat for waterfowl and shorebirds
- Significant breeding habitat for sensitive marsh birds and waterfowl
- Foraging habitat for black tern (special concern), common nighthawk (special concern), black crowned night heron, great blue heron and great egret"

The NVCA and others have stated on several occasions that the Minesing Wetlands has been under threat for many years. Although local authorities have attempted to mitigate the flooding problems using everything from bulldozers to dynamite to keep the creeks and drains clear of silt and debris, no permanent solution is in sight. One of the most illuminating reports, *"60 years of forest change in the Minesing Wetlands,"* was written by NVCA staff. It describes the die-off of the deciduous trees in the Wetlands, its causes and some suggestions for remedial action. This will be discussed in more detail in Section 6, "*Flooding and Drainage".* Additional extracts from the publication are included in *Appendix 6.1* and the full paper can be found at:

https://minesingwetlandsfriends.files.wordpress.com/2013/12/minesing_forestloss_may8_14_final.pdf

As can be seen in the following illustration (taken from the above paper) most of the forest loss has occurred along the Mad River and Willow Creek, two water courses bordered by increasing levels of development.




*Willow Creek flows through the middle of the larger of the two blue areas. These blue areas show forest loss in the Minesing Wetlands from 1953 to 2013. The proposed point of effluent discharge into Willow Creek is in the top right of the picture, just north of Highway 26.*

## 5. HINE'S EMERALD DRAGONFLY - ONE ENDANGERED SPECIES

Discovered here in 2007, the globally rare Hine's Emerald dragonfly (HED) lives only in the Minesing Wetlands in all of Canada. Within the wetlands, its only known habitat comprises the stretch of Willow Creek adjacent to the Minesing Wetlands and the border area of the Minesing Wetlands into which it flows. This location is not far from the mixing zone. Its rarity derives from the fact it cannot tolerate any environmental changes, especially in water quality/ temperature or lesser/greater water volume than it is accustomed to. Unfortunately, it's ONE known habitat in Canada is right in the path of 12 million litres of treated sewage water every day.

The HIne's Emerald dragonfly was evaluated by the Committee on the Status of Species at Risk in Ontario (COSSARO) and subsequently listed as endangered on January 13, 2012. The federal Committee on the Status of Endangered Wildlife in Canada (COSEWIC) also listed it as endangered.

In 2013, the Ministry of Natural Resources and Forestry (MNRF) commissioned an expert panel, including discoverer Chris Evans of Midhurst, to recommend a habitat recovery strategy for this highly sensitive animal. After considerable research, the committee recommended that the Snow Valley Uplands be included in its protected habitat + a protection zone of 500 metres into Willow Creek. *(Appendix 6.2)*

Although MNRF included the 500 metre protection zone in its Dec. 2014 *HED Habitat Recovery Strategy,* it did not include the Snow Valley Uplands area as had been recommended *(Appendix 6.3).* In its 2014/2015 annual report, the *Environmental Commissioner of Ontario* was noticeably critical of the Minister's rejection of that specific recommendation. *(Appendix 6.4)*

Note that in its final brochure, MNRF does clearly describe the types of activities which are "generally incompatible" with *preserving* the HED's habitat including:

- "alteration of aquatic or wetland habitat such as altering water quality, flows, levels, vegetation characteristics or increasing sediment deposition
- Large-scale construction, such as housing developments or roads" (bolding by MRA)

The Nature Conservancy of Canada (NCC) has been concerned about the health of the Minesing Wetlands for a long time. In recent years, their concerns have expanded to include the fragile habitat of the Hine's Emerald Dragonfly. In spring 2018, they acquired another 43 hectares in the Minesing Wetlands specifically to protect this sensitive creature. *(Appendix 6.5).*

## 6. FLOODING AND DRAINAGE

Every spring there are floods where Willow Creek intersects George Johnston Road. The area can be seen on the Minesing Wetlands illustration above at the northeast corner of the Wetlands. This is where Willow Creek runs parallel to the Swaley Drain, both passing under George Johnson Road about 2 or 3 km downstream of the WWTP discharge point.

According to a report from the Director of Public Works for the Township of Springwater dated March 17, 2014, *"A 2013 survey by the Township Drainage Superintendent survey suggests that the grade in this area is on the order of 0.06% as there is a fall of approximately 2.5 meters over a length of approximately 4,500 meters. For context the minimum ditch grade the Township will consider in a new development is 0.5%". (Appendix 7.1).* Clearly, a gradient 10 times more gradual than the minimum the township needs for a development will not be able to handle such a vast quantity of wastewater.

It is unclear how any development proposal could have even been considered with such a gradual gradient available to handle the wastewater. The annual flooding event will be exacerbated if a wastewater treatment plant is permitted to add millions of litres of water per day for 365 days of the year, to the creek only a few kilometres upstream of the Wetlands.

Mr. Harold Parker of 1839 George Johnston Rd and Mr. Bill Haight of 2117 George Johnston Rd (whose farm floods every spring), appeared independently at the April 21, 2017 Township meeting to express concern about drainage and suggest that a municipal drain is needed to alleviate the flooding.

The response from Ainley was to say,

*"The request to turn Willow Creek and Matheson Creek into Municipal Drains is outside the scope of the Midhurst Class EA".*

Ainley did not acknowledge the problem, or that the development might exacerbate the problem. They did not suggest a solution.

The proponent aims to mitigate the effects of these damaging consequences from their proposed new development by employing LID technologies. LID means Low Impact, *NOT* No Impact. There *will be* more run-off, more sand and siltation and more flooding after the development. The additional run-off will be added to the net increase in water from the WWTP as explained in section 4.3 above.

## 7. WASTEWATER QUALITY - TOTAL PHOSPHORUS

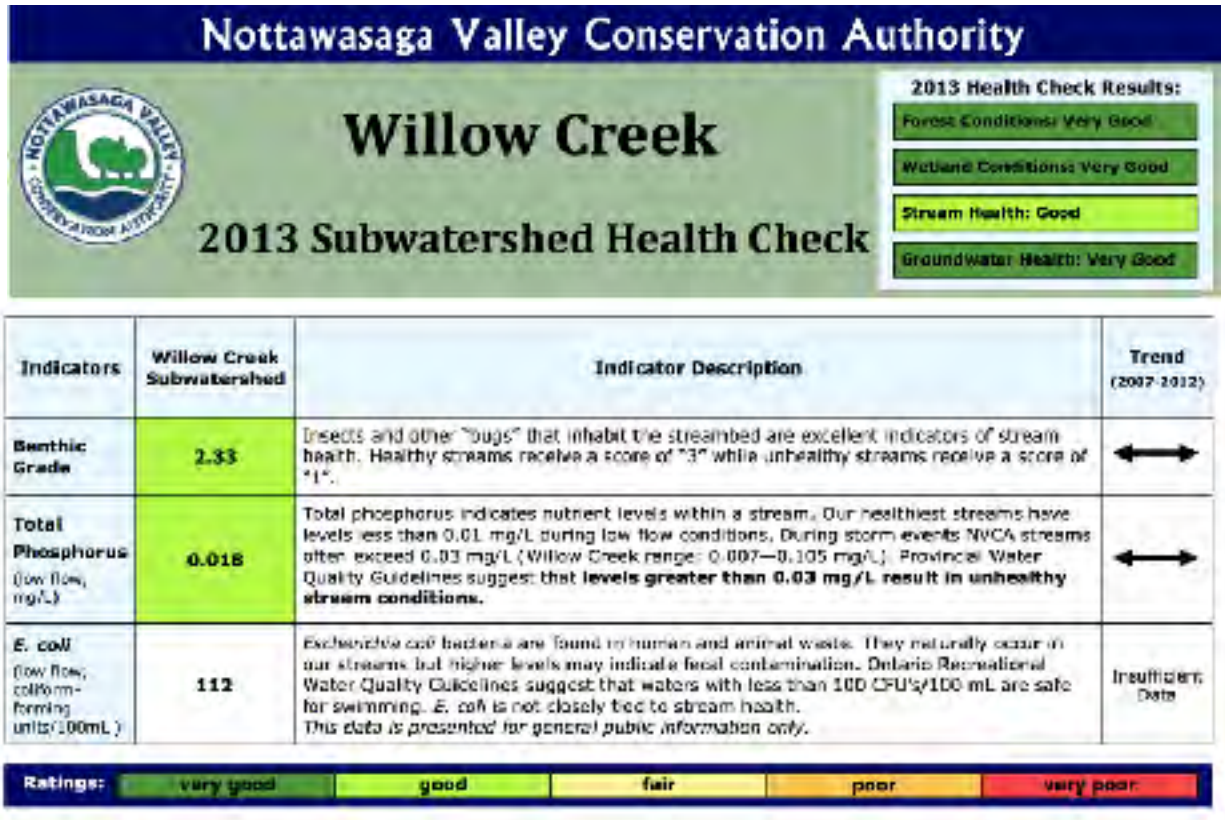
Of the many pollutants that affect water quality, including e-coli, nitrates and pharmaceuticals, we would like to focus on phosphorus. This is because the proponent's stated *objective* for Phase 1 of their developments will *break their commitment to the NVC*A.

The Provincial Water Quality Objective (PWQO) for total Phosphorus is 0.03mg/L. The proponent, however, states that the treated effluent from the WWTP for Phase 1 of the development will be 0.05mg/L. *This is 67% higher than permitted.* The proponent implies that this is not an issue because, at full build out, the phosphorus will be reduced to comply with PWQO. Note that this approach would likely defer compliance for 10 years of more.

Willow Creek and the Minesing Wetlands are thus expected to maintain a healthy ecology while enduring highly elevated phosphorus over an injurious period of time.

How can this be acceptable?

The chart below shows measurements taken in Willow Creek by the NVCA in 2013. 0.018mg/L phosphorus is well within the PWQO. But, note also that NVCA states "*levels greater than 0.03mg/L result in unhealthy stream conditions*" and that *"our healthiest streams have levels less than 0.01 mg/l during low flow conditions.*



Nottawasaga Valley Conservation Authority

Willow Creek

2013 Subwatershed Health Check

2013 Health Check Results:

- Forest Conditions: Very Good
- Wetland Conditions: Very Good
- Stream Health: Good
- Groundwater Health: Very Good

| Indicators | Willow Creek Subwatershed | Indicator Description | Trend (2007-2012) |
|---|---|---|---|
| Benthic Grade | 2.33 | Insects and other "bugs" that inhabit the streambed are excellent indicators of stream health. Healthy streams receive a score of "3" while unhealthy streams receive a score of "1". | ⟷ |
| Total Phosphorus (low flow, mg/L) | 0.018 | Total phosphorus indicates nutrient levels within a stream. Our healthiest streams have levels less than 0.01 mg/L during low flow conditions. During storm events NVCA streams often exceed 0.03 mg/L (Willow Creek range: 0.007—0.105 mg/L). Provincial Water Quality Guidelines suggest that **levels greater than 0.03 mg/L result in unhealthy stream conditions.** | ⟷ |
| *E. coli* (low flow, coliform-forming units/100mL) | 112 | Escherichia coli bacteria are found in human and animal waste. They naturally occur in our streams but higher levels may indicate fecal contamination. Ontario Recreational Water Quality Guidelines suggest that waters with less than 100 CFU's/100 mL are safe for swimming. *E. coli* is not closely tied to stream health. *This data is presented for general public information only.* | Insufficient Data |

Ratings: very good | good | fair | poor | very poor

The MOECC stressed that, in its opinion, *"the EA should clearly stipulate the kind of SWM that should apply for the new/expanded roads and what criteria should be used (as a minimum, achieving enhanced level of water quality control; addressing the need for peak flow control; would road works also be required to meet the 25 mm infiltration target discussed in the phosphorus budget work? etc.)"*

Ainley's response was alarming:

*"The NVCA's requirement for a net zero increase in phosphorus loading is specifically related to the new development lands (approx. 756 ha) within the Midhurst Secondary Plan (MSP). Therefore, the Phosphorous Budget that has been developed, only accessed the Pre & Post conditions for the proposed development lands. As the transportation improvements associated with this Class EA are external to the new developments (they are within the existing community) they are not bound by the requirements by the NVCA's conditions and in particular the Phosphorous Budget".*

If not for the Midhurst Secondary Plan, there would be no reason to widen or upgrade any roads within Midhurst's existing built-boundary. Any additional pollution resulting from road works made necessary by the MSP, must be included in any commitment made by the proponent for a zero phosphorus increase.

Furthermore, misleading statements have been made to Midhurst residents. Springwater Council passed a resolution stating that Midhurst residents will not be required to decommission their septic system and hook up to a new wastewater treatment plant. However, in its letter to NVCA dated April 5, 2018, responding to NVCA comments of June 30, 2017 and a meeting with NVCA staff in October 2017, Ainley writes the following:

*"The Environmental Study Report (ESR) that is prepared at the completion of the Class EA, includes a cumulative assessment of the phosphorus loading (from stormwater and wastewater) associated with the development of the MSP and identifies the net difference, between the pre-development condition and the post-development condition for the Phase 1 (300ha) approved lands and for full build out of the MSP. This analysis currently shows a small increase in the phosphorus loading, and the ESR will identify, at a high level, phosphorus offsetting methods such as; the elimination of residential septic systems in Midhurst, watercourse improvements, and/or agricultural improvements and then confirm that it would be possible to implement a phosphorus offset strategy to achieve a net-zero increase. However, the phosphorus offset strategy cannot be developed until after the finalization and acceptance of the Class EA, at which time the net difference in the phosphorus loading will be known (currently estimated at in 93 kg/year for Phase 1 and 66 kg/ year for full build out of the MSP)".*

The above paragraphs demonstrate clearly that the proponent is prepared to:

i) break their commitment to NVCA by exceeding a zero phosphorus increase commitment by 93Kg/year in Phase 1 of the development and 66 Kg/year at full build-out.

ii) mislead the NVCA by failing to point out that any phosphorus resulting from road works in support of the development, but inside the existing community, would be excluded from the Phosphorus Budget

(iii) force the municipality to break its commitments to the residents by forcing them to abandon their investment in septic systems and hook up to a new and otherwise unnecessary WWTP. Who will compensate residents for this expense?

iv) postpone consideration of a phosphorus offset strategy until after "the acceptance of the Class EA, at which time the net difference in phosphorus loading will be known".

As stated earlier, we have focused on phosphorus, but there are many more concerns which should have been addressed early in negotiations with the developers. For example, with the wetlands losing forest canopy to flooding at such an alarming rate, a commitment to *no net increase* in the volume of water being added to the Minesing Wetlands is clearly essential.

## 8. CONCLUSIONS

The MRA, Lotimer & Associates and MRA environmental lawyer Rod Northey remain unconvinced that

1. *the EA is even legal*

2. *the health and safety of residents will be preserved. This is paramount.*

3. *groundwater-takings large enough to provide 19 million litres daily for a potable water system bigger than any other groundwater-based system in all of Simcoe County are sustainable for the long term*

4. *private wells will not experience water shortages from the drawdown caused by pumping deeper inter-connected aquifers*

5. *Willow Creek's coldwater fishery will not be adversely affected*

6. *a sewage treatment plant discharging 12 million litres daily of treated effluent can do so with "negligible" harm to its receptors and the rare and sensitive inhabitants, both fauna and flora, of the fragile, unique Minesing Wetlands*

7. *there will be no increased silting or bank erosion in Willow Creek due to lower or higher water levels, which would further harm the diminishing forest canopy*

8. *a "net zero increase" in phosphorus loading can be achieved WITHOUT forcing over 1,000 Midhurst homes to hook up to the new wastewater treatment system and excluding run-off from new and expanded roads within the existing village*

Even though we have not discussed here the many financial, transportation, political and other environmental problems, it is still clear to us that the Midhurst Secondary Plan actually deserves a Ministerial Zoning Order to stop it altogether, and thus avoid "environmental and health and safety concerns".

At the very least, such a huge housing development, faced with so many unique, complex and consequential challenges, requires an Individual Environmental Assessment.

*Note: Please also review the significant supplementary information in Appendix 7.*

Prepared by:

Sandy Buxton, MRA President [redacted]

David Strachan, MRA Treasurer and Past-President [redacted]

*on behalf of our members and many supporters throughout Canada*

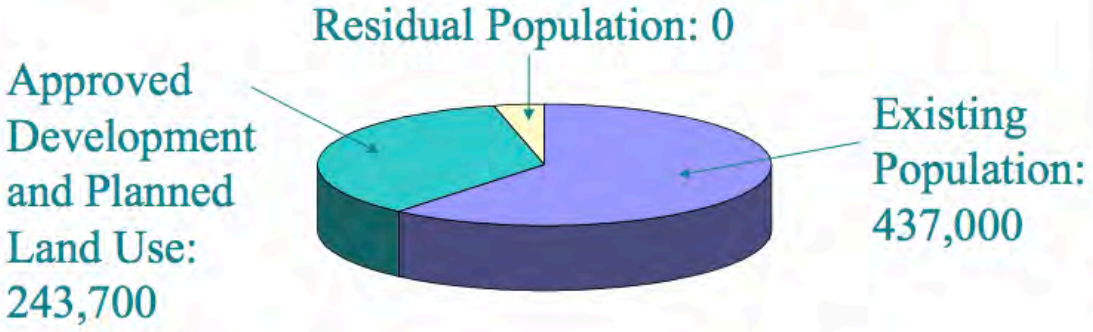
Intergovernmental Action Plan for Simcoe, Barrie & Orillia

DILLON CONSULTING

Ainley Group
Bourrie & Associates
Caldwell Consulting
Clara Consulting
EDP Consulting
Enid Slack Consulting
Lapointe Consulting
TeraTrends
Will Dunning Inc.

# Issues from ECA - SWOT

## 2031 Projected Population (667,000)




- ***100% of the projected 2031 population (667,000) could be accommodated through existing planning commitments***

**(2006 Report)**

# Appendix A

## Midhurst Secondary Plan - Summary of Non-Compliance with 2006 Growth Plan[1]

| | |
|---|---|
| 1. Settlement Area definition | Non-compliant |
| 2. Protection of Prime Agricultural Land | Non-compliant |
| 3. Reduce Urban Sprawl | Non-compliant |
| 4. Need for more housing approvals in Simcoe County | No |
| 5. Direct significant portion of new growth to built-up areas | Non-compliant |
| 6. Focusing intensification in intensification areas | Non-compliant |
| 7. Building compact transit-supportive communities | Non-compliant |
| 8. Reduce dependence on the automobile | Non-compliant |
| 9. Providing convenient access to intra- and inter-city transit | Non-compliant |
| 10. Ensure the availability of sufficient land for employment | Non-compliant |
| 11. Planning and investing for a balance of jobs and housing | Non-compliant |
| 12. Encourage cities and towns to develop as complete communities | Non-compliant |
| 13. Directing growth to areas that offer municipal wastewater systems | Non-compliant |
| 14. Municipalities are encouraged to ensure the informed involvement of local citizens | Non-compliant |
| 15. Timing of public meetings (Planning Act - 20 day notice) | Non-compliant |
| 16. Information and material (for a public meeting - 20 day notice) | Non-compliant |

[1] As of November 3, 2008, when The Midhurst Secondary Plan (MSP) was adopted by Springwater Council; and three years later when it was approved by the Corporate Services of Simcoe County (October 12, 2011).

On October 28, 2011, the Province appealed the decision to the OMB, stating the reasons why the MSP did not comply with County or Provincial policy.

On January 19, 2012, the Minister of Infrastructure created a “Special Rule” (O. Reg 311/06 revised) to permit the first 50% of the development, despite its many policy violations.

But the MSP still failed to comply with one of the conditions of the “Special Rule”. So the Province, singling out Midhurst by name, released another regulation, O. Reg 22/13 stating that the problematic condition “6.3.2.1 clause b) shall not apply”.
i.e. Provincial laws changed twice to accommodate the Midhurst Secondary Plan.

# Appendix B

## Midhurst Secondary Plan Violations - (expanded version)

***The Planning Act 1990***

**PART I**
**PROVINCIAL ADMINISTRATION**

**Provincial interest**

2. The Minister, the council of a municipality, a local board, a planning board and the Municipal Board, in carrying out their responsibilities under this Act, shall have regard to, among other matters, matters of provincial interest such as,

(a) the protection of ecological systems, including natural areas, features and functions;

**(b) the protection of the agricultural resources of the Province;**

***Provincial Policy Statement*** (May 22, 1996)**,** clause 1.1.1.c. states -
Expansions into prime agricultural areas are permitted only where:

1. there are no reasonable alternatives which avoid prime agricultural areas; and
2. there are no reasonable alternatives with lower priority agricultural lands in the prime agricultural area;

*There are plenty of alternatives to the prime agricultural area which the MSP would consume.*

Clause 2.1.1 Prime agricultural areas will be protected for agriculture. Permitted uses and activities in these areas are: agricultural uses; secondary uses; and agriculture-related uses. Proposed new secondary uses and agriculture-related uses will be compatible with, and will not hinder, surrounding agricultural operations.
2.1.2 Lot creation in prime agricultural areas is generally discouraged and will be permitted only in the following situations:

a. new lots for agricultural uses may be permitted provided that they are of a size appropriate for the type of agricultural use(s) common in the area and are sufficiently large to maintain flexibility for future changes in the type or size of agricultural operation;
b. new lots may be permitted for agriculture-related uses; and
c. new lots for residential uses may be permitted for:
    1. a farm retirement lot;
    2. a residence surplus to a farming operation; and
    3. residential infilling.

Any new lot for residential uses will be limited to a minimum size needed to accommodate the residence and an appropriate sewage and water system.

2.1.3 An area may be excluded from prime agricultural areas only for:

a. an expansion of an urban area or rural settlement area, in accordance with policy 1.1.1c);
b. extraction of mineral resources, in accordance with policy 2.2; and
c. limited non-residential uses, provided that:
    1. there is a demonstrated need for additional land to be designated to accommodate the proposed use;
    2. there are no reasonable alternative locations which avoid prime agricultural areas; and
    3. there are no reasonable alternative locations in prime agricultural areas with lower priority agricultural lands.

Impacts from any new non-agricultural uses on surrounding agricultural operations and lands will be mitigated.
2.1.4 New land uses, including the creation of lots, and new or expanding livestock facilities will comply with the minimum distance separation formulae.
2.1.5 In prime agricultural areas, agricultural uses and normal farm practices will be promoted and protected.

***Provincial Policy Statement*** (March 2005)**,** clause 1.1.3.9 states -
"A planning authority may identify a settlement area or allow the expansion of a settlement area boundary only at the time of a comprehensive review and only where it has been demonstrated that:
c) in prime agricultural areas: there are no reasonable alternatives which avoid prime agricultural areas

*The settlement area boundary in question was created by assuming that the STUDY AREA referred to in the 1998 Official Plan was a settlement area. Whether or not it was referred to in 1998 as a settlement area is irrelevant, because a settlement area suitable for urban uses was not defined until the Provincial Policy Statement of 2005 which, as well as providing a settlement area definition, also defined the "comprehensive review" required to create a new settlement area.*
*c) There are plenty of alternatives to the prime agricultural area consumed by the MSP.*

*The Provincial Policy Statement 2005 defines comprehensive review as follows:*

**Comprehensive review:** means
a) for the purposes of policies 1.1.3.9 and 1.3.2, an official plan review which is initiated by a planning authority, or an official plan amendment which is initiated or adopted by a planning authority, which:

1. is based on a review of population and growth projections and which reflect projections and allocations by upper-tier municipalities and *provincial plans*, where applicable; considers alternative directions for growth; and determines how best to accommodate this growth while protecting provincial interests;

*There was no official plan review, based on population and growth projections allocated by upper tier provincial plans*

d) impacts from new or expanding settlement areas on agricultural operations which are adjacent or close to the settlement area are mitigated to the extent feasible.

*No attempt was made in the MSP to mitigate the effects on adjacent agricultural operations*

*The Provincial Policy Statement 2005 defines settlement area as follows:*
**Settlement areas:** means urban areas and rural settlement areas within municipalities (such as cities, towns, villages and hamlets) that are:

a) built up areas where development is concentrated and which have a mix of land uses; and
b) lands which have been designated in an official plan for development over the long term planning horizon provided for in policy 1.1.2. In cases where land in *designated growth areas* is not available, the *settlement area* may be no larger than the area where development is concentrated.

*The so called "settlement area" is many times larger than the built-up area where development is concentrated*

***Provincial Policy Statement*** (March 2005)**,** clause 1.1.4 states -
**1.1.4 Rural Areas in Municipalities**
In *rural areas* located in municipalities:
a) permitted uses and activities shall relate to the management or use of resources, resource-based recreational activities, limited residential development and other rural land uses;
b) development shall be appropriate to the *infrastructure* which is planned or available, and avoid the need for the unjustified and/or uneconomical expansion of this *infrastructure*;
c) new land uses, including the creation of lots, and new or expanding livestock facilities, shall comply with the *minimum distance separation formulae*;
d) development that is compatible with the rural landscape and can be sustained by rural service levels should be promoted;
e) locally-important agricultural and resource areas should be designated and protected by directing non-related development to areas where it will not constrain these uses;
f) opportunities should be retained to locate new or expanding land uses that require separation from other uses;

***Growth Plan for the GGH*** (June 2006). *Settlement Areas* are defined in Section 6, as areas where:

a) development is concentrated and which have a mix of land uses; ***and***

b) lands have been designated in an official plan for development over the long term planning horizon provided for in the Provincial Policy Statement, 2005. Where there are no lands that have been designated over the long-term, the settlement area may be no larger than the area where development is concentrated.

*The "settlement area" identified in the MSP does not meet this criterea:*

a) *There is no concentration of development in the so called settlement area and there is no mix of land uses; and*

b) *In the 1998 Springwater Official Plan, no lands were designated over the long-term planning horizon. It follows therefore that the settlement area may be no larger than the built boundary.*

***Growth Plan*** (June 2006) **1.1** (page 7, para 10, 11 and 15) states -

"Despite it's many assets, Ontario and the *GGH* face a number of challenges in sustaining and growing its economy;

- Increasing numbers of automobiles are traveling over longer distances resulting in clogged transportation corridors. Traffic congestion and delays in the movement of goods costs Ontario upwards of $5 billion in lost GDP each year.

*The MSP relies upon the automobile to access employment. There are no meaningful and sustainable jobs to support an additional 28,000 people (or 12,000 for the first phase) in Midhurst. Employment opportunities will be dependent, as they are today, upon long distance commuting.*

- Urban sprawl continues to the degradation of our natural environment, air quality and water resources as well as the consumption of agricultural lands and other natural resources so critical to the future economy."

*The MSP provides a good example of urban sprawl. Furthermore this plan relies on the Minesing Wetlands to absorb the discharged wastewater from 12,000 or more residences. 100% of the proposed development would be on prime agricultural land, mostly classes 1 and 2.*

***Growth Plan* 2.1** (page 13, para 3 and 4) states -
"There is a large supply of land already designated for future urban development in the *GGH*. In most communities there is enough land to accommodate projected growth based on the growth forecasts and *intensification target* and *density* targets of this Plan. It is important to optimize the use of the existing land supply to avoid over-designating new land for future urban development.

Strong, healthy and prosperous rural communities are vital to the economic success of the *GGH* and contribute to our quality of life.

*The Province has a surplus of potential development land and there is no need to designate farmlands surrounding a particularly charming and remote rural village, as "lands for urban use". Furthermore the provincial IGAP report (costing $3 million) concluded in 2006 that:* ***"100% of the projected 2031 population (667,000) could be accommodated through existing planning commitments".***
*i.e. A Midhurst Secondary Plan of this magnitude is UNNECESSARY*

*Midhurst is currently a strong, healthy and prosperous community. As history has demonstrated, communities cannot remain prosperous if there is no local industry on which to base development. Allowing this development would be detrimental to quality of life of both old and new residents.*

***Growth Plan* 2.2.2.1** (page 14) states -
"Population and employment growth will be accommodated by -

a) directing a significant portion of new growth to the *built-up areas* in the community through *intensification*

*None of the new development would be in the existing built-up area*

b) focusing *intensification* in *intensification* areas"

*There is no intensification area in Midhurst*

c) *building compact transit-supportive communities in designated greenfield areas*

*No public transit is proposed because Development Charges cannot be applied to NEW services.*

d) *reduce dependence on the automobile through the development of mixed-use, transit-supportive pedestrian friendly urban environments*

*The MSP will depend on the automobile for long distance commuting*

e) *providing convenient access to intra- and inter-city transit*

*No proposed intra-city transit could be categorized as convenient. Distances are too great.*

f) *ensuring the availability of sufficient land for employment to accommodate forecasted growth to support the GGH economic competitiveness*

*The MSP stipulates that at full build-out there would be 10,000 new dwellings. Based on the Schedule 7 ratio of 23% employment lands, Midhurst would need be able to support 12,000 jobs. There is no provision for employment lands to support 12,000 employees.*

g) *planning and investing for a balance of jobs and housing in communities across the GGH to reduce the need for long distance commuting and to increase the modal share for transit, walking and cycling.*

*Long distance commuting will be the norm with the MSP.*

h) *Encouraging cities and towns to develop as complete communities with a diverse mix of land uses, a range and mix of employment and housing types, high quality public open space and easy access to local stores and services.*

*The MSP calls for a population of 30,000. It will not be practical to duplicate facilities and services already available in nearby Barrie. Midhurst will NOT be a "complete community".*

i) *Directing development to settlement areas, except where necessary for development related to the management or use of resources, resource based recreational activities, and rural land uses that cannot be located in settlement areas.*

*There is no designated settlement area resulting from a comprehensive review.*

j) *Directing major growth to settlement areas that offer municipal water and wastewater systems and limiting growth in settlement areas that are serviced by other forms of water and wastewater services.*

*Midhurst has no municipal waste water system.*

k) *Prohibiting the establishment of new settlement areas".*

*The MSP unofficially converted a study area into a settlement area.*

***Growth Plan*** **2.2.3.1 General Intensification** states -

By the year 2015 and for each year thereafter, a minimum of 40 per cent of all residential development occurring annually within each upper- and single-tier municipality will be within the built-up area.

*The MSP allows almost 100% of new residential development to occur* ***OUTSIDE*** *the built-up area.*

***Growth Plan*** Section 5.4.4.3 (page 38) states -
"Municipalities are encouraged to engage the public and stakeholders in local efforts to implement this (the Growth) Plan and to provide the necessary information to ensure the informed involvement of local citizens".

*There was no attempt made to ensure the informed involvement of local citizens. When residents* ***were*** *informed, three years after the plan was adopted by the Township, 1,476 people hand signed a protest petition.*

***Places to Grow*** Amendment 1, Effective January 2012, Section 6, states that;
"The intent of this policy is that by 2031 development for all the municipalities in Simcoe County will not exceed the overall population and population forecasts contained in Schedule 7".

*The MSP causes Springwater to exceed the province's population forecast by a wide margin*

***Places to Grow*** Section 7 and Schedule 8, Amendment 1, shows that -
Springwater Township does not contain any Primary Settlement Area as defined in Section 7 and illustrated in Schedule 8.

***Places to Grow*** Section 7 defines **Lands Not for Urban** Uses as Lands that are designated for agricultural or rural uses within a settlement area identified in the approved official plan for the municipality.

*The Springwater Official Plan approved in 1998, defined a study area. This area was mistakenly assumed to be a settlement area. Had it been a settlement area, these lands are in any event defined as Lands NOT for Urban Uses as they are classes 1 and 2 agricultural lands protected in the township Official Plan, as well as in Provincial plans in-effect at the time.*

***Places to Grow*** Section 7 defines **Settlement Areas as:**

*Urban areas and rural settlement areas within municipalities (such as cities, towns, villages and hamlets) that are:*

- *a) built up areas where development is concentrated and which have a mix of land uses; and*
- *b) lands which have been designated in an official plan for development in accordance with the policies of this Plan. Where there are no lands that have been designated for development, the settlement area may be no larger than the area where development is concentrated.*
- *(Based on PPS, 2014 and modified for this Plan)*

*The midhurst "Settlement Area" does not satisfy this definition because:*

*a) there is no concentration of development outside the built-boundary; and*

*b) no lands were designated for development, so the settlement area was "no larger than the area where development is concentrated". Additionally, lands in the official plan were designated over the usual twenty year planning horizon, not a long term planning horizon, the panning horizon having been changed to "long-term" in 2008 when the developers worked with the Township to draft the Midhurst Secondary Plan. (3.3.3 b).*

*Note this definition is derived from the 2014 PPS, to which all new developments must adhere.*

***The Planning Act*** states -

**Timing of public meeting**

(19) The public meeting required under clause (15) (d) shall be held no earlier than 20 days after the requirements for giving notice have been complied with. 2006, c. 23, s. 9 (2).

**Information and material**

(19.1) The information and material referred to in clause (15) (c), including a copy of the current proposed plan, shall be made available to the public at least 20 days before the public meeting required under clause (15) (d) is held. 2006, c. 23, s. 9 (2).

*Notice of the PIC was published in a **Barrie** (not Springwater) newspaper 14 days before the August 28 PIC. No copy of the proposed plan was published prior to the PIC.*

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Legislative Assembly of Ontario

Second Session, 40th Parliament

Assemblée législative de l'Ontario

Deuxième session, 40e législature

# Official Report of Debates (Hansard)

# Journal des débats (Hansard)

**Monday 29 April 2013**

**Lundi 29 avril 2013**

Speaker
Honourable Dave Levac

Clerk
Deborah Deller

Président
L'honorable Dave Levac

Greffière
Deborah Deller

We do agree in the House that local food is extremely important. We've debated this, as the member from Beaches–East York said, and we've had enough conversation. We're all in agreement that this act is a lot of fluff. Instead of this act taking action to support local farmers, to employ local farmers and to provide local food to the Ontario consumer, this government's act is making plans for a plan.

We know how important it is to have local food production created in Ontario, and that it sustains jobs. This is an industry that has been here from the moment of time because growing food is a part of survival. If we don't have access to local food, then we're not going to have access to food so we can continue to sustain ourselves. It's extremely important that we keep that in mind, but by the same token, we need to pass this bill to committee because we're all in agreement that it is a very important thing to do and that local food is something that has to be sustainable.

We also need to make sure we're promoting the advertising of local food and helping our farmers—not just having a lot of fluff about how great local food is, but having a real plan so that we can keep our farmers in our economy, in a job and creating the local food that we all want to see here in the House and that all our communities want to see in our farmers' markets. Part of that is making it a strong bill so that we can have that support for farmers, so they can continue on with the good work they have been doing.

**The Deputy Speaker (Mr. Bas Balkissoon):** The member for Renfrew–Nipissing–Pembroke, you have two minutes.

**Mr. John Yakabuski:** I want to thank my colleague from Beaches–East York; the Minister of Health, who didn't speak too long; and the members from Huron–Bruce and London–Fanshawe for their comments as well.

To the member from Huron–Bruce: Thanks for the shout-out to Crystal Mackay. It's always great to hear about the fine agricultural people we have in Renfrew county. I say to the member for Huron–Bruce, maybe she can make it up to the Beachburg Fair one of these days. It's the first big fair in Renfrew county, always around the 20th or the 23rd of July. It's a great fair and it really shows what kind of community spirit there is, and the hard-working spirit of our agricultural people.

I appreciate all the comments that have been made, and I think that there's an opportunity here for us all to renew our commitment to our agricultural people across Ontario. They do such a tremendous job for us. Our products are of the highest quality. They are safe. They are tasty. They are nutritious. We need to spend a lot more time letting the world know just how great our products are, but more importantly, letting each other know not only how good our products are but where they come from. They come from your neighbours. I know that if you live in the city of Toronto, you may not think of that, but your neighbours are not that far away. They're outside of the city of Toronto, and they're producing the kind of quality food that makes us among the healthiest people in the world here in Ontario and Canada.

**1620**

I think the Local Food Week is an opportunity to blow our horn, maybe, champion a few things and put a stamp on a special week of the year. But let's not forget: Our commitment to farmers should be at least as good as their commitment has been to us.

**The Deputy Speaker (Mr. Bas Balkissoon):** Further debate?

**Mr. Garfield Dunlop:** It's a pleasure to rise today and speak to the Local Food Act. I know we've had a lot of debate on this, but it's nice to talk about something as wholesome and that is such an important part of our heritage here in the province. Almost all of our families—many of our families—date back as farmers in different communities and different townships. To me, it's something that's almost family-like.

First of all, I should tell you that my wife, the girl I married, was a dairy farmer's daughter. Even today—

**Interjection:** She's got the hair.

**Mr. Garfield Dunlop:** She's got the hair, yes.

Even today, we always travel the back roads wherever we go so we can look at all the different farms and what's new in the operations, because once you've been a farmer, you're sort of a farmer for life. You've always got that love and concern for the land.

With that, Mr. Speaker, I should tell you that both of my children have decided in the last year to get into real estate, and they've both bought farms. I'm very proud of them, because they've made deals with neighbouring farmers—they both have full-time jobs—to make sure the hay is put in place and taken off and make sure there are crops put in on a rotating basis.

With my daughter's farm—she's into horses; I think they have four horses now. They're right across the road from a farm where two of my granddaughters train horses all the time. So agriculture has become a very important part of our family right now. I'm looking forward to doing a lot of work out at their farms. I like doing physical work anyhow, and I'm looking forward to helping them both a lot over the next few years.

I also want to say a few things about local food. One of the things I really enjoy—I don't know how many other people in the room do this, but I love going to farmers' markets. It's a great place to meet people. You meet the very sensible, common sense type of people, and they're in there on the weekends, earning a few dollars, whether it's produce or some fruit or maple syrup—that type of thing. It's just fun to go and be part of that. Again, it goes back to our heritage and the kind of people we are. All of my farmers' markets in my riding seem to be doing very, very well. We've got some small ones, and we've got, for example, the Orillia Farmers' Market, a large farmers' market. But there are some challenges they face. Obviously, the Local Food Act—I give credit to the Premier. It's a nice, warm and cozy type of legislation. It doesn't really say an awful lot, except it gets a lot of debate.

One of the things I wanted to put on the record, though, is how can we help farmers more? Calling it a Local Food Act—I hope everyone would want to buy, and would buy, local food, whether it's at the farmers' market or at our produce stands. I know we've got Ego's up our way; we've got Hewitt's in Orillia. These are all people who sell really nutritious, good food. They're well-supported by our communities, and they're particularly well-supported by people who visit our communities, particularly in the summer months when they come to their cottages and love to go to the farmers' markets as well.

Just before lunch, I met with people in my riding, people from Simcoe county, and they're concerned—this is where I think the real concerns are—how good farmland is being just crushed with this Green Energy Act. I don't know how many have seen these solar farms. Whoever came up with the idea that we're only using class 6 and 7 farmland—it is such a misdemeanor to people to actually say. I can show you farms—I don't actually have the exact bushels per acre, but they're some of the best farmland you can imagine, because they've had proper tile drainage, proper fertilizer etc. Now they're covered in solar panels, with no accountability and no accountability to the local municipality. What really drives me crazy is why this House has twice now voted against bills that would give municipalities more power over where those bloody solar panels would go. They are sick. Some day, I think we're going to pay the price for it. We're already paying it with our hydro costs and special rates for people who have put these in. That's what the farmers are telling me. There's land that they could have bought and put into productivity, with wheat or corn or soybeans. They could have done that, and you know what? Right now they're covered in these metal solar panels. Someone, like the Samsungs of the world or the big energy companies, is making a lot of money out of this at the expense of all the people who are trying to, say, use the energy for their factories and they're finding that the energy costs are too high because of this. So, it has been a real mistake.

The same group talked to me about growth. We took the greenbelt, and all we've done is leapfrog it into Simcoe county. I'm going to tell you, it has been a mistake. We've got a place up in the Midhurst area, in Springwater township, where they want to put 22,000 more people in the secondary plan. Originally, the growth plan for Simcoe called for 6,000 people. Now the government has made an amendment that will allow 22,000 people. Guess where the people are going? Not in areas where there may be pine trees or some more rugged area; they're going right on the farmland. The best farmland you can imagine is going to be plowed under for sewers and water and townhouses. I tell you, it's completely irresponsible. The people up in our area, particularly the Simcoe County Federation of Agriculture, are adamantly opposed to this kind of nonsense. But, you know what? We're stuck with these guys. They've made these laws. They're making these amendments. I have no idea who made the amendment to go ahead and give them 22,000 more people in one little township. It's almost like a favour is being paid to somebody, you know, for something they've done. I don't know. But it's not right, and we have to make changes.

I want to thank, first of all, the Premier for bringing the bill forward. It's a good topic to debate. But I want to pay special attention to some of our former Ministers of Agriculture, people I've worked with here: for example, Bill Stewart, Lorne Henderson, Helen Johns, Ernie Hardeman in the last term, and Noble Villeneuve—Noble Villeneuve was my favourite minister. I met him a number of times at ROMA. He was here before I became elected in 1999. I understand that his daughter, Roxane, is now our candidate up in that area. I've talked to her a few times. She's just like her dad. She's full of energy and enthusiasm and will make a great member when she arrives here at Queen's Park. I'm quite sure she will do excellent work and will be here after the next election.

With that, I've only got two minutes left, but I wanted to say, as we move forward with the Local Food Act, I thought that one thing that was really interesting today was the thought of an amendment by our education critic to actually make sure that this act had input from education. Who needs to be trained more than our young people? Young people from all political stripes and from all different ridings across Ontario should know in their schools about nutritious food, how to buy local food and how to support our economy by buying local food. So I applaud Lisa MacLeod for bringing that amendment forward. I hope that when we get to the committee hearings the government will listen to these kinds of amendments. The government says, "We want to get the bill passed; we want to get it into law." So let's make sure that we look at really, really good amendments at the same time as we move forward.

I also want to thank all my colleagues, particularly in my party, that have come from agricultural backgrounds and agricultural communities. I know that basically it's almost impossible to be an MPP in rural Ontario without being highly connected to fall fairs and all the different associations, whether it's the cattlemen's association, the hog producers, the chicken farmers or the Dairy Farmers of Ontario. We're all connected to those people on a regular basis. It's a group of people that I love to work with.

This year I've been fortunate enough that I've been able to work with another group of people I really enjoy working with, and that's all the people I'm working with to fight the College of Trades—all the tradespeople in Ontario. So I've had kind of a perfect year as far as being able to work with people, because we've been able to work with the people who do hard work and create jobs and create opportunities for people. Of course, the farmers are right in there.

**1630**

I've only got 20 seconds left, but I did want to say a special thank you to all the farmers in the riding of Simcoe North. In particular, I'm noticing a lot more

# MRA Hydrogeologist's Analysis
## of EA Reports on
# Water for Midhurst Secondary Plan

*March 2017*

*by*

Tim Lotimer, FGC, P. Geo

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# MRA INTRODUCTION

Tim Lotimer is a professional geoscientist with 40 years' experience, primarily with regard to municipal groundwater supplies. Some of his recent Class EA water supply projects were for the Regions of Halton and Waterloo, the Municipality of Chatham-Kent and the County of Brant. He is also on the Earth Sciences faculty at McMaster University.

In 2016, the MRA retained Tim as an independent expert to analyse the water-related reports prepared by the developers' consultants for the required MSP Environmental Assessment.

Tim reviewed all relevant reports on the Township website. One key report is the Draft hydrogeological study report prepared by Golder Associates in June 2016 on the Midhurst Water Supply Exploration Program. *Note that the final report has yet to be released, but is expected to remain essentially unchanged.*

In addition, Tim reviewed other publicly available reports which provide information on the Midhurst area; its geology, hydrogeology, existing water-takings and ecological characteristics.

The following is the presentation he gave to Springwater Council on March 8, 2017. It is crafted from the viewpoint of the MRA's concerns about the impact of the proposed water-taking on water users, wetlands and streams.



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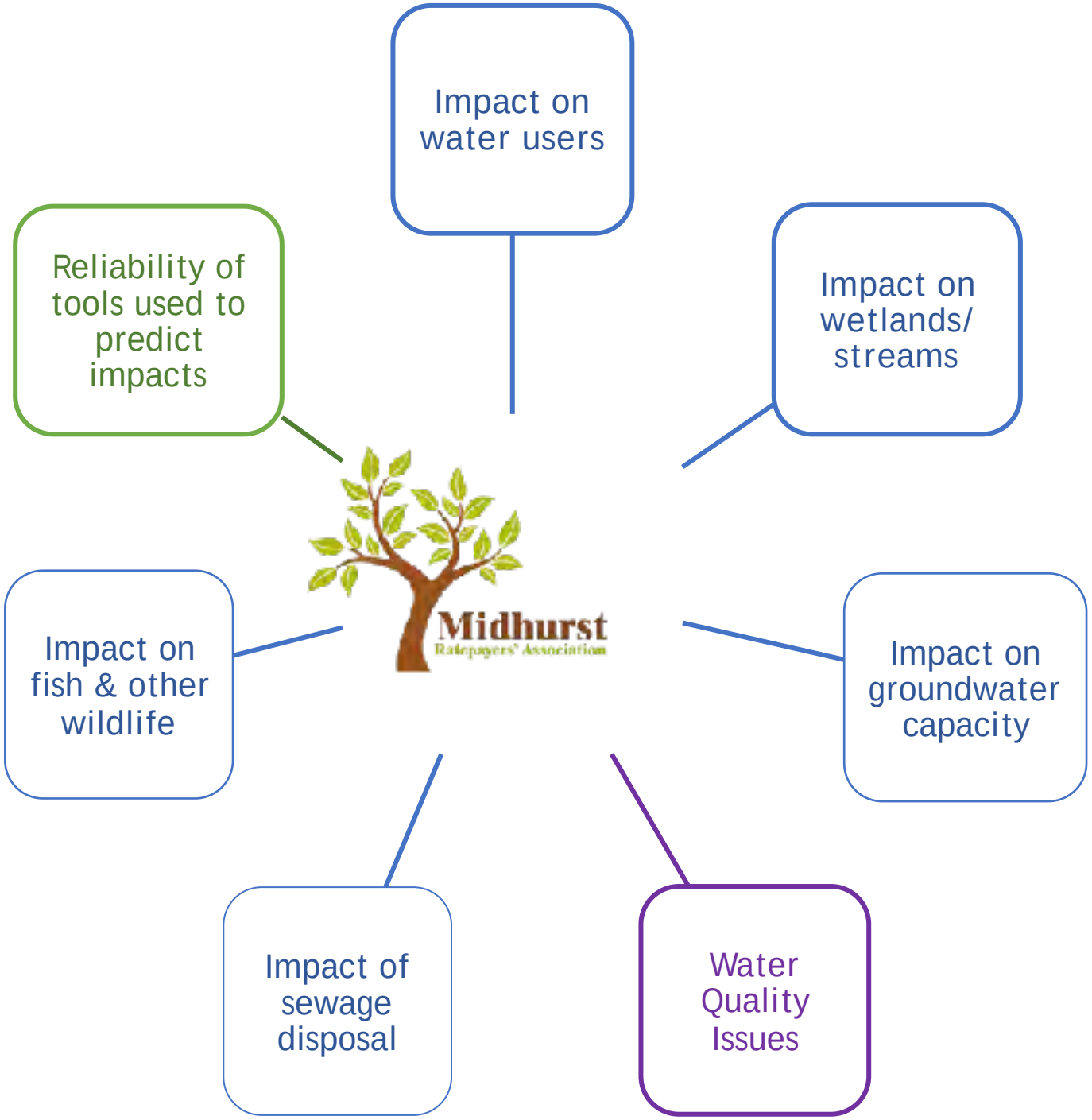




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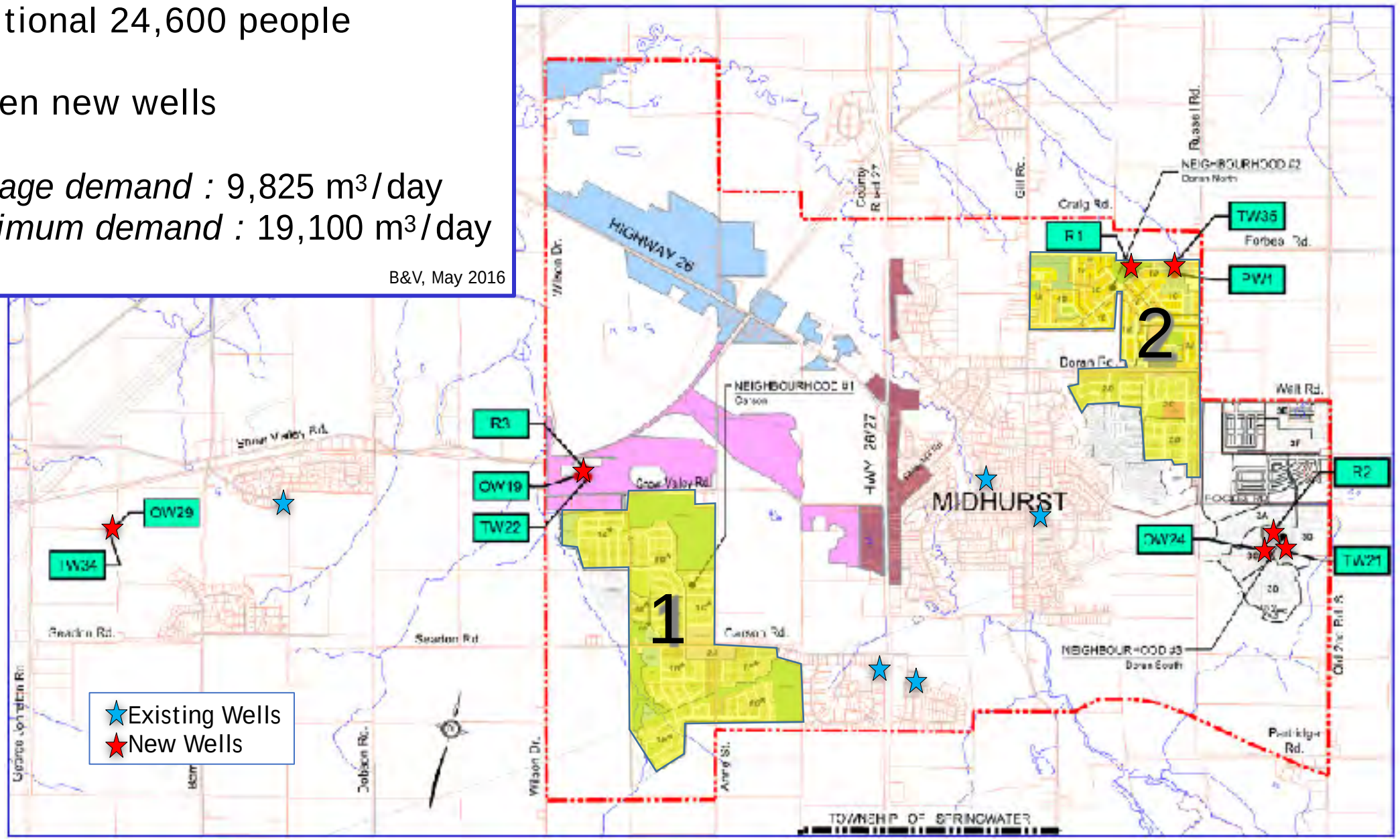
2017-03-08

Additional 24,600 people

Eleven new wells

*average demand :* 9,825 m³/day
*maximum demand :* 19,100 m³/day

B&V, May 2016



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2017-03-08

The water source will be 11 new wells. Sewage will be treated and discharged into Willow Creek.

People and flow rates from B&V, May 2016

BLUE stars = existing wells– approximate location

Red stars = proposed new wells – approximate location.

Some locations have multiple wells (i.e. Snow Valley will have 3 wells)



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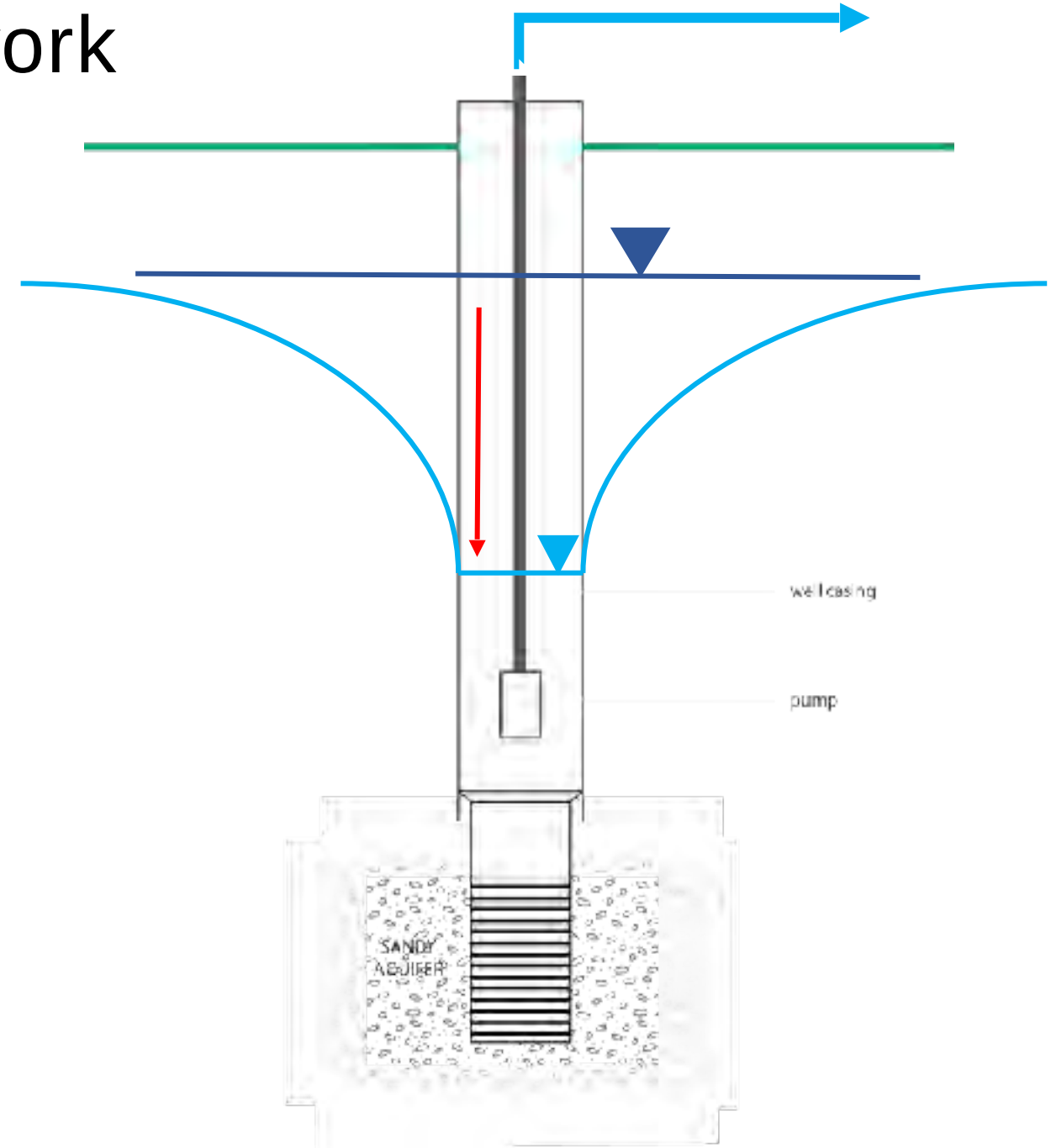
# Municipal Class EA

Phase 4: Selection of the preferred design

Must include a detailed discussion of:

- Identification of the *potential impacts on the environment*
- Description of *mitigation measures to minimize environmental effects*

# How wells work




Non-pumping level

Drawdown

Pumping level



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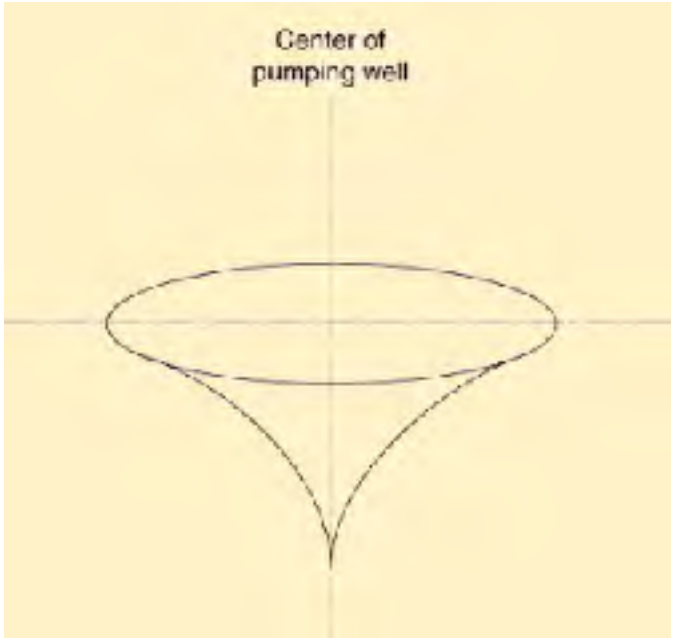
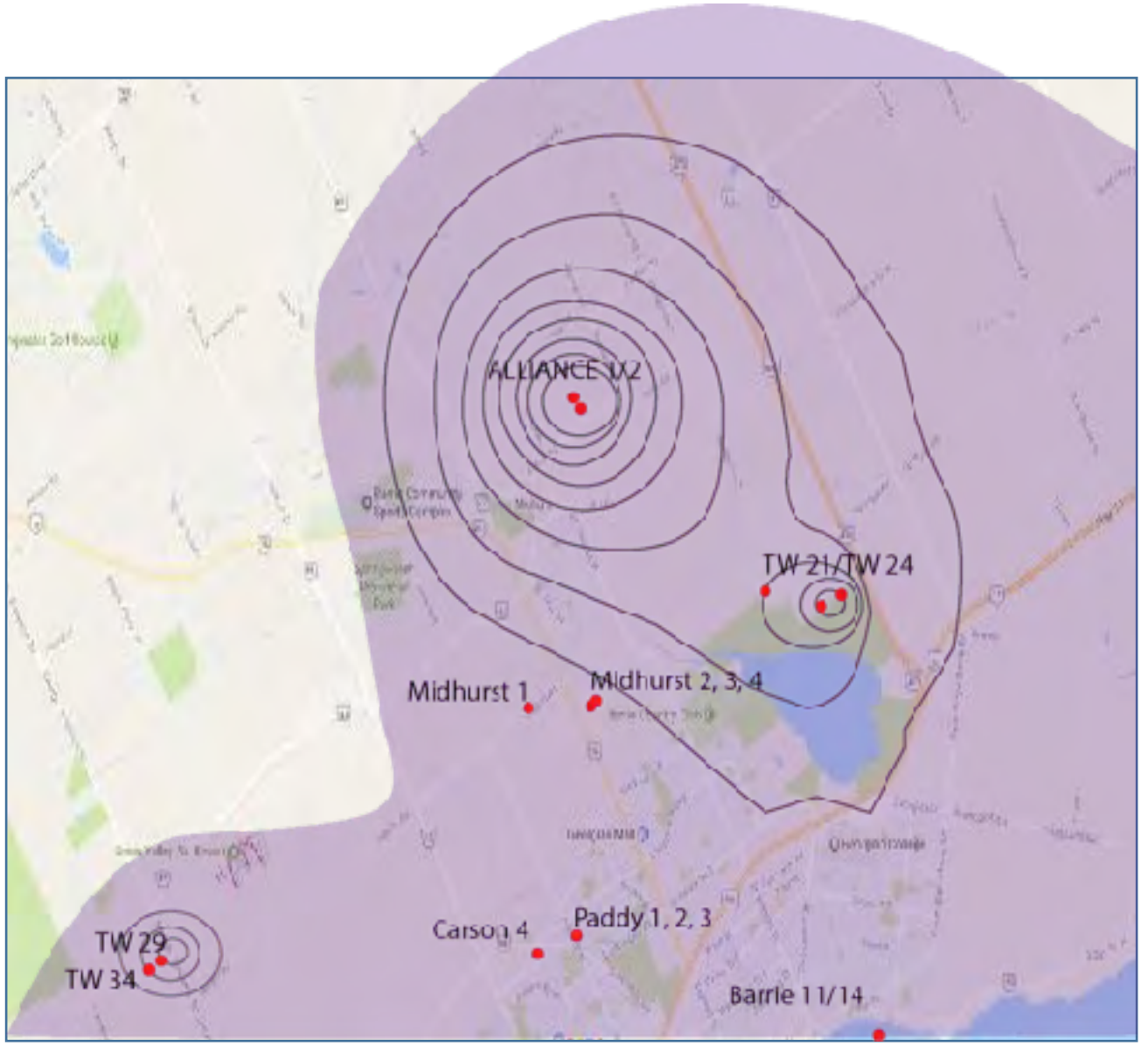
Many current residents of Springwater Township rely on wells for their private water supply.

When a well is pumped the pumping level in the well drops. This is called drawdown.

Not only is there drawdown in the well, but also drawdown in the aquifer. This is called the zone-of-influence of pumping.

# Impacts to Private Water Supply Wells



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2017-03-08

The above figure shows contour lines of the drawdown that results from pumping from the deep aquifer at 3 of the 4 proposed sites.

As illustrated by the slide on the left, the drawdown is greatest near the wells and decreases as you go farther away.

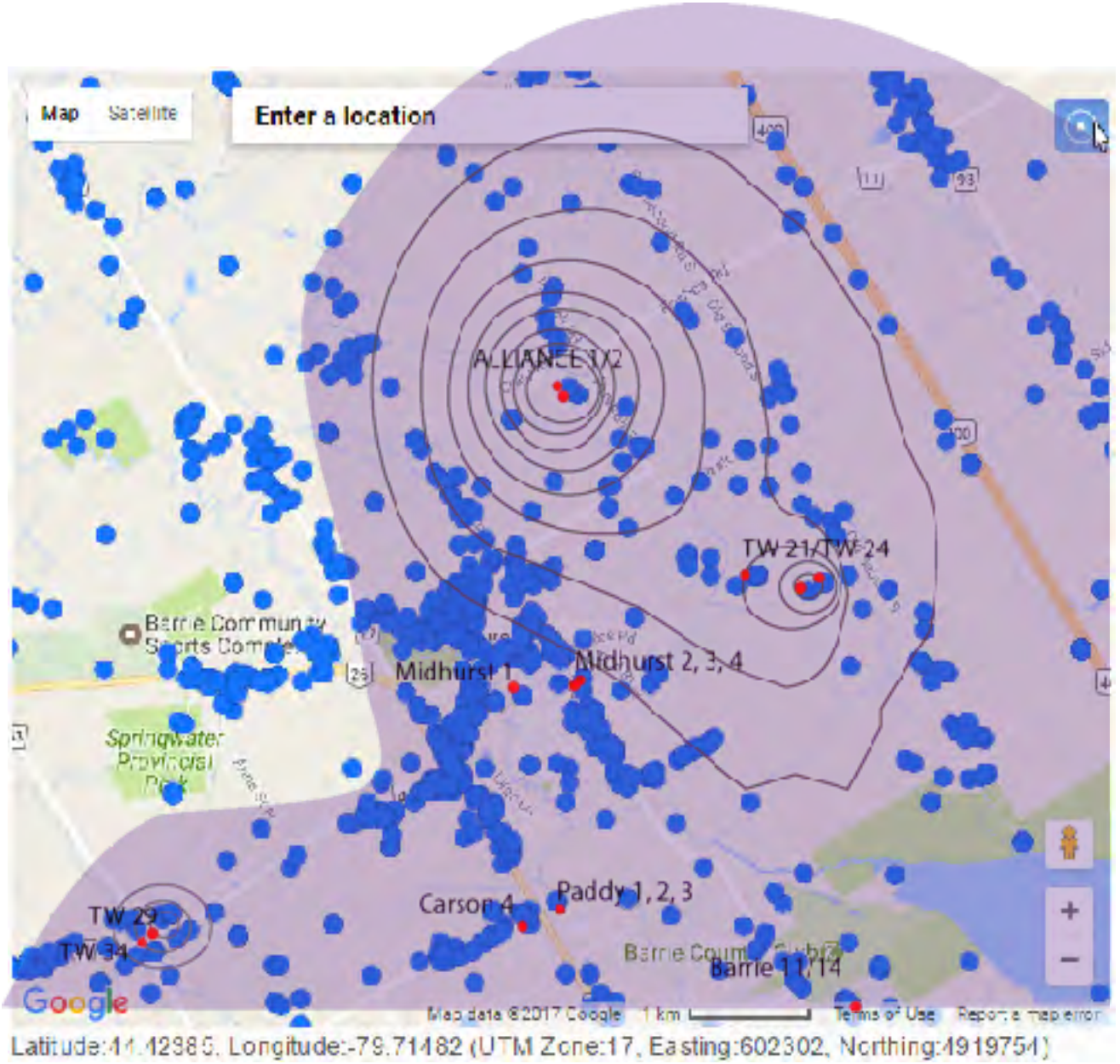
The purple colour is the zone-of-influence - the area where more than a metre of drawdown can be expected.  It results from the pumping of these wells.

# Impacts to Private Water Supply Wells

- Well locations according to Provincial database*.

- Only about 50% of the existing wells are known to be included in the Provincial database*.

* *Text added by MRA*



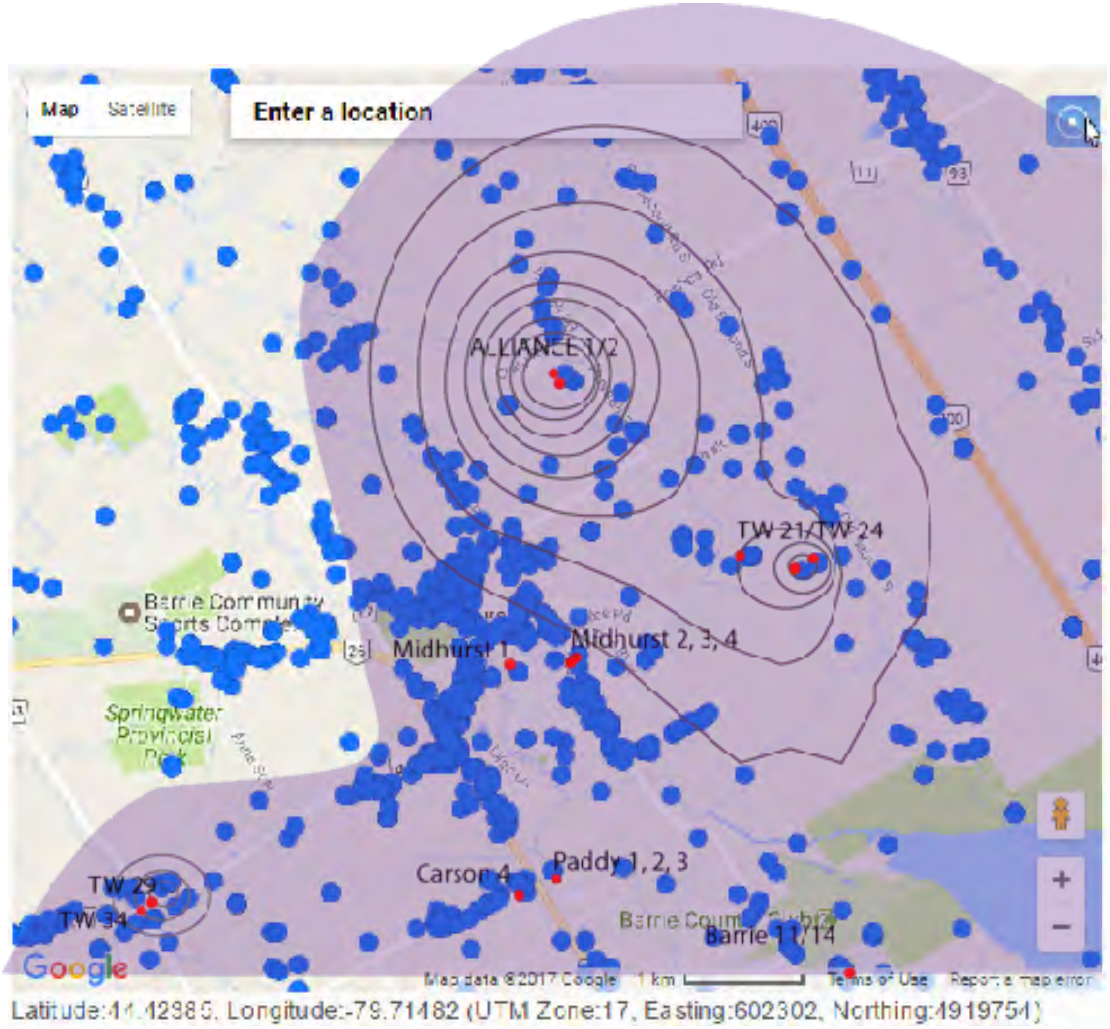
On the above slide, blue dots have been added to show the location of private wells in the MOECC water well record database.

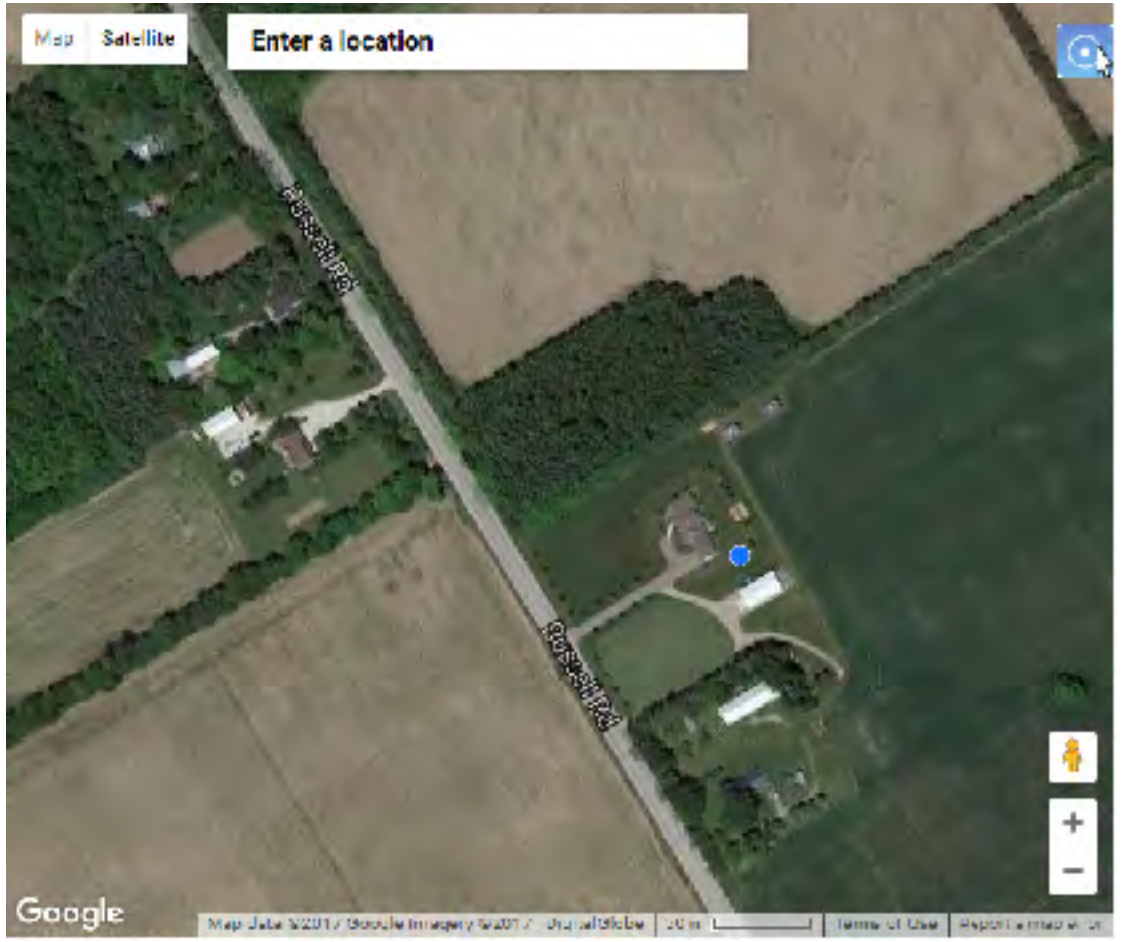
To assess impacts to these wells, it would be necessary to measure the normal pumping level in each of the wells and compare this to the predicted interference from pumping of the new wells.

A complete door-to-door survey of private wells and their operating characteristics to allow this assessment cannot be found in the Golder (2016) report.

# Impacts to Private Water Supply Wells

- Enlarged view of Russell Rd showing only one well*.
- In reality, there are several more wells*.




** Text added by MRA*



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2017-03-08

The MOECC water well record data base is not complete: wells are often missing.

In the above slide, an area is shown where there are *several* homes but only *one well* is identified.

Tim's review of this specific MOECC database shows that there are wells within both the deep and shallower aquifers, which are contained inside the zone-of-influence of pumping.

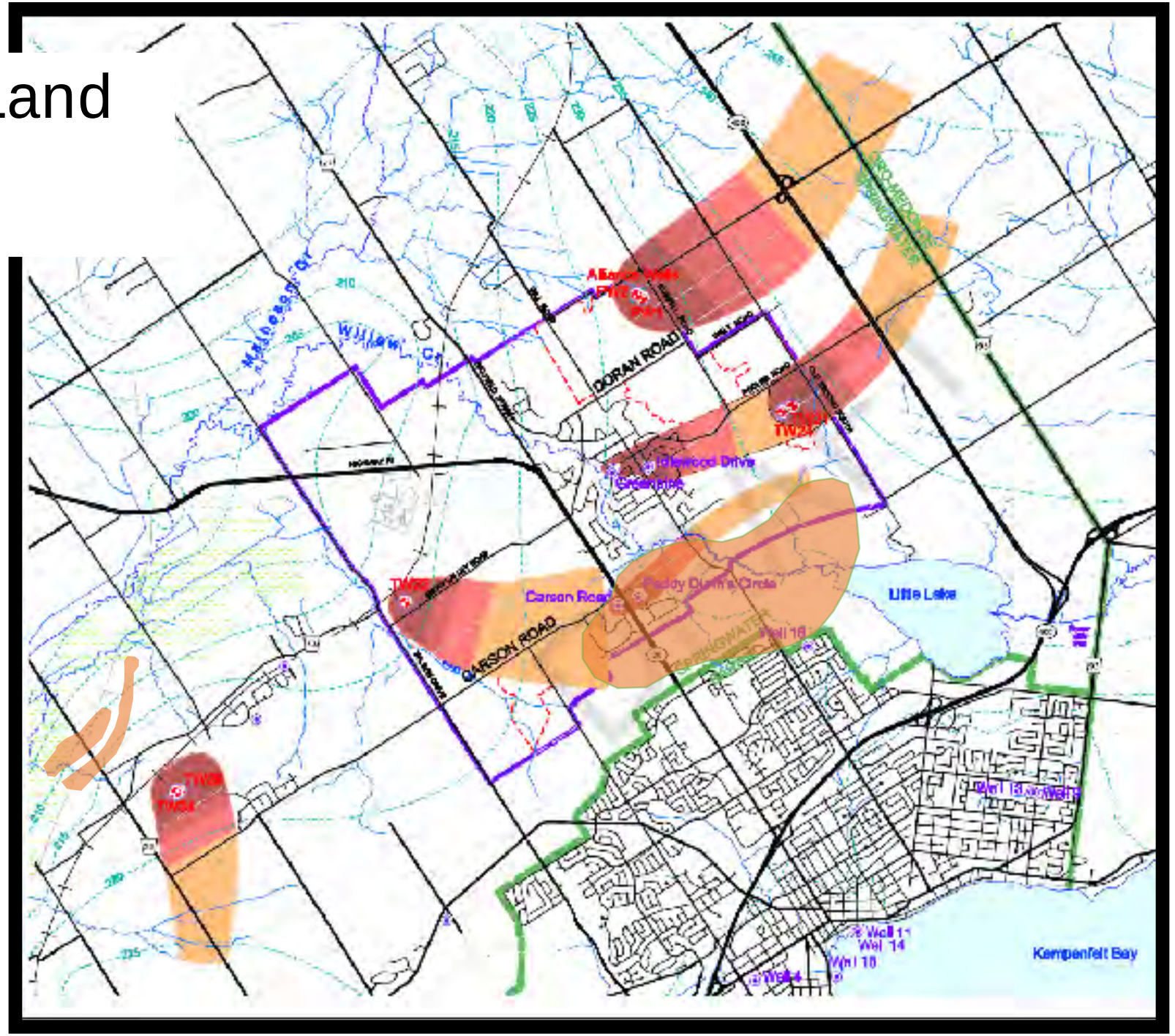
The aquifer testing program shows that, in some areas, pumping from the deep aquifer also causes drawdown in the shallower aquifers.

# Impacts to Land Owners

- Chart showing Well Head Protection Areas where pollution is strictly controlled*

- Wells are located at the darker end of shaded areas*

** Text added by MRA*



The colourful shapes on the above slide denote the Well Head Protection Areas (WHPAs) for the existing Midhurst and Snow Valley wells PLUS Barrie's municipal wells - all located within the Willow Creek subwatershed.

The WHPAs provide an indication of the capture zone of the wells – where the water is coming from within the groundwater flow system.

They also show the areas where limitations may be placed on property use according to the the Source Water Protection Plan. There are many farms and private rural dwellings within Springwater Township and adjacent Oro-Medonte Township which may be affected by these limitations.

It is also important to note that some of the new wells will capture water that currently flows to the existing Midhurst *municipal* wells causing impacts on them.

(Note that Barrie's water system uses wells drawing on aquifers which also supply Midhurst's water for the north end and Lake Simcoe for the south end. The systems do not mix water; therefore, the wells shown here will continue to provide water for north Barrie.)

Sources:
Golder (2016) Study and the source protection MOECC Approved Assessment Reports for the City of Barrie and the Midhurst municipal drinking water systems.



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# Impacts of the Water Taking

- Current and proposed *average daily* and *maximum daily* demand of municipal takings within the Willow Creek subwatershed

| | Average Day | Maximum Day |
|---|---|---|
| Existing Midhurst Wells | 1,450 $m^3$/day | 4,095 $m^3$/day |
| Existing Barrie Wells* | 20,966 $m^3$/day? | 20,966 $m^3$/day? |
| Proposed New Wells | 9,825 $m^3$/day | 19,014 $m^3$/day |
| TOTAL | 32,241 $m^3$/day | 44,075 $m^3$/day |

* Operating capacity of wells within the Willow Creek subwatershed



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When considering water impacts, the cumulative taking of all of the municipal water Supplies within the Willow Creek Sub-watershed must be included.

The average daily taking from the proposed new wells is 1/3 of the total average daily municipal taking within the subwatershed.

Sources:
Barrie total taking in 2010 (groundwater base case) was 40,280 m3/day (Tier 3 Study). Of that amount, 17,800 m3/day is modelled groundwater inflow from the Willow Creek subwatershed. Midhurst takings from the SWP Assessment Report based on 2014 data. Proposed taking from B&V 2016.

T3 Figure 1.2 shows Barrie Wells 9, 13 and 16 within the NVCA Willow Creek Subwatershed.

T3 Table 3.1 shows PTTW Well 9 - 6,552 m3/day; Well 13 - 6,552 m3/day;
Well 16- 7,862 m3/day



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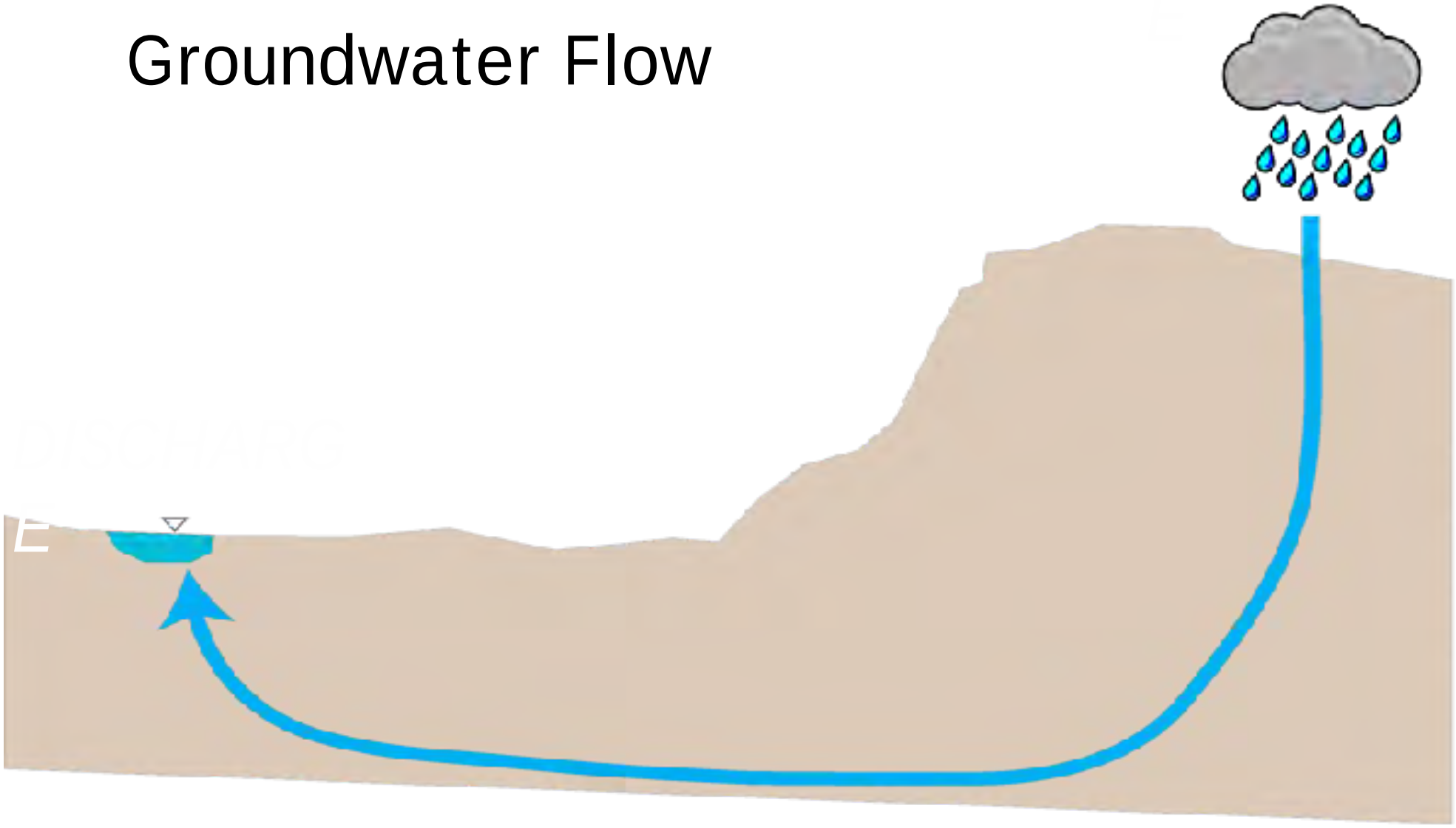
# Groundwater Flow



# Impact of Proposed New Water Supply

- The water-taking from the municipal wells within the watershed is considered to be *consumptive taking*

  ➢ *A consumptive groundwater-taking occurs when the water is pumped from an aquifer, but not returned to the aquifer from which it was taken*

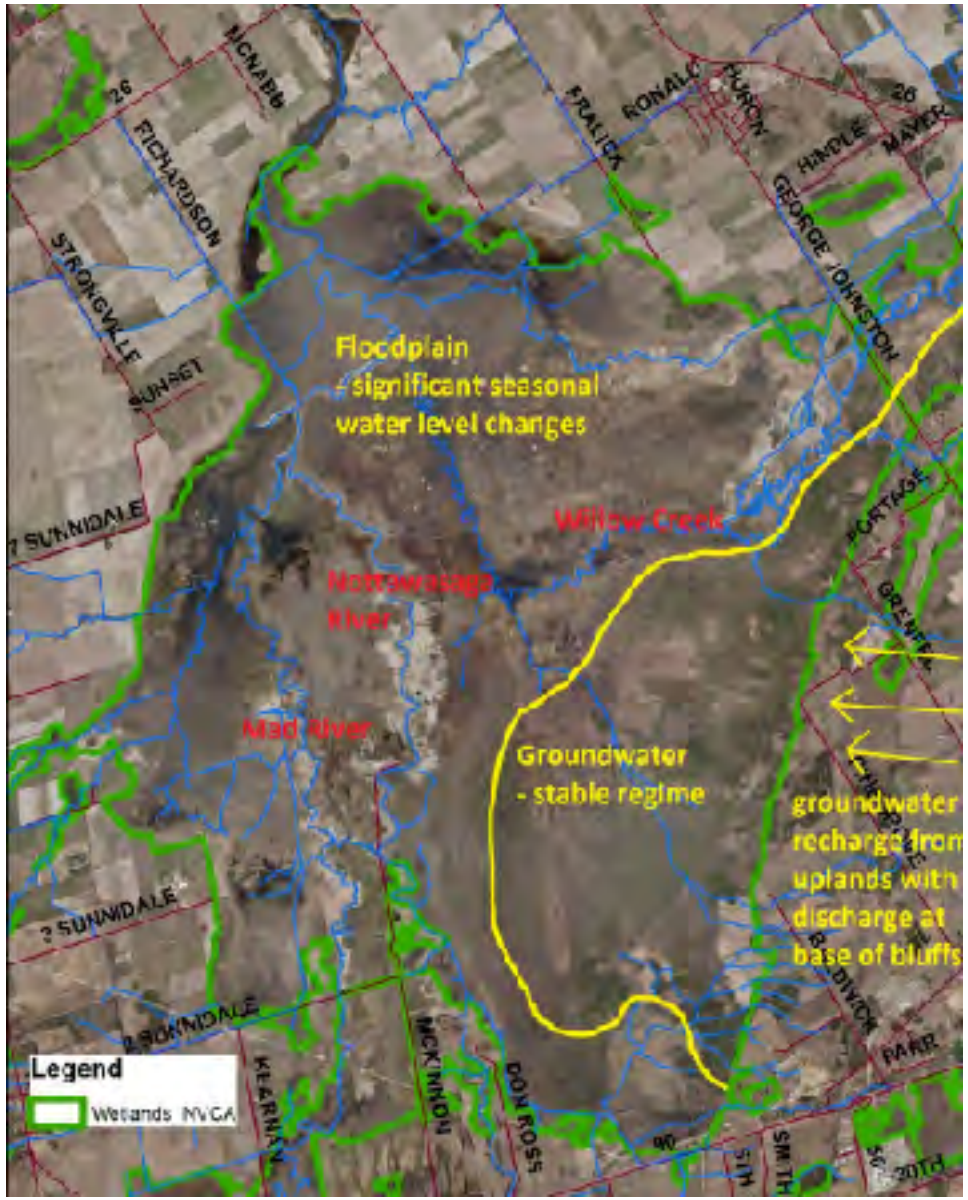
- This results in a reduction of groundwater flow to the *existing* receptors connected to the pumped aquifer (other groundwater users, streams and wetlands) that approximately equals the amount of water pumped

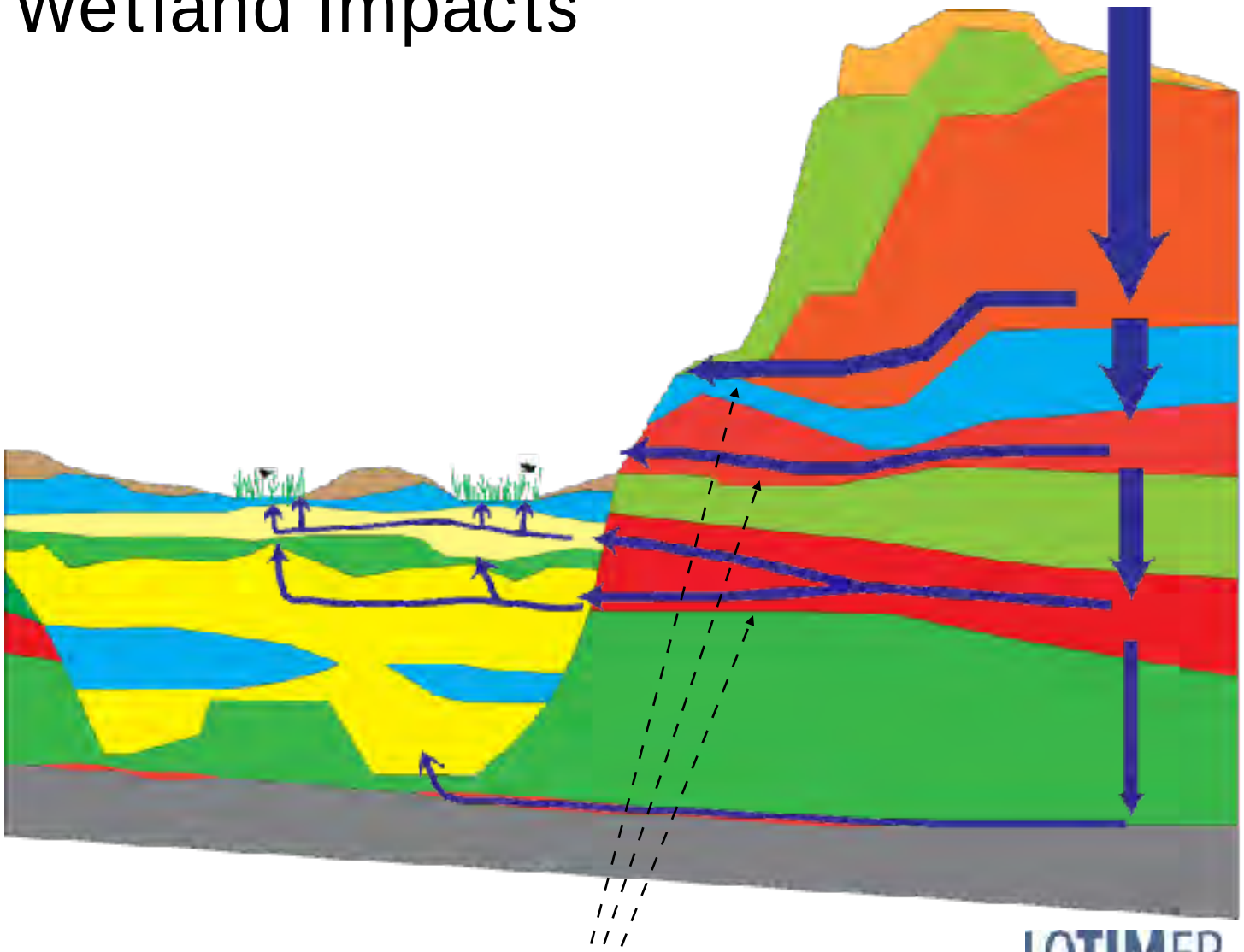
Groundwater flow is from areas of recharge (typically the higher ground, such as the Oro Moraine) to areas of discharge (typically streams and wetlands).

Groundwater moves through the pore spaces in the geological materials found below the surface.

The movement is governed by gravity, with groundwater moving from areas of higher hydraulic potential to those of lower hydraulic potential.

# Wetland Impacts



Cold groundwater from aquifers entering creeks and wetlands

Map from NVCA, 2015 - Minesing Wetlands

The above slide on the left is from the NVCA. It shows the area of the Minesing Wetlands which is *very* dependent on groundwater discharge.

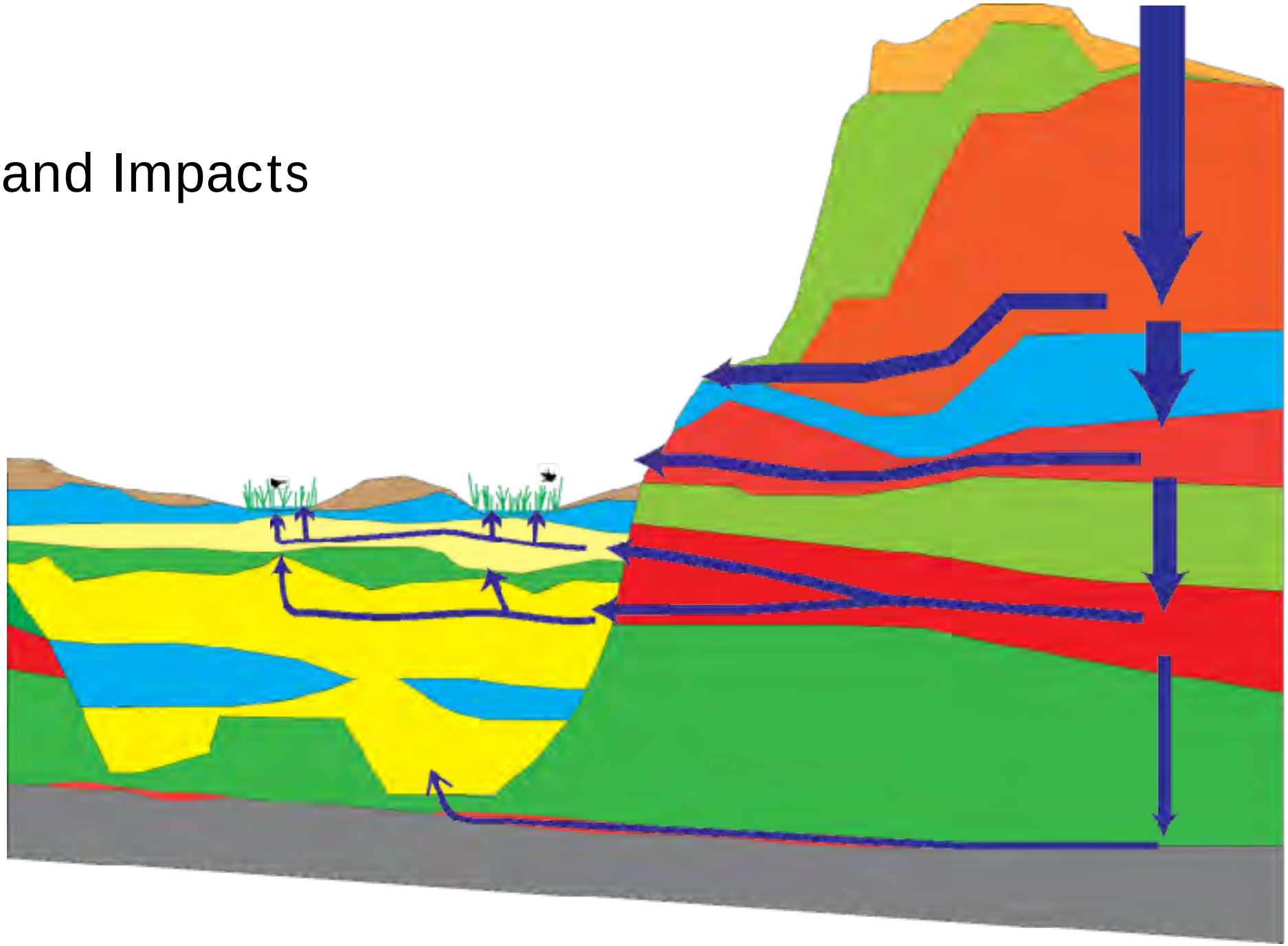
The conceptual drawing on the right shows the hydrogeological setting resulting from this groundwater discharge shown on the left by the NVCA.

The geologic layers are taken from the Ontario Geological Survey mapping for the Snow Valley Area.

The blue arrows are a conceptual representation of groundwater flow. Their thickness is for illustrative purposes only.  They have been drawn to show a gradual reduction in groundwater flow downward, as it moves through the geologic layers.

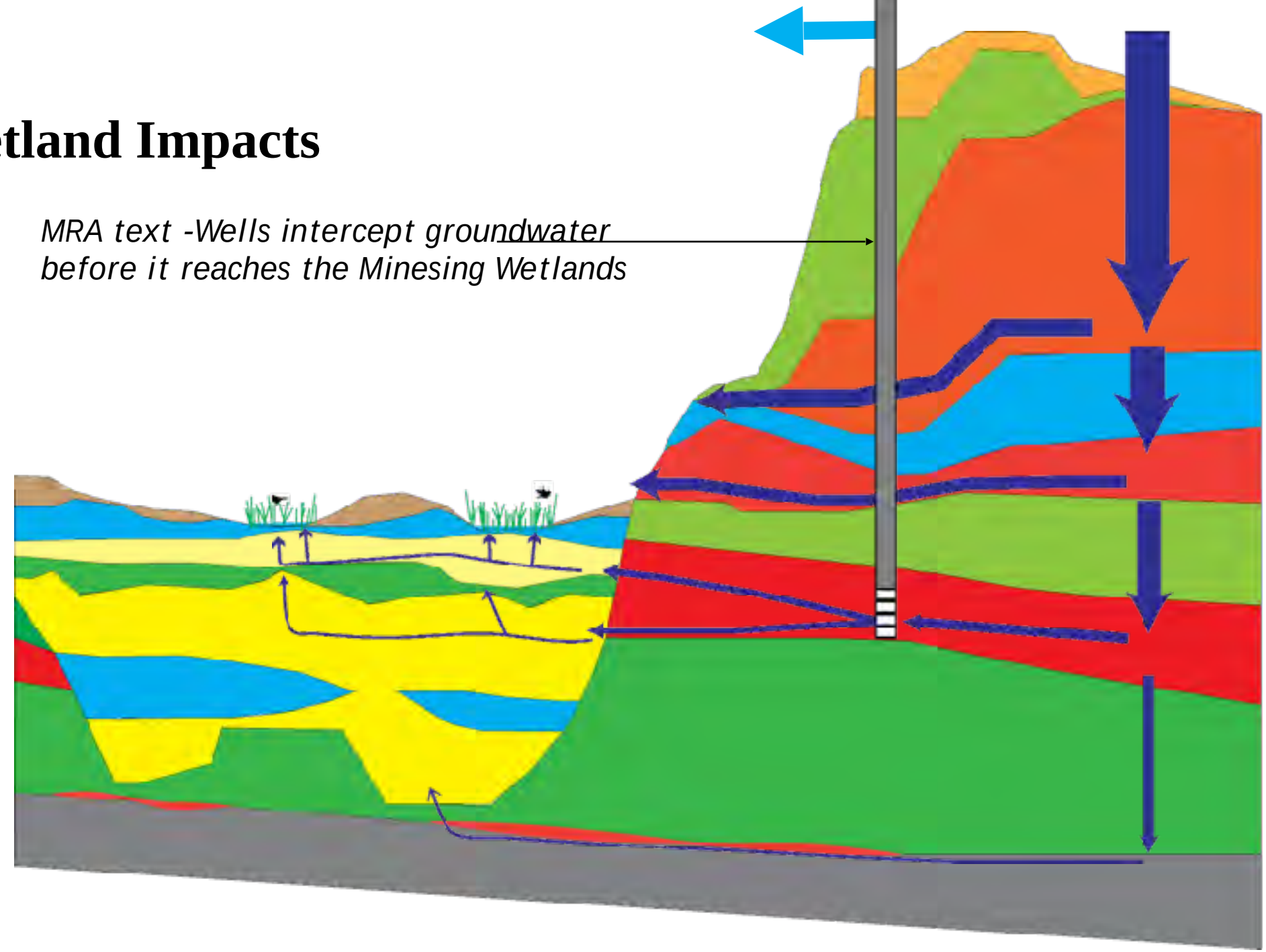
The Golder (2016) report does not contain the water budget information necessary to allow estimates of the volumes of water which move between the various hydrogeological units.

# Wetland Impacts



# Wetland Impacts

*MRA text -Wells intercept groundwater before it reaches the Minesing Wetlands*





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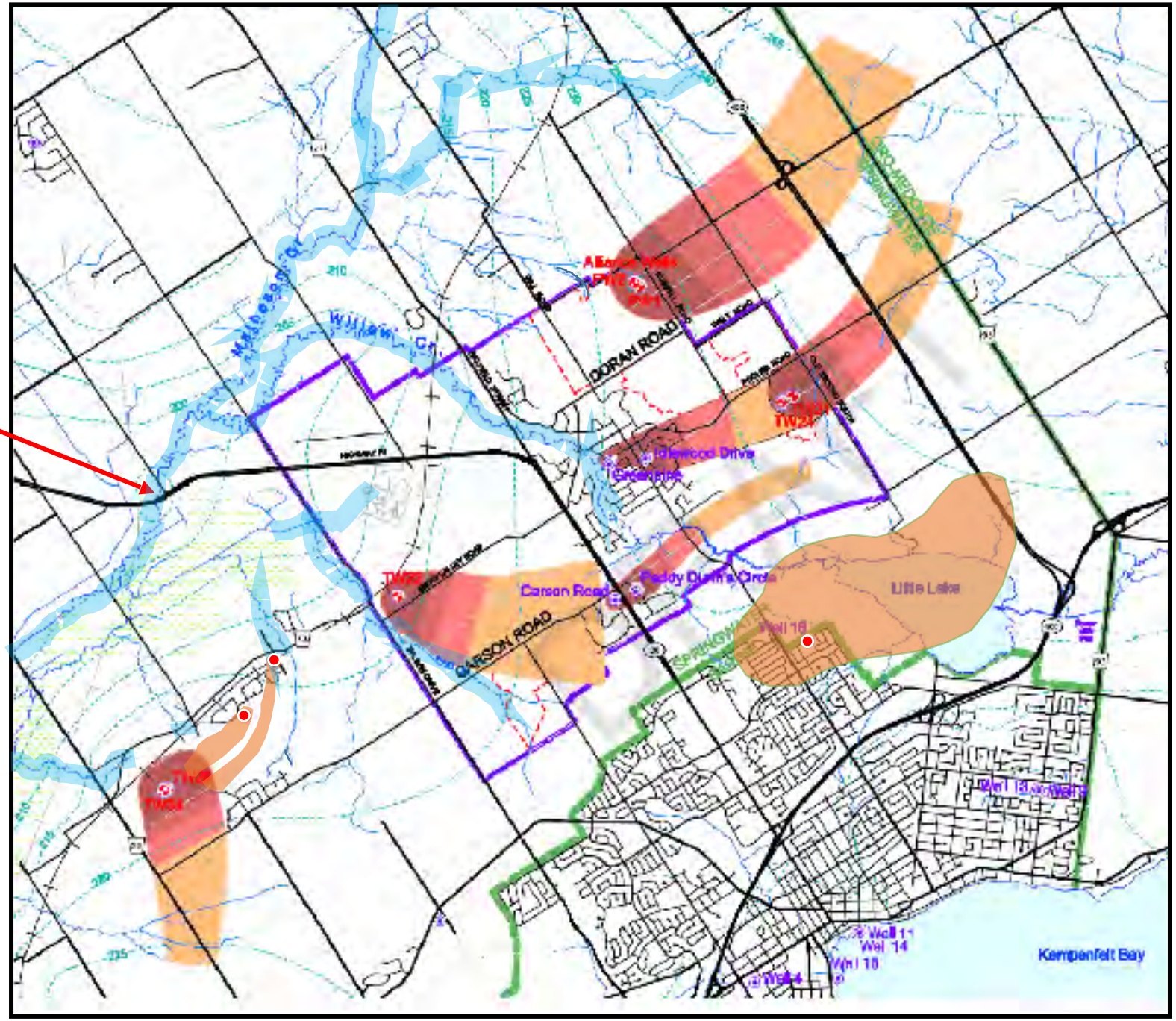
Proposed Sewage Discharge



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2017-03-08

A similar process happens with streams: pumping from a well can reduce the groundwater discharge to a stream.

The colourful shapes show the capture zones for the new wells. From these, one can determine where stream flow reductions can be expected to occur.

Because it maintains a constant temperature of about 10 degrees C , groundwater discharging into streams is considered “warm” in winter, thereby protecting trout eggs from freezing, and “cold” in summer, thereby preventing heat stress to fish.

The treated sewage water to be discharged “downstream” cannot replace the natural groundwater to be removed from the streams “upstream” as a result of pumping.

Sources:
Golder (2016)
Black and Veatch (2016)
Well 16 capture zone: Map from Lake Simcoe SPA Approved Assessment Report F9-1

# Summer / Winter Impact on Wildlife*

Groundwater removed by wells upstream lowers water levels in the creeks.

Due to less water and the upstream removal of groundwater at a consistent $10^0$C all year, water temperature will rise in summer and freeze in winter.

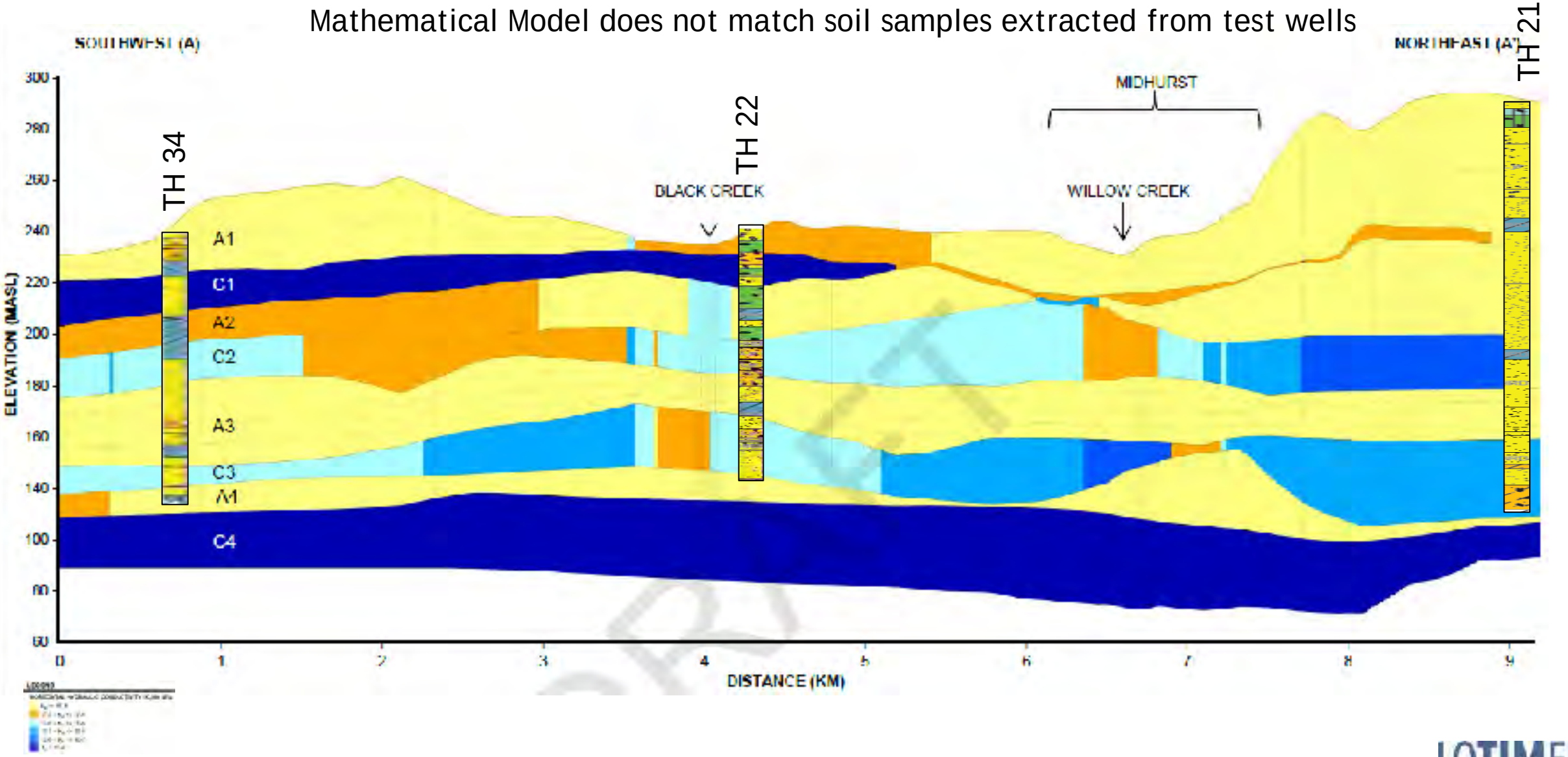
Treated sewage water added downstream is warmer than groundwater, further raising the temperature. It will also change water quality and quantity.

Will fish and other wildlife be adversely affected, even to the point of extinction?

** Explanatory slide added by MRA*

# GEOLOGIC MODEL + DRILLING PROGRAM

Mathematical Model does not match soil samples extracted from test wells



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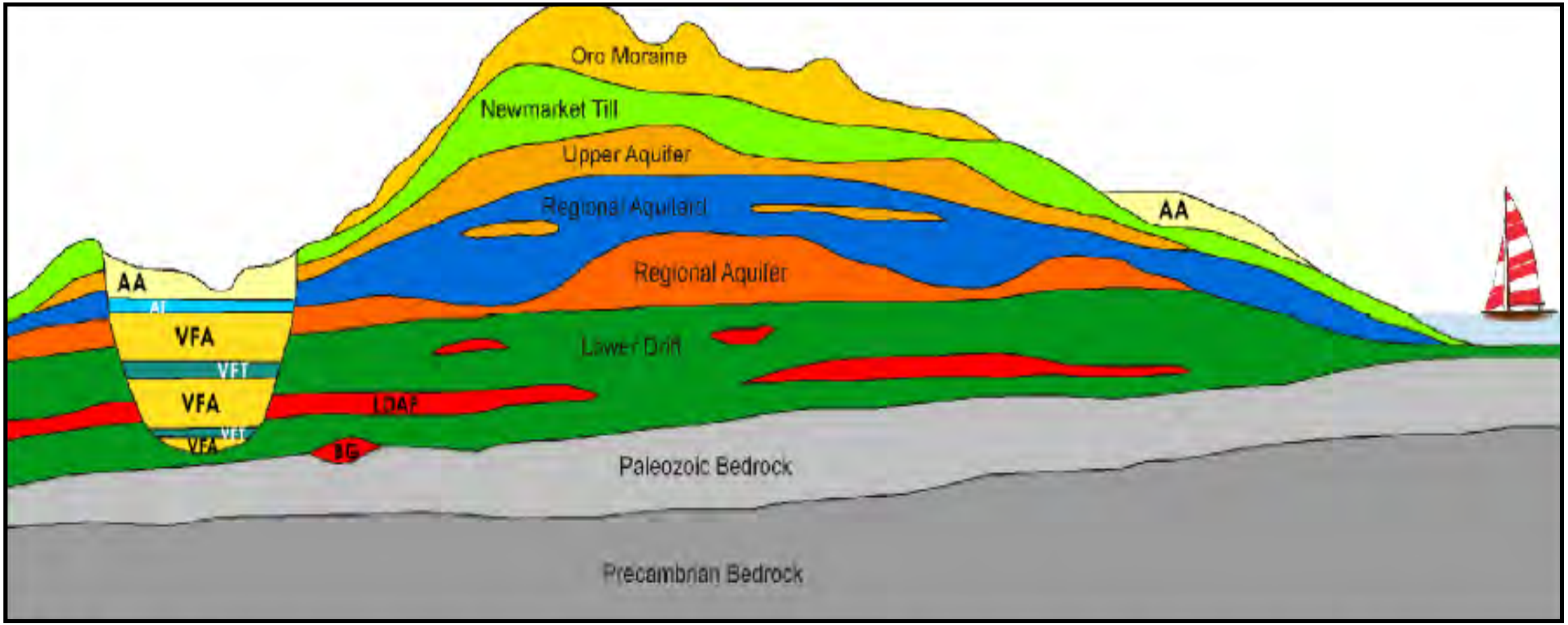
In the above slide, the geological information obtained from drilling at 3 of the 4 proposed water supply locations is superimposed.

A comparison of the test well results to the mathematical model shows that the field program contradicts the model.

# Ontario Geological Survey, 2011



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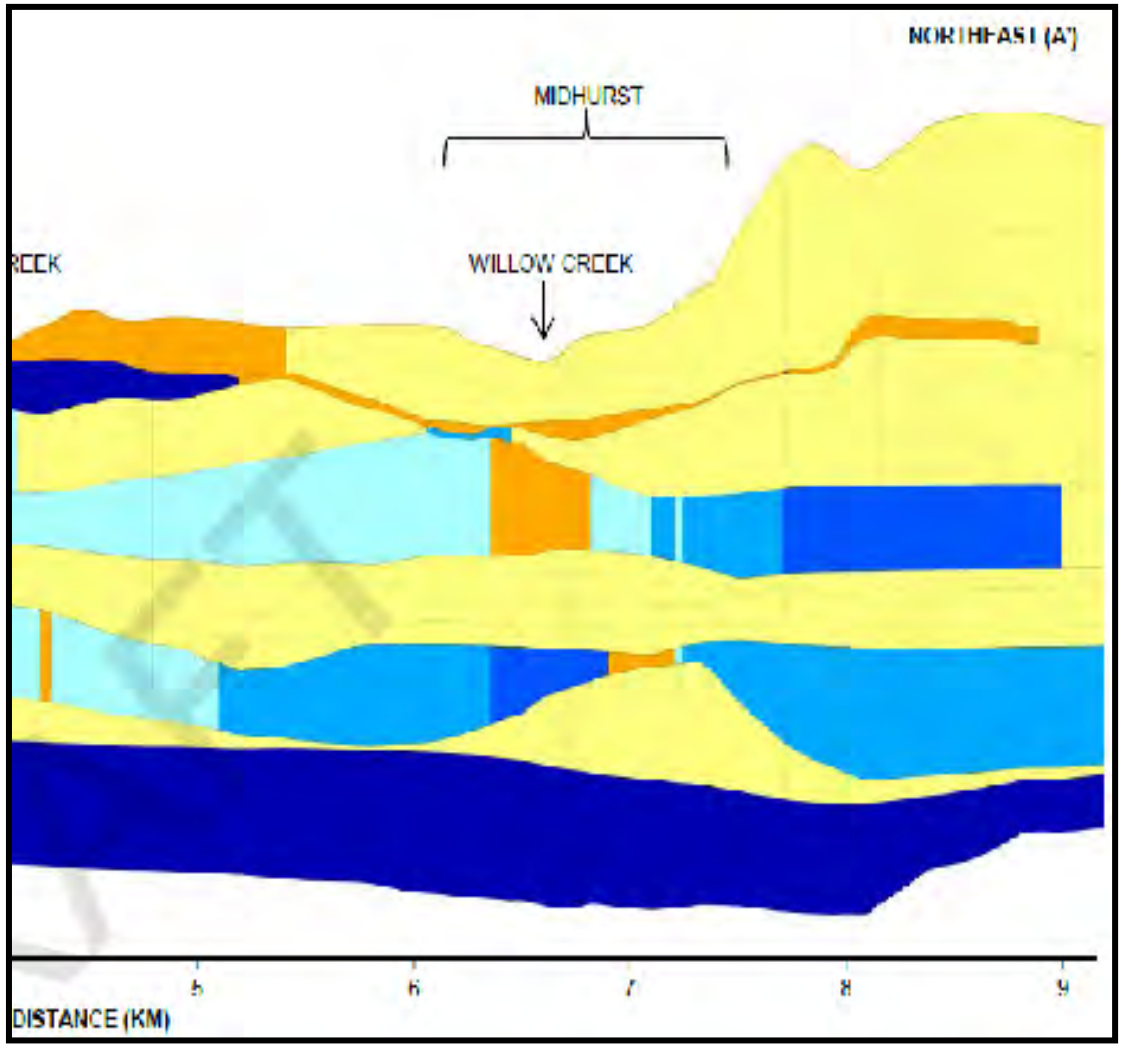
The Ontario Geological Survey has studied the Midhurst area.

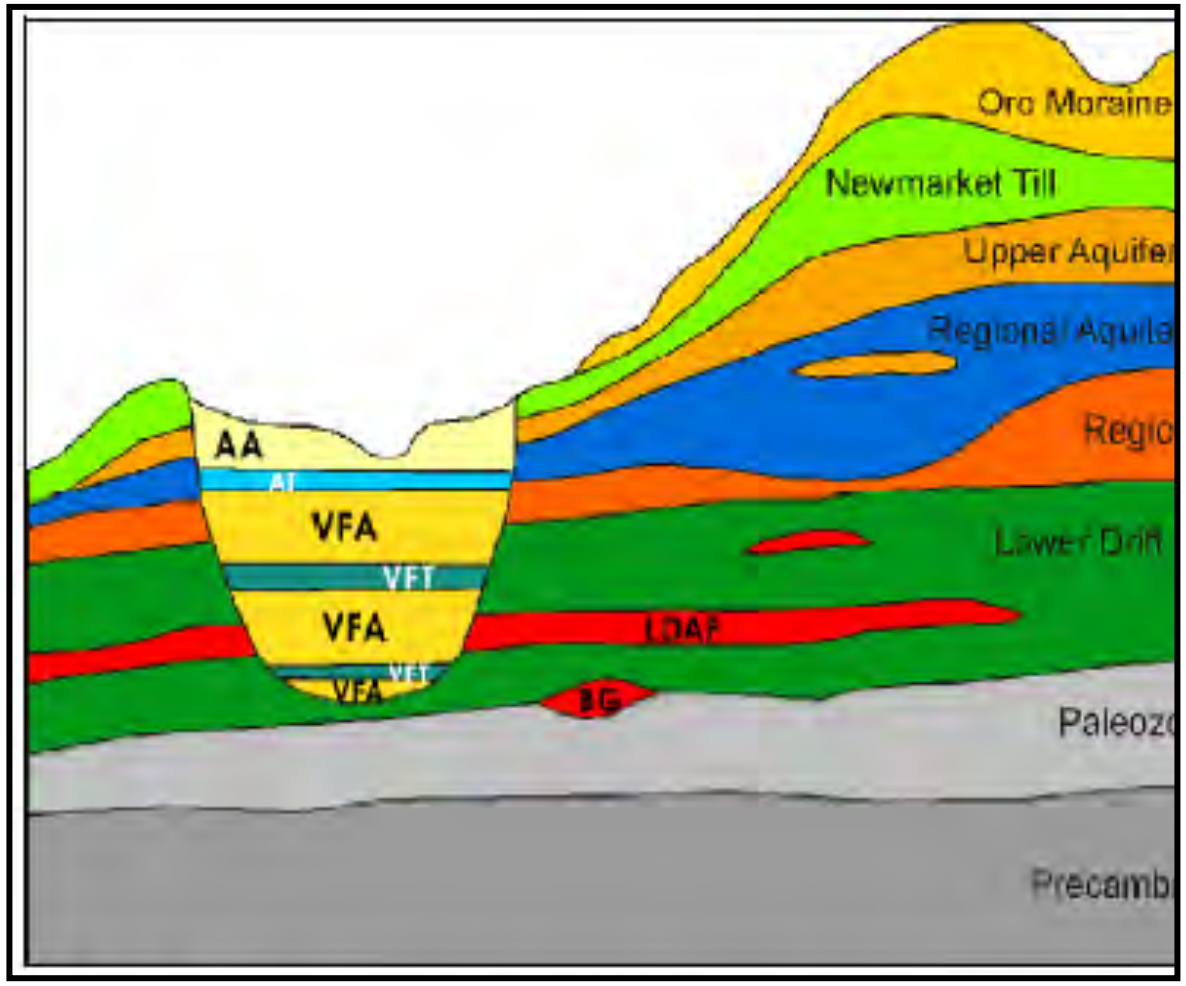
The above drawing shows that the area has various layers, which can be divided into aquifers and aquitards.

An interesting finding of the work of the Geological Survey is that sediments within the low lying areas reflect newer deposits, whereas deposits shown in the upland areas are essentially missing. The aquifers and aquitards of the upland areas may or may not be connected to the sediments within the valley fill areas (VFA) associated with the streams and wetlands.

# Comparison of Geologic Models

Mathematical Model does not match 2011 Ontario Geological Survey



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The above slide compares the Golder (2016) model cross-section to the Ontario Geological Survey conceptual geologic cross-section.

The major difference is the way in which the model represents the valley fill areas (VFA) where sensitive surface water features are present.

The Ontario Geological Survey layers do not extend through the VFAs because they are interpreted as having been eroded away during more recent geological events.

# Proposed New Water Supply – Water Quality Treatment

| WELL SITE | WELL # | HIGHLIGHTS OF WATER QUALITY TEST RESULTS |
|---|---|---|
| Carson: Sand and Gravel Site | OW19 / TW22 | Low iron and manganese concentrations and elevated nitrate concentration |
| Carson: West Snow Valley Site | OW20 / TW34 | High iron and manganese concentrations with observed bubbles of gas and a slight sulphurous odour |
| Doran: Road Alliance Site | TW35 / PW1 | High manganese concentration and slightly elevated iron concentrations |
| Doran: Old Second Road Site | TW21 / OW24 | No detectable issue |

Bubbles of gas = methane gas



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# Proposed New Water Supply – Water Quality Treatment

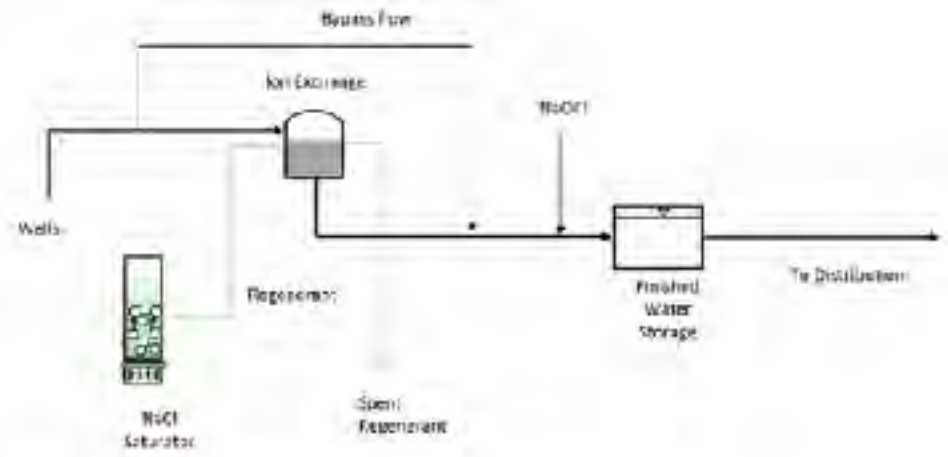


Figure 5 - Sand and Gravel Site Well Water Treatment System

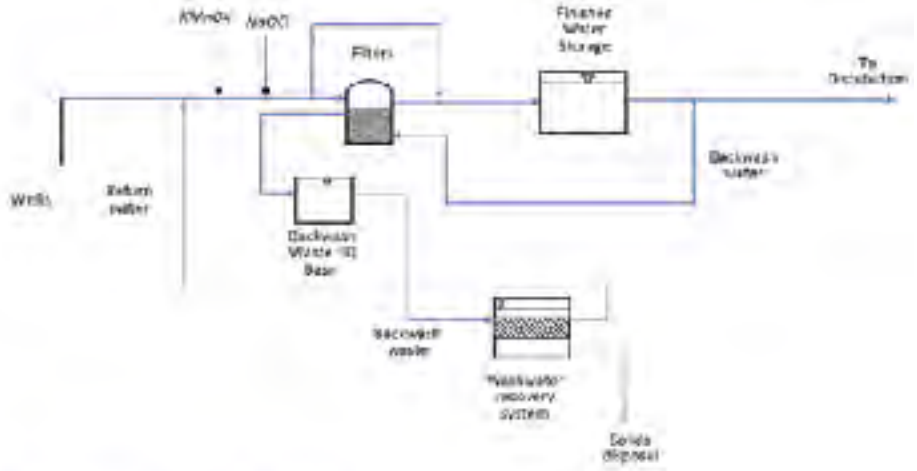


Figure 8 - Treatment at the Alliance Site

- Disinfection
- Green sand filtration to lower iron and manganese
- Ion exchange to lower elevated nitrate
- Air stripping to remove volatile organic compounds

- Note: current Midhurst wells are disinfected and then sodium silicate added to keep iron in solution



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# Conclusions

1. The predicted impacts are based on short-term pumping of individual wells. Most of the aquifer tests described in the Golder (2016) study were for 3 days. It is not uncommon to conduct 30 day or longer tests to determine the nature of impacts in a multi-aquifer system such as is observed in the Midhurst area

2. Only some of the necessary 11 wells have been constructed

3. Combined pumping of all new wells at the required volume to meet the needs of the proposed development has not been done

4*. No water budget has been done.

# Conclusions

5. The hydrogeological study does not include a complete survey of private well use and the potential for impacts to these private wells

6. An assessment of the possible limitations to land use within the new Well Head Protection Areas has not been completed

7. The hydrogeological study does not include an assessment of stream flow reductions along reaches of Willow and Matheson creek

8*. The hydrogeological study does not include an assessment of the impact on fish and other wildlife

# Conclusions

9. The hydrogeological study does not include an assessment of the impact to the Minesing Wetland complex

10*. Predictions of impacts from the proposed water-taking have been determined using an outdated mathematical groundwater model which differs from the actual field tests

11*. Cost of serving two different source water treatment plants will increase.

12*. Cost of treating “new” water will be much higher.

** Added by MRA*

# 25. Project Unit 14-015. An Update on Subsurface Data Collection for Three-Dimensional Sediment Mapping in the Central Part of the County of Simcoe, Southern Ontario

**R.P.M. Mulligan**[1]

[1]Earth Resources and Geoscience Mapping Section, Ontario Geological Survey

## INTRODUCTION

The Ontario Geological Survey (OGS) has been conducting three-dimensional (3-D) sediment mapping investigations across southern Ontario since 2002. These projects rely heavily on the collection of new, high-quality geological and geophysical data in order to better constrain bedrock topography, drift thickness and to characterize the Quaternary glacial stratigraphy, which, in turn, controls the nature, extent and connectivity of surface and groundwater flow systems in the region. Numerous parallel and complementary studies have been conducted for the current project in the central part of the County of Simcoe (herein referred to as "central Simcoe County"): a ground-based gravity survey was undertaken to better constrain bedrock topography in the region (Rainsford and Biswas 2014), surficial mapping began in 2014 and continued in 2015 (Mulligan 2014, 2015, 2017a, 2017b), sediment drilling programs were conducted in 2015 and 2016 (Mulligan 2016), augmented by seismic reflection surveys and downhole geophysical logging undertaken by the Geological Survey of Canada (GSC) as part of OGS–GSC collaborative efforts (Russell and Dyer 2016; Crow et al. 2017; Pugin et al. 2017). This article focusses on results from continued sediment drilling during the summer of 2017 and introduces plans for future collaborative work on the geophysical and hydrogeological properties of the Quaternary sediments in the vicinity of drilled boreholes.

In 2017, 12 boreholes were drilled in Simcoe County, bringing the number of cored boreholes drilled for this study up to 26, and the number of cored boreholes in the area logged by OGS staff to 32 (Figure 25.1); 5 boreholes were drilled in support of previous mapping in the area (Bajc 1994; *see* Figure 25.1, yellow circles); 1 borehole drilled in support of an MSC thesis (Fitzgerald 1982: "UW-78") and 1 borehole ("Elmvale") was drilled in support of local groundwater studies.

## REGIONAL GEOLOGIC SETTING

Central Simcoe County is bounded by Georgian Bay to the north, the Niagara Escarpment to the west, and drumlinized till plain separated by large valleys and flat low-lying plains to the south and east. The area is underlain primarily by Paleozoic bedrock, consisting of Upper Ordovician limestones in the central and northern parts of the study area and Upper Ordovician shales overlain by Lower Silurian dolostones forming the caprock of the Niagara Escarpment in the southwestern part. In the northern part of the study area, several inliers of Precambrian bedrock of the Grenville Province have been intersected in boreholes (Bajc 1994; Armstrong and Carter 2010), including one as much as 34 km south of the nearest known outcrop (Mulligan 2016). To the east of the Niagara Escarpment, the Paleozoic bedrock

*Summary of Field Work and Other Activities 2017,*
*Ontario Geological Survey, Open File Report 6333, p.25-1 to 25-10.*

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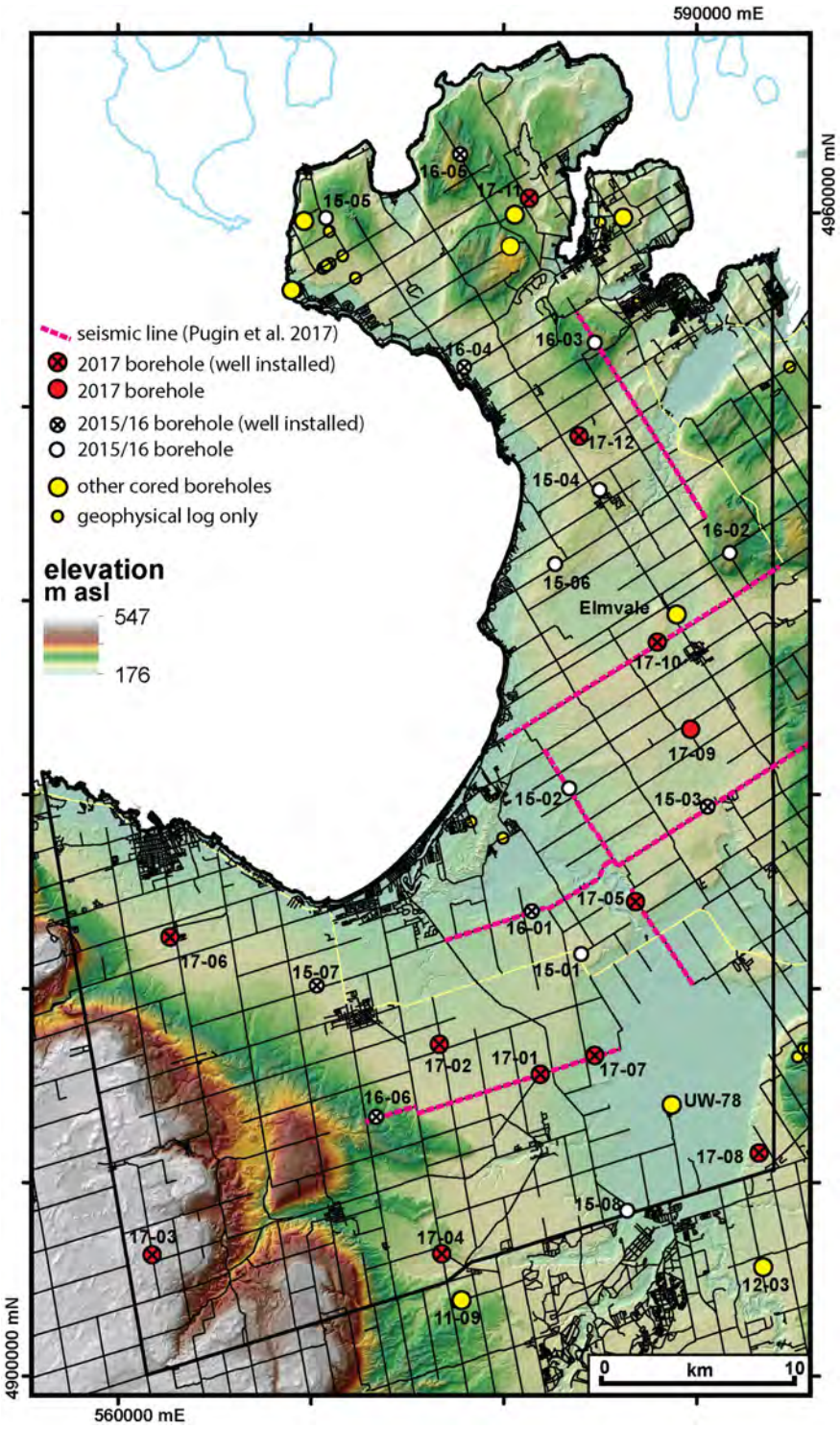


**Figure 25.1.** Map of subsurface data collected in central Simcoe County. Map shows the locations of boreholes drilled in 2017 (red circles); the locations of boreholes drilled in 2015 and 2016 (white circles); and the locations of previously drilled boreholes (larger yellow circles). Seismic transect data *from* Pugin et al. (2017). Boreholes not drilled as part of this study are *from* Bajc (1994: unlabelled boreholes P92-01–P92-05 (near top of figure)), *from* Bajc et al. (2015: [SS-]11-09 and [SS-]12-03 (near bottom of figure)) and *from* Fitzgerald (1982: UW-78). The Elmvale borehole was drilled to support local field groundwater geochemistry investigations led by Dr. W. Shotyk (R.P.M. Mulligan, unpublished data, 2012–2013). Map features are overlain on digital elevation model (DEM) image (hillshade) (from Ministry of Natural Resources 2010). Universal Transverse Mercator (UTM) co-ordinates are provided using North American Datum 1983 (NAD83) in Zone 17N.

surface is characterized by a broad, but poorly defined, valley up to 40 km wide that appears to extend from southern Georgian Bay southeastward to Lake Ontario. At its deepest known point within the study area, the bedrock is eroded down to 81.25 m above sea level (asl). The valley likely had its origins in a preglacial drainage system (Spencer 1890), which was subsequently enhanced by multiple Quaternary glacial episodes (Gao 2011; Mulligan and Bajc, in press; D.R. Sharpe, Geological Survey of Canada, written communication, 2017).

Overlying the bedrock valley, Quaternary sediments form successions greater than 150 m thick beneath uplands in the north and east and up to 139 m beneath lowlands in the central parts of the study area. Previous drilling by the author has identified 4 major stratigraphic packages overlying bedrock in the study area (Mulligan 2016). These packages bear strong similarities to those identified by previous OGS drilling investigations to the south (Bajc et al. 2015) and east (Burt and Dodge 2011), although the subunits within the sediment groups show significant local variations and their subsurface relationships remain difficult to fully establish. Quaternary sediment successions encountered in 2017 reached a maximum thickness of 138.75 m in borehole CS-17-09 (Figures 25.1 and 25.2), whereas drift thickness is significantly reduced in the bedrock-dominated terrain along the Niagara Escarpment with borehole CS-17-03 (not shown on Figure 25.2) encountering just 6.8 m of sediment overlying bedrock.

# RESULTS

## Bedrock Topography and Geology

The drilling conducted as part of this study represents the only boreholes and/or wells that reach the bedrock surface across large parts of the study area. Three boreholes (CS-17-11, CS-17-10 and CS-17-09) intersected Precambrian bedrock (*see* Figures 25.1 and 25.2; Photo 25.1A), bringing the total number of new inliers in the area to 5. Of note is that 3 of the 5 intersections of basement rock (boreholes CS-17-10, CS-17-09 and CS-15-03; *see* Figures 25.1 and 25.2) occur in a nearly straight line, oriented north-northwest to south-southeast, located 23 to 30 km south of the nearest surficial exposures of basement rocks. These 3 locations were also the lowest bedrock elevations in the project area and suggest the presence of a significant (but still poorly defined) valley and/or re-entrant eroded into the Paleozoic bedrock surface, which also coincides with a high on the underlying basement.

## Quaternary Stratigraphy

### LOWER TILLS AND GLACIOLACUSTRINE COMPLEX

The Quaternary stratigraphy is floored by a lower, coarse-grained till that is 2 to 15 m thick. It is commonly encountered directly overlying the bedrock surface and is clast rich with high proportions of Canadian Shield-derived material. Concentrations of green-grey argillaceous dolostone clasts (lower Gull River Formation?) are observed in the till (Photo 25.1B) where it floors the newly discovered bedrock valley incised down to Precambrian basement rock. The lower coarse-grained till is commonly overlain by fine-grained silt–clay rhythmites several metres thick. The rhythmites contain abundant trace fossils and partially bioturbated beds (Photo 25.1C). The rhythmites vary from thicker couplets (2–7 cm) with ice-rafted debris to clast-free, finely laminated clay. Overlying the rhythmites is a fine-grained, pebbly silt to clayey silt till up to 15 m thick (Photo 25.1D). It is widespread in the central and northern part of the study area, but is commonly absent in the south and west, apparently as a result of erosion during younger glacial cycles, although equivalent deposits are encountered extensively farther south (Bajc et al. 2015). The till is locally overlain by silt–clay rhythmites with ice-rafted debris, which are marked by a strong weathering profile, down to as much as 4.5 m through both the rhythmites and the upper part of the till (Photo 25.1E).

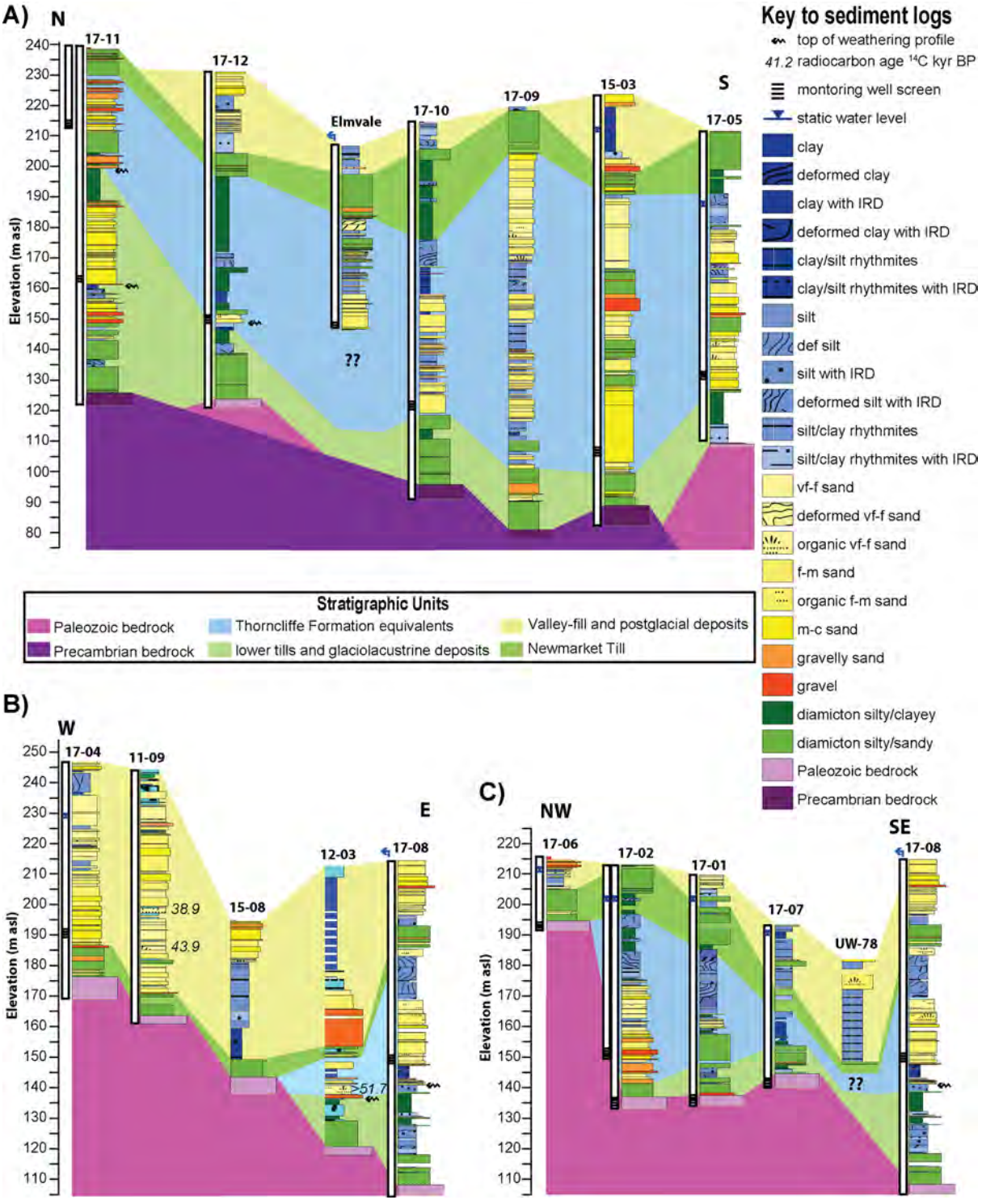


**Figure 25.2.** Cross-sectional profiles showing the relationship and general architecture of major sediment groups observed within the study area. No horizontal scale. **A**) The cross section extends from the north to the southern part of the study area, covering the relatively flat-lying lowlands to the east of Nottawasaga Bay. **B**) The cross section extends from west to east along the southern boundary of the study area. **C**) The cross section extends from the west to the southeastern corner of the study area. *See* Figure 25.1 for borehole locations; *see also* Mulligan (2016) for logs and relationships of boreholes not shown here. Abbreviations used in "Key to sediment logs": def = deformed; f-m = fine to medium grained; IRD = ice-rafted debris; m-c = medium to coarse grained; vf-f = very fine to fine grained.

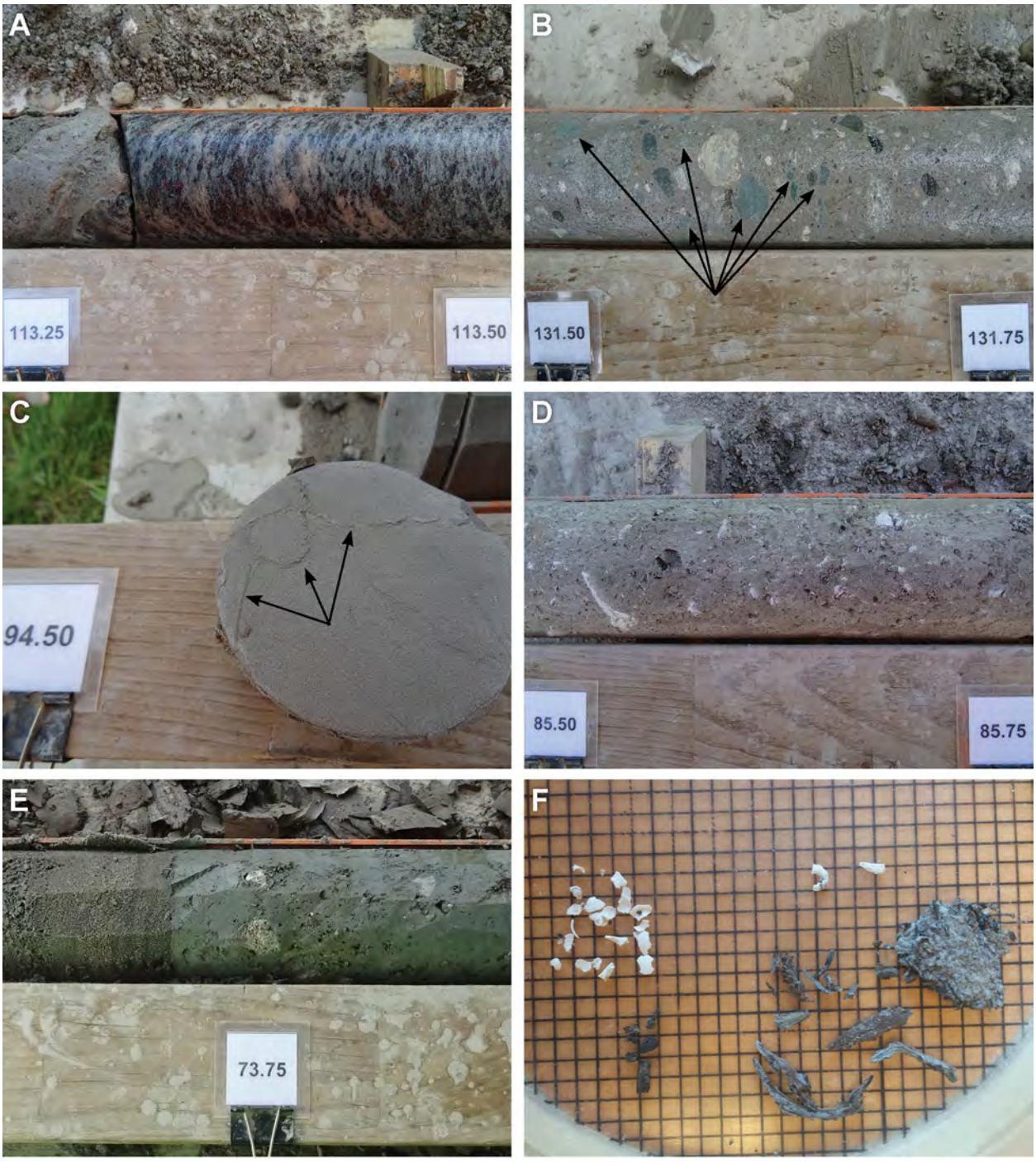


**Photo 25.1.** Characteristic sediment facies of stratigraphic units identified within the study area. Numbers indicate depth in metres below ground surface; for scale, core diameter is 8.5 cm. **A**) Grenville Province (Proterozoic) granitic gneiss directly overlain by Quaternary (Illinoisan or older) glacial till in borehole CS-17-11. **B**) Clast-rich lower coarse-grained till, rich in greenish clasts (lower Gull River Formation?) (indicated by arrows; borehole CS-17-09). **C**) Sandy parting plane with horizontal trace fossils (upper left part of core, indicated by arrows) in fine-grained rhythmites of the lower glaciolacustrine deposits (borehole CS-17-05). **D**) Gritty, pebbly facies of the lower fine-grained till (borehole CS-17-05). **E**) Oxidized upper part of the lower fine-grained till and overlying glaciolacustrine silt and clays (borehole CS-17-08). **F**) Organic material including shell fragments (unidentified gastropods and pelecypods), wood, leaves and peat mats observed in nonglacial deposits overlying the lower fine-grained till from boreholes CS-17-12 (left) and CS-17-08 (right).

At 2 locations (boreholes CS-17-08 and CS-17-12), fossiliferous sands overlie the weathering profile. Abundant organic material, consisting primarily of wood, twigs, leaves and mosses, was collected (Photo 25.1F); multiple samples were submitted for radiocarbon age determination. Numerous shell fragments (gastropods and pelecypods) were also observed and collected for analysis (*see* Photo 25.1F). The deep weathering profiles underlying the nonglacial sediments are consistent with timescales associated with a full interglacial episode. The presence of molluscs and other organic material indicative of tundra-like paleoenvironments in the nonglacial sediments indicate a transition to glacial conditions. Together, the data suggest this interval provides a record of soil development during the Illinoisan interglacial episode followed by sedimentation along lakes or streams in the colder early to Middle Wisconsin Episode during build-up of the Laurentide Ice Sheet (Mulligan and Bajc, in press).

## THORNCLIFFE FORMATION EQUIVALENTS

Thick successions (up to 113 m) of sand, gravel and diamict and/or silt and clay overlie the lower drift sequence. Finely laminated and bioturbated clays occur at the base of the unit (Photo 25.2A), likely marking the beginning of Wisconsin Episode glacial advance into central and southern Ontario. Elsewhere, sand, gravel and diamicton form fining-upward successions at the base of the unit (Photo 25.2B); these

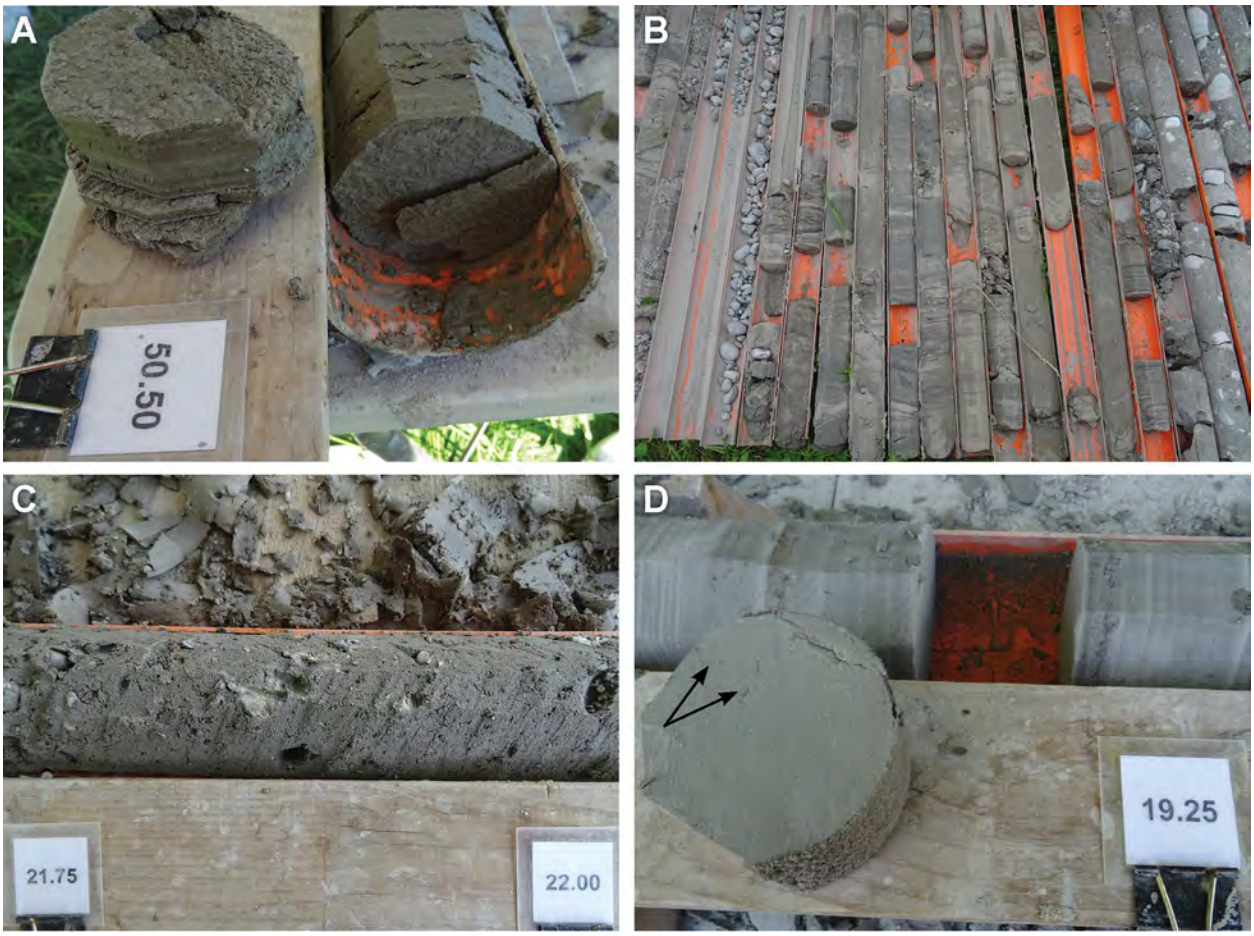


**Photo 25.2.** **A**) Bioturbated clays within the lower parts of the Thorncliffe Formation equivalents (borehole CS-17-10). **B**) Sand-rich facies of the Thorncliffe Formation equivalents overlying the lower fine-grained till (borehole CS-17-05). Top is in upper left of the photo, base is at lower right of photo. **C**) Sand-rich, well-consolidated and clast-rich facies of Newmarket Till (borehole CS-17-08). **D**) Trace fossils along silt parting planes (indicated by arrows) in silt–clay rhythmites deposited in glacial Lake Algonquin. Numbers indicate depth in metres below ground surface; for scale, core diameter is 8.5 cm.

facies likely record the approach of ice into the study area and erosion of the bioturbated clays, followed by retreat of the ice front, permitting deposition of extensive subaquatic fan sediments in lakes that bordered the ice front and covered the study area. In some areas, sand and gravel comprise the entire sediment package and, in other parts, no significant coarse-grained material was encountered (*see* Figure 25.2). Locally, significant accumulations of detrital organic, typically wood, twigs, leaves and mosses, are observed within sand-rich bodies of this stratigraphic interval. In these zones, the sediment cores have a high gas content and emit a noticeable sulphurous odour. The odour arises from *in situ* decomposition of the buried organic material through natural bacterial activity (Aravena and Wassenaar 1993; Hamilton 2015).

Within this stratigraphic package, there is a high degree of variation and architectural complexity as observed from the boreholes drilled in this study and in preliminary comparisons with surrounding water wells. Subregions within the study area locally host consistent stratigraphic successions, but their correlation with adjacent areas remains challenging in some places. Ongoing analysis of regional seismic reflection profiles collected by the GSC (Pugin et al. 2017) may assist in better assessing sediment architecture.

## NEWMARKET TILL

The Newmarket Till was encountered in all boreholes drilled in 2017. It ranges from 7 to 30 m thick and is consistently encountered on uplands, lowlands and on the Niagara Escarpment. Boreholes reveal significant variations in sediment facies and physical properties of the Newmarket Till. It is generally a pebbly to stony, well-consolidated silty sand till (Photo 25.2C) that, toward the north, becomes increasingly enriched in matrix sand content and Precambrian bedrock clasts. In some areas, the till has a silt to clayey silt texture and contains deformed (sheared and folded) silt and clay interbeds (borehole CS-17-10; *see* Figures 25.1 and 25.2A). Elsewhere, a gradational upward transition was observed, changing from laminated to deformed silt and clay of the underlying deposits, into a fine-grained stone-poor diamict that becomes increasingly sandy and clast rich (borehole CS-17-05; *see* Figures 25.1 and 25.2A). The level of matrix consolidation varies greatly: well- to highly consolidated facies predominate, but boreholes drilled on the southern flank of the "Edenvale moraine" encountered softer, crudely stratified, cobble-rich facies. The till sheet has a relatively subdued relief throughout much of the central lowlands (*see* Figure 25.2A), but significant topographic variation is observed between uplands and lowlands, particularly in the vicinity of the Minesing basin (*see* Figures 25.2B and 25.2C). Boreholes drilled in the vicinity intersect Newmarket Till at elevations as low as 144 m asl in CS-15-08 (*see* Figure 25.2B). In borehole CS-17-08, the Newmarket Till is intersected at 189.75 m asl (*see* Figures 25.1, 25.2B and 25.2C), less than 2 km to the east, the till is observed along the flanks of the adjacent uplands at 233 m asl, then can be traced eastward to an elevation of 280 to 284 m asl, where it is observed in a gravel pit 4 km east of borehole CS-17-08 and at higher elevations farther east on the uplands. Total elevation range on the till surface in the vicinity of the Minesing basin exceeds 170 m.

## VALLEY-FILL AND POSTGLACIAL DEPOSITS

Locally, thick accumulations of sand with lesser gravel and silt occur within valleys of the study area. These deposits are mapped extensively in the southwest part of the study area along the Niagara Escarpment. They were intersected in borehole CS-17-04 as well as in borehole SS-11-09, which is located 3 km to the south (*see* Figure 25.1; Bajc et al. 2015). These deposits consist primarily of medium- and fine-grained sand, with rarer pebbly or gravelly beds and minor amounts of detrital organic material (*see* Figure 25.2B). These deposits commonly form fining-upward successions and are typically draped by, or interbedded with, fine-grained glaciolacustrine silt–clay rhythmites.

Thick successions of fine-grained silt–clay rhythmites locally overlie either Newmarket Till or sandy, valley-fill sediments at lower elevations (*see* Figure 25.2). Ice-rafted debris is generally concentrated in discrete bands in the lowermost parts of the rhythmites and trace fossils may be encountered throughout (Photo 25.2D). At a few locations, poorly consolidated and crudely stratified silt-rich diamict beds are observed near the base of the fine-grained sediments (boreholes CS-17-01 and CS-17-07; *see* Figures 25.1 and 25.2C). Fine-grained sediments typically coarsen upward toward the ground surface, where, locally, thick accumulations of sand and/or gravel occur. Significant accumulations of detrital organic (wood, moss and well-preserved leaves of *Dryas integrifolia*) were intersected in the lower parts of sands that extend to surface in borehole CS-17-08.

The uppermost sediment package records fluctuating environmental conditions during ice retreat from the region (Deane 1950; R.P.M. Mulligan, Ontario Geological Survey, unpublished data, 2017). The coarse-grained sediment facies directly overlying the Newmarket Till record ice-marginal sedimentation in subaquatic fan settings during the earliest phase of deglaciation in the study area. Fine-grained rhythmites record the prior existence of ice-dammed lakes at elevations greater than 100 m above Georgian Bay. Thin diamictons in the vicinity of the "Edenvale moraine" (Chapman and Putnam 1984; *see also* Mulligan 2014, 2015) record the delivery of poorly sorted sediment to the lake floor by subaqueous debris flows and/or ice rafting associated with late-stage ice advance(s) and/or surge(s) out from the Georgian Bay basin. Coarse-grained deposits capping the sediment sequence mark the final fall of glacial lake levels in the study area.

## Hydrogeology

Several boreholes intersected potentially significant buried aquifers (sand, gravel and some bedrock units) and continue to provide valuable data on the hydraulic properties of Quaternary sediments in the region, the distribution of coarse-grained sediment bodies that may be suitable for future groundwater supply, and the locations of potentially significant recharge areas. To better inform questions surrounding the hydrogeologic significance of the Quaternary sediments in the region, monitoring wells were installed at 11 of the 12 boreholes drilled in the summer of 2017 (*see* Figures 25.1 and 25.2). If no significant aquifers were intersected within the sediment succession, a well was screened at the bedrock interface. At 2 locations, a shallow and a deep well were installed to assess the potential connectivity of locally significant groundwater flow systems. Water-level measurements have been recorded by Nottawasaga Valley Conservation Authority staff (*see* Figure 25.2) and data loggers are installed at several locations for long-term monitoring.

# FUTURE WORK

## Hydrogeology

The OGS is initiating a hydrogeological mapping project of south and central Simcoe County in 2018, building on the 3-D sediment mapping work currently underway. This integrative study is the first of its kind by the OGS, and will involve the integration of physical and hydrochemical data with the 3-D sediment model(s) that are under development. It is anticipated that the integration of physical and hydrochemical data within the sedimentary framework will provide additional data to support the mapping of recharge areas, the identification of hydraulically distinct aquifers and aquitards, and will provide information for the assessment of newly identified aquifers for water supply potential.

Future work will include the integration of existing hydrogeological data sets within the stratigraphic framework, as it is developed. Existing hydrogeological data sets comprise the OGS Ambient Groundwater Geochemistry data, the physical hydrogeological testing results of the local conservation authorities and agencies and any physical hydrogeological data that can be obtained from the water-well

information system of the Ministry of Environment and Climate Change. Groundwater sampling of the monitoring wells that have been installed for this project, as well as those for south Simcoe County, is scheduled for the summer of 2018.

## Geophysics

Additional downhole geophysical logging of the sediments and bedrock at monitoring well locations will be conducted by the GSC. These data will help integrate geologic and hydrogeologic investigations (Crow et al. 2017) and permit the full integration of seismic reflection surveys into the regional 3-D model (Pugin et al. 2017). These data collected by the GSC in Simcoe County will be prepared and made available to the public by the GSC.

## Modelling

Following completion of subsurface data collection for central Simcoe County, the project will shift to database development, model generation and product delivery. Surficial maps for the majority of the area have been released (Mulligan 2017a, 2017b) and new maps for the northernmost part of the study area are in preparation. As with other OGS 3-D sediment mapping projects, all subsurface data will be available for download following completion of all laboratory analyses (Bajc et al. 2015; Burt and Dodge 2016).

## ACKNOWLEDGMENTS

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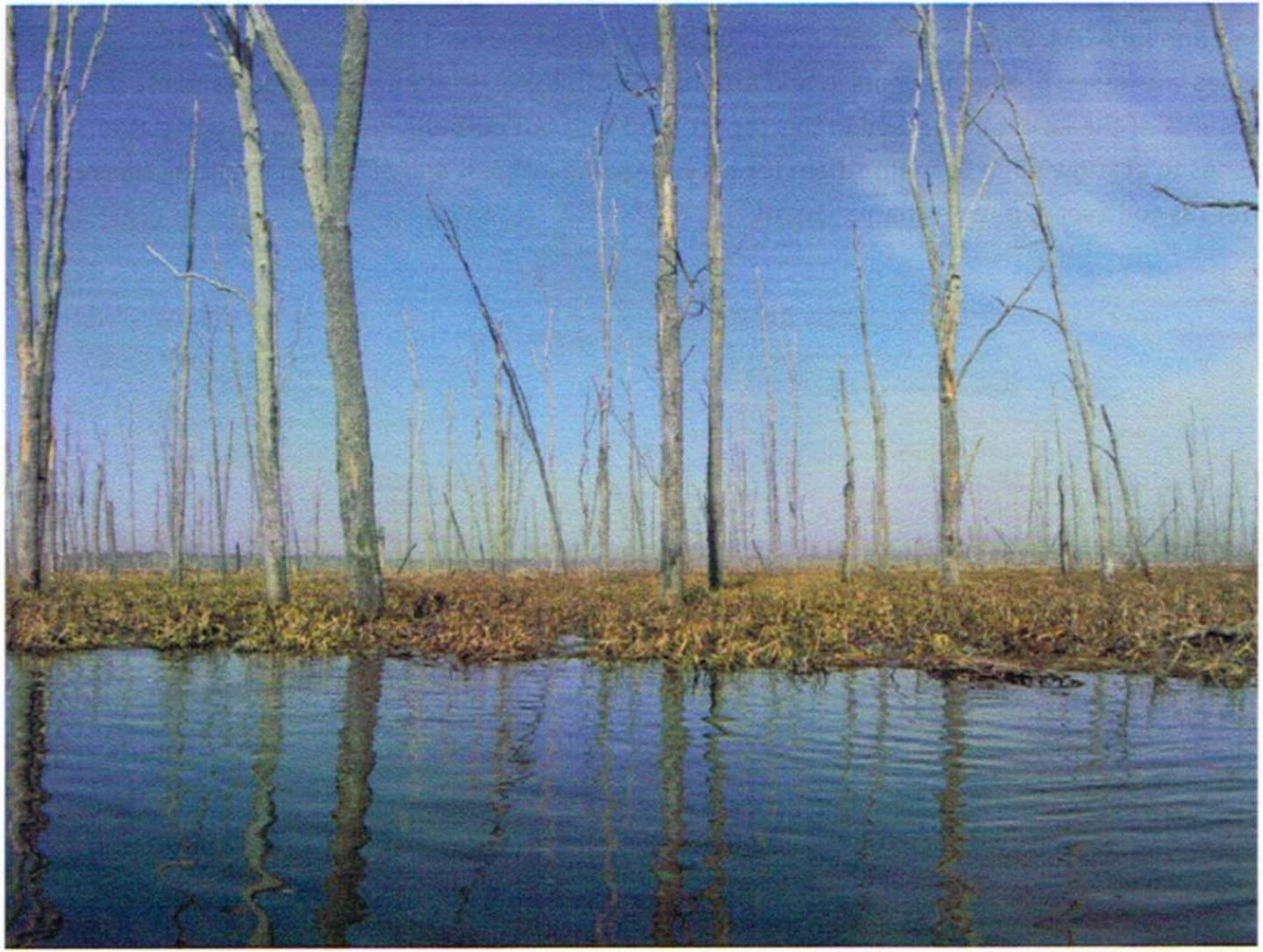
# 60 years of forest change in the Minesing Wetlands (1953-2013): Causal factors, ecological implications and recommendations for reforestation



Prepared By Sean Rootham and Dave Featherstone

MRA comments and annotation in RED

## 1.0 Introduction

The Minesing Wetlands is internationally recognized as an area of unique biological diversity and ecological importance. Located in the heart of the Nottawasaga River watershed in Simcoe County (Figure 1), the wetland complex includes swamp, marsh, and fen communities, and is one of the largest wetlands in Southern Ontario.

The Minesing Wetlands have been evolving since the retreat of North American glaciers 11,000 years ago, which left a large glacial lake (Lake Algonquin) that covered much of the Nottawasaga Valley (Simcoe Lowlands). Over time this lake drained northeastwardly toward the Ottawa Valley. Approximately 5,000 years ago, the Minesing lowlands were again inundated by rising lake levels in Georgian Bay (Lake Edenvale - Nipissing transgression). With the opening of the St. Clair River outlet, lake levels receded to present day levels and vegetation communities dominated by floodplain swamp forests, boreal forest and fen evolved over the emerging lowlands forming the Minesing Wetlands.

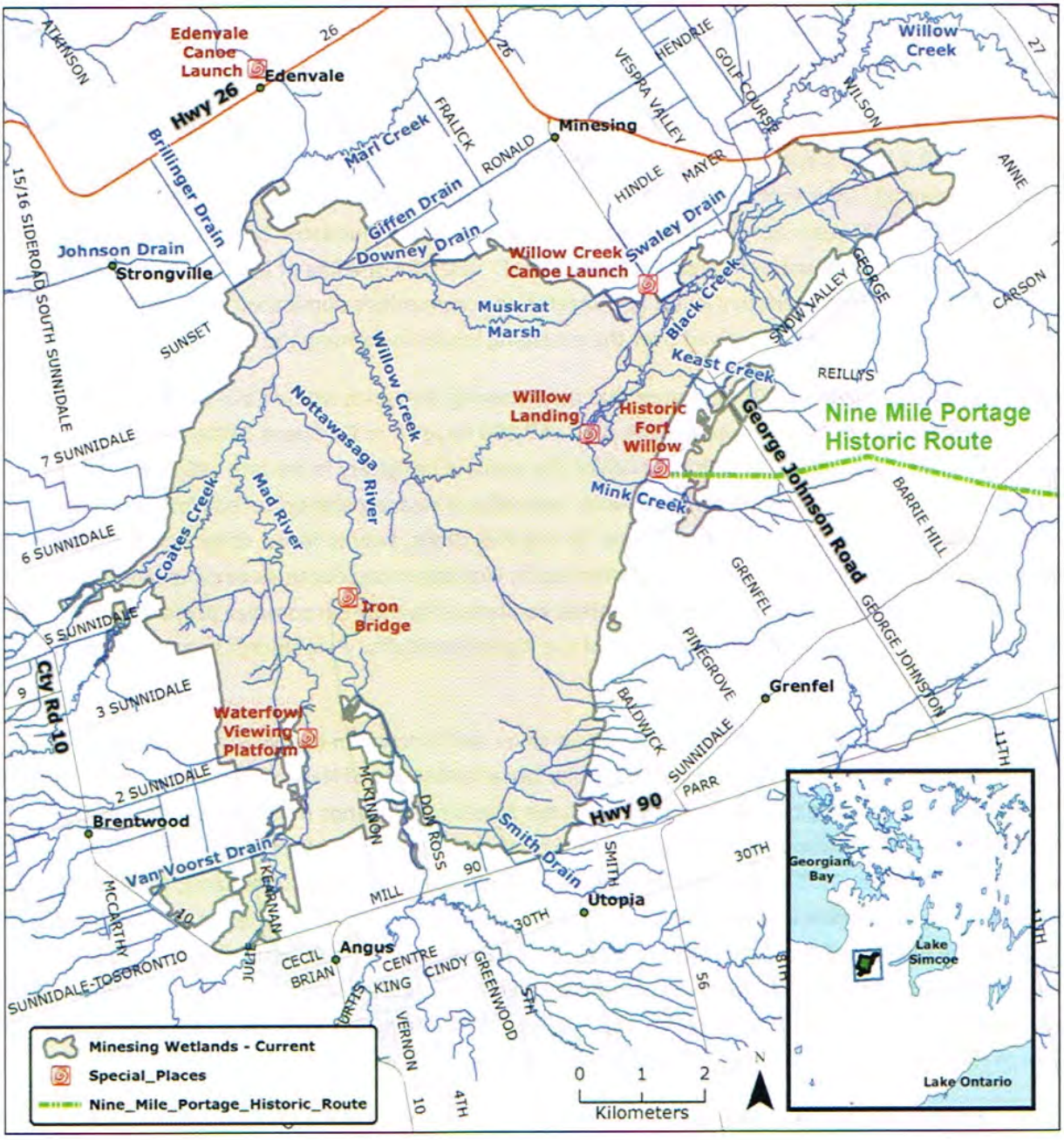
Ducks Unlimited Canada (2010) estimated that the Minesing Wetlands would have covered an area nearly twice the size of the current wetland area of 7,250 ha prior to European Settlement (Figure 2). Drainage works were undertaken along much of the wetland periphery in the late 1800s and into the 1900s to facilitate drainage of agricultural fields. Agricultural clearing also occurred along the wider, drier river levees in the heart of the wetlands. In the mid-1900s, swamp forest cover was the dominant vegetation community type in the Minesing Wetlands. Floodplain deciduous swamps comprised the majority of wetland cover with a significant mixed coniferous swamp/fen complex present in the southeast portion of the wetland at the base of the Algonquin Bluffs. Fen, thicket swamp and marsh cover was also present.

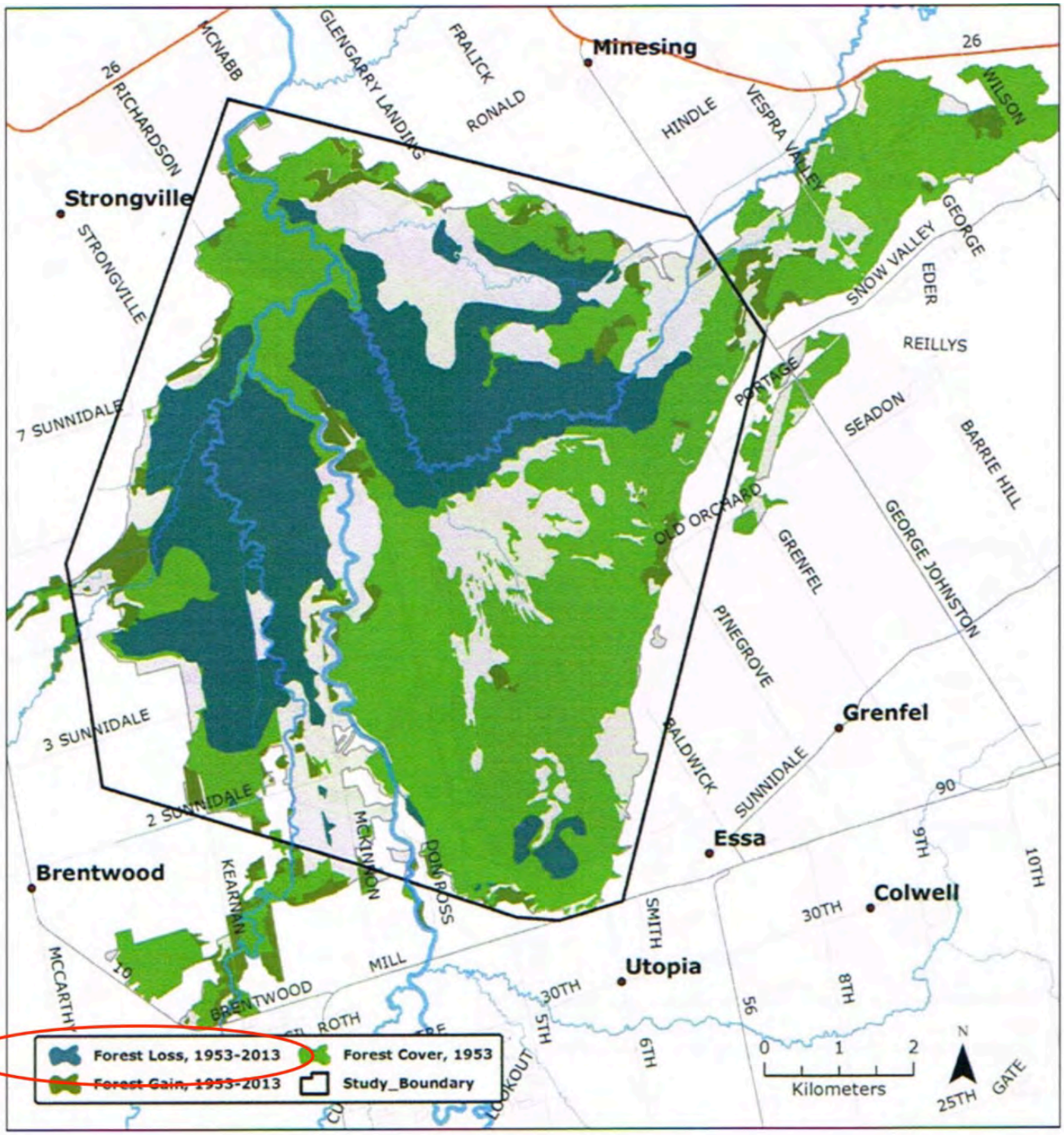
Several reports have highlighted changes in forest cover and function in the Minesing Wetlands. A master plan for the wetlands was presented to the Ontario Ministry of Natural Resources (MNR) in 1974 that described the ecological and social history in the Minesing Wetlands (Moriyama, 1974) and ecological land classification of the deciduous and coniferous forest complexes across the wetland landscape (Bobbette, 1975). A study of the Willow Creek watershed (AAA Consultants, 1977) provided a detailed account of forest loss and hydrology changes along Willow Creek. Bowles et al. (2007) also reported the dieback of floodplain swamp forests and shift to open marsh. However, a systematic review of forest loss over time has not been undertaken for the core area of Minesing Wetlands (roughly bounded by County Road 90 to the south, Highway 26 to the north, County Road 10 to the west and George Johnston Road to the east). The purpose of this report is to:

- provide a review of forest loss over time;
- assess potential causal factors associated with forest loss;
- identify the implications of forest decline on wetland features and functions;
- assess the future trajectory of forest loss; and,

- provide recommendations for watershed planning and stewardship, wetland monitoring and floodplain forest reforestation

Figure 1: Minesing Wetlands and Vicinity






Blue areas indicate the forest losses. These two areas are along the Madd River and Willow Creek

**Summary of Forest Change in the Minesing Wetlands 1953-2012**

- 1,860 ha of deciduous forest loss within the study boundary
- 240 ha of forest gain within the study boundary (220 ha deciduous forest, 20 ha coniferous forest)

timber in the Minesing Wetlands "was now beginning to die and the Swamp was becoming a menace to the health of the neighbourhood."

The 1964 Nottawasaga Valley Conservation Report (Department of Energy and Resources Management, 1964) describes post-settlement shifts in vegetation that likely reflected changing floodplain hydrology acting as a precursor to eventual forest loss. In particular the report notes that "The region drained by the Mad River where it flows into the main Nottawasaga was covered with a series of tamarack, cedar, spruce and birch swamps." "This has changed considerably since the original (presettlement – author's note) survey. The cover on this area is presently a hardwood forest, mainly of silver maple, elm and ash." This suggests a shift from mixed conifer swamp (with relatively stable flow and nutrient regimes) to a deciduous swamp adapted to fluctuating flow regimes and higher sediment/nutrient loading. Based on remnant conifer swamp cover along the east edge of the Minesing Wetlands near Fralick Road, similar changes may have been occurring concurrently within the Willow Creek portion of the wetland. Further research utilizing original pre-settlement surveys could shed further light on shifts in forest community composition.

AAA Consultants (1977) prepared an assessment of watershed conditions for Willow Creek that stated increases in water discharge and sedimentation was the result of upstream drainage alteration that had reduced the flood storage capacity and moisture regime of the wetland. They also observed that this change was beginning to impact plant biology, especially tree composition and viability as noted with the tree die-off of the bottomland forest around Willow Creek. Moriyama (1974) pointed out that due to historical land clearing and drainage alteration there was an increase in the intensity of sedimentation runoff into the Minesing Wetlands resulting in the formation of levees along forested areas and creating a backlog of water levels in lower lying areas. The result was longer periods of inundation and die-off of non-water tolerant plants (Moriyama, 1974). Decline of deciduous forests would have reduced evapotranspiration during the growing season resulting in greater persistence of wet conditions, which likely exacerbated floodplain forest decline.

### 4.1.2 Levee Breaks/Crevasse Splays

Building on Moriyama's (1974) work, the Minesing Wetlands has acted as a "delta" for receiving river systems since the recession of post-glacial Lake Algonquin (approximately ten thousand years ago). Naturally aggrading river systems would have developed from centuries of sediment transport into the wetlands. These systems are characterized by natural levee development and levee breaks (avulsions) often referred to as "crevasse splays" (Keddy, 2010). In some areas (i.e. along the Mad River north of Concession 2), levees were further enhanced by farmers to protect farmland from spring flooding.

Changes in land use during the settlement period increased sediment transport to the wetland and likely resulted in further channel bed aggradation. Increased channel bed aggradation may have increased incidences of levee breaks (crevasse splays), which, in turn, would have resulted in locally wetter conditions in floodplain forests beyond the levees.

In addition to channel bed aggradation, extreme floods as well as log and ice jams also trigger crevasse splays (Keddy, 2010). Hurricane Hazel in 1954 triggered extreme flooding/sediment deposition and no



https://minesingwetlandsfriends.files.wordpress.com2013/12minesing_forestloss_may8_14_final.pdf

Photo: C.G. Evans

# Hine's Emerald
*(Somatochlora hineana)* in Ontario

# Ontario Recovery Strategy Series

Recovery strategy prepared under the *Endangered Species Act, 2007*

*Natural. Valued. Protected.*

Ministry of Natural Resources

Ontario

# About the Ontario Recovery Strategy Series

This series presents the collection of recovery strategies that are prepared or adopted as advice to the Province of Ontario on the recommended approach to recover species at risk. The Province ensures the preparation of recovery strategies to meet its commitments to recover species at risk under the Endangered Species Act (ESA) and the Accord for the Protection of Species at Risk in Canada.

### What is recovery?

Recovery of species at risk is the process by which the decline of an endangered, threatened, or extirpated species is arrested or reversed, and threats are removed or reduced to improve the likelihood of a species' persistence in the wild.

### What is a recovery strategy?

Under the ESA a recovery strategy provides the best available scientific knowledge on what is required to achieve recovery of a species. A recovery strategy outlines the habitat needs and the threats to the survival and recovery of the species. It also makes recommendations on the objectives for protection and recovery, the approaches to achieve those objectives, and the area that should be considered in the development of a habitat regulation. Sections 11 to 15 of the ESA outline the required content and timelines for developing recovery strategies published in this series.

Recovery strategies are required to be prepared for endangered and threatened species within one or two years respectively of the species being added to the Species at Risk in Ontario list. There is a transition period of five years (until June 30, 2013) to develop recovery strategies for those species listed as endangered or threatened in the schedules of the ESA. Recovery strategies are required to be prepared for extirpated species only if reintroduction is considered feasible.

### What's next?

Nine months after the completion of a recovery strategy a government response statement will be published which summarizes the actions that the Government of Ontario intends to take in response to the strategy. The implementation of recovery strategies depends on the continued cooperation and actions of government agencies, individuals, communities, land users, and conservationists.

### For more information

To learn more about species at risk recovery in Ontario, please visit the Ministry of Natural Resources Species at Risk webpage at: **www.ontario.ca/speciesatrisk**

## RECOMMENDED CITATION

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**Cover illustration:** Mature male Hine's Emerald two kilometres southeast of Minesing Wetlands. C.G. Evans 2010.

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*Cette publication hautement spécialisée* Recovery strategies prepared under the *Endangered Species Act, 2007*, *n'est disponible qu'en Anglais en vertu du Règlement 411/97 qui en exempte l'application de la Loi sur les services en français. Pour obtenir de l'aide en français, veuillez communiquer avec Cathy Darevic au ministère des Richesses naturelles au 705-755-5580.*

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- Dan Soluk (University of South Dakota)

## DECLARATION

The Ontario Ministry of Natural Resources has led the development of this recovery strategy for the Hine's Emerald in accordance with the requirements of the *Endangered Species Act,* 2007 (ESA). This recovery strategy has been prepared as advice to the Government of Ontario, other responsible jurisdictions and the many different constituencies that may be involved in recovering the species.

The recovery strategy does not necessarily represent the views of all of the individuals who provided advice or contributed to its preparation, or the official positions of the organizations with which the individuals are associated.

The goals, objectives and recovery approaches identified in the strategy are based on the best available knowledge and are subject to revision as new information becomes available. Implementation of this strategy is subject to appropriations, priorities and budgetary constraints of the participating jurisdictions and organizations.

Success in the recovery of this species depends on the commitment and cooperation of many different constituencies that will be involved in implementing the directions set out in this strategy.

## RESPONSIBLE JURISDICTIONS

Ontario Ministry of Natural Resources
Environment Canada, Canadian Wildlife Service - Ontario

# EXECUTIVE SUMMARY

Hine's Emerald *(Somatochlora hineana*) is a globally rare dragonfly restricted to southern Ontario, Wisconsin, Michigan, Illinois and Missouri. In Ontario it is only known to occur in the Minesing Wetlands located in the County of Simcoe. It is listed as endangered under Ontario's *Endangered Species Act, 2007* due to its habitat specificity, potential threats and extremely limited geographic range. It has also been listed as endangered or extirpated throughout its known global range.

The key features used to distinguish Hine's Emerald from other similar species are the unique conformations of its sexual appendages or genital plates on the end of the abdomen, dark metallic green thorax with two creamy yellow lateral stripes and its relatively large size (60-65 mm long and 90-95 mm wingspan).

Hine's Emerald is restricted throughout its range to calcareous wetlands (marshes, sedge meadows and fens) dominated by graminoid vegetation and fed primarily by groundwater seeps. Adult males occur in seepage areas and fens and adjacent margins, whereas females are usually found in dry meadows, sometimes in adjacent forest openings, only coming into wetlands to lay eggs. Adults may also utilize adjacent forests, gravel roads, trails and fields for foraging before returning to the wetlands to mate and lay eggs. Hine's Emerald deposit eggs in shallow channels or sheetflow in areas of herbaceous vegetation in marshes, meadow marshes and fens. The larvae remain in cool, shallow, slowly-moving waters of spring-fed marshes, alkaline fens, mineral-rich fens with shallow creeks, springs, small pools, marl deposits and calcareous marshy streams for three to five years before emerging as adults. In some locations, larvae use crayfish burrows, mainly of Digger Crayfish or of Devil Crawfish (also known as Meadow Crayfish), as refuge habitat in the summer and winter months. Crayfish burrows are thought to be a critical component of Hine's Emerald habitat where seasonal drought and freezing occurs and may be a factor limiting its distribution.

The main threats to this species in Ontario are habitat loss due to changes in surface and sub-surface hydrology (including water quality), competition from invasive species (Garlic Mustard, Purple Loosestrife, Glossy Buckthorn and the non-native genotype of Common Reed) and vegetation succession from native species. The inter-species dependency of Hine's Emerald on Digger Crayfish indicates that threats to the persistence of burrowing crayfish in Ontario would have a severe negative effect on Hine's Emerald.

The recovery goal for Hine's Emerald is to prevent any loss of population, genetic diversity or habitat functionality at extant sites or at any other extant locations which may be identified in the future in Ontario.

The recovery objectives outlined to achieve this goal are as follows:

- protect and maintain the quantity and quality of Hine's Emerald habitat and habitat functionality, including the hydrological and hydrogeological function;
- reduce or mitigate threats to Hine's Emerald and its habitat;

- increase knowledge of Hine's Emerald biology in Ontario including distribution, abundance, life history and habitat needs; and
- increase public awareness and understanding of Hine's Emerald and its habitat in Ontario.

It is recommended that the area regulated as habitat include all extant locations. In Ontario, this currently includes only the Minesing Wetlands. In order to protect both the adult and larvae stages of Hine's Emerald, it is recommended that the area prescribed as habitat include fen and wetland meadows, (i) where Hine's Emerald have been observed and (ii) that are connected by surface or ground water to areas where Hine's Emerald have been observed. In addition to these areas the prescribed habitat should also include 500 metres beyond each of these habitats. For the purposes of perching, movement and roosting, all forests and dry meadows that are adjacent to the areas described above should also be prescribed as habitat.

To allow for migration and dispersal between habitat patches used by Hine's Emerald it is recommended that corridors connecting the habitat areas described above be prescribed as habitat. Corridors are believed to be both natural (creeks, swales and other water features) and anthropogenic features (trails, utility rights-of-way and gravel roads) that have forested edges or riparian habitat.

Due to the dependence of Hine's Emerald habitat on groundwater recharge it is recommended that prescribed habitat include the Snow Valley Uplands, where the current regional groundwater infiltration regime is maintained for the entire Minesing Wetlands.

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# 1.0 BACKGROUND INFORMATION

## 1.1 Species Assessment and Classification

| |
|---|
| COMMON NAME: Hine's Emerald |
| SCIENTIFIC NAME: *Somatochlora hineana* |
| SARO List Classification: Endangered |
| SARO List History: Endangered (2012) |
| COSEWIC Assessment History: Endangered (2011) |
| SARA Schedule 1: No Schedule, No Status |
| CONSERVATION STATUS RANKINGS:<br>GRANK: G2G3 NRANK: N1 SRANK: S1 |

The glossary provides definitions for technical terms, including the abbreviations above.

## 1.2 Species Description and Biology

Species Description

Hine's Emerald (*Somatochlora hineana*) is a dragonfly in the Family Corduliidae (Order Odonata), more commonly known as Emeralds. Emeralds are characterized by their brilliant emerald green eyes (USFWS 2001).

Identification of adults in flight is difficult between species of the Emerald family, particularly of the genus *Somatochlora*. These species are generally very difficult to track in flight as they are extremely swift, erratic and agile. They have excellent evasive abilities and cryptic colouration. Hine's Emerald tends to fly high, often in dappled shade. However, in the United States they are often observed flying low over the breeding habitat during male terrestrial patrols and female oviposition flights, making identification discernible with aid of binoculars (P. McKenzie, pers. comm. 2012). In Ontario, the habitat of Hine's Emerald is quite rare and often remote, making access very difficult. These attributes make this species very difficult to locate and even harder to capture and identify (C.G. Evans pers. obs.).

The most similar species to Hine's Emerald are the Clamp-tipped Emerald (*S. tenebrosa*), Williamson's Emerald (*S. williamsoni*) and the female Brush-tipped Emerald (*S. walshii*). The key features that distinguish Hine's Emerald from these other species are its unique conformation of sexual appendages of the male and genital plates of the female on the end of the abdomen, either the terminal appendages (or claspers) for males or the ovipositor (or genital plates) for females. These features are readily

discernible in the hand but rarely inflight (USFWS 2001). Other features used to distinguish adults from other species in the genus *Somatochlora* with similar sexual appendages include its dark metallic green thorax with two creamy yellow lateral stripes, and its relatively large size (60-65 mm long and 90-95 mm wingspan).

The larvae or nymphs of different species in the genus *Somatochlora* are extremely similar, and reliable identification can only be made in final instar larvae using characteristics observable only under a microscope (Cashatt and Vogt 2001). The only identification key available that includes Hine's Emerald describes the final instar larvae only (Cashatt and Vogt 2001). Thus, accurate identification of earlier instars is not possible except by genetic analyses, but such analyses have not been undertaken in Ontario (P. McKenzie and T. Cashett, pers. comm. 2012).

Species Biology

Similar to other dragonflies, Hine's Emerald undergoes incomplete metamorphosis involving three stages: aquatic egg, aquatic larva (nymph) and terrestrial/aerial adult (COSEWIC 2011). The majority of the three to five year lifespan of Hine's Emerald is spent in the aquatic larval stage (COSEWIC 2011). During this stage, they are thought to be opportunistic sit-and-wait predators that prey upon small aquatic invertebrates including mayflies (Ephemeroptera), caddisflies (Trichoptera), oligochaete worms, and also likely upon isopods, smaller dragonfly larvae, mosquito larvae, other worms, snails and even small fish (USFWS 2001, COSEWIC 2011).

As water temperatures drop in the fall, the larvae become less active and little is known about their overwintering ecology. However, in the summer and winter months they have been found inside crayfish burrows (COSEWIC 2011). During the larval period, Hine's Emerald larvae grow and molt several times before they reach their final instar. Hine's Emerald larvae appear to be physiologically well adapted to survive periodic conditions of drought (USFWS 2001, COSEWIC 2011).

Once in their final instar, larvae climb from the water onto emergent vegetation for their final transformation into adults. Emergence of Hine's Emerald dragonflies continues throughout the summer and peak emergence in Ontario occurs for two to three weeks in early to mid-June (COSEWIC 2011).

Newly-emerged adults seek out protection in vegetation, where over a period of a few days, their bodies harden and their sexual organs mature (Corbet 1999). Prior to reproducing (the pre-reproductive stage), adults spend 7 to 10 days aerially foraging on gnats, mosquitoes and other small flying insects (USFWS 2001). During this pre-reproductive stage, they may forage up to three kilometres away from their larval habitats, foraging most actively in the morning but continuing throughout the day and possibly into dusk (USFWS 2001). Foraging may occur over open fields and wet or dry meadows, along hedgerows or forest margins, or along narrow roads. Foraging flight varies from fast, low (less than two metres), along roads or trails up to one kilometre long, to slow, high (treetop height), circuitous floating flights near forest/meadow margins (USFWS 2001).

During the reproductive stage, which is approximately two to four weeks long, adult males establish small territories near forests or swamps suitable for mating and near aquatic habitat suitable for ovipositing (Cashatt and Vogt 1990, Vogt and Cashatt 1994). Insufficient data on natural breeding exist to date to delineate the breeding season for the Ontario population. However, based on the breeding season for Hine's Emerald in the climactically similar zone of Michigan, the breeding season in Ontario likely extends from late June to late July (MOS Tech. Note # 3, 2001). Adults also continue to forage, flying up to two kilometres away from their breeding sites (Cashatt and Vogt 1990, Vogt and Cashatt 1994). Males defend their territories making fast flights back and forth and occasionally hovering over territories that range in size from two to four square metres (Cashatt and Vogt 1990, Vogt and Cashatt 1994). A female entering a male's territory is intercepted by the male and mating occurs on nearby vegetation (Cashatt and Vogt 1990, Vogt and Cashatt 1994). After fertilization, the females then repeatedly insert the tip of their abdomens into mud or shallow water, ovipositing up to 200 eggs (COSEWIC 2011).

The adult lifespan of Hine's Emerald is typically four to six weeks (Zercher et al. 2001) but may extend up to a maximum of a few months; i.e., seven to ten days pre-reproductive, two to four weeks reproductive and up to several weeks post-reproductive (COSEWIC 2011).

Hine's Emerald dragonflies are vulnerable to predation during all life stages. Aquatic larvae may be eaten by larger predatory insects (e.g., larger dragonfly larvae), crayfish, amphibians, fish, wading birds, shorebirds, dabbling ducks and turtles (USFWS 2001). Emerging larvae are vulnerable to predation by birds and frogs. Adults, particularly soft, poorly flying newly-emerged adults, are also susceptible to predation by birds and frogs as well as to spiders and even larger dragonflies (USFWS 2001).

## 1.3 Distribution, Abundance and Population Trends

Hine's Emerald is endemic to North America and is listed as endangered or extirpated throughout its entire distribution. In the United States of America, the species is known to occur in the states of Wisconsin, Michigan, Illinois and Missouri (Figure 1). Historically, the species was known from the states of Ohio, Indiana and Alabama (Figure 1; Vogt and Cashatt 1994, COSEWIC 2011). In Canada, the species is known only from a single location in southern Ontario – the Minesing Wetlands and immediately adjacent areas (Figure 1). Based on COSEWIC convention, the extent of occurrence for this site is considered to be 28 $km^2$ (COSEWIC 2011).

The Ontario occurrence is thought to contain a single population (COSEWIC 2011), hereby referred to as the Minesing Wetlands population. Minesing Wetlands is located in the County of Simcoe, located between the towns of Barrie and Wasaga Beach. It had been suspected that Hine's Emerald may be present in Ontario due to presence of similar habitats found at known sites in the United States. This led to targeted surveys

between 1999 and 2002, all of which resulted in negative findings (COSEWIC 2011). In June 2007 a single male was observed and photographed by a local naturalist of Minesing Wetlands (report co-author, Christopher Evans) and identified by Colin Jones (Ontario Ministry of Natural Resources, OMNR). Significant survey efforts in 2007 to 2009 resulted in additional captures of adults and nymphs at Minesing Wetlands, providing a better delineation of adult and larval habitat ranges. Twenty-eight other sites that were identified as having appropriate habitat were searched (see COSEWIC 2011 for details). Although Hine's Emerald have not been found at these sites to-date, it should be noted that negative survey results are not uncommon for this species where it is extant (COSEWIC 2011). Experts suggest there is a high likelihood of extant Hine's Emerald populations at least at some of these twenty-eight locations. Further surveys are necessary to investigate this possibility.

Species abundance of the Ontario population is currently unknown. Mark-recapture methods have been used to estimate adult populations ranging from 1,710 (Lockport Prairie, Illinois) to 118,140 (the Ridge Sanctuary, Wisconsin) at other locations. However, these methods are not thought to be appropriate for long-term monitoring (Soluk et al. 1998 in COSEWIC 2011) and there are currently no known recommendations for population estimates that are suitable for long-term monitoring.

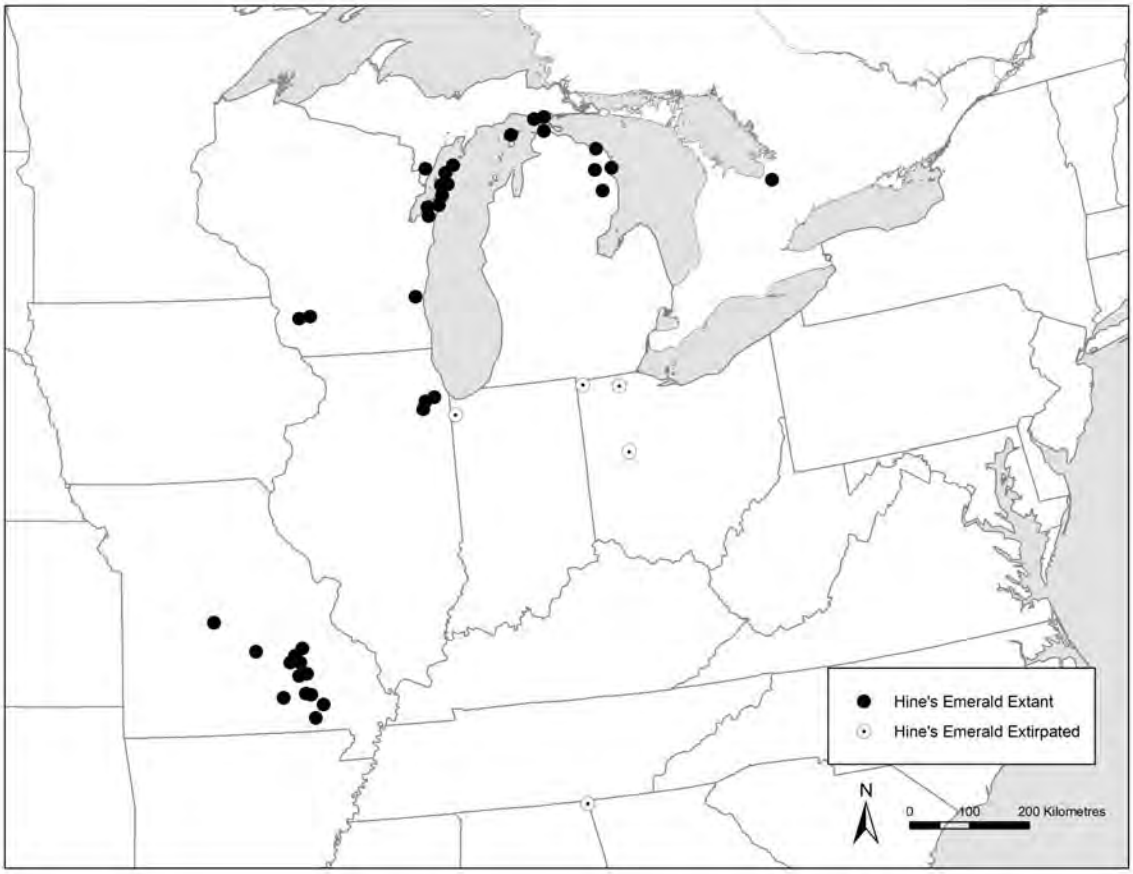


Figure 1. Extant and extirpated locations of Hine's Emerald in North America (adapted from COSEWIC 2011).

## 1.4 Habitat Needs

Hine's Emerald is a species found in calcareous wetlands including marshes, meadow marshes and fens dominated by graminoid vegetation (particularly sedges) which are fed primarily by groundwater from intermittent seeps (COSEWIC 2011). Most sites also have an underlying layer of shallow dolomitic bedrock (Cashatt and Vogt 2001).

Limestone bedrock of the Verulam Formation underlies the Minesing Wetlands at a depth of 60 to 90 metres (Hanna 1982) which is atypical for Hine's Emerald sites, however thick glaciolacustrine silts and clays underlay the wetland complex (Post 2009). These deposits act as an impermeable layer which directs seepage flows from the adjacent bluffs laterally (northwest) through the fen thereby providing hydrogeological conditions which are similar to the shallow bedrock sites where Hine's Emerald is found in the United States (Post 2009, COSEWIC 2011).

Hydrogeochemical analysis of Minesing Wetlands groundwater indicates that the fen is dominated by calcium and bicarbonate ions with the postulated source being from deep groundwater or mineral soils below the peat, regionally originating from the outcropping aquifers at the stranded glacial shoreline deposits and through shallow peat (Bradford 1999). Groundwater discharge along the eastern margin could account for the observed hydrogeochemical trends from the bluffs towards the fen along the principal direction of groundwater flow (Bradford 1999).

Adults use various habitats for foraging, resting, breeding and movement. As discussed in the species biology section, adults forage and breed in wet habitats such as marshy areas and open water. This includes habitats such as cattail seepage marshes, seepage sedge meadows, sedge hummocks near marshy stream edges, swales, muck, sluggish water at the edge of springs, small puddles, streamlets and in marl/muck bottomed pools (COSEWIC 2011). Adjacent forest areas provide protected, shaded areas for perching and roosting (USFWS 2001). Corridors between habitat patches are essential for movement and dispersal. Areas used as corridors include marshes, sedge meadows, dolomite prairie, fringing shrubby and forest areas bordering wetlands (Foster and Soluk 2004).

There are some observed differences in habitat use between male and female Hine's Emerald. Generally, adult males of this species occur in seepage areas and fens, whereas the females are usually found in dry meadows, only coming into wetlands and aquatic habitat to lay eggs (Foster and Soluk 2006). Adult females deposit eggs in shallow channels or sheetflow in areas of herbaceous vegetation in marshes, meadow marshes and fens (Cashatt and Vogt 2001). Soil types range from organic muck to mineral soils such as marl (COSEWIC 2011). It should be noted that to date there have been no observations of Hine's Emerald laying eggs in Ontario.

In Ontario, the known habitat of Hine's Emerald is restricted to the Minesing Wetlands and immediately adjacent areas, where adults have been found in open string fen areas (elongated openings), fallow farm fields, forests, trails and roadside openings

(COSEWIC 2011). The habitat in the open fens of Minesing Wetlands is dominated by herbaceous plants and include, Bog Buckbean (*Menyanthes trifoliata*), Twig Rush (*Cladium mariscoides*), Beaked Spike-rush (*Eleocharis rostellata*), sedges (such as *Carex limosa*, *C. livida*, *C. chordorrhiza*), Common Bog Arrow-grass (*Triglochin maritima*) and the native Common Reed (*Phragmites australis* ssp. *americanus*). "String islands" of Tamarack (*Larix laricina*) and Eastern White Cedar (*Thuja occidentalis*) swamp forest lie adjacent to these open fen habitats (COSEWIC 2011).

Larvae are found in cool, shallow, slowly-moving waters of spring-fed marshes, alkaline fens, mineral-rich fens with shallow creeks, springs, small pools, marl deposits and calcareous marshy streams (Pintor and Soluk 2006). In the northern United States, Hine's Emerald larvae often inhabit crayfish burrows to seek refuge, especially during drought periods (Pintor and Soluk 2006). In Missouri, Hine's Emerald larvae have only been found in crayfish burrows (P. McKenzie, pers. comm. 2012). The burrows used have been found to belong to semi-terrestrial crayfish [i.e., Devil Crawfish (also referred to as Meadow Crayfish, *Cambarus diogenes*) in the United States and Digger Crayfish (*Fallicambarus fodiens)* in the Minesing Wetlands (COSEWIC 2011)]. The presence of crayfish burrows likely represents a critical component of Hine's Emerald habitat, possibly limiting its distribution from otherwise suitable sites (Pinto and Soluk 2006, COSEWIC 2011).

Digger Crayfish construct fairly complex burrows mainly in wetlands but also in roadside ditches, temporary bodies of water and creek banks (Guiaşu 2007, Crandall 2010). These burrows are often made in clay or muck soils with the mud chimneys being the only portion exposed above ground (Guiaşu 2007). Despite Digger Crayfish being the most wide-spread species of the Cambaridae family, occurring in 21 states and one province (Ontario), it is not locally common and occurs in isolated patches (Guiaşu 2007).

## 1.5 Limiting Factors

The low number of extant populations and restricted range in North America emphasizes the extremely narrow habitat preferences of Hine's Emerald. Fen habitats like those associated with the Minesing Wetlands population comprise less than a fraction of one percent of the total wetland area south of the Canadian Shield in Ontario (Riley 1989) and suitable community types of sufficient size are found in only a portion of these habitats.

Despite significant searches for additional populations in south-central Ontario, Minesing Wetlands remains the only known population in Ontario and Canada. Though negative survey results do not necessarily suggest absence of other small populations, the negative results to date suggest that Hine's Emerald may only occur at very few additional Canadian locations (COSEWIC 2011).

It is likely that the presence of crayfish burrows and perhaps burrows related to particular crayfish species may be a limiting factor to Hine's Emerald distribution.

## 1.6 Threats to Survival and Recovery

Alteration of Hydrology (high threat)
Reduced groundwater inputs associated with proposed development or climate change could directly impact Hine's Emerald breeding sites by reducing the water necessary to maintain larval habitat (COSEWIC 2011). Minesing Wetlands is a provincially and internationally significant wetland, thus it is afforded protection under Ontario's *Planning Act – Provincial Policy Statement*[1]. However, depending on the type of adjacent land use, activities may still alter the hydrology of the wetland. Land use in this upland area currently comprises agriculture and low to medium intensity rural residential developments.

The fen habitats in Minesing Wetlands are sustained primarily by groundwater seepage. Maintenance of current hydrogeological functions that support Hine's Emerald habitat is dependent on effective management of recharge areas in the adjacent uplands (Post et al. 2010). Any changes to surface and sub-surface hydrology that affect the quantity of groundwater flow are likely to negatively impact larval habitat and consequently reduce populations of Hine's Emerald (USFWS 2001).

Snow Valley Uplands[2] is the recharge area that supports the groundwater aquifer feeding the east portion of the Minesing Wetlands (Post 2009). This groundwater system provides the framework for wetland habitats that support Hine's Emerald, as well as habitat for other sensitive species at risk. Portions of the upland recharge area are designated for current and proposed residential development (Township of Springwater Official Plan 1998 and County of Simcoe Official Plan 2007) that could reduce the quantity of groundwater recharge through creation of impermeable surfaces. Additionally, municipal water supplies from local wells may also reduce the quantity of groundwater moving toward Minesing Wetlands. Reduced recharge and increased water-taking could potentially impact groundwater seepages at the base of the bluffs that support Hine's Emerald habitat (Post pers. obs.).

Climate change may also potentially impact hydrogeological conditions that support Hine's Emerald habitat (Davies and Simonovic 2005). Winter and summer air temperatures are expected to increase over time (Portmann et al. 2009). Precipitation trends are less certain, although most models indicate an increase in extreme events (droughts and floods) and "flashier" storm events (Zedler 2010). Projected increases in wind speeds could increase evapotranspiration in the Lake Huron basin (Snyder et al. 2011). Any one factor or a combination of these factors could decrease the volume of

[1] The Planning Act – Provincial Policy Statement protects the area deemed provincially significant and up to 120 meters surrounding this area
[2] See Figure 1.1 in Spoelstra and Post 2012 for a description of the Snow Valley Uplands.

precipitation and runoff recharging the Snow Valley Upland aquifer and the resulting seepage in the Minesing Wetlands.

Altered hydrology can also lead to vegetation succession. Succession is restricted based on hydrological conditions in the open fen of Minesing Wetlands. If the hydrology is altered, succession may reduce the availability of suitable breeding and larval habitat. Thus, indirectly, reduced groundwater flows across the open fen habitats could impact Hine's Emerald breeding sites by changing the composition of the vegetation community (COSEWIC 2011). Open graminoid fen sites could shift to shrub fen or conifer swamp communities. This would reduce the amount of appropriate larvae and breeding habitat for Hine's Emerald.

Contamination of Groundwater (low threat)

Contamination of groundwater is a potential threat to Hine's Emerald habitat (USFWS 2001). The permeable sands and gravels associated with the Snow Valley Uplands provide a potential conduit for contaminants to enter the underlying aquifer which feeds the Minesing Wetlands. Road salt, agricultural pesticides, agricultural fertilizers, faulty septic beds and urban contaminants are potential contaminant sources that could impact groundwater quality (Post 2009). Recent investigations indicate that slightly elevated levels of nutrients (likely from agricultural activities) and sodium/chloride (from road salt) are present in groundwater at the periphery of the Minesing Wetlands (Spoelstra and Post 2012). Although current levels are considered too low to pose a risk to ecological functions and do not persist into the open fen habitats, these elevated levels strongly indicate the link between upland recharge areas and groundwater discharge to the Minesing Wetlands. Thus, this has the potential to become a high threat to Hine's Emerald and its habitat.

Invasive Species (medium threat)

Invasive species represent another potential impact to Hine's Emerald habitat. Approximately 14 percent of the plants documented in the Minesing Wetlands area are introduced (Bowles et al. 2007). The main species of concern include Garlic Mustard (*Alliaria petiolata*), Purple Loosestrife (*Lythrum salicaria*), Glossy False Buckthorn (*Frangula alnus*) and the non-native genotype of Common Reed (*Phragmites australis ssp. australis*). These species have been known to act dominantly in certain ecosystems such as wetlands and forests, reduce habitat quality for sensitive native wildlife and compete with and directly exclude other native plants (Meekins and McCarthy 1999, Catling and Mitrow 2009, COSEWIC 2011). Of particular concern are the non-native Common Reed and Glossy Buckthorn, which are expanding throughout Ontario at an exponential rate. In the Minesing wetland, the non-native Common Reed has been documented around the periphery of the wetland complex, while the native Common Reed is found only in the fen portion of the wetland. While Glossy Buckthorn is not currently known within the Minesing Wetlands area, like the non-native Common Reed, it is also expanding rapidly in southern Ontario. If either of these non-native species continue to move into the open fen area of Minesing Wetland, this could significantly impact the open fen habitat and restrict or eliminate burrowing crayfish activity in current Hine's Emerald breeding sites.

Road Mortality (low threat)
Dragonflies are susceptible to road mortality (Rao and Girish 2007, Soluk et al. 2011), however the extent to which Hine's Emerald is impacted by road mortality in Ontario is unknown. Hine's Emerald does not seem to avoid roads, and may in fact use them as corridors (Soluk et al. 2011, C.G. Post pers. obs.). Dragonfly road mortalities generally happen in two stages: (i) dragonflies that are hit by cars exceeding 50 to 60 km/h experience severe shock and fall to the ground; (ii) dragonflies either recover from the shock and fly away or, as is usually the case, they are run over by a second vehicle (Rao and Girish 2007). This coupled with the distribution of carcasses (usually in vehicle grills), make quantifying this threat difficult.

Soluk and Moss (2003) conducted a road mortality study of a Hine's Emerald population in Wisconsin. They estimated that dragonfly road mortality rates were roughly 16 per day, and a minimum estimate of 699 per year.

Several roads surrounding Minesing Wetlands have been observed as active foraging habitat for both male and female Hine's Emerald and Harlequin Darners (*Gomphaeschna furcillata*; C.G. Evans pers. obs.). Male Hine's Emerald commonly patrol these routes in what are thought to be territorial patrols at heights of between one and two metres, which may make them vulnerable to road mortality (C.G. Evans pers. obs.). Adult females appear to forage mainly at heights greater than three metres in these areas and thus are not particularly susceptible to significant road mortality. However, one injured teneral female Hine's Emerald was removed from the surface of Portage Trail, apparently a victim of a collision with a vehicle (C.G. Evans pers. obs.). Little research has been conducted on the effects of road mortality on dragonflies and so the exact impact of this threat on the Canadian Hine's Emerald population is unknown.

Anthropogenic Disturbance to Habitat (low threat)
Fen habitats are sensitive to human disturbance, such as trampling. Unrestricted access to these habitats could impact the open fen habitats that support Hine's Emerald in the Minesing Wetlands. Disturbance of the fen habitat by all terrain vehicles (ATVs) is currently not an issue due to restricted vehicle access in the fen as well as the difficulty of the terrain. All terrain vehicles could be of potential threat to adult Hine's Emerald along the trail networks in Minesing Wetlands; the trails have restricted access but this is not easily enforced as many land owners use the trails to access their properties in Minesing Wetlands.

Direct human-caused mortality (unknown)
The exact threat from direct mortality, such as collections, is unknown. Dragonflies have longer breeding periods and generally smaller population sizes than many other insects (Soluk et al. 2011). Therefore direct mortality of an individual will likely have a larger impact on the overall population compared to species with short breeding periods and larger population sizes.

## 1.7 Knowledge Gaps

Population Size and Range

Hine's Emerald abundance in Ontario is unknown. Further, other population sizes in North America are relatively unknown. A standardized, repeatable population estimate technique is required to understand baseline populations and future trends. Adults are generally encountered during focused surveys during their summer flight period (COSEWIC 2011). Despite efforts being made to mark and recapture individuals, this technique is not favoured (COSEWIC 2011). Removal method and use of exuviae have been suggested as other potential population estimate techniques (Foster and Soluk 2004, COSEWIC 2011). However, this has proved to be unsuccessful in the Midwest United States, where there are too few excuviae or lavae to use such a method (P. McKenzie, pers. comm. 2012).

In Ontario, focused surveys from 2007 to 2009 have provided further insight into the range of Hine's Emerald in the vicinity of the Minesing Wetlands but the full extent of the population range in Minesing has likely not been fully determined to date.

Other extant populations of Hine's Emerald may be present in southern Ontario. Although focused survey efforts have failed to find any other populations, Hine's Emerald can be very difficult to find, especially in areas with small populations (COSEWIC 2011). New populations in Missouri were found only after two to three years of surveys by experts (P. McKenzie, pers. comm. 2012). Additional surveys in suitable habitats elsewhere in southern Ontario may be warranted to search for additional populations.

Dispersal

Based on current knowledge, it is unknown if any dispersal is happening between Minesing Wetlands and other Hine's Emerald populations. It is unknown how far Hine's Emerald can travel. Currently, the maximum recorded dispersal distance of an individual is 5.4 km (COSEWIC 2011). However, there are genetic studies that link populations together over larger distances. The evidence so far suggests that these dispersal events were relatively recent (approximately 4000 years ago during the Pleistocene age) leading experts to suggest that dispersal distances would be larger than the current observed maximum distance (5.4 km).

Habitat Requirements

Hine's Emerald habitat in Ontario differs from that of the populations in the United States. Similarities between sites include the importance of groundwater to Hine's Emerald habitat and the use of crayfish burrows by larvae. The populations in the United States are found in areas of shallow soil over the bedrock, whereas Minesing Wetlands has a deep layer of soil over bedrock. Thus, questions arise as to what habitat features Hine's Emerald are selecting for.

There is uncertainty about how the hydrogeological processes provide critical support for Hine's Emerald habitat in the Minesing Wetlands. Although recent hydrogeological studies (e.g., Post 2009, Post et al. 2010, Spoelstra and Post 2012) have provided important baseline information on wetland hydrogeology (groundwater levels and chemistry), a regular, dedicated monitoring program is required to fully understand seasonal habitats and to identify trends over time. Hydrogeological conditions associated with the recharge area that feeds the groundwater system which, in turn, support Hine's Emerald habitat are not well known.

Inter-species Interactions

It appears that Hine's Emerald use crayfish burrows during the larval phase of their lifecycle (USFWS 2001, COSEWIC 2011), but the nature and extent of this use is not yet understood. Studies in the United States have determined that Hine's Emerald use Devil Crawfish burrows (USFWS 2001), whereas investigations in Ontario have found Hine's Emerald in Digger Crayfish burrows (COSEWIC 2011). It is unknown if these are the only two crayfish species' burrows that Hine's Emerald use for larval habitat. It is unknown whether or not this use of burrows is obligatory, opportunistic or incidental in Minesing Wetlands, however, it has been shown to be beneficial and likely obligatory at one site in the United States (Pintor and Soluk 2006). Further study of the interaction between Hine's Emerald and burrowing crayfish in Minesing Wetlands habitats would potentially be valuable in locating other extant populations of Hine's Emerald in Ontario and Canada and in identifying and restoring historical habitats.

Identified Threats.

Most of threats listed above are not fully understood. While most experts agree that the listed threats are valid, the degree of impact (current and/or future) is uncertain. Of note are the exact threats from direct human-related mortalities and road mortalities to this population.

## 1.8 Recovery Actions Completed or Underway

Population Size and Range

In 2007 to 2009, relatively intensive Hine's Emerald (adult) surveys were undertaken in fen and boreal swamp habitats as well as upland habitats along the eastern periphery of the Minesing Wetlands. Larval habitats (crayfish burrows) were sampled and confirmed in 2008 (COSEWIC 2011). These surveys have assisted with identification of the range of Hine's Emerald habitat in Minesing Wetlands, although additional surveys may be required to document the full extent of the population range.

Genetic Studies

The Natural Heritage Information Centre (NHIC) and the Illinois State Museum (under the direction of Drs Cashett and Mahoney) are currently working together to determine the genetic diversity of the Minesing Wetlands population of Hine's Emerald. Work is being conducted on both mitochrondial and nuclear DNA sequencing from populations across the United States and Ontario. When completed we should understand the

variation within the Ontario population compared with the entire Hine's Emerald geographic range (Mahoney pers comm. 2012). This work will play an integral part of guiding future conservation efforts for this population.

Further work has been conducted in the United States which used microsatellite markers of both adult and larval Hine's Emerald adults to examine relatedness between populations in Illinois and Wisconsin (Monroe et al. 2010). An exciting part of this study was using non-lethal methods to collect genetic material (including the use of excuvae, fecal pellets and wing-clippings). Using the 10 microsatellites markers from this study will aid in understanding the population across the entire Hine's Emerald range. This work will also contribute to a greater understanding of population structure that may aid in any attempts at re-establishment or augmentation for Hine's Emerald in the United States populations.

Habitat Requirements

Recent hydrogeological studies in Minesing Wetlands (Post 2009, Post et al. 2010, Spoelstra and Post 2012) have assisted in documenting hydrogeological conditions (groundwater levels and groundwater chemistry) in ecotone gradients from the east periphery of the wetland through the boreal swamps to the open fen habitats along two transects of shallow nested monitoring wells. The 2010 study provided a useful comparison between 1999 hydrogeological and ecological conditions (Bradford 1999) and current (Post 2009) conditions.

Intensive groundwater monitoring was conducted (Bradford 1999, Post et al. 2010) at twelve locations within the wetland. Collectively, these groundwater-focused studies provide important baseline information regarding hydrogeological conditions that provide critical support for Hine's Emerald habitat in Minesing Wetlands.

Anticipated future hydrogeochemical characterization in the wetland includes:

- establishing a series of monitoring wells up-gradient of the wetland for collecting water samples and monitoring water levels in the groundwater source;
- investigating the intra-annual variability of groundwater chemistry in the wetland and in nearby upland groundwater; and
- establishing a regular monitoring program of water levels and groundwater chemistry for the Minesing Wetlands for the purpose of detecting and quantifying long-term changes (Spoelstra and Post 2012).

Habitat Protection and Stewardship

The Nature Conservancy of Canada and the Nottawasaga Valley Conservation Authority's Minesing Wetlands Natural Area Conservation Plan (2011) identifies conservation actions within Hine's Emerald habitat. Actions include working with landowners to conserve areas identified as Hine's Emerald breeding habitat, conducting a landscape connectivity analysis and monitoring and removing invasive species.

# 2.0 RECOVERY

## 2.1 Recovery Goal

The recovery goal for Hine's Emerald is to prevent any loss of population, genetic diversity, or habitat functionality at extant sites or at any other extant locations which may be identified in the future in Ontario.

## 2.2 Protection and Recovery Objectives

Table 1. Protection and recovery objectives

| No. | Protection or Recovery Objective |
|---|---|
| 1 | Protect and maintain the quantity and quality of Hine's Emerald habitat and habitat functionality, including the hydrological and hydrogeological function |
| 2 | Reduce or mitigate threats to Hine's Emerald and its habitat |
| 3 | Increase knowledge of Hine's Emerald biology in Ontario including distribution, abundance, life history and habitat needs |
| 4 | Increase public awareness and understanding of Hine's Emerald and its habitat in Ontario |

## 2.3 Approaches to Recovery

Table 2. Approaches to recovery of Hine's Emerald in Ontario

| Relative Priority | Relative Timeframe | Recovery Theme | Approach to Recovery | Threats or Knowledge Gaps Addressed |
|---|---|---|---|---|
| Objective 1: Protect and maintain the quantity and quality of Hine's Emerald habitat and habitat functionality, including the hydrological and hydrogeological function | | | | |
| Critical | Ongoing | Habitat protection | **1.1** Work with municipalities and other planning agencies to protect habitat and populations through municipal land use planning processes<br>● provide habitat mapping to municipalities and other planning agencies<br>● work with municipalities to adopt protection measures in official plans, other planning documents and municipal plan review processes<br>● work with municipalities to assist in wetland protection including protection of upland hydrogeological functions that support wetland habitats<br>● work with municipalities in maintaining water budgets, particularly in recharge areas, to ensure there is no net loss in recharge. This includes maintaining current hydrologic and hydrogeologic function | • Alteration of hydrology<br>• Contamination of groundwater |
| Critical | Short-term | Habitat protection | **1.2** Develop a habitat regulation to provide enhanced protection and clarity on the area defined as habitat for Hine's Emerald in Ontario. | • Alteration of hydrology<br>• Contamination of groundwater |
| Necessary | Ongoing | Habitat protection | **1.3** Identify high-priority private lands within Hine's Emerald distribution and promote securement through conservation easement, stewardship agreement or land acquisition when there are willing sellers.<br>● prioritize areas according to urgency of threat | • Alteration of hydrology<br>• Contamination of groundwater |

| | | | | |
|---|---|---|---|---|
| | | | • identify and contact private landowners<br>• Determine the ideal protection strategy for each site | |
| Necessary | Ongoing | Habitat protection | **1.4** Identify areas of probable habitat for Hine's Emerald.<br>• through GIS modeling, develop a habitat suitability index model of predicted habitat in Ontario<br>• identify current landowner, management and land-use policies for these areas | • Population size and range |
| Beneficial | Ongoing | Stewardship | **1.5** Where feasible, restore altered hydrological and/or hydrogeological regimes.<br>• research into low impact development potential<br>• explore potential retrofits to enhance recharge function<br>• promote enhanced recharge opportunities as new technologies and/or development arise<br>• protect or restore hydrological regime in the larvae habitat | • Alteration of hydrology<br>• Contamination of groundwater |
| Beneficial | Long-term | Stewardship | **1.6** Explore and encourage land owner incentive programs for Hine's Emerald habitat protection and restoration (e.g., Conservation Land Tax Incentive Program) | • Alteration of hydrology |
| Objective 2: Reduce or mitigate threats to Hine's Emerald and its habitat | | | | |
| Critical | Ongoing | Management | **2.1** Develop and implement management actions to maintain or increase known population<br>• identify and assess known threats at the current extant site and at any sites identified through future inventory efforts<br>• work with owners/managers to develop site-specific management plans to address threats through stewardship (e.g. invasive species control, managed access, and similar activities)<br>• develop a best management practices document for activities that may alter the ground water of areas occupied Hine's Emerald<br>• monitor sites to assess the effects of management | • All threats |

| | | | | |
|---|---|---|---|---|
| | | | actions<br>• adapt management in response to monitoring results<br>• report on management actions and outcomes | |
| Critical | Ongoing | Habitat protection | **2.2** Protect burrowing crayfish and their habitat within known and suspected Hine's Emerald locations in Ontario.<br>• determine threats to burrowing crayfish and mitigate where possible.<br>• protect the habitat of burrowing crayfish<br>• determine and monitor population estimates | • Alteration of hydrology |
| Necessary | Ongoing | Habitat protection | **2.3** Ensure protection and recovery approaches are identified in management plans for all applicable levels of government (including federal, provincial, municipal and conservation authorities)<br>• identify appropriate zoning designations and activities in management and resource stewardship plans<br>• encourage and enable agencies to ensure they are considering Hine's Emerald and the ESA when issuing authorizations that may impact the species or its habitat (e.g., MOE review of Permit to Take Water applications) | • Alteration of hydrology<br>• Invasive species, |
| Necessary | Ongoing | Management | **2.4** Monitor and mitigate invasive species in and around Hine's Emerald habitat<br>• identify invasive species in immediate habitat and adjacent areas.<br>• mitigate invasive species using best available information such as the Ontario Phragmites Best Management document (OMNR 2011).<br>• encourage private stewardship through programs such as the Ontario Invasive Plant Council and the Ontario Federation of Anglers and Hunters' aquatic invasive species program. | • Invasive species |
| Objective 3: Increase knowledge of Hine's Emerald biology in Ontario including distribution, abundance, life history and habitat needs. | | | | |

| | | | | |
|---|---|---|---|---|
| Critical | Ongoing | Inventory, Monitoring and Assessment | 3.1 Develop and implement a monitoring program to assess changes in populations and habitats over time<br>● develop and/or adopt standardized monitoring protocols for the species at its different life stages and its habitat<br>● complete monitoring at sites and intervals as prescribed by the protocols<br>● collaborate with experts in the United States to develop and improve monitoring and sampling skills, techniques and data<br>● report monitoring results at regular intervals and assess trends in populations, area of occupancy and habitat condition (threats) every five years<br>● submit all data to the Ontario Odonata Atlas Database and Natural Heritage Information Centre (NHIC) | • All threats and knowledge gaps |
| Critical | Ongoing | Inventory, Monitoring and Assessment | 3.2 Conduct surveys to locate new populations<br>• create tools to identify Hine's Emerald larvae and adults from other dragonflies.<br>• use current/updated knowledge of habitat to develop a GIS model of predicted habitat in Ontario, especially keying in on fen habitats and areas with Digger Crayfish burrows.<br>• conduct field surveys in areas targeted by habitat type searches over a minimum of two field seasons to determine whether the species is present<br>• conduct surveys in areas of similar habitat surrounding Minesing Wetland that may currently or historically harbour larval populations, including but not limited to Bear Creek, Marl Creek, Marl Lake, Matheson Creek and Willow Creek habitats<br>• document any new occurrences of the species and the surrounding habitat, and submit all data (positive and negative) to the NHIC and the Ontario Odonata Atlas Database<br>• use the findings or research on habitat requirements to refine the habitat model | • All threats<br>• All knowledge gaps on habitat requirements |
| Critical | Short-term | Research | 3.3 Investigate the sensitivity of Hine's Emerald to various | • Alteration of |

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| | | | factors that may influence habitat constraints (e.g., water quality/quantity)<br>• conduct studies to determine microhabitat characteristics<br>• coordinate research with experts both in Canada and the United States<br>• coordinate research between agencies who are conducting research within in Hine's Emerald habitat<br>• explore sensitivity to groundwater fluctuations | hydrology<br>• Contamination of groundwater<br>• Knowledge gaps |
| Necessary | Short-term | Research | 3.4 Investigate the relationship between Hine's Emerald and crayfish species<br>• document the distribution of crayfish whose burrows Hine's Emerald are known to use (i.e., Digger Crayfish and Devil Crawfish)<br>• determine the relationship between Hine's Emerald and burrowing crayfish (i.e., Digger Crayfish and Devil Crawfish) in Ontario<br>• determine if there is a relationship between Hine's Emerald and any other crayfish species in Ontario | • Alteration of hydrology<br>• Knowledge gaps |
| Necessary | Ongoing | Research | 3.5 Investigate interspecies relationships<br>• investigate interactions between other Emerald species<br>• conduct genetic DNA studies with such collaborators as NHIC, conservation authorities, University of Waterloo, University of Guelph and *Somatochlora* DNA experts (e.g., Illinois State Museum)<br>• collaborate with Illinois State Museum to receive copies of genetic analyses involving Hine's Emerald from Ontario | • Knowledge gaps |
| Necessary | Ongoing | Monitoring | 3.6 Monitor hydrogeological function within Minesing Wetlands<br>• monitor groundwater levels in recharge areas<br>• monitor groundwater quality in recharge and in suitable habitats | • Alteration of hydrology |

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| | | | • monitor surficial hydrological function in larval habitat<br>• enhance the number of shallow monitoring wells along existing groundwater transects in suitable habitats<br>• monitor groundwater levels along existing groundwater transects in suitable habitats<br>• Calculate water budgets | |
| Beneficial | Ongoing | Communication | 3.7 Participate in inter-jurisdictional recovery and research teams, including the United States Fish and Wildlife Service Hine's Emerald recovery team | • All threats<br>• All knowledge gaps |
| Objective 4: Increase public awareness and understanding of Hine's Emerald and its habitat in Ontario | | | | |
| Necessary | Short-term | Communication | **4.1** Provide information to stakeholders and interested parties to increase their awareness of this species<br>• identify audiences with the most potential for conservation (e.g., landowners, municipal agencies, and other interest groups) and gauge their awareness and information needs<br>• in coordination with OMNR, identify appropriate means of communicating with target audiences (e.g., workshops, newsletters, internet sites, public meetings)<br>• develop and communicate tangible stewardship steps the stakeholder can undertake<br>• create programming on the bigger picture of Hine's Emerald habitats and their importance to humans (i.e., the importance of Minesing Wetlands) | • All threats |

## 2.4 Area for Consideration in Developing a Habitat Regulation

*Under the ESA, a recovery strategy must include a recommendation to the Minister of Natural Resources on the area that should be considered in developing a habitat regulation. A habitat regulation is a legal instrument that prescribes an area that will be protected as the habitat of the species. The recommendation provided below by the authors will be one of many sources considered by the Minister when developing the habitat regulation for this species.*

It is recommended that the area regulated as habitat for Hine's Emerald include all extant locations. In Ontario, the extant sites currently include only the Minesing Wetlands and possibly some adjacent lands where adults have been observed in potential larval habitat. This recommendation is specific to Minesing Wetland, given our current knowledge of Hine's Emerald distribution in Ontario. If other extant locations are found in the future, additional habitat should be prescribed under the ESA on a site-specific basis. Furthermore, due to the lack of understanding of Hine's Emerald biology and knowledge of the Ontario population, serious knowledge gaps exist on the habitat for Hine's Emerald. Given this, it is recommended that the area prescribed as habitat for Hine's Emerald be re-evaluated as new information is gathered.

Minesing Wetlands and the surrounding area are found over limestone bedrock, with rich and deep, mineral soils. Groundwater discharge plays an essential role in the fen areas that relate to Hine's Emerald habitat. The principal source of groundwater to the fen areas correspond to the Snow Valley Upland area, east of the Minesing Wetlands (Bradford 1999, Beckers and Frind 2001, Post et al. 2010).

Hine's Emerald has two different life stages (larval and adult) that depend on different habitat. First, the larvae require areas that support their foraging, overwintering and refuge habitats. These areas are characterized as string fen and wet meadow areas. There is strong evidence of Hine's Emerald larvae being dependent on Digger Crayfish and Devil Crawfish burrows as refuges (Pintor and Soluk 2006). Second, the adults require areas that support breeding, foraging and roosting habitats. These habitat requirements differ between female and male adult Hine's Emerald during the breeding season (Foster and Soluk 2006). Males have been found to occupy string fens and wet intermediate meadow areas, whereas females were found to occupy dry meadow areas (Foster and Soluk 2006, COSEWIC 2011). Adjacent forest areas provide protected, shaded areas for perching and roosting by both females and males (USFWS 2001).

Dispersal patterns of Hine's Emerald in Minesing Wetlands have not been studied. However, experts suggest that corridors that connect prescribed habitat are essential to the recovery of Hine's Emerald, particularly to enable their movement and dispersal (C.G. Evans pers. obs).

In order to protect both the adult and larvae stages of Hine's Emerald, it is recommended that the area prescribed as habitat include all fen, wetland meadows,

and hydrologically connected fen and wet meadow habitat where Hine's Emerald have been observed (Foster and Soluk 2006). The groundwater area that feeds the fen must be considered in order to protect the current hydrological regime. It is thought that 500 meters surrounding this area be considered the minimum local recharge area (R. Post, pers. obs.). Thus, in addition to the hydrologically connected fen and wet meadow habitat, the prescribed habitat should also include 500 metres beyond each of these habitats. Additionally, for the purposes of perching, movement and roosting, all forests and dry meadows that are adjacent to the areas described above should also be prescribed as habitat.

Corridors are believed to be both natural (creeks, swales and other water features) and anthropogenic features (trails, utility rights-of-way and gravel roads) that have forested edges or riparian habitat (C.G. Evans and D. Featherstone, pers. obs.). To allow for migration and dispersal between habitat patches used by Hine's Emerald it is recommended that corridors connecting these areas be prescribed as habitat.

Due to the dependence of Hine's Emerald habitat on groundwater recharge it is recommended that prescribed habitat include the Snow Valley Uplands areas as defined by Becker and Frind (2001), where the current regional groundwater infiltration regime is maintained for the entire Minesing Wetlands (i.e., maintaining the current water balance and water quality).

# 3.0 GLOSSARY

Calcareous: A type of sediment, sedimentary rock, or soil type formed from, or contains a high proportion of calcium carbonate.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC): The committee responsible for assessing and classifying species at risk in Canada.

Committee on the Status of Species at Risk in Ontario (COSSARO): The committee established under section 3 of the *Endangered Species Act, 2007* that is responsible for assessing and classifying species at risk in Ontario.

Conservation status rank: A rank assigned to a species or ecological community that primarily conveys the degree of rarity of the species or community at the global (G), national (N) or subnational (S) level. These ranks, termed G-rank, N-rank and S-rank, are not legal designations. The conservation status of a species or ecosystem is designated by a number from 1 to 5, preceded by the letter G, N or S reflecting the appropriate geographic scale of the assessment. The numbers mean the following:

1 = critically imperilled
2 = imperilled
3 = vulnerable
4 = apparently secure
5 = secure

Conspecific: From the same species

Discharge Area: An area in which there are upward components of hydraulic head in the aquifer. Ground water is flowing toward the surface in a discharge area and may escape as a spring, seep or baseflow or by evaporation and transpiration.

*Endangered Species Act, 2007* (ESA): The provincial legislation that provides protection to species at risk in Ontario.

Exuviae: The cast-off skins or coverings. In this case, the cast off shell or covering of the dragonfly larvae, shed after the larva emerges from the water to molt to the adult life stage.

Fen: Wetlands with unique hydrology that provides mineralized water to the soil's surface.

Haplotype: The genetic makeup of an individual with respect to a specific pair of alleles or genes.

Hydrogeology: The study of the interrelationships of geologic materials and processes with water, especially ground water.

Hydrology: The study of the occurrence, distribution, and chemistry of all waters of the earth.

Instar: An insect or other arthropod between molts

Larva (pl: larvae): An immature stage of any invertebrate that differs from the adult stage.

Metapopulation: A population belonging to a group of populations of the same species that exchange individuals through migration and recolonize sites in which other metapopulations have become extinct.

Molt: Shed of old shell to make way for new growth

Nymph: A larva of an insect with incomplete metamorphosis

Odonata: The taxonomic order comprising dragonflies and damselflies.

Oviposition: To lay eggs, especially by means of an ovipositor.

Ovipositor: An organ found in some species of insects at the end of the female abdomen. This organ is used to deposit eggs.

Recharge area: An area in which there are downward components of hydraulic head in the aquifer. Infiltration moves downward into the deeper parts of an aquifer in a recharge area.

*Species at Risk Act* (SARA): The federal legislation that provides protection to species at risk in Canada. This act establishes Schedule 1 as the legal list of wildlife species at risk to which the SARA provisions apply. Schedules 2 and 3 contain lists of species that at the time the act came into force needed to be reassessed. After species on Schedule 2 and 3 are reassessed and found to be at risk, they undergo the SARA listing process to be included in Schedule 1.

Species at Risk in Ontario (SARO) List: The regulation made under section 7 of the *Endangered Species Act, 2007* that provides the official status classification of species at risk in Ontario. This list was first published in 2004 as a policy and became a regulation in 2008.

Succession*:* The progressive replacement of one dominant type of species or community by another in an ecosystem.

Teneral: The period when the adult insect is newly emerged from the pupal case or nymphal skin. During the teneral period, the insect's exoskeleton has not hardened or darkened, leaving it vulnerable.

Thoracic: Arising from the thorax, the portion of the body between the head and the abdomen.

Tibial (Tibia): The fourth segment of the insect leg, between the femur and tarsi.

Water balance: An equation that can be used to describe the flow of water in and out of a system.

Water budget: An evaluation of all the sources of supply and the corresponding discharges with respect to an aquifer or a drainage basin.

Water table: The surface in an unconfined aquifer or confining bed at which the pore water pressure is atmospheric. It can be measured by installing shallow wells extending a few feet into the zone of saturation and then measuring the water level in those wells.

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# Habitat Protection Summary for Hine's Emerald

Hine's Emerald is a medium-sized dragonfly (about 60 millimetres long) with bright green eyes, a metallic green thorax with two lateral yellow stripes, and a blackish-brown abdomen. Hine's Emerald lives in groundwater-fed wetlands, such as fens. Larvae use crayfish burrows during periods of low water and during the winter. In Ontario, Hine's Emerald has only been documented in and around Minesing Wetland, near Barrie. It was assessed by the Committee on the Status of Species at Risk in Ontario (COSSARO) and listed as endangered on January 13, 2012 due to its extremely limited geographic range and potential threats to habitat. More information about the species' status can be found at: http://www.mnr.gov.on.ca/stdprodconsume/groups/lr/@mnr/@species/documents/research/stdprod_091159.pdf

## Brief description of the proposed habitat regulation:

The proposed habitat regulation for Hine's Emerald would protect the part of a fen, marsh, spring or seepage area, or other aquatic feature that is being used for egg-laying or larval development. Wetland and aquatic areas would be protected within 1600 metres of an egg-laying or larval development site, plus up to 100 metres of natural vegetation such as forests, shrub thickets, old fields, or hedgerows, that border these areas. In addition, groundwater recharge or discharge areas located within 500 metres of those protected wetlands or aquatic features that are attached to and maintain the water quality and quantity of a breeding area, would be protected.

## Habitat Categorization:

The following text indicates how the species' habitat would be categorized, as per the policy "Categorizing and Protecting Habitat under the Endangered Species Act" which can be found at: http://www.mnr.gov.on.ca/stdprodconsume/groups/lr/@mnr/@species/documents/document/stdprod_085648.pdf.

1

**Category 1 (Red)**

- Any part of a wetland or aquatic feature used for breeding (e.g., egg-laying or larval development)

2

**Category 2 (Orange)**

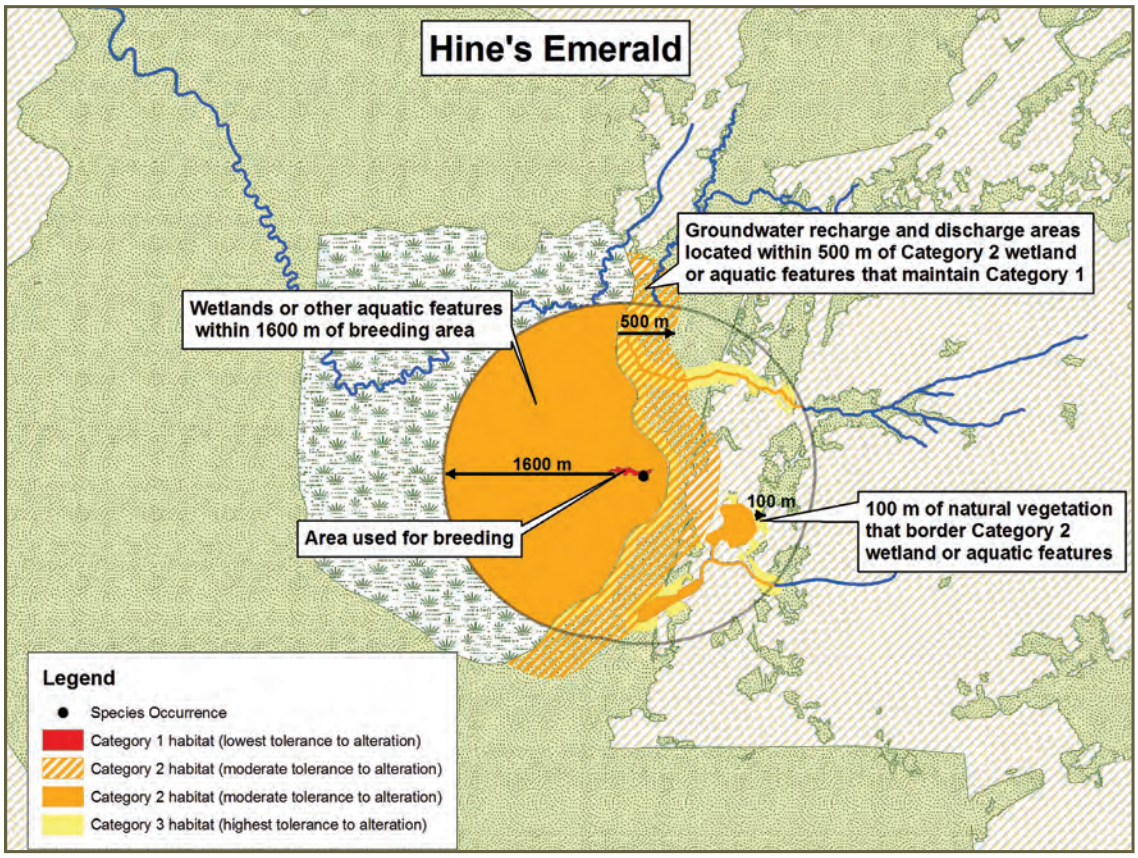
- Any part of a wetland or aquatic feature (including streams, ponds, or temporary pools) that is within 1600 metres of a breeding area
- Groundwater recharge or discharge areas located within 500 metres of those wetland or aquatic features listed above that are attached to and maintain the water quality and quantity of a breeding area

3

**Category 3 (Yellow)**

- Up to 100 metres of naturally-vegetated areas such as forests, shrub thickets, old fields, or hedgerows that border the wetlands or aquatic features mentioned above (Category 2 habitat)

**Sample Application of the Proposed Habitat Regulation:**




This protection applies to areas that were used by the species anytime in the past seven years. If the species was last observed more than seven years ago, the MNR considers the species to still be present at the site unless one of the following occurs:

- seven consecutive years of MNR-approved surveys have been conducted and indicate that the species no longer exists at the site, or
- the species has been designated as extirpated at the specific site.

The proposed regulation would apply where the species occurs in the geographic townships of Essa, Flos, Innisfil, Sunnidale, Tosorontio, and Vespra within Simcoe County.

**Supporting Rationale:**

- Hine's Emeralds rely on slow-moving, calcareous water with emergent vegetation for egg-laying and larval development. These conditions are associated with fens, marshes or areas where groundwater rises to the surface.
- Larvae depend on crayfish burrows for refuge from drought and for over-wintering. Crayfish burrows can be found along riparian edges.
- Adults of Hine's Emerald travel to areas of natural vegetation for foraging, mating, refuge, and rest. Because of the difficulty of flying through thickets and forests, Hine's Emeralds typically stay near the edge of these types of habitats, which is approximately the first 100 metres.
- 1600 metres represents the average distance Hine's Emerald will travel to carry out these life processes.
- The wetlands the species occurs in are threatened by changes to the quantity and quality of water flowing into them. Protecting groundwater recharge and discharge areas within 500 metres of these wetlands will help to reduce these threats and is essential to maintaining breeding habitat for Hine's Emerald.
- The seven-year term allows sufficient time to determine that the site is no longer being used.

**Activities in Hine's Emerald habitat:**

Activities in regulated habitat can continue as long as the function of these areas for the species is maintained and individuals of the species are not *killed, harmed, or harassed*.

*Generally compatible:*

- Removal of an individual shrub or tree for maintenance purposes
- Yard work such the maintenance of existing lawns and gardens
- Renovations of small structures, such as a shed or a deck
- Regular use of well water for household and farm purposes
- Non-motorized vehicle use of existing recreational trails

*Generally not compatible**:

- Alteration of aquatic or wetland habitat, such as altering water quality, flows, levels, vegetation characteristics, or increasing sediment deposition
- Large-scale construction, such as housing development or roads
- Significant reduction or clearing of forests and other natural vegetation
- Broad-scale application of road salt, fertilizers, or pesticides, including drift or run-off into protected habitat

* If you are considering an activity that may not be compatible with regulated habitat, please contact your local MNR office for more information and/or to discuss ESA authorization options. Please note that any activity that occurs outside of regulated habitat but that has a reasonable potential to negatively impact regulated habitat could require authorization under the ESA.

**Key Terms:**

- **Fen:** A fen is a type of wetland that accumulates peat. They are located in areas where mineralized groundwater discharges to the surface. Water pH is slightly acidic to neutral. Typical fen vegetation includes sedges and mosses, grasses, reeds, low shrubs, and sometimes a sparse layer of tamarack and white cedar. Fen communities are defined according to the Ecological Land Classification (ELC) for Southern Ontario: First Approximation and its Application, dated September, 1998 and published by the Ontario Ministry of Natural Resources.
- **Groundwater discharge area:** An area where groundwater is flowing up towards the surface and may escape as a spring, seep, or into rivers and wetlands.
- **Groundwater recharge area:** An area where water from the surface is moving downward into the deeper parts of an aquifer.
- **Vernal pool:** A temporary pool of water which collects in a landform depression following snowmelt and heavy spring rains.

Environmental
Commissioner
of Ontario

Commissaire à
l'environnement
de l'Ontario

November 2015

The Honourable Speaker
of the Legislative Assembly of Ontario

Room 180, Legislative Building
Legislative Assembly
Province of Ontario
Queen's Park

Dear Speaker:

In accordance with Section 58 of the *Environmental Bill of Rights, 1993*, I am pleased to present the 2014/2015 Annual Report of the Environmental Commissioner of Ontario for your submission to the Legislative Assembly of Ontario.

Sincerely,

Ellen Schwartzel

Environmental Commissioner of Ontario

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## Habitat Regulations and Recovery Strategies

Under the *ESA*, recovery strategies must include recommendations on the area that should be considered in developing a habitat regulation and the Minister of Natural Resources and Forestry is required to consider the applicable recovery strategy and government response statement when making a habitat regulation. In addition, MNRF policy states that the government will also consider: the area protected under the general definition of habitat; the best available scientific information on the species; and the social and economic implications of habitat regulation.

## New Habitat Regulations for Five Species

On January 1, 2015, the MNRF amended O. Reg. 242/08 (General) under the *ESA* to define habitat for the following species:

- eastern sand darter (*Ammocrypta pellucida*), an endangered fish;
- Hine's emerald (*Somatochlora hineana*), an endangered insect (dragonfly);
- Hungerford's crawling water beetle (*Brychius hungerfordi*), an endangered insect;
- Pitcher's thistle (*Cirsium pitcheri*), a threatened plant; and
- wavy-rayed lampmussel (*Lampsilis fasciola*), a threatened mollusc.

The key aspects of these new regulated habitat definitions include:

- Geographic restrictions – habitat is limited to specific municipalities and waterbodies and, sometimes, specifically excludes certain areas;
- Specific habitat features and uses – habitat is defined in reference to certain environmental features and/or species uses;
- Historical habitat – some areas that have been occupied by the species in the past, but are not currently occupied; and
- Buffer zones – protection, in varying forms, for areas in close proximity to primary use areas.

# IMPLICATIONS OF THE DECISION

## Gains and Losses in Scope of Protection

Relative to the general habitat definition, the areas protected under the new regulation are broader in some respects, but narrower in others. The potential implications of the shift to regulated habitat definitions are set out below. However, it can be difficult to predict the impacts of these changes on species at risk because of knowledge gaps regarding species' distribution, habitat needs and other ecological requirements.

### New Protection for Historical Habitat

The new regulated habitat definitions all include some historical habitat. In some cases, this includes habitat occupied at any time in the past and, in other cases, it includes only habitat occupied within the last few years. This allowance could provide species the space to re-establish themselves within ideal habitat environments.

### New Protection for Buffer Zones

The new regulatory provisions protect buffer zones around areas that are, or have been, used by the species. For example, some areas near locations used by the wavy-rayed lampmussel are also considered habitat. Protecting buffer zones could allow populations room to grow, and helps ensure that primary use areas are not damaged by nearby activities.

### Narrowed Protection Based on Geographic Area

The regulated habitat definitions are each limited to specific geographic areas. Generally, this does not exclude areas where the species is known to occur. However, for two species there is reason to believe that undocumented populations may occur outside of the defined geographic areas. An eastern sand darter population was iden-

tified in 2013 far away from previously known habitat locations, suggesting other populations may also exist elsewhere. Additionally, the recovery strategy for the Hine's emerald dragonfly notes that "there is a high likelihood of extant Hine's emerald populations at least at some of 28 locations identified [by the Committee on the Status of Endangered Wildlife in Canada] as having appropriate habitat." Many of these locations are outside the geographic areas in the habitat regulation. If populations of these species are discovered outside the areas listed in the regulation, amendments will be required before those habitats are protected.

### Narrowed Protection Based on Habitat Features and Uses

The new regulatory provisions all define habitat in reference to certain environmental features and/or particular uses. In some cases, these clauses merely specify the environments the species tends to inhabit and, thus, are unlikely to exclude any areas where the species occurs. In other cases, however, such restrictions may exclude areas that were included in the general habitat definition. For example, Pitcher's thistle habitat is restricted in part to sand dunes with less than 25 per cent tree cover (and associated buffer areas). Although the recovery strategy says that Pitcher's thistle prefers open dune habitat, there is no mention of the 25 per cent threshold. The ministry offered no explanation for why it decided to restrict the habitat definition in this way.

## Consideration of Recovery Strategy Recommendations

The habitat recommendations set out in each species' recovery strategy vary widely. In some cases, the recommendation is only that the Minister consider the approach used to identify critical habitat; in other cases, there is a detailed description of what areas and features should be considered. The Minister is not required or expected to follow all recovery strategy habitat recommendations when making the habitat regulation. However, these recommendations offer important insight on the best available scientific information about a species' habitat protection needs.

Photo credit - Fritz Flohr Reynolds (left)

There are several recommendations in the recovery strategies for Hungerford's crawling water beetle, Pitcher's thistle and Hine's emerald that are not incorporated into the species' habitat definition. Most significantly, the regulation does not incorporate the recommendation that the Snow Valley Uplands areas be prescribed as part of Hine's emerald habitat. The recovery strategy explains that this area is critical to maintaining groundwater flow to the wetland area inhabited by the Hine's emerald dragonfly. Despite this, the regulatory habitat definition only includes a small portion of the Snow Valley Uplands areas.

## ECO COMMENT

Overall, the areas inhabited by known populations of eastern sand darter, Hine's emerald, Hungerford's crawling water beetle, Pitcher's thistle and wavy-rayed lampmussel are better protected by their regulatory habitat definitions than they were by the general habitat definition.

One advantage of regulated habitat definitions is that the geographic area restrictions offer specificity about

where a species might be present, providing some certainty to both the MNRF and proponents. However, when there is good reason to believe that populations exist outside of the geographic area defined in regulation – as with eastern sand darter and the Hine's emerald – this approach leaves the habitat of any such populations without protection, and potentially misleads stakeholders about where the species might be present. While it is the MNRF's stated practice to amend habitat regulations as needed to address newly discovered habitat, this takes time during which habitat could be lost. For this reason, the ECO suggests that, for species believed to have undocumented populations outside of the regulated habitat areas, the ministry include a clause protecting other, outside areas relied upon for life processes by the species.

In the case of Hine's emerald, the failure to protect the Snow Valley Uplands areas is troubling. The importance of such protection was explained and expressly recommended in the species' recovery strategy. The MNRF's decision is particularly disconcerting because the Snow Valley Uplands are under pressure from development, as noted in the recovery strategy. This makes protecting the area all the more important, although possibly more controversial. Given the specificity of this recommendation in the recovery strategy, and with no explanation of the ministry's decision provided, the ECO concludes that the MNRF opted to favour development, rather than to prioritize the protection of this species at risk habitat.

The ECO is pleased with the MNRF's effort to identify stakeholders in this decision and to directly engage with them by: placing notices in local papers; alerting local governments and organizations; and sending letters to landowners identified as possibly having species at risk habitat on their properties. Despite this effort, however, many of the Environmental Registry comments indicated serious misunderstandings about how habitat regulations operate and what types of activities are prohibited in regulated habitat. These misconceptions could be partially addressed through a more comprehensive Registry proposal notice. The notice should have explained the relationship between recovery strategies, government response statements and habitat regulations, as well as provided an overview of how the habitat regulation interacts with the section 10 prohibition on damaging or destroying habitat. Furthermore, hosting consultation meetings in communities with a significant interest (in this case, the area affected by the Hine's emerald provision), would likely improve public understanding of the proposal and also present an opportunity to engage community members in the protection of species at risk.

*For a more detailed review of this decision, please refer to Section 1.3.8 of the Supplement to this Annual Report.*

### Comments from the MNRF

MNRF recognizes the importance of clearly describing the habitat protected for a species to facilitate the effective implementation of protection. These habitat regulations protect the areas that are necessary for the protection and recovery of the five species at risk in a way that is practical and reasonable to implement.

The inclusion of information in habitat regulations about where they apply provides increased certainty and clarity for the public. These areas include locations where the species is likely to expand or be found due to increased survey effort. MNRF remains committed to updating regulations as necessary to incorporate new occurrence information.

Although the regulation for Hine's Emerald does not include all of Snow Valley Uplands, it does include a 500 m area around the habitat used by the species. This area helps to protect the flow of groundwater into the wetlands and aquatic areas used by the species. In addition, if activities outside this area are likely to have an adverse effect on the habitat they may still require authorization under the Endangered Species Act to consider the needs of the species.

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# Nature Conservancy of Canada increases protection for Minesing Wetlands

April 11, 2018
Barrie, ON

## Only known Canadian site for the endangered Hine's emerald dragonfly

The Nature Conservancy of Canada (NCC) today announced the protection of an additional 43 hectares (107 acres) in the Minesing Wetlands. Located 12 kilometres west of Barrie, the Minesing Wetlands are vitally important as they are one of the largest and least disturbed wetland areas remaining in southern Ontario.

The federally endangered Hine's emerald dragonfly's very specific habitat needs make the Minesing Wetlands the only known place in Canada that supports this rare and beautiful insect. By increasing the amount of protected and restored land in the wetlands, NCC hopes to expand the Hine's emerald dragonfly's current habitat range.

Since 1974, NCC and its partners have protected over 5,500 hectares (13,500 acres) of a variety of habitats in the Minesing Wetlands. At more than 10,900 hectares (26,900 acres), the Minesing Wetlands natural area is home to many species at risk, including several turtle species and birds, such as least bittern and cerulean warbler. The area supports a wide variety of wetland birds, which flock to the area in the tens of thousands during spring migration when most of the wetlands resemble a large lake.

These wetlands are also important to surrounding communities in providing flood control, water filtration, fish habitat and recreational opportunities. Over 70 per cent of southern Ontario's wetlands have been converted for alternative uses since European settlement. The remaining wetlands are threatened by non-native, invasive plant species, pollution and habitat fragmentation. It is very likely that without the actions of NCC, the Nottawasaga Valley Conservation Authority and other key partners, this portion of the Minesing Wetlands may have been further developed and degraded.

This Nature Conservancy of Canada project was generously supported by funding from the Government of Canada through the Natural Areas Conservation Program, the Patrick Hodgson Family Foundation, Robert and Ellen Eisenberg, Ontario Power Generation and the support of other donors.

## Quotes

"The Minesing Wetlands are incredibly important to the local community and all of Ontario. Rich in native plants and wildlife,

they are also key in filtering water, absorbing heavy rain floodwaters, preventing property damage and protecting local infrastructure — helping to mitigate severe weather events from our ever-changing climate." Wendy Cridland, Nature Conservancy of Canada acting vice-president, Ontario Region

"On behalf of my colleague, Catherine McKenna, Minister of Environment and Climate Change, I congratulate the Nature Conservancy of Canada for their work in conserving an additional 43 hectares of important habitat in the Minesing Wetlands. Through the Natural Areas Conservation Program, our government is working with Canadians to preserve habitat for species at risk and protect biodiversity." Deb Schulte, Member of Parliament for King-Vaughan and Chair of the House of Commons Standing Committee on the Environment and Sustainable Development

## Facts

- Going forward, NCC will manage the natural portions of this property for their conservation value, and restore the meadows, which were once used for cattle grazing, back to a functional, forested swamp, ensuring the entire property remains an important piece of the Minesing complex for the long term.
- The property is being named after the late Patrick W. E. Hodgson, who was a long-time supporter of the Nature Conservancy of Canada's work in the Minesing Wetlands.
- The Patrick W. E. Hodgson Property is adjacent to existing conservation lands and contains moist meadows and a swamp forest that buffer the core of the Minesing Wetlands.
- Buffering and expanding the sensitive core of the Minesing Wetlands, where conservation has been active for the past 45 years, was identified as a top, urgent priority by NCC and partners in 2017.
- Residential development around the Minesing Wetlands, associated changes in water quality and quantity, and the spread of non-native phragmites all threaten the Hine's emerald dragonfly's survival.
- The Minesing Wetlands are home to unique wetland community types, such as southern Ontario's largest fen, a coniferous swamp more typical of northern Ontario, and hackberry and bur oak woodlands, which are more typical of the southern U.S.
- The Minesing Wetlands are designated as a Provincially Significant Wetland (PSW), Area of Natural and Scientific Interest (ANSI) and Ramsar wetland of international significance.

## About

The Nature Conservancy of Canada (NCC) is the nation's leading not-for-profit, private land conservation organization, working to protect our most important natural areas and the species they sustain. Since 1962, NCC and its partners have helped to protect more than 1.1 million hectares (2.8 million acres), coast to coast, with more than 74,400 hectares (184,000 acres) in Ontario. To learn more, visit natureconservancy.ca.

The Government of Canada's Natural Areas Conservation Program (NACP) is a unique public-private partnership to accelerate the pace of land conservation across southern Canada. The Nature Conservancy of Canada (NCC) manages the program. Federal funds are matched by contributions raised by NCC and its partners. Habitat conserved under the NACP enhances natural corridors and other protected areas.

## Video and images

B-roll and images are available here.

**Learn More**

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## Media Contact:


### Nicole Senyi

Communications Manager
Ontario Region
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nicole.senyi@natureconservancy.ca

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**FOR INFORMATION**

**REPORT TO:** **MAYOR AND COUNCIL**

**FROM:** **Brad Sokach, P.Eng.**
**Director of Public Works**

**DATE:** **March 17, 2014**

**SUBJECT:** **Swaley Drain Maintenance**

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**REPORT HIGHLIGHTS**

- The Township Drainage Superintendent received a verbal request for cleaning of a portion of the Swaley Drain.
- A formal petition, as required under the Drainage Act, has not been received for the work, however is expected.
- A survey of the lower portion of the Swaley Drain has been completed including a portion of what is thought to be the Muskrat Creek.

## Background

This report is being generated to update Council on efforts related to the Swaley Municipal Drain (Swaley).

The Swaley Drain is a Municipal Drain. Maintenance of Municipal Drains are the responsibility of the Township as directed by Township Council who receive advice and recommendations from the drainage superintendent (Mark Archer, Deputy Director of Public Works) or an appointed drainage engineer.

Municipal drains are defined engineered drains under the Drainage Act as opposed to roadside ditches, for example.

Several engineered branches of Municipal Drains feed into the main Swaley Drain and in the event of maintenance work being directed by Council, any upstream benefitting landowners (as prescribed in the Engineers report) would have a proportional financial responsibility for the net cost of the work. The most current assessment of landowners within the Swaley Drain catchment area was updated by the appointed drainage engineer in 2003. There are over 3,358 acres and 94 landowners who would be responsible for paying a proportional cost of any work completed.

Municipal drains are regulated under the Drainage Act. The Act is prescriptive and clearly defines the duties and rights of Council and Landowners for any request for drainage

maintenance right through to the engineering review, tendering, construction and future maintenance of the Drain.

In December 2013, the Township was requested to attend a site visit with a resident whose land is adjacent to George Johnston Road and drains to the Swaley Drain. The resident contends that as a result of silt buildup in the drain, his field tiles are underwater and are not functioning properly. The resident has asked the Township to undertake work to remove the silt and thus improve the functioning of the field drains.

The landowner/resident also contends that undefined Township actions have made the situation worse. The Drainage Superintendent has determined that the drain has silted in and the cleaning of the section requested by the landowner will not lower the water levels because of the water levels throughout, and the actual bottom in the Minesing wetland (where the drain outlets) will not provide sufficient gradient to improve the drainage flows. The Landowner has accepted these findings but has verbally requested that the Township take the required actions to improve the outlet of the Swaley Drain.

It is important to note that the efforts required to improve the drainage at the outlet of the Swaley Drain are within the Minesing Wetland and beyond the end of the Swaley Drain as defined under the Drainage Act.

The drawing below shows the different municipal drains feeding into the Swaley Drain. As noted above, costs associated with the maintenance of a municipal drain are assessed against all benefitting landowners which would include landowners contributing water to all of the drains feeding to the Swaley Drain. As shown in the drawing the Swaley Drain discharges to the Minesing Wetland where it is thought to have originally discharged into the Muskrat Creek.

The lines in red in the above drawing represent the Swaley Drain or other drains feeding to the Swaley Drain. The yellow line represents the approximate location of the Muskrat Creek.

In response to the inquiry by the resident, the Drainage Superintendent set out to evaluate the condition of subject area of the drain, the elevations and fall associated with the drain, and the condition of the outlet in the Minesing Wetland. In addition to having the lower portion of the drain surveyed, the Township's Drainage Superintendent and a longtime resident familiar with the Minesing Wetland tracked through the Minesing Wetland to the end of the Swaley Drain. They then followed the natural flow through what is thought to be the former Muskrat Creek to its discharge at the Downey Drain. The purpose of this, in part, was to investigate the feasibility of deepening the Swaley Drain and Muskrat Creek to better drain the resident's property.

The Swaley Drain extends approximately 1.8 km from George Johnston Road west into the Minesing Wetland. The Muskrat Creek then runs an additional 2.5 km to the Downey Drain. The Muskrat Creek appears to run through Ministry of Natural Resources (MNR) and Nottawasaga Valley Conservation Authority (NVCA) owned land.

The surveying completed by the Township's Drainage Superintendent suggested that there is very little grade from George Johnston Road to the Downey Drain. The survey suggests that the grade in this area is on the order of 0.06% as there is a fall of approximately 2.5 meters over a length of approximately 4,500 meters. For context the minimum ditch grade the Township will consider in a new development is 0.5%.

The survey results were also compared to the original Swaley Drain design drawings. The survey clearly shows that the drain has silted-in since the original construction. There is no historical information available regarding the elevation of the bottom of the Muskrat River at the time of construction of the Swaley Drain. Based on the current conditions it is difficult to understand how cleaning out the sediment in the Swaley Drain will improve drainage as there will still be an obstructed area through the Muskrat Creek.

It is the opinion of the Drainage Superintendent that at this time any work within the Swaley Drain would not markedly improve the drainage on the resident/landowners land.

**Next Steps**

The Township contacted the Ontario Ministry of Agriculture Food and Rural Affairs (OMAFRA) who have advised that the municipality should take the following next steps in accordance with its responsibilities under the Drainage Act:

- Advise the affected landowners of their ability to head up a petition for maintenance on the existing limits of the drain or to request for an extension of the drain;
- Upon receipt of a valid petition seek Township Council direction regarding the request in the petition;
- Alternatively, a consultation process, with peer Drainage experts could be undertaken that would determine if the Act is the best practice to address the request.

Township staff understand that the resident will be providing a petition for a clean-out of the drain in the coming weeks.

Until a valid petition has been received, the Township does not have an obligation to take any further steps regarding to the cleaning of the drain.

The Township's Drainage Superintendent is planning to meet with a Drainage peer to discuss the matter as well as attend the drain during the spring thaw with representatives of the NVCA.

## Guiding Principles

The above initiative is not tied to a guiding principle.

## Applicable Municipal Policy or Legislation

Drainage Act

Submitted by: Brad Sokach, P.Eng. on behalf of Mark Archer
Report Reviewed by: Mark Archer
Approved by: Robert Brindley, Chief Administrative Officer
Version code: E09 11/03/2014 7:55:40 AM1641837
SHARED\E - Environmental Services\E09 Drains\E09 - Swaley Drain

May 29, 2013

Brad Sokach
Township of Springwater
Simcoe County Administration Centre
1110 Highway 26
Midhurst, Ontario
L0L 1X0

**Dear Mr. Sokach**

**Re: Class Environmental Assessment (Phase 3 and 4)**
**Water, Wastewater and Transportation Infrastructure**
**Midhurst (Township of Springwater)**

NVCA staff is in receipt of the notice of Study Commencement for Phase 3 and 4 of the Midhurst Water, Wastewater and Transportation Infrastructure Class Environmental Assessment (EA) and thanks you for the opportunity to comment on this EA. NVCA staff provided comments on the Midhurst Secondary Plan on September 26, 2008 and provides the following updated comments to be considered as part of the current Environmental Assessment Study. Our role in this matter is to ensure that development is directed outside of natural hazards and environmental features, ensuring that impacts from flooding and erosion hazards and negative impacts to natural heritage features are avoided and/or mitigated. NVCA will integrate comments on the EA with future Planning Act review comments as part of this role.

NVCA owns and manages in excess of 10,000 acres of the internationally significant Minesing Wetland. As part of the North American Waterfowl Management Plan the NVCA works within a formal agreement in partnership with Environment Canada, Nature Conservancy of Canada, Wildlife Habitat Canada, Ducks Unlimited and the Ministries of Agriculture and Natural Resources to protect and conserve this wetland and as such impacts to water quality are of high interest as per our management agreements and guidelines.

**SUMMARY**

NVCA staff request the following maters be addressed through the EA process:

1. Is there enough water supply available for use without impacting local aquifers, watercourses, local wetlands and fisheries?
2. Have pump tests and associated monitoring been conducted to determine the impacts of operating 3 simultaneous water supply wells, i.e. have the cumulative impacts of utilizing multiple wells been assessed on local wetlands and watercourses?

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3. Is there enough water quality information available to understand the Willow Creek system?
4. How will the sewage treatment plant conform with the Intergovernmental Action Plan (IGAP), particularly related to phosphorous and assimilative capacity?
5. Will the effluent result in elevated total phosphorous in Willow Creek and the Nottawasaga River?
6. Will the sewage outfall aggravate flooding and erosion hazards in Willow Creek?
7. Will the water quality of Willow Creek, the Nottawasaga River, Georgian Bay and the Minesing Wetlands be protected?
8. Have the cumulative impacts of multiple sewage systems outletting into the Matheson/Willow Creek system and the overall Nottawasaga River been considered?
9. Will there be safeguards in the sewage treatment plant in case there are upsets/spills or failures in the treatment system?
10. Will there be thermal impacts to Willow Creek?
11. Will the fishery be protected?
12. Will Source Water Protection be addressed?
13. Has a comprehensive monitoring program been developed to examine baseline information and impacts to water quality, water quantity and natural heritage? NVCA recommends this program be developed and integrated into this study and the overall development process.

**BACKGROUND**

The Secondary Plan (Official Plan Amendment, or OPA 38) was approved by the Township of Springwater in 2008. On April 28, 2009 NVCA staff met with the Township, their engineer and stakeholders to discuss NVCA interests as they relate to servicing Midhurst. In 2011 the County modified and approved the Secondary Plan which contemplates 10,000 units up to full build-out. 3850 units are part of the first phase of development. In July 2009 The Ainley Group released *Class EA Study for the Midhurst Water, Wastewater and Transportation Master Plan* (MSP), a Phase 1 and 2 Environmental Assessment to address the provision of water, wastewater and transportation upgrades to service future growth in the Midhurst area.

The MSP resulted in preferred options for water supply to be 3 new municipal wells, and a centralized sewage treatment plant with surface water discharge to Willow Creek to address wastewater. The preferred option wastewater treatment plant (WWTP) is located at Snow Valley Road and Wilson Drive and the effluent is proposed to be piped 5 km to Willow Creek at Highway 26 near Golf Course Road.

The Township is currently undertaking Phases 3 and 4 of the Schedule C Environmental Assessment, which will address alternative design concepts for the preferred solution and provide an Environmental Study Report.

## AREA CHARACTERIZATION

The study area includes many environmental and hazard features associated with Willow and Matheson Creeks, including watercourses, cold water fish habitat, floodplain, slope hazard areas, meander belt, and wetlands. The lands surrounding these features are regulated by NVCA pursuant to Ontario Regulation172/06 and permits are required from NVCA prior to developing in regulated areas.

The study area downstream of the proposed outfall to George Johnston Road is rich in natural heritage and hosts such species as northern brook lamprey (special concern- recently sampled at George Johnston Road), snapping turtle (special concern- records at Mayer's Marsh and Black Creek and most likely present in this reach of Willow Creek), nesting cliff swallows under George Johnston Road, foraging barn swallows (threatened), and nesting tree swallows. This reach of Willow Creek supports brown trout and adjacent marsh wetlands support breeding amphibians and nesting waterfowl.

The substrate in Willow Creek downstream of the proposed outfall is a sandsilt- clay mix with little vegetation growth and the grade is gentle downstream to its confluence with the Nottawasaga River.

Downstream of George Johnston Road, Willow Creek enters the core of the internationally significant Minesing Wetlands. After passing through a mosaic of emergent marsh, thicket swamp and open swamp habitats, Willow Creek enters an extensive shallow marsh community dominated by manna grass with cattail patches also present. Muck and silt substrates in the creek channel support extensive aquatic vegetation including sago pondweed, smartweeds (Polygonum), duckweeds and filamentous green algae. The marsh complex supports a number of significant fish and wildlife functions:

- Northern pike spawning/rearing/adult habitat
- Spawning habitat for a unique population of wetland spawning walleye
- Significant breeding habitat for amphibians such as leopard frog and green frog as well as habitat for painted turtle and snapping turtle (special concern)
- Significant staging/stopover habitat for waterfowl and shorebirds
- Significant breeding habitat for sensitive marsh birds and waterfowl including: American bittern, least bittern (threatened), Virginia rail, sora and sandhill crane. A heronry is located between Willow Creek and the Nottawasaga River.
- Foraging habitat for black tern (special concern), common nighthawk (special concern), black-crowned night heron, great blue heron and great egret
- Habitat for large numbers of muskrats and a diverse array of dragonflies and damselflies

Willow Creek eventually enters the main Nottawasaga River 5.7 km upstream of Highway 26. The Nottawasaga River is a Policy 2 receiver in this area, which means it commonly exceeds the Provincial water quality objectives for phosphorous

concentrations. This reach of the main river is characterized by low gradient and mobile sand/silt substrate. The small substrates and their mobile character are not conducive to rich aquatic ecosystems that typically provide biological assimilative capacity in river systems. In addition, the river is separated from the adjacent wetlands by high levees during low flow periods – the traditional filtering of nutrients by wetlands does not occur except under high flow conditions. This reach of the river is turbid even under low flow summer conditions and is sensitive to nutrient inputs. NVCA data suggests that these inputs may be expressed as water column algal blooms which result in high turbidity which impacts aquatic ecosystems and watercourse aesthetics.

Please note that NVCA has been conducting additional monitoring in the Midhurst area in 2012, and has site specific water quality data for the Middle and Lower Nottawasaga River for 2009 and 2010. NVCA staff would be pleased to share this information with the Township.

**HYDROGEOLOGY**

14. Have the cumulative impacts of three new wells been assessed? Have there been simultaneous pump tests and have local receptors been monitored for drawdown and recovery. NVCA staff would be interested in attending the pump tests and assisting with identifying the monitoring locations prior to the test. Our areas of interest include impacts on wetlands and fisheries.

**SOURCE WATER PROTECTION**

15. Midhurst is in the South Georgian Bay Source Water Protection Area. The proposed Protection Plan for this area was drafted in October 2012 and recommends each municipality incorporate source water protection policies into their Official Plans. If the three wells shown on Option F of Appendix F of the Master Plan are finalized and selected as municipal wells, corresponding policies for the well head protection area will need to be developed. NVCA recommends this be incorporated into the Environmental Assessment study to allow landowners in the affected areas to assess the impacts of the wells on their use of the land. As the Township will be implementing policies related to source water protection, should this EA consider identifying recharge areas and significant threats at this time?

**FISHERIES**

16. Willow Creek is a coldwater fishery between St. Vincent Street and Vespra Valley Road and should be managed consistent with the protection, enhancement and restoration guidelines of a coldwater fisheries habitat ecosystem. A naturally reproducing population of resident brown trout is present in this reach. Downstream there is a unique population of wetland spawning walleye and Lake Sturgeon, a Species at Risk. More information can be found on this in the Fisheries Habitat Management Plan (NVCA, March, 2009)

NVCA has entered into a Level II Agreement with the Department of Fisheries and Oceans and which has established a streamlined approach to addressing issues pertaining to the Federal Fisheries Act. NVCA staff, in consultation with DFO staff, are responsible for co-coordinating the review of proposed works that may potentially result in the harmful alteration, disruption or destruction (HADD) of a fish habitat. NVCA will continue to review the Environmental Assessment for fisheries interest at this time.

**ENGINEERING**

17. NVCA staff acknowledges the preliminary analysis completed in Section 3.2 of the report *Interim Assimilation Analysis: Discharge of Treated Sewage Effluent from the Proposed Midhurst WWTP to Willow Creek* prepared by AECOM Canada Ltd. dated June, 2009, and agrees that more work is required. NVCA staff notes that Willow Creek is a highly erodible watercourse and recommends a fluvial geomorphology study to determine what controls are required to protect the system against erosion.

18. NVCA staff has an interest in assuring there is no new development in the flood and erosion hazard and that flooding and erosion is not aggravated on adjacent lands and looks forward to reviewing forthcoming information on this matter. In addition NVCA staff has questions about the cumulative impacts of the increased flow of the sewage treatment plant and the multiple stormwater management systems that will be required for development upstream and increase in flooding through coincident timing of peaks increasing for downstream properties.

**WATER QUALITY**

19. Is the data provided in Appendix H for ultimate build out?

**Instream Temperature**

20. Appendix H discusses mean daily temperature, but maximum daily temperature is likely a better indicator of potential for stresses to coldwater fisheries. This is a critical component that should be examined. Please provide additional information on how the temperature of the effluent will not have negative impacts on the coldwater fishery. The MSP states the temperatures will cool while being piped to the outlet. Is there any additional information/modelling that can be provided on this?

**Bacteria**

21. Has the Township considered an ultraviolet treatment for bacteria? The Nottawasaga River is unusually turbid which decreases the rate of bacterial die-off. This is exceptionally important as meeting the recreational guidelines at Wasaga Beach is an important economic factor in Simcoe County. In addition, use of chlorine provides opportunity for a spill which can have severe detrimental impacts to aquatic life, amphibians, livestock and agricultural uses.

22. In light of the sensitivity of downstream receptors, it is NVCA staff opinion that excessive contingencies should be incorporated in case of a spill or upset from the treatment plant.

**Phosphorous**

23. NVCA staff has concerns about the potential increases in levels of phosphorous downstream from the WWTP outfall on Willow Creek and the Nottawasaga River. Willow Creek flows into the Minesing wetlands, a very slow moving system host to sensitive and rare flora and fauna. NVCA staff have documented significant increases in phytoplankton and turbidity at total phosphorous levels less than 0.02 mg/L in flat sandy sections of the river. Additional phosphorous could result in denser algae blooms. In light of this NVCA recommends striving for no additional phosphorous contributions to Willow Creek and the Nottawasaga River system. Taking an integrated approach to both the Environmental Assessment and development process through a 'treatment train' approach should enable achieving this, and NVCA strongly recommends installing a state of the art WWTP with phosphorous removal to the greatest extent feasible, use of best management practices, use of innovative stormwater management techniques and phosphorous offsetting to mitigate loading.

24. Would an end of pipe polishing facility provide any feasible opportunities for additional treatment?

**Nitrogen/Ammonia**

25. Section 3.5 of the report *Interim Assimilation Analysis: Discharge of Treated Sewage Effluent from the Proposed Midhurst WWTP to Willow Creek* prepared by AECOM Canada Ltd. dated June, 2009 indicates that an effluent limit of 9.8 mg/L of Nitrate will protect aquatic life in Willow Creek. There is also reference to the Environment Canada (2008) Ideal Performance Standard (IPS) of 4.7 mg/L nitrate-nitrogen. CCME has provided a 2012 update document on water quality guidelines for the protection of aquatic life. NVCA staff acknowledges the variety of information available on nitrogen and generally has concerns with nitrogen and impact on wildlife. In light of this NVCA staff prefers a conservative approach in dealing with nitrogen and looks forward to reviewing this section of the forthcoming Environmental Study Report.

26. Section 3.5.1 of the report *Interim Assimilation Analysis: Discharge of Treated Sewage Effluent from the Proposed Midhurst WWTP to Willow Creek* prepared by AECOM Canada Ltd. dated June, 2009 indicates that there will be a mixing zone downstream of the of the discharge in Willow Creek where un-ionized ammonia will exceed the Provincial Water Quality Objectives during low flow periods, and mixing zone characteristics will be determined in the current phases of the EA. Please provide this additional data once available, and the possible impacts to aquatic and amphibian life.

## Other

27. Organophosphates and pharmaceuticals are emerging issues in the Great Lakes basin. Can these issues be addressed through this study?

## ROADS

28. The potential Anne St. North connection would bisect a large forest block and potentially impact connectivity in the Little Lake-Minesing corridor. NVCA staff strongly recommends implementing measures to minimize vehicle-wildlife collisions and reduce road kill, such as wildlife crossing culverts.

## MONITORING

29. NVCA staff recommends a comprehensive monitoring program to gather baseline data and monitor the impacts of the proposed land use changes. With the exception of the Provincial water quality monitoring network station at George Johnston Road, there is a limited water quality dataset for Willow Creek. NVCA staff suggest that additional data be collected to complete the Environmental Study Report including a multi season total phosphorus/nitrogen analyses in Willow Creek from upstream of Midhurst to the main Nottawasaga River, with particular emphasis on baseflow conditions between June and September. Additional background information and future monitoring of water quality, water quantity, erosion and natural heritage is recommended and NVCA staff would be pleased to work with the Township and their agents on this matter.

## CONCLUSION

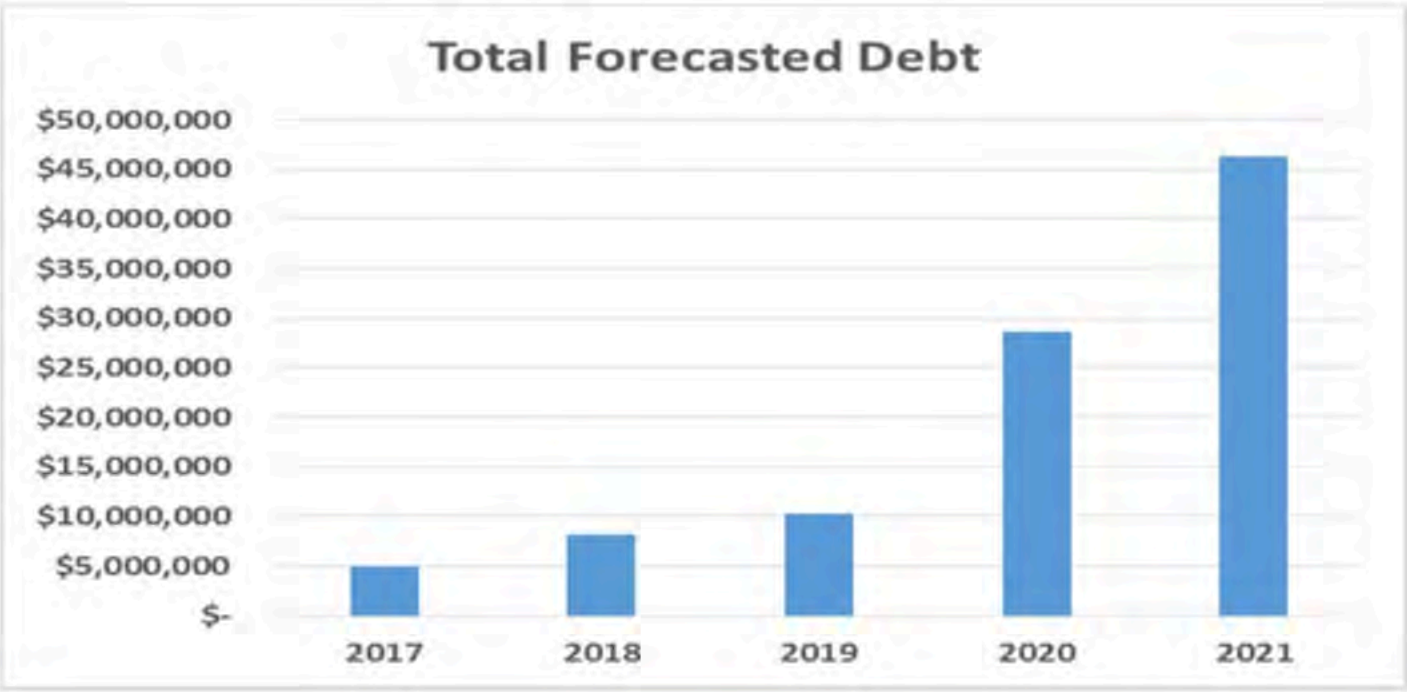
While much work has been completed in this area, NVCA staff requires more information to continue our review. We understand there are more studies forthcoming and we look forward to reviewing and commenting on this information and note that other issues may arise during the course of this review. We trust this is of assistance and if you have any questions or concerns, please do not hesitate to contact the undersigned.

Kindest regards,

Patti Young, MCIP, RPP
Senior Planner

FD/DF/GS/PY

c: **Chunmei Liu**, Ministry of Environment
**Kathy Suggit**, County of Simcoe
**NVCA Chair and Board of Directors**






*These debts are required to cover expenses needed in support of the Midhurst Secondary Plan.*
*The loans will not be repaid until building permits are issued and development charges can be collected.*

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LOTIMER
& ASSOCIATES INC.

To: Mrs. Sandy Buxton, Midhurst Ratepayers' Association
From: Mr. Tim Lotimer, FGC, P.Geo.,
Date: September 8, 2018
Subject: Midhurst Class EA, Draft Environmental Study Report

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In accordance with your request we have reviewed the Ministry of the Environment and Climate Change (MOECC) comments, dated April 30, 2018, on the draft Environmental Study Report. Our review was limited to those aspects related to hydrogeology, water supply and resultant surface water impacts that will occur as a result of the water supply taking.

We have not discussed these comments with the MOECC and would be pleased to meet with them to provide clarification or further explanation.

| Section | MOECC Comment | Response of Midhurst Ratepayers Association |
|---|---|---|
| | | |
| 1.1 | The MOECC indicates that the study (Golder 2016) did not measure the effect of pumping on surface water features but used a groundwater model to predict impacts. | No direct monitoring of stream flow etc. was undertaken during the study. Yet, It is common practice to determine impacts on surface water features by actually measuring changes to stream flow and hydraulic gradients beneath streams during pumping tests. This has been routinely done in other S. Ontario jurisdictions with significant groundwater takings, e.g. Regions of Waterloo and Halton. Their assessments of very large groundwater takings, like the one proposed in Midhurst, used aquifer tests which extended much longer than occurred in this study. Such field monitoring can then confirm the predictions made by other methods, including groundwater and/or surface water models. |
| 1.1 | The MOECC notes that the study forms a good basis for the additional hydrogeological studies that will be necessary when applying for a Permit to Take Water for the use of the proposed wells. | With this statement, the MOECC is essentially confirming that more work/hydrogeological study is essential to adequately assess the impacts of the proposed water supply taking.<br>We note that the study consisted of short tests of individual wells and not a combined test with all of the wells pumping for a sufficient duration. As a result, drawdown of water levels in the shallow groundwater system (aquifers A1 and A2) was just starting. Consequently, trends that would allow an assessment of impacts to the shallow |

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| | | component of the groundwater flow system connected to the multiple tributaries, Willow Creek and the Minesing Wetlands were not fully developed. |
| 2.3i | The MOECC indicates that significantly more detailed information will be required on the environmental effects of the proposed taking when applying for a Permit to Take Water | The MOECC confirms that more work/hydrogeological study is necessary to adequately assess the impacts of the proposed taking. The environmental impacts to be further evaluated include:<br>• Water availability and sustainable yield<br>• Interrelationships between surface water and groundwater, including the impact or potential impact on water quality and quantity |
| 2.3ii | The MOECC notes that the study suggests that the proposed water supply aquifer discharges directly to Nottawasaga Bay | The conclusion that the proposed water supply aquifer discharges directly to Nottawasaga Bay is contradicted by Golders groundwater model. The model output of the deep A3/A4 aquifer equipotentials illustrate that Willow Creek is the regional groundwater discharge boundary for this aquifer. This is also consistent with the groundwater model output of the Barrie Tier 3 study.<br>The consequence of the groundwater flow system is that water pumped from the proposed new wells will intercept groundwater that normally discharges to Willow Creek. This impact will be significant, particularly during periods of low baseflow, as the reduction will be equivalent to the volume of water pumped by the new wells. |
| 2.3ii (con't) | The MOECC expects that further verification will be required to show that there are no surface water reaches (such as the multiple tributaries and shallow wetlands connected to Willow Creek) where there is a significant interconnection between shallow and deep systems that could result in ecological impacts due to the proposed water taking. | The MOECC confirms that more work/hydrogeological study is necessary to adequately assess the impacts of the proposed water taking. |
| 2.3iii | The MOECC does not agree that the model predicted impacts to baseflow in Willow Creek are insignificant | The MOECC points out that in its experience the prediction of stream flow losses using large scale groundwater models may be inaccurate. This is a very serious concern as the potential impact of |

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| | | the proposed taking during low flow periods and/or drought could be very serious to stream and wetland ecology. |
| 2.3iii (con't) | The MOECC notes that "the results (of large scale groundwater models such as the one that was used by Golder) should not be relied upon to provide estimates of potential baseflow reductions and should not be used as the basis to determine if the proposed water taking is acceptable or not" | The MOECC confirms that more work/hydrogeological study is necessary to adequately assess the impacts of the proposed water taking. |
| 2.3iii (con't) | The MOECC "strongly disagrees" with Golder that the estimated baseflow reduction would be considered acceptable. | The MOECC confirms that more work/hydrogeological study is necessary to adequately assess the impacts of the proposed taking. |
| 2.3iii (con't) | The MOECC notes that sewage discharge may result in greater dry weather flows than currently exists | The MOECC neglects to point out that the area of potential stream low-flow impacts is mostly upstream of the point of sewage discharge. Consequently, impacts on these sensitive surface water features will not be mitigated by the discharge of sewage. Furthermore the use of sewage, as a replacement of groundwater discharge to streams and wetlands, is never a preferred mitigation strategy. |

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& ASSOCIATES INC.

To: Mrs. Sandy Buxton, Midhurst Ratepayers' Association
From: Mr. Tim Lotimer, FGC, P.Geo.,
Date: September 8, 2018
Subject: Midhurst Class EA, Draft Environmental Study Report

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In accordance with your request, we have reviewed the Golder comments, dated April 21, 2017, on our slides prepared for presentation at the Council of Springwater Township meeting on March 8, 2017.

| Reference Slide | Golder Comment | Response of Midhurst Ratepayers Association |
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| | | |
| 6 | In this comment, Golder suggests that a detailed assessment of private wells is not necessary. One reason given is that many of the area wells are in an aquifer shallower, and therefore hydraulically separated, from the proposed pumping wells that will be installed in a deeper aquifer. | Large scale groundwater takings often cause adverse impacts to private wells and should be thoroughly assessed during groundwater studies to ensure that there are no water shortages for private well users. The pumping tests of the test wells showed that there was drawdown even in the shallow aquifer from pumping the test wells in the deep aquifer, suggesting that all wells within the zone-of-influence may be impacted by the proposed taking. |
| 8 | In this comment, Golder suggests that the well head protection areas for the existing Midhurst wells is small and home owners do not face land use restrictions | The proposed water taking is much greater than the existing taking; therefore the well head protection areas will extend well beyond the municipal boundaries and possibly affect home owners via land use restrictions even though they are not serviced by the proposed water taking. |
| 9 | In this comment, Golder suggests that the cumulative impact on Willow Creek is below MNR and DFO thresholds | The thresholds used by Golder were not appropriate as noted by the Ministry of the Environment in their review (April 30, 2018) of Golders report |
| 10 | In this comment, Golder suggests that the proposed water-taking will not result in an equivalent water loss to Willow Creek | The capture zones of the proposed new wells are delineated in Figure 12 of the groundwater modelling report of Golder (May 2018 p 356). The deep A3/A4 aquifer equipotentials illustrate that Willow Creek is the regional groundwater discharge boundary for this aquifer. The capture zones of the proposed new wells show that the proposed water-taking will result in the interception of water flowing to Willow Creek and thus result in a reduction of flow in Willow |

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| | | Creek equal to the proposed taking – upstream of the point of sewage discharge. Golder does not address in detail, the ecological impacts of this stream flow loss, on reaches of Willow Creek that are upstream of the sewage discharge location. |
| 11-14 | In this comment, Golder suggests that the discussion of recharge and discharge is incorrect | The groundwater model of Golder (May 2018) supports the concept of recharge and discharge as set out in the slides |
| 12, 13, 14 22 | In this comment, Golder suggests that these slides are inaccurate and misleading | The slides prepared for the presentation are based on the most recent geological and hydrogeological interpretations of the Ontario Geological Survey and illustrate fundamental concepts of groundwater flow in a multiple aquifer/aquitard system such as those found in the Midhurst area.<br>We note that considerable updating and revisions to the geological understanding of the area have been done by the Ontario Geological Survey since Golder completed their studies. The work of the Ontario Geological Survey shows that the stratigraphy of the Central and South Parts of the County of Simcoe is much more complex than is modelled by Golder. This calls into question the reliability of the predictions made using the Golder model. |
| 16 | In this comment, Golder suggests that the 3 day individual pumping tests were conducted in a fashion that provided data which allow the use of a groundwater model to predict impacts | Pumping all wells at the same time is a much better way to provide data for a groundwater model. Water level decline in the shallower aquifers require a longer period to respond to pumping in a predictable way. A 30 day test or longer is often necessary to adequately assess the water level decline and the resultant impacts in areas of sensitive ecological features, such as Willow Creek and the Minesing Wetlands.<br>Areas where pumping tests of this duration are common include the Region of Waterloo and the Region of Halton. |
| 17 | In this comment, Golder suggests that an investigation of the potential impacts to private wells “is simply unheard of” | Given that the Township of Springwater will be required by law to mitigate any adverse impacts to private wells, it is in the taxpayers’ best interests to accurately understand the costs of mitigation that will result from the proposed taking. The mitigation process is often lengthy and private well owners should not have their supply disrupted by a municipal taking that does not extend to them. |

| | | |
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| 17 (con't) | In this comment, Golder suggests that baseflow loss will be minor and meet MNR and MOE thresholds | The thresholds used by Golder were not appropriate as noted by the Ministry of the Environment in their review (April 30, 2018) of Golders report |
| 20 | In this comment, Golder suggests that their groundwater model is already being used by Springwater Township for source water protection purposes and is a reliable way to assess water supply impacts | The purpose of the source water protection program is significantly different from a prediction of water supply impacts.<br>Use of models prepared for source water protection for wells completed in deeper aquifers, such as is proposed, are not designed to accurately determine, with sufficient spatial coverage, the impacts to sensitive ecological features such as Willow Creek and the Minesing Wetlands. |
| 21,22 and 23 | In this comment, Golder suggests that their geological model and numerical groundwater flow model reflects an accurate assessment of the current understanding | We note that considerable work has been done by the Ontario Geological Survey (OGS) since completion of Golders work. A recent OGS report (Mulligan, 2017) notes that, in 2017, the OGS has just finished the mapping and collection of geological information for the area that includes the Minesing Wetlands and augments the area in which the proposed wells will be completed. Their next step, a multi-year project starting in 2018, is to conduct hydrogeological mapping of this area. Predictions of impacts using the existing geological model and numerical flow model should be updated to reflect the findings of the completed OGS studies. |
| 24 | In this comment, Golder advises that treatment is proposed to remove nitrate from the groundwater that is interpreted to be caused by the application of agricultural fertilizer on the land within the capture zones of the proposed wells. They further suggest that changing the land use from agricultural to residential will eliminate this major source of nitrate. | The presence of nitrate is further evidence of the hydraulic connection between all of the aquifers in the Midhurst area and demonstrates that the deep aquifer is connected with the shallow aquifer via infiltration/recharge. Similar changes in land use in other areas of Ontario (for example the Region of Waterloo and County of Oxford) have shown that it may take many decades before any land use changes result in the elimination of nitrate contamination. |

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March 3, 2017

Ms. Sandy Buxton
President, Midhurst Ratepayers Association
[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. Buxton

On behalf of the Township of Springwater, we wish to thank you for your interest in the above-mentioned Class EA. We have reviewed your comments which were received following the October 18, 2016 Public Information Centre (PIC). Your comments/requests have been summarized and our responses are provided following each comment.

- *Will there be enough water for all, considering both today's needs and future groundwater extraction predicted to be six (6) times greater than current Midhurst usage?*

Please refer to the attached Fact Sheet # 1 associated with Water Supply.

- *Where in the reports is there a list of all existing water uses and the current amount of water being taken by our community?*

A description of municipal water use in both Midhurst and Barrie is provided in Section 2 of Appendix M in Hydrogeological Study.

- *How did the studies measure the amount?*

The water taking amounts were measured and provided by municipal water staff at Township of Springwater and City of Barrie.

- *How many private well users live within the area that might be affected by the proposed new wells?*

Most private wells draw from shallow Aquifer A1 or A2. Both field testing and modelling indicate that pumping at the proposed new wells, located in underlying Aquifer A3 / A4, will result in only small drawdown within Aquifers A1 and A2 and will not affect private well use.

- *Does Barrie take its water from the same or related aquifers as does Midhurst?*

Barrie draws water from regional Aquifer A3.

- *Where do the new studies address the existing quantity of groundwater taken by Barrie?*

Section 2 of Appendix M in the Hydrogeological Study

- *Where do the new studies consider any current approval Barrie has to take more water in the future?*

Section 2 of Appendix M in Hydrogeological Study, discusses future water use at City of Barrie. In 2011 the City of Barrie began taking water from Kempenfelt Bay and treats the water in the Surface Water Treatment Plant (SWTP) located on Royal Parkside Drive. The SWTP will service the southern pressure zone, which includes all of the new development areas in the south end of Barrie. Consequently, Barrie's water supply will increasingly draw from Lake Simcoe as opposed to groundwater sources. As a result, groundwater takings at Barrie will actually decrease relatively to current water takings and will be less than currently assumed in the modelling impact assessment. From this perspective, the modelling impact assessment is conservative relative to future cumulative groundwater takings.

- *Where do the reports provide a current and future water "budget" - a description or illustration of how water flows through the watershed and in what quantities both today and in the future?*

Key aspects of the groundwater budget, including recharge rates, pumping rates, stream baseflow, and groundwater flow patterns are described in Appendix M, Hydrogeological Study. A comprehensive current and future modelled water budget – wherein each boundary condition input / output is tallied – was completed internally as part of the study but only those items pertinent to the impact assessment (for eg. current versus future stream baseflow) were reported on.

- *How can exploration of four (4) new groundwater wells be an accurate method for concluding there is sufficient water to pump maximum amounts from eleven (11) new wells?*

The field investigation, documented in Hydrogeological Study, included (but was not limited to): the drilling and installation of 20 test wells and 21 observation wells (a total of 41 wells); five aquifer tests (two in A3 and three in A4); and the use of a highly sophisticated numerical model to assess the potential for future groundwater impacts. In our view the breadth and detail of this study has provided an adequate basis to evaluate the long-term sustainability of the water supply.

- *Why in 2016 and beyond, should we all rely on a 2004 model prepared by the consultants (Golder)? How can this 2004 model be a "state of the art" model for today?*

The model used in the hydrogeological study was:

a) completed in 2015;
b) employed the most recent code version available at the time (FEFLOW 6.2);
c) incorporated recent data collected as part of the recent field investigation (Golder, 2015); and
d) underwent a rigorous and unprecedented calibration process to both well water levels and monthly baseflow measurements at Willow Creek.

This model marks a significant level of refinement over preceding models and in our professional opinion provides an appropriate tool to assess current and future groundwater conditions at Midhurst and the surrounding Willow Creek watershed.

- *Has Golder run a worst case scenario showing all wells which draw on the aquifers - private, Barrie and other municipal wells - taking water at the maximum permitted rates of extraction?*

The modelling, as described in Appendix M, Hydrogeological Study, examines a scenario where the Carson and Doran Neighbourhood wells are pumped at their maximum rates during a three month period over the summer every year of operation. During this scenario, the Barrie wells are pumped at the "Existing Plus Committed Plus Planned Demand" for the year 2031 as documented in the City of Barrie Tier Three Water Budget and Local Area Risk Assessment. Domestic wells are not considered in the modelling as their pumping volumes are practically insignificant relative to the municipal water supply systems – this is a common approach when modelling regional aquifer systems in Ontario.

- *Will the proposed groundwater extractions take water from the same aquifers which supply the Minesing Wetland and related water courses?*

The proposed groundwater extractions draw water from Aquifers A3 and A4. These deep units are confined and lie below the shallow aquifers (A1 and A2) that are the primary source of groundwater to Minesing Wetland and associated surface water features. Nonetheless, the deep and shallow aquifers do have a limited hydraulic connection whereby larger water takings in A3/A4 may, over the long-term, manifest as minor and localized water level and baseflow changes in A1/A2. The impact of the proposed groundwater extractions on the Minesing Wetland and other water courses is described in Appendix M, Hydrogeological Study. As noted in that report, estimated baseflow losses in Willow Creek directly upstream of the Minesing Wetland are small and range between 3% to 7% over the course of the year. Baseflow loss to Minesing Wetland itself would be even smaller as the Wetland draws from a larger groundwater catchment than considered in the model. Also note that this discussion pertains only to the groundwater component of flow – when surface water inputs are considered (for example, overland flow to the Wetland and the upstream inflows from the Nottawasaga River) pumping-induced changes to the flow regime at Minesing Wetland are negligible.

- *How do the studies assess their existing groundwater needs?*

Groundwater contributions to Willow Creek and Minesing Wetland are assessed by reviewing long-term flow records and further supplemented through the construction and calibration of a numerical flow model as described in Appendix M, Hydrogeological Study.

- *Do the studies predict a loss of groundwater for these features? If so, how much?*

Ecological needs for groundwater are addressed. The Hydrogeological Study predicts a 3-7% potential reduction in groundwater, which is well below the DFO "Environmental Flow Needs" threshold of a maximum flow reduction of 10%. Any reduction in flow from the groundwater will not impair ecological needs or assimilation potential in Willow Creek. In the predicted potential baseflow reductions of 3-7% is for Willow Creek at Hwy. 26, in the reach where the WWTP discharge is proposed. This minor loss equates to a maximum potential reductions of 1mm in the water table in the upland fen areas where the Hines Emerald Dragonfly has been reported and as such will have no impact on the HED habitat.

- *Has a fisheries analysis been undertaken to determine whether the proposed development will reduce the amount of cold groundwater available to supply these fisheries waters?*

The proposed groundwater extractions take water from Aquifers A3 and A4. These deep units are confined and lie below the shallow aquifers (A1 and A2) that are the primary source of groundwater to Willow Creek. Nonetheless, the deep and shallow aquifers do have a limited hydraulic connection whereby larger water takings in A3/A4 may, over the long-term, manifest as minor and localized water level and baseflow changes in A1/A2. The impact of the proposed groundwater extractions on Willow Creek is described in Appendix M, Hydrogeological Study. As noted in that report, estimated baseflow losses to Willow Creek, where they occur, are minor (3% to 7%). These potential losses are within the DFO (2013) acceptable threshold of 10% reductions in flow and will have no significant impact on groundwater availability for fisheries.

- *What seasonal variation has been considered since groundwater can be very significant during hot, dry summer months?*

The modelling study considers monthly variations in both recharge (including reduced infiltration during summer) and water taking patterns (including increased pumping during summer) as described in Appendix M, Hydrogeological Study. The Assimilative Capacity Study shows that potential groundwater losses range from 4.7%-6.3% in winter, 3.3% to 4.8% in spring, 6.2-6.8% in summer and peak at 7.32% in October.

- *The new studies say that water used by Midhurst residents will be treated and discharged into Willow Creek. How will this new amount of treated water affect the water levels, quality and temperature of existing streams?*

The Willow Creek Assimilative Capacity Study was completed in May 2016. The discharge of treated effluent from the Midhurst WWTP will have no significant impact on Willow Creek outside of a small mixing zone that will occupy a portion of the creek immediately downstream of the discharge.

- Willow Creek currently exceeds the Provincial Water Quality Objective for Total Phosphorus of 0.03 mg/L. At Full Build Out of the Midhurst Secondary Plan, effluent will be treated to the PWQO of 0.03 mg/L and there will be no measurable increase in the creek as a result of the discharge.
- Nitrogen forms will be treated to a very high standard in the WWTP. The effluent will be non-lethal to aquatic life as it leaves the plant, prior to any mixing with the creek. The effluent will mix with the creek after discharge and the resultant dilution and assimilation processes will quickly reduce ammonia concentrations so they will meet the water quality objective for un-ionized ammonia within 360m of the point of discharge. No significant impacts will occur within this 360m "mixing zone" which is allowed under MOECC Policy. Nitrate in the creek will be maintained below water quality objectives at all points. Water quality that is at or below an objective is suitable for indefinite exposure of the most sensitive life stages of the most sensitive aquatic life and is thus safe for aquatic life.
- Dissolved oxygen concentrations will be maintained at 7.8 – 8.1 mg/L in Willow Creek, well above the requirements for aquatic life.
- The effluent discharge will have a minimal effect on water temperatures in Willow Creek. At Full Build Out, and minimum creek flows, the maximum water temperature increases will be 1.05 $^{o}$C in January and 0.85 $^{o}$C in July. Therefore, temperatures will remain within current ranges with no impacts to aquatic life. In addition, these calculations did not take into account the cooling effect that will take place on the effluent as it passes through the 4.5km long sanitary forcemain from the WWTP on Snow Valley Rd to the discharge point at Willow Creek and Hwy 26 nor the exchange of heat with the atmosphere.

- Based upon 10 plus years of Willow Creek flow data that has been analyzed, the flows within Willow Creek vary between a 7Q20 flow rate 430L/s to high of 24,000± L/s. The data also shows great variations within each specific season, depending upon the amount of precipitation that falls in a season. Therefore, given the significant variations in the existing flows the additional 143L/s of flow from the Wastewater Treatment Plant, after the development of the entire Midhurst Secondary Plan, will not affect the Willow Creek.

In addition, the discharge of effluent would result in an average increased water depth of 1 to 3cm and average increased velocity of 0.01 m/sec, changes that would be virtually immeasurable in Willow Creek.

- *Will there be any change in temperature to the water supporting coldwater fisheries?*

Effluent discharge will have a minimal effect on water temperatures in the creek. A mass balance model was built using predicted effluent temperatures (validated by comparison with effluent temperature data from existing WWTPs in southern Ontario) and monthly average and 75th percentile temperatures in Willow Creek near the proposed discharge point. At average water temperatures, the maximum temperature increase in Willow Creek was 1.05°C (at Full Build Out and minimum creek flows), which was predicted for January. Through the summer (June 1 to August 31), the maximum temperature increase was 0.85°C, equating to a final downstream temperature of 18.6°C. At 75th percentile Willow Creek water temperatures, Full Build out and minimum creek flows, the maximum fully mixed downstream temperature was 19.43°C (experienced in July), which was a 0.08°C increase over upstream Willow Creek upstream temperatures of 19.35°C. These are conservative downstream temperature estimates since the effluent will be cooled as it travels along the 4.5km buried forcemain from the WWTP on Snow Valley Road to the discharge point at Willow Creek and will exchange heat with the atmosphere after discharge.

The PWQO for water temperature is, “The natural thermal regime of any body of water shall not be altered so as to impair the quality of the natural environment. In particular, the diversity, distribution and abundance of plant and animal life shall not be significantly changed.” (MOE 1994). We reviewed the thermal tolerances of resident trout species as representative coldwater organisms. We have captured Brown Trout within Willow Creek and Ministry of Natural Resources and Forestry (MNRF) have indicated that others have collected them in Willow Creek as well. Although Brook Trout have a lower thermal tolerance than Brown Trout and were included in fish species lists of Willow Creek provided by NVCA and MNRF, we have not captured Brook Trout in field surveys within Willow Creek and Scientific Collection results provided by MNRF indicate Brook Trout only in tributaries to Willow Creek.

Water temperature appears to be the most important factor separating trout streams from non-trout streams (Stoneman and Jones, 2000). The habitat requirements of brown trout are essentially the same as brook trout but it can remain active and thriving in slightly higher temperatures; the upper range of which has been reported as 24°C (Brynildson et al 1963) or 25°C (Hasnain et al. 2010). Elliot and Elliot (2010) produced a growth model to assess the impacts of climate change and resulting changes to water temperature on Brown Trout. They found that water temperatures would have to increase by 4ºC in winter and spring or 3ºC in summer and fall before they had a marked negative impact on growth.

Given the conservative mass balance model predictions of a maximum downstream Willow Creek temperature increase from 19.35°C to 19.43°C, the temperature impacts from the WWTP would not

be expected to push downstream temperatures above the upper tolerance for Brown Trout or effect growth rates.

- *The Ramsar-designated Minesing Wetlands provides habitat for many such flora and fauna which may well be very sensitive to any change in water levels, flow, quality or temperature, such as the endangered Hine's Emerald Dragonfly found only near the proposed sewage effluent discharge mouth. How do the studies deal with these species?*

Hutchinson Environmental Sciences Ltd. has prepared detailed analyses of changes in water quality associated with the project and any implications to the natural environment that might impact the Hine's Emerald Dragonfly habitat. The only observed Hine's Emerald Dragonfly habitat is located in the upland fen areas of the Minesing wetland, >5 km from the WWTP discharge to Willow Creek and has no direct hydrological connection to the discharge area. Golder Associates developed a hydrologic/hydrogeologic model that indicates a maximum surface water level decrease of less than 1 mm in the Minesing Wetland, near the HED habitat, as a result of operating the water supply wells over a ten-year period at full development build out. Therefore, there is no potential for project effects on the HED.

The Technical Memorandum prepared by Hutchinson Environmental Sciences Ltd concludes that the development of the Midhurst secondary plan area does not threaten the HED or its habitat, by noting that:

- No physical disturbances associated with the development of the Midhurst secondary plan will occur within 5 km of the regulated HED habitat and so there are no direct impacts;

- A hydrologic/hydrogeologic model prepared by Golder Associates indicated the maximum surface water level decrease of less than 1 mm in the Minesing Wetland over a ten-year period at full development build out. Therefore, with respect to the regulated HED habitat, the HED's use of the wetlands for egg-laying and larval development would not be affected as a result of water level changes;

- A series of Best Management Practices, similar to what has been developed to protect the largest known HED population in Wisconsin (i.e. the Ridges Sanctuary 2013), have been or will be implemented in the design of the Midhurst Secondary Plan area, as additional protective measures.

- *Is the level of nitrate in the aquifers stable or is there a risk that it will increase over time?*

Nitrate is going to be removed from the water through treatment, however in the recharge area for the wells there will be a removal of the farming source of nitrate, which is expected to result in decreasing nitrate over time.

- *Does the presence of nitrate suggest that there may be other pollutants that have not yet been identified that will require additional treatment to make the water safe to drink?*

Contaminant source inventories were completed for the capture zones of the wells and have not identified potential contaminant sources. In addition, all water sampling has been analyzed relative to the Ontario Drinking Water Standards.

In summary, the Water, Wastewater and Stormwater associated with the development of the Midhurst Secondary Plan will meet and/or exceed all Provincial regulations and requirements. In addition to meeting these Provincial regulations and requirements, the extensive reports that have been prepared in support of the Midhurst Class EA, confirm that the regional water aquifers, Willow Creek and Minesing Wetlands will not be detrimentally impacted.

We have also attached several Fact Sheets that have been developed in response to questions received at or following the Public Information Centre (PIC), which provide additional information that may be helpful.

Thank you again for your interest in this Class EA. If you have any other concerns, please do not hesitate to contact us.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P.Eng.
President & CEO

# Fact Sheet # 1: Water Supply

## 1) Hydrogeological Study Requirements

The Ministry of Environment and Climate Change (MOECC) has a requirement that a hydrogeological study must be completed in accordance with Ministry guidelines.

In particular, these guidelines outline that a hydrogeological study is required to develop a comprehensive picture and associated model to determine how any proposed development in the Province can be serviced with Municipal water, while accessing the existing aquifers and their interaction with the natural features that rely on groundwater throughout the area. The work associated with developing the study should include a detailed review of regional and local geology, the physical characteristics of the regional aquifers and adjacent units, groundwater flow direction, summary of existing and proposed groundwater withdrawals, estimates of groundwater recharge, and groundwater-surface water interaction (local streams and groundwater).

## 2) Midhurst Hydrogeological Study

A comprehensive hydrogeological study has been completed, in accordance with MOECC guidelines and requirements, in support of the Midhurst Secondary Plan. In particular, the Hydrogeological study identifies:

a) There are four main Aquifers throughout the area (Aquifer A1, A2, A3 & A4). The majority of private wells are constructed in the shallow Aquifers A1 and A2, whereas the majority of existing and proposed municipal wells in Simcoe County are constructed in the deeper Aquifers A3 and A4.

b) Water levels within Aquifers A1 and A2 are relatively sensitive to seasonal weather fluctuations as a result of the aquifers being shallow and unconfined (although in some areas A2 is relatively deep and confined). Conversely, water levels within Aquifers A3 and A4 are less sensitive to seasonal weather fluctuations as a result of the aquifers being deep and confined under lower permeability soils.

c) The hydrogeological study considered the private and municipal wells throughout the area utilizing the MOECC water well database.

d) The water supply potential of aquifers A3 and A4 was assessed through borehole drilling, observation well construction, test well construction and pumping tests and water quality sampling at multiple sites throughout Midhurst.

## Fact Sheet # 1: Water Supply

In particular water quality samples were collected and analysed against the Ontario Drinking Water Quality Standards (ODWS). In addition, 72-hour pump tests were completed on a number of the test wells, while data was being recorded at a number of observation wells throughout the area.

A key component of the aforementioned hydrogeological study was the completion of groundwater modelling to assess the long-term sustainability of the proposed groundwater supply. The model is regional in scale and encompasses an area of 746km², stretching from the south end of Barrie to north of Craighurst and west to the Minesing Wetland. Significant refinements were made to the model as a result of extensive data collected as part of the field investigations to ensure that the model was appropriately calibrated.

e) The hydrogeological study examines a worst case scenario for the aquifers, whereby the proposed new Municipal Wells are pumped at their required capacity while the existing Municipal wells in Midhurst are pumped at their maximum allowable rates and the wells in Barrie are pumped at the "Existing Plus Committed Plus Planned Demand" for the year 2031 as documented by the City of Barrie. Domestic wells are not considered in the modelling as their pumping volumes are extremely low, relative to the municipal water supply systems, which is a common approach when modelling regional aquifer systems in Ontario.

f) The hydrogeological study and associated modelling concluded that pumping of the municipal wells being proposed for the Midhurst Secondary Plan would not have an adverse effect on the existing municipal and/or private wells within the regional area and that the baseflows within the local streams would continue at sustainable rates.

**3)** The Environmental Study Report (ESR) including all Technical Reports related to Water Supply will be reviewed by the Technical Experts within the Ministry of the Environment & Climate Change (MOECC) prior to the release and finalization of the of the ESR.

## Fact Sheet # 2: Willow Creek and Minesing Wetland

1) The Minesing Wetland spans an area of more than 6,000 hectares (15,000 acres) with an assemblage of fens, marshes, swamps and bogs supports a network of flora and fauna.

2) The Matheson Creek drainage area represents approximately 11% of the Minesing Wetland drainage area. Note Willow Creek is within the Matheson Creek watershed;

3) The phosphorus loading within the Minesing Wetland varies greatly each year and depends upon the amount and type of precipitation throughout the year. However, the current phosphorus loading within the Minesing Wetland has been estimated to be between 35,000 and 40,000 kg per year;

4) As identified in "Pollutant Target Loads: Lake Simcoe and Nottawasaga River Basins" Report dated June 2006 and prepared by the Louis Berger Group and Greenland International, Inc. the combined phosphorus loading entering the Minesing Wetland from the Matheson Creek watershed and the Black Creek watershed is over 3,800kg per year. Note the Midhurst Secondary Plan is completely within the Matheson Creek and Black Creek watersheds.

5) A detailed assessment of the cumulative loading of phosphorus from the Midhurst Secondary Plan (both Stormwater Management and the Wastewater Treatment Plant) discharging to Willow Creek and the Minesing Wetland has been completed.

   To facilitate this a phosphorus budget modelling tool was developed and adapted specifically for the Nottawasaga Valley Conservation Authority (NVCA), from the modelling tool that was developed for the Lake Simcoe Protection Plan (LSPP) by the Ministry of Environment and Climate Change (MOECC), along with the inclusion of new industry standards for Low Impact Development (LID) in Ontario.

   This phosphorus assessment concluded that with the extensive use of Low Impact Development (LID) measures throughout the Midhurst Secondary Plan, the traditional impact of stormwater from new development will be significantly reduced. In particular, the cumulative "net" phosphorus load after the buildout of the entire Midhurst Secondary Plan is approximately 66 kg/year, which (conservatively) represents less than 0.5% of the current phosphorus load flowing through the Minesing Wetland on an annual basis.

6) The combination of, the latest treatment technologies at the Wastewater Treatment Plant and assimilation processes in Willow Creek, will maintain un-ionized ammonia concentrations below the Provincial Water Quality Objectives (PWQO). Therefore,

## Fact Sheet # 2: Willow Creek and Minesing Wetland

Willow Creek or Minesing Wetland will not be negatively affected by ammonia from the Midhurst Secondary Plan.

7) Willow Creek currently exceeds the Provincial Water Quality Objective (PWQO) for Total Phosphorus of 0.03 mg/L. At Full Build Out of the Midhurst Secondary Plan, effluent will be treated to the PWQO of 0.03 mg/L and there will be no measurable increase in the creek as a result of the discharge.

8) Based upon 10 plus years of Willow Creek flow data that has been analyzed, the flows within Willow Creek vary between a 7Q20 flow rate of 430 Litres per second (L/s) to a high of 24,000± L/s. The data also shows great variations within each specific season, depending upon the amount of precipitation that falls in a particular season. Therefore, given the significant variations in the existing flows within Willow Creek, the additional 143L/s of flow from the Wastewater Treatment Plant, after the buildout of the entire Midhurst Secondary Plan, will not affect the characteristics of Willow Creek from fluvial geomorphological perspective.

9) Nitrogen forms will be treated to a very high standard in the WWTP. The effluent will be non-lethal to aquatic life as it leaves the plant, prior to any mixing with the creek. The effluent will mix with the creek after discharge and the resultant dilution and assimilation processes will quickly reduce ammonia concentrations so they will meet the water quality objective for un-ionized ammonia within 360m of the point of discharge. No significant impacts will occur within this 360m “mixing zone” which is allowed under MOECC Policy. Nitrate in the creek will be maintained below water quality objectives at all points. Water quality that is at or below an objective is suitable for indefinite exposure of the most sensitive life stages of the most sensitive aquatic life and is thus safe for aquatic life.

10) Dissolved oxygen concentrations will be maintained at 7.8 – 8.1 mg/L in Willow Creek, well above the requirements for aquatic life.

11) Effluent discharge will have a minimal effect on water temperatures in the creek. At Full Build Out, and minimum creek flows, the maximum water temperature increases will be 1.05 $^{o}$C in January and 0.85 $^{o}$C in July, without accounting for exchange of heat with the atmosphere. Temperatures will therefore remain within current ranges with no impacts to aquatic life.

12) At Full Build Out, the flow from the WWTP would make up 25% of the total flow of Willow Creek at 7Q20 low flows (i.e., 430 L/s). The discharge of effluent would result in an average increased water depth of 0.01 to 0.03 m and average increased velocity

## Fact Sheet # 2: Willow Creek and Minesing Wetland

of 0.01 m/sec, changes that would be virtually immeasurable in Willow Creek and would have no effects on erosion.

13) The Midhurst Developers Group is committed to working with the Nottawasaga Valley Conservation Authority (NVCA) to achieving a net-zero increase in phosphorus, if required.

In particular, if it is deemed necessary by the MOECC, a program similar to what was set up with the Developers group in the Tottenham area could be established. In the Tottenham scenario, an Expansion to the Wastewater Treatment Plant, which was necessary to accommodate new growth, was going to increase the amount of phosphorous being discharged to the Beeton Creek. Therefore, the local Developers were required by MOECC to provide monies to the NVCA for the implementation of a phosphorous offsetting program; whereby works would be undertaken by the NVCA, at key spots throughout the watershed, to reduce the amount of phosphorous entering the creek and therefore, offset the additional load from the expanded Wastewater Treatment Plant and ensuring no negative impact on the watershed.

## Fact Sheet # 3: Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs)

1) Pharmaceuticals and Personal Care Products (PPCPs) can originate from numerous sources, but primarily come from humans. When humans take medications only a portion is absorbed by the body. In addition, PPCPs can come from fragrances, shampoos, laundry and dishwashing detergents and other consumer products.

2) Endocrine Disruptors Compounds (EDCs) are chemicals, both natural and man-made, that at certain doses, can interfere with the endocrine (or hormone) system in mammals. Endocrine disruptors may be found in many everyday products– including plastic bottles, metal food cans, detergents, flame retardants, food, toys and cosmetics.

3) There are currently no Federal and/or Provincial regulations in Canada relating to the levels of PPCPs and EDCs in wastewater and/or drinking water. In addition, neither the US Environmental Protection Agency nor the equivalent agencies in Europe and Asia have any regulations for PPCPs and EDCs in wastewater and/or drinking water.

4) The effects of the PPCPs and EDCs on the environment continue to be investigated by the United States Environmental Protection Agency (US EPA) and many other scientists and organizations around the world to determine the levels that exist in our water systems and whether those levels, present any potential danger to the environment. To date the levels that have been found are extremely low concentrations (usually parts per trillion). One part per trillion is equal to one drop of water in 26 Olympic-size swimming pools.

5) PPCPs and EDCs are found throughout the world in all bodies of water influenced by human and/or animal wastewater, including rivers and streams, groundwater coastal marine environments, and many drinking water sources.

6) The detection of a compound in water does not mean that adverse health effects will or are likely to occur. In fact, no relationships have been established between PPCPs and EDCs in water and adverse effects in humans. Some studies indicate that there are endocrine-related effects on growth and development from environmental exposures in fish and wildlife. However, the US EPA and the Ministry of Environment and Climate Change (MOECC) have not established acceptable levels of PPCPs and EDCs in water or wastewater.

7) Given the very low concentrations in which they are generally found detection of PPCPs and EDCs is the major challenge. It is only due to recent advances in

## Fact Sheet # 3: Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs)

analytical techniques and instrumentation that have allowed for the reportable measurement of concentrations at such low levels.

8) In 2011 the World Health Organization (WHO) Undertook a Study on "Pharmaceuticals in Drinking Water." This Study was a working group of leading experts from USA, Switzerland, Australia, England, Canada, Singapore, Denmark, Japan and Italy. The Study the involved three human health risk assessments (USA, UK and Australia). The major findings of this Study were:

   a) Trace concentrations of pharmaceuticals in surface water impacted by wastewater discharges are extremely low (only detectable in last decade);

   b) Substantial margins of safety (more than 1000 fold) suggest adverse health impacts are very unlikely;

   c) From a treatment perspective, pharmaceuticals are not unusual organic chemicals. Therefore, treatment removal rates are reasonably predictable based upon the physical and chemical properties of the compounds;

   d) Conventional Biological Wastewater treatment processes with coagulation, filtration and chlorination can remove about 50% of these compounds, whereas advanced wastewater treatment processes (similar to what is being proposed in Midhurst), such as ozonation, membrane treatment and advanced oxidation, can generally achieve much higher removal rates (and in some cases up to 100%) compared with conventional treatment processes;

   e) Current levels of exposure do not warrant development of formal guidelines;

   f) There is also a lack of standardized sampling and analysis protocols to support monitoring studies.

   g) Consideration should be given to preventative measures such as "Take Back" programs, regulations, public education encouraging proper disposal to minimize pharmaceuticals in the environment.

## Fact Sheet # 3: Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs)

One of the main recommendations of the WHO study was:

*"The substantial margin of safety for consumption of very low concentrations of pharmaceuticals in drinking-water suggests that appreciable adverse impacts on human health are very unlikely. As such, concerns over pharmaceuticals should not divert attention and valuable resources of water suppliers and regulators from other priorities, such as pathogenic microbial water quality issues. The low risk to human health from current levels of exposure in drinking-water suggests that development of formal guideline values for pharmaceuticals in the WHO Guidelines for Drinking-water Quality and the installation of specialized treatment processes to reduce trace concentrations of pharmaceuticals are not warranted."*

9) A study on the "*Reduction of Intersex in a Wild Fish Population in Response to Major Municipal Wastewater Treatment Plant Upgrades" was* published in the "*Environmental Science and Technology"* magazine in December 2016 by team of researchers from the University of Waterloo, University of McMaster and Environment and Climate Change Canada. The study, which was based upon 10 years of data, found that the microorganisms used to remove ammonia in the wastewater treatment process also reduced the levels of endocrine disrupters in the water, which caused the intersex occurrences in fish to dramatically decline.

   Within the study, intersex in fish downstream of municipal Wastewater Treatment Plants (WWTPs) was studied in the Grand River, in southern Ontario. Consistent high rates of intersex in male rainbow darter have been reported for several years in the Grand River, in close proximity to two WWTPs. The larger WWTP (Kitchener) recently underwent significant upgrades that included the conversion from a carbonaceous activated sludge to nitrifying activated sludge treatment process. This created a unique opportunity to assess whether upgrades designed to improve effluent quality could also remediate the intersex previously observed in wild fish. Multiple years (2007−2012) of intersex data on male rainbow darter collected before the upgrades at sites associated with the WWTP outfall were compared with intersex data collected in post-upgrade years (2013−2015). These upgrades resulted in a reduction from 70 to 100% intersex incidence (pre-upgrade) to <10% in post-upgrade years. Although the cause of intersex remains unknown, indicators of effluent quality including nutrients, pharmaceuticals, and estrogenicity improved in the effluent after the upgrades.

   This study demonstrated that investment in WWTP upgrades improved effluent quality and was associated with an immediate change in biological responses in the receiving environment.

## Fact Sheet # 3: Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs)

Having long-term data of the fish population, before and after the wastewater treatment upgrades makes this a truly unique study," said Mark Servos, Canada Research Chair in Water Quality Protection in the University of Waterloo's Department of Biology. "The changes to Kitchener's wastewater treatment system have had a much larger positive impact then we had anticipated."

Upgrades to a wastewater treatment plant along Ontario's Grand River led to a 70 per cent drop in fish that have both male and female characteristics within one year and a full recovery of the fish population within three years, according to researchers at the University of Waterloo.

10) The advanced Wastewater Treatment process that is being proposed for Midhurst will provide one of the best barriers available in the industry and as such will significantly minimize PPCPs and EDCs within the wastewater, entering Willow Creek.

11) Inappropriate disposal practices, such as flushing unwanted or excess drugs down the toilets or discarding them into household waste, are very common and are a main contributor to pharmaceuticals in wastewater and other environmental media, such as surface waters and landfill leachate.

    As this issue is global in nature, organizations like the World Health Organization (WHO) have continued to stress the need for countries to develop programs for the retrieval and proper disposal of unused or expired pharmaceuticals.

    Therefore, it is important that policies promoting safe disposal or regulations governing disposal practices for unwanted or excess drugs be developed, at the Provincial and/or Federal level. Such programs or regulations would reduce the amount of pharmaceuticals entering water bodies. In addition, takeback programs, guidance and enhanced consumer education will support efforts for the proper disposal of medicines and reduce the impact of pharmaceuticals entering our water sources.

## Fact Sheet # 4: Low Impact Development (LID)

**1)** Low Impact Development (LID) is an innovative stormwater management approach with a basic principle that is modeled after nature: manage rainfall at the source using uniformly distributed decentralized micro-scale controls. LID's goal is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source.

Techniques are based on the premise that stormwater management should not be seen as stormwater disposal. Instead of conveying and managing / treating stormwater in large, costly end-of-pipe facilities located at the bottom of drainage areas, LID addresses stormwater through a variety of methods through a typical new development. These landscape features, known as Integrated Management Practices (IMPs), are the building blocks of LID. Almost all components of the urban environment have the potential to serve as an IMP. This includes not only open space, but also rooftops, streetscapes, parking lots, sidewalks, and medians. LID is a versatile approach that can be applied equally well to new development, urban retrofits, and redevelopment / revitalization projects.

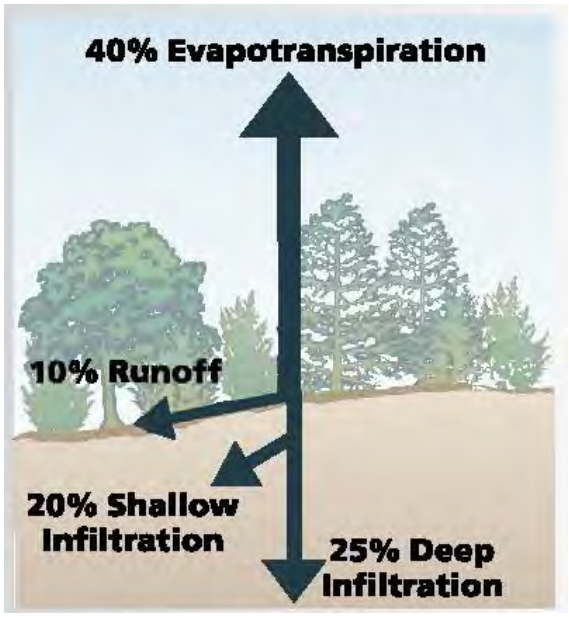
**2) LID Provides many environmental and economic Benefits**

- Improved Water Quality. Stormwater runoff can pick up pollutants such as oil, bacteria, sediments, metals, hydrocarbons and some nutrients from impervious surfaces and discharge these to surface waters. Using LID practices will reduce pollutant-laden stormwater reaching local waters. Better water quality increases property values and lowers government clean-up costs.
- Improved Groundwater Recharge. Runoff that is quickly shunted through storm sewers into Storm ponds and ultimately in water courses cannot soak into the ground. LID practices retain more rainfall on-site, allowing it to enter the ground and be filtered by soil as it seeps down to the water table.
- Reduced Number of Costly Flooding Events. In communities that rely on ditches and drains to divert runoff to local waterways, flooding can occur when large volumes of stormwater enter surface waters very quickly. Holistically incorporating LID practices reduces the volume and speed of stormwater runoff and decreases costly flooding and property damage. Restored Aquatic Habitat. Rapidly moving stormwater erodes stream banks and scours stream channels, obliterating habitat for fish and other aquatic life. Using LID practices reduces the amount of stormwater reaching a surface water system and helps to maintain natural stream channel functions and habitat.

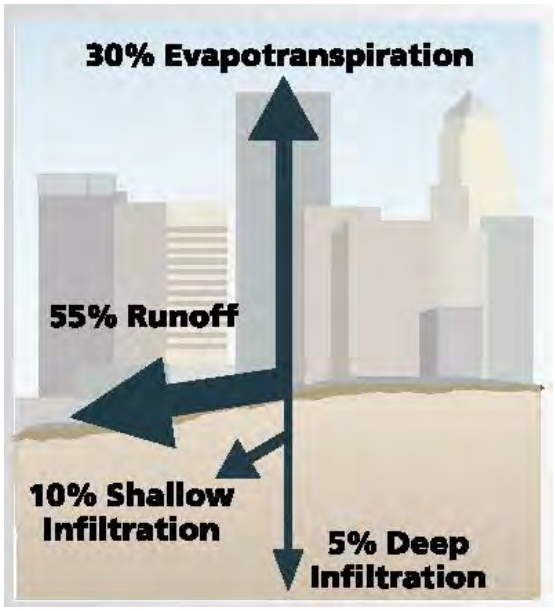
## Fact Sheet # 4: Low Impact Development (LID)

- Enhanced Neighborhood Beauty. Traditional stormwater management infrastructure includes unsightly pipes, outfalls, concrete channels and fenced basins. Using LID broadly can increase property values and enhance communities by making them more beautiful, sustainable and wildlife friendly.

When implemented broadly, LID can also mitigate the urban heat island effect (by infiltrating water running off hot pavements and shading and minimizing impervious surfaces), mitigate climate change (by sequestering carbon in plants), save energy (from green roofs, tree shading, and reduced/ avoided water treatment costs), reduce air pollution (by avoiding power plant emissions and reducing ground-level ozone), increase property values (by improving neighborhood aesthetics and connecting the built and natural environments), and increase groundwater recharge, potentially slowing or reversing land and well field subsidence.




Typical Pre-Development Stormwater Flows

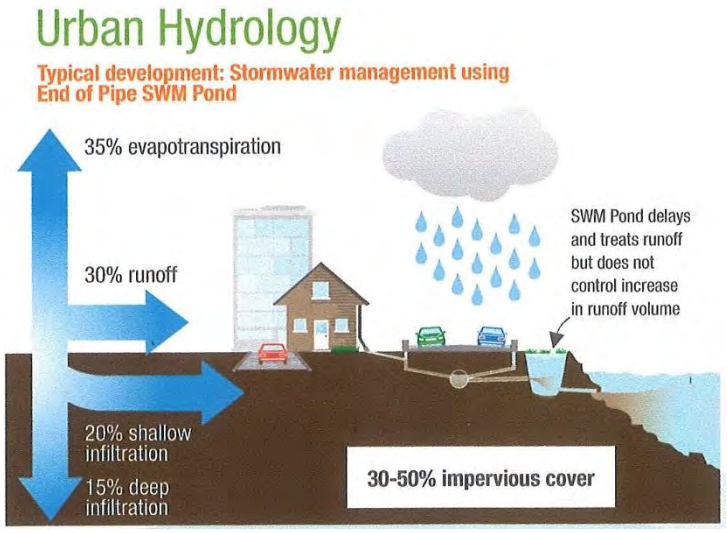



Typical Post-Development Stormwater Flows with No LIDs

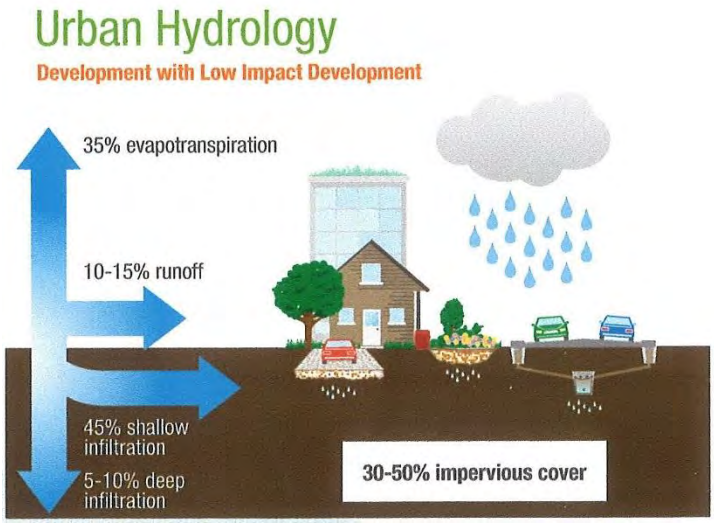
## Fact Sheet # 4: Low Impact Development (LID)

**Typical Natural Ground Pre-Development**

**Typical Urban Development without LID's**




**Typical Urban Development with LID's**



## Fact Sheet # 4: Low Impact Development (LID)

**3)** Although not mandated by MOECC requirements, LIDs are being heavily promoted by most Conservation Authorities including Nottawasaga Valley (NVCA), Credit Valley (CVC), Toronto Region (TRCA) and Lake Simcoe (LSRCA) for new developments.

**4)** LIDs will be implemented throughout the Midhurst Secondary Plan to achieve:

- The ability of the stormwater management system to hold back the first 25 mm of storm runoff for a period of 48 hours.
- Reduce the Post-Development phosphorous loading to below Pre-Development loading levels, such that when the additional phosphorous load from the new Wastewater Treatment Plant (WWTP) is included, there shall be no net increase.
- The ability of the stormwater management system to infiltrate back into the ground, close to the source, the first 20 mm of rainfall while also ensuring a healthy hydrologic cycle.

**5)** In summary the implementation of Low Impact Development measures through the Midhurst Secondary Plan is an environmentally sound technology and economically sustainable approach to reduce the impacts of development and help to protect the local environment, protect public health, and improve community livability.

# Fact Sheet # 5: Existing and Proposed Traffic in Midhurst

## 1) Traffic Study Requirements

a) Traffic Studies must be completed in a strategic manner in accordance with guidelines issued by the Ministry of Transportation, Transportation Research Board and the Institute of Transportation Engineers. In particular, the following is a brief overview of the process for the completion of Traffic Studies:

i) Obtain Traffic Data for the for A.M. and P.M. peak hours on the primary roads to accurately determine existing traffic throughout the community;

ii) Create a computer model using Ministry of Transportation approved software in accordance with the "Highway Capacity Manual" prepared by the Transportation Research Board;

iii) Calculate the Traffic "Trips" to and from the proposed developments, in accordance with the "Trip Generation Manual" prepared by the Institute of Transportation Engineers;

iv) Calculate the Impacts on the road network utilizing the AM and PM peak hours;

v) The peak hour analysis should be undertaken for

- Existing traffic conditions;
- Existing traffic conditions plus background growth;
- Existing traffic conditions plus background growth plus development generated traffic;

vi) Identify improvements to accommodate the proposed growth on the existing road network utilizing the A.M. and P.M. peak hours;

## 2) Midhurst Traffic Studies

a) Detailed Traffic Studies, prepared in support of the Midhurst Secondary Plan, were completed as part of the Midhurst Phase 1 & 2 Master Transportation Plan and were approved in 2009. The Phase 1 & 2 Master Plan identified specific road upgrades/improvements that needed to be completed to accommodate the development of the Midhurst Secondary Plan.

b) At the initiation of the Phase 3 & 4 Class EA, updated 2013 traffic data was collected. In addition, the traffic data that was collected in 2013 has been increased annually by 1% to allow for background growth since 2013. The 1% background annual growth rate was based upon actual MTO observed traffic growth along Highway 26 north of Barrie between 2006 and 2010.

## Fact Sheet # 5: Existing and Proposed Traffic in Midhurst

c) During Phase 3 the traffic models were further refined to accommodate the proposed improvements to Highway 400/Forbes Rd intersection in lieu of the previously (Phase 1 and 2 Master Plan) proposed new Pooles Road partial interchange. In addition; the traffic models have been updated to reflect the proposed staging of the developments.

d) The latest Traffic Studies have confirmed that the proposed traffic from the Midhurst Secondary Plan can be accommodated.

In particular, the Traffic models confirm that the capacity of the "reconstructed" existing streets including Pooles Road, St Vincent Street, Finlay Mill Road, Carson Road, with 1 lane in each direction and improvements at key intersections, can accommodate the proposed traffic from the new developments. In conjunction with the reconstruction of these streets, sidewalks and bike lanes will be incorporated into the design.

e) During the completion of Phase 3 the alternatives of extending Carson Road between Hwy 26 and St Vincent St and extending Russel Rd southerly and westerly to connect with the dead end of Jodies Lane to provide additional relief were both analysed. However, neither of these alternatives provided sufficient benefit from a traffic standpoint to offset the major constraints relating to both topographic and/or environmental features along the proposed routes. Therefore; alternatives are not being recommended.

f) The extension of Anne Street North from Carson Road to Highway 26 was not identified in the Phase 1 & 2 Master Plan completed in 2009, as being necessary to accommodate the Midhurst Secondary Plan traffic. In addition, the extension would result in environmental impacts to a natural area including the crossing of the Minesing/Little Lake wildlife corridor. Therefore, the extension of Anne Street North from Carson Road to Highway 26 is not considered as part of this Class EA process.

g) In accordance with Ministry of Transportation's "Geometric Design Standards" and the Transportation Research Boards "Highway Capacity Manual" roads are not designed for the infrequent events and/or extreme worst case scenarios. In particular, in accordance with these guidelines, a rural road is typically designed to accommodate for the 30$^{th}$ Peak Hour of traffic throughout a year and similarly for urban roads a design of between the 10$^{th}$ and 20$^{th}$ Peak Hour of traffic throughout a year is common practice. Therefore, the development of Traffic models utilizing am and pm weekday Peak Hours from the proposed

## Fact Sheet # 5: Existing and Proposed Traffic in Midhurst

developments, as opposed to using traffic counts for events such as holiday long weekend traffic bypassing Hwy 400 and coming through Midhurst, is appropriate.

h) The Midhurst Traffic model includes trips from the new development areas in Doran North and South to and from the shopping areas at the north end of Barrie, via St. Vincent St and/or Bayfield St. The Traffic model assumes that trips from Doran Road and Russel Road areas with an origin or destinations further south than the Hwy 400 & Bayfield St Intersection will use the Forbes / Hwy 400 route link, as the shortest time route. It should be noted that this assumption is based upon actual time trips for travelling from an origin on Doran Road and the destination of Hwy 400/Bayfield Street intersection, with route 1 being through the existing streets in Midhurst and the existing streets in the north end of Barrie and route 2 being Russell Road and Highway 400.

i) The costs associated with the reconstruction of all Municipal road projects identified within the Midhurst Class EA will be borne by the Midhurst Developers Group. The only exception to this is the proposed Craig Road Extension which is included in the Township Development Charges Projects.

j) Signs along St Vincent will be included in the designs, notifying drivers of the seasonal migration of turtles.

k) The Traffic models indicate satisfactory Levels of Service (LOS) for the intersection of St. Vincent and Jodie's Lane with stop control on Jodie's Lane and design horizon traffic for the year 2041 as Level of Service B with average delay of 15 to 20 seconds. Therefore, delays to exit/enter driveways along St Vincent St and/or Pooles Road will be similar.

l) The need for inclusion of sidewalks and bike lanes on key existing roads through Midhurst was identified in the Phase 1 & 2 Master Plan and has been reiterated by a large number of respondents throughout the Class EA process. Therefore, the reconstruction of the key existing streets will include sidewalks and bike lanes. However, the location and specifics of these on each road will be determined during the detailed engineering design in the future.

m) The detailed Traffic Model has confirmed that the identified road improvements can accommodate the proposed traffic from the new developments. Any increase in traffic on the secondary roads adjacent to these roads will be minor and well within the capacity of the existing road. In particular, the model has identified the following:

## Fact Sheet # 5: Existing and Proposed Traffic in Midhurst

i) An increase in traffic along Spence Avenue from approximately 21 vehicles in the peak hour in 2013 to 107 by 2041 due to development. However, this is still considered light traffic for a two lane street and as such no improvements are proposed along Spence Avenue.

ii) Park Trail will not be a route preferred over the proposed completion of the link between Gill Road and St. Vincent.

iii) Silverwood Crescent and Frid Street will not be a preferred route over Pooles to St. Vincent unless significant delays are occurring at that intersection and that is why we propose signalization at Pooles and St. Vincent.

iv) Wattie Road to Green Pine Road to St. Vincent does serve as an east/west route to Finlay Mill Road and the Hwy 26 corridor and we have assigned traffic to that route from Doran South development area. The traffic model shows an increase in traffic during the peak hour in 2013 from 175 to 302 as two-way peak hour traffic in 2041. This is well within the capacity of the existing two lane road and as such no improvements are proposed along Wattie Road.

## Fact Sheet # 6: Craig Road Extension

1) The need for the extension of Craig Road from Russel Rd to County Rd 27 was identified in the 2008/09 Midhurst Master Plan and has been re-confirmed in the Traffic Study completed as part of Phase 3 of this Class EA.

2) The extension of Craig Road from Russel Rd to County Rd 27 will create a main arterial road that provides a direct, controlled access connection between several Provincial Highways that are regionally significant north-south traffic corridors. These include:

   - Highway 400;
   - Highway 26/County Road 27; &
   - Highway 93 / Penetanguishene Road.

   This link also provides an effective access corridor for proposed developments along Doran Road and Russell Road.

3) As a direct connection between two regionally significant north-south traffic corridors the Craig Road extension will act as a regionally-significant link in the area transportation system. In this regard Craig Road could serve to accommodate future growth expected in regional traffic by providing a key distributor role between the major transportation corridors in the area, namely County Road 27, Highway 400, and Highway 93.

4) This new arterial road will provide a main alternative to traffic that is currently taking the Forbes Road exit off Hwy 400 and meandering through the existing roads in Midhurst, when south bound traffic on the Hwy 400 is backed up approaching Barrie on holiday weekends.

5) Further to the comments received during and following the Public Information Centre (PIC) we are now proposing that:

   a) Alternative No. 3 be identified as the Recommended Solution of the proposed route for Craig Road Extension. For details on Alternative No. 3 see page 3.

   b) The construction of Craig Road Extension, from Russell to County Rd 27, be completed in conjunction with the first Stage of development.

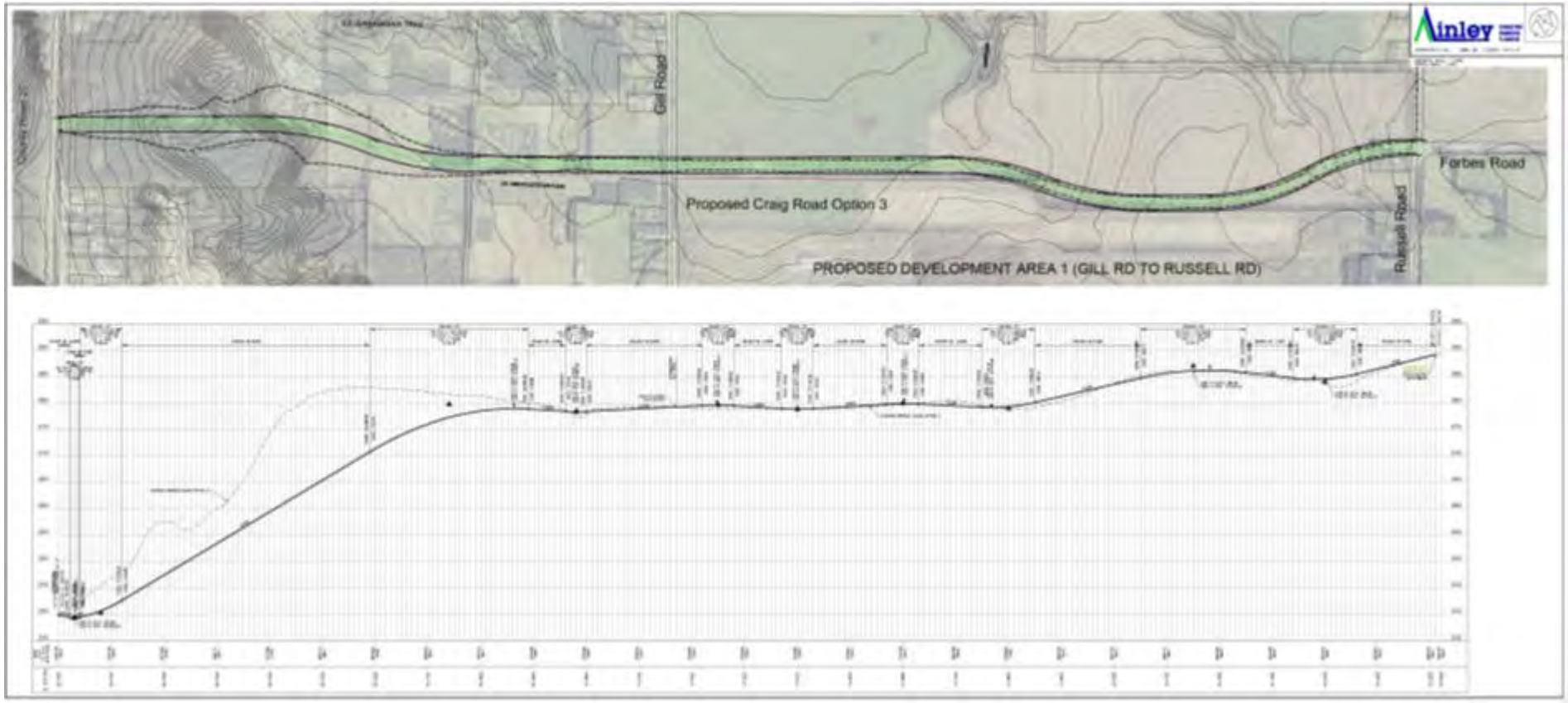
6) This proposed alignment (Alternative No. 3) will have no impact on the existing trails in the area and in particular the Ganarska Trail. In addition, the proposed design for Craig Road Extension allows for the construction of a multi-use trail that could provide additional interconnection with the existing trail systems.

## Fact Sheet # 6: Craig Road Extension

7) The extension of Craig Road from Russel Road to County Rd 27 is included in the current Development Charges, whereby it is identified that 100% of the costs will come from Development Charges collected from the Development Community. Therefore, the existing residents will not be responsible for paying for Craig Road Extension.

**Fact Sheet # 6: Craig Road Extension**

# Craig Road Extension - Alternative 3



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March 3, 2017

Mr. David Strachan
[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. Strachan:

On behalf of the Township of Springwater, we wish to thank you for your interest in the above-mentioned Class EA. We have reviewed your comments which were received following the October 18, 2016 Public Information Centre (PIC). Your comments/requests have been summarized and our responses are provided following each comment.

- *Forbes Road/Hwy.400 Interchange - Please advise what plans you have to handle summer weekend traffic currently looking for a detour off a backed-up 400 Hwy. around Barrie. This traffic currently forms a bumper to bumper line-up along Findlay Mill Road (i.e. through the middle of Midhurst Village).*
- *Slides 39 to 53 – Doubts traffic info?*
- *Craig Road cost to be borne by Twp?*
- *No new Village by-passes – totally inadequate?*
- *How can it be appropriate to route 6 times the volume of traffic through existing streets….and then charge Springwater residents for a new road and road upgrades?" How is this in the public interest?*

Please refer to the attached Fact Sheet #5 associated with Existing and Proposed Traffic on Midhurst and #6 associated with Craig Road Extension.

- *Slide 20 – Phase 2 TP concentration reduction is "hard to believe". Warrants a closer look.*

The numbers presented are correct, however we have adjusted the presentation of the material to clarify that when Phase 2 of the Wastewater Treatment Plant (WWTP) is brought on line in the future, all of the discharge will have a Phosphorous concentration of 0.03mg/L, which is lower than the existing concentrations in Willow Creek.

- *Agriculture – Are these Springwater farmlands truly "a reasonable choice for the location of urban development"*

This Class EA is solely related to identifying the Water, Wastewater & Transportation Infrastructure necessary to support the development of the Midhurst Secondary Plan. The referenced May, 2008 Agricultural Assessment Report (prepared by AgPlan Limited) was prepared in support of the Development Applications that were going through the Secondary Plan process at the time.

- *Requests Council to seek impartial peer reviews of the Midhurst Secondary Plan EA Reports.*

The Draft Environmental Study Report (ESR) will be submitted to the Ministry of Environment and Climate Change (MOECC) for a comprehensive Review prior to being finalized and made available for the 30-day Public Review Period.

Thank you again for your interest in this Class EA.

Should you have any questions please do not hesitate to contact the undersigned.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P.Eng.
President & CEO

# Fact Sheet # 5: Existing and Proposed Traffic in Midhurst

## 1) Traffic Study Requirements

a) Traffic Studies must be completed in a strategic manner in accordance with guidelines issued by the Ministry of Transportation, Transportation Research Board and the Institute of Transportation Engineers. In particular, the following is a brief overview of the process for the completion of Traffic Studies:

i) Obtain Traffic Data for the for A.M. and P.M. peak hours on the primary roads to accurately determine existing traffic throughout the community;

ii) Create a computer model using Ministry of Transportation approved software in accordance with the "Highway Capacity Manual" prepared by the Transportation Research Board;

iii) Calculate the Traffic "Trips" to and from the proposed developments, in accordance with the "Trip Generation Manual" prepared by the Institute of Transportation Engineers;

iv) Calculate the Impacts on the road network utilizing the AM and PM peak hours;

v) The peak hour analysis should be undertaken for

- Existing traffic conditions;
- Existing traffic conditions plus background growth;
- Existing traffic conditions plus background growth plus development generated traffic;

vi) Identify improvements to accommodate the proposed growth on the existing road network utilizing the A.M. and P.M. peak hours;

## 2) Midhurst Traffic Studies

a) Detailed Traffic Studies, prepared in support of the Midhurst Secondary Plan, were completed as part of the Midhurst Phase 1 & 2 Master Transportation Plan and were approved in 2009. The Phase 1 & 2 Master Plan identified specific road upgrades/improvements that needed to be completed to accommodate the development of the Midhurst Secondary Plan.

b) At the initiation of the Phase 3 & 4 Class EA, updated 2013 traffic data was collected. In addition, the traffic data that was collected in 2013 has been increased annually by 1% to allow for background growth since 2013. The 1% background annual growth rate was based upon actual MTO observed traffic growth along Highway 26 north of Barrie between 2006 and 2010.

## Fact Sheet # 5: Existing and Proposed Traffic in Midhurst

c) During Phase 3 the traffic models were further refined to accommodate the proposed improvements to Highway 400/Forbes Rd intersection in lieu of the previously (Phase 1 and 2 Master Plan) proposed new Pooles Road partial interchange. In addition; the traffic models have been updated to reflect the proposed staging of the developments.

d) The latest Traffic Studies have confirmed that the proposed traffic from the Midhurst Secondary Plan can be accommodated.

In particular, the Traffic models confirm that the capacity of the "reconstructed" existing streets including Pooles Road, St Vincent Street, Finlay Mill Road, Carson Road, with 1 lane in each direction and improvements at key intersections, can accommodate the proposed traffic from the new developments. In conjunction with the reconstruction of these streets, sidewalks and bike lanes will be incorporated into the design.

e) During the completion of Phase 3 the alternatives of extending Carson Road between Hwy 26 and St Vincent St and extending Russel Rd southerly and westerly to connect with the dead end of Jodies Lane to provide additional relief were both analysed. However, neither of these alternatives provided sufficient benefit from a traffic standpoint to offset the major constraints relating to both topographic and/or environmental features along the proposed routes. Therefore; alternatives are not being recommended.

f) The extension of Anne Street North from Carson Road to Highway 26 was not identified in the Phase 1 & 2 Master Plan completed in 2009, as being necessary to accommodate the Midhurst Secondary Plan traffic. In addition, the extension would result in environmental impacts to a natural area including the crossing of the Minesing/Little Lake wildlife corridor. Therefore, the extension of Anne Street North from Carson Road to Highway 26 is not considered as part of this Class EA process.

g) In accordance with Ministry of Transportation's "Geometric Design Standards" and the Transportation Research Boards "Highway Capacity Manual" roads are not designed for the infrequent events and/or extreme worst case scenarios. In particular, in accordance with these guidelines, a rural road is typically designed to accommodate for the 30$^{th}$ Peak Hour of traffic throughout a year and similarly for urban roads a design of between the 10$^{th}$ and 20$^{th}$ Peak Hour of traffic throughout a year is common practice. Therefore, the development of Traffic models utilizing am and pm weekday Peak Hours from the proposed

## Fact Sheet # 5: Existing and Proposed Traffic in Midhurst

developments, as opposed to using traffic counts for events such as holiday long weekend traffic bypassing Hwy 400 and coming through Midhurst, is appropriate.

h) The Midhurst Traffic model includes trips from the new development areas in Doran North and South to and from the shopping areas at the north end of Barrie, via St. Vincent St and/or Bayfield St. The Traffic model assumes that trips from Doran Road and Russel Road areas with an origin or destinations further south than the Hwy 400 & Bayfield St Intersection will use the Forbes / Hwy 400 route link, as the shortest time route. It should be noted that this assumption is based upon actual time trips for travelling from an origin on Doran Road and the destination of Hwy 400/Bayfield Street intersection, with route 1 being through the existing streets in Midhurst and the existing streets in the north end of Barrie and route 2 being Russell Road and Highway 400.

i) The costs associated with the reconstruction of all Municipal road projects identified within the Midhurst Class EA will be borne by the Midhurst Developers Group. The only exception to this is the proposed Craig Road Extension which is included in the Township Development Charges Projects.

j) Signs along St Vincent will be included in the designs, notifying drivers of the seasonal migration of turtles.

k) The Traffic models indicate satisfactory Levels of Service (LOS) for the intersection of St. Vincent and Jodie's Lane with stop control on Jodie's Lane and design horizon traffic for the year 2041 as Level of Service B with average delay of 15 to 20 seconds. Therefore, delays to exit/enter driveways along St Vincent St and/or Pooles Road will be similar.

l) The need for inclusion of sidewalks and bike lanes on key existing roads through Midhurst was identified in the Phase 1 & 2 Master Plan and has been reiterated by a large number of respondents throughout the Class EA process. Therefore, the reconstruction of the key existing streets will include sidewalks and bike lanes. However, the location and specifics of these on each road will be determined during the detailed engineering design in the future.

m) The detailed Traffic Model has confirmed that the identified road improvements can accommodate the proposed traffic from the new developments. Any increase in traffic on the secondary roads adjacent to these roads will be minor and well within the capacity of the existing road. In particular, the model has identified the following:

## Fact Sheet # 5: Existing and Proposed Traffic in Midhurst

i) An increase in traffic along Spence Avenue from approximately 21 vehicles in the peak hour in 2013 to 107 by 2041 due to development. However, this is still considered light traffic for a two lane street and as such no improvements are proposed along Spence Avenue.

ii) Park Trail will not be a route preferred over the proposed completion of the link between Gill Road and St. Vincent.

iii) Silverwood Crescent and Frid Street will not be a preferred route over Pooles to St. Vincent unless significant delays are occurring at that intersection and that is why we propose signalization at Pooles and St. Vincent.

iv) Wattie Road to Green Pine Road to St. Vincent does serve as an east/west route to Finlay Mill Road and the Hwy 26 corridor and we have assigned traffic to that route from Doran South development area. The traffic model shows an increase in traffic during the peak hour in 2013 from 175 to 302 as two-way peak hour traffic in 2041. This is well within the capacity of the existing two lane road and as such no improvements are proposed along Wattie Road.

## Fact Sheet # 6: Craig Road Extension

1) The need for the extension of Craig Road from Russel Rd to County Rd 27 was identified in the 2008/09 Midhurst Master Plan and has been re-confirmed in the Traffic Study completed as part of Phase 3 of this Class EA.

2) The extension of Craig Road from Russel Rd to County Rd 27 will create a main arterial road that provides a direct, controlled access connection between several Provincial Highways that are regionally significant north-south traffic corridors. These include:

   - Highway 400;
   - Highway 26/County Road 27; &
   - Highway 93 / Penetanguishene Road.

   This link also provides an effective access corridor for proposed developments along Doran Road and Russell Road.

3) As a direct connection between two regionally significant north-south traffic corridors the Craig Road extension will act as a regionally-significant link in the area transportation system. In this regard Craig Road could serve to accommodate future growth expected in regional traffic by providing a key distributor role between the major transportation corridors in the area, namely County Road 27, Highway 400, and Highway 93.

4) This new arterial road will provide a main alternative to traffic that is currently taking the Forbes Road exit off Hwy 400 and meandering through the existing roads in Midhurst, when south bound traffic on the Hwy 400 is backed up approaching Barrie on holiday weekends.

5) Further to the comments received during and following the Public Information Centre (PIC) we are now proposing that:

   a) Alternative No. 3 be identified as the Recommended Solution of the proposed route for Craig Road Extension. For details on Alternative No. 3 see page 3.

   b) The construction of Craig Road Extension, from Russell to County Rd 27, be completed in conjunction with the first Stage of development.

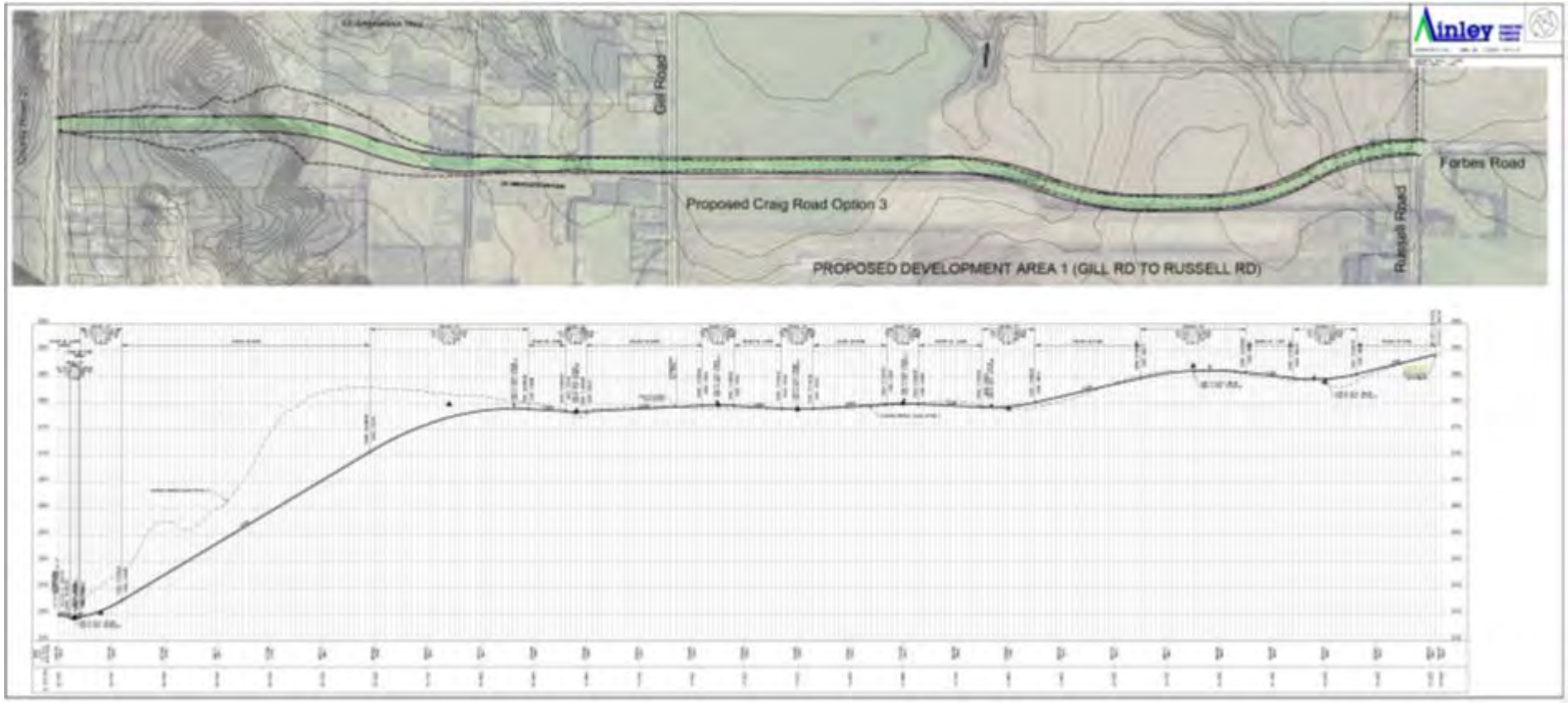
6) This proposed alignment (Alternative No. 3) will have no impact on the existing trails in the area and in particular the Ganarska Trail. In addition, the proposed design for Craig Road Extension allows for the construction of a multi-use trail that could provide additional interconnection with the existing trail systems.

## Fact Sheet # 6: Craig Road Extension

7) The extension of Craig Road from Russel Road to County Rd 27 is included in the current Development Charges, whereby it is identified that 100% of the costs will come from Development Charges collected from the Development Community. Therefore, the existing residents will not be responsible for paying for Craig Road Extension.

**Fact Sheet # 6: Craig Road Extension**

# Craig Road Extension - Alternative 3



# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## MRA - PART II ORDER RESPONSE

| | |
|---|---|
| **PROPONENT:** | **Township of Springwater** |
| **PROJECT TITLE:** | **Midhurst Phase 3 & 4 Class EA (Water, Wastewater & Transportation)** |
| **PROJECT LOCATION:** | **Midhurst Secondary Plan Area – Township of Springwater, ON** |
| **PREPARED BY:** | **Joe Mullan, P.Eng. - Ainley Group** |
| **DATE SUBMITTED TO MECP** | **October 26, 2018** |
| **PHONE # and E-MAIL:** | **(705) 445-3451, mullan@ainleygroup.com** |

| No | Issues and Concerns | Proponent Response | Status |
|---|---|---|---|
| 1 | **MRA Issues Letter - Section 1 Introduction:**<br>**Questions the need for such a huge residential undertaking in an area like Midhurst. References the pie graph in *Appendix 1*, taken from the IGAP reports of 2005/2006. Notes that it shows that, in 2006, there was more than enough land already approved for development to meet the Province's 2031 population target for Simcoe County of 667,000.** | These are Planning related matters which were dealt with through the adoption of the Midhurst Secondary Plan in 2012 and subsequent approvals by the County and the Ontario Municipal Board, all in accordance with the Planning Act. As such, these items are beyond the scope of this Class Environmental Assessment process. | We have communicated with the MRA throughout the Class EA process regarding their issues and unfortunately, we do not feel any further communication with them will change their minds on any of their issues. |
| 2 | **MRA Issues Letter - Section 1 Introduction:**<br>**Specifically, our concerns are:**<br>• **The non-compliance of the EA with Provincial laws and policies.** | This issue was previously raised prior to the approvals by the County and the Ontario Municipal Board of the approval of the Midhurst Secondary Plan in 2012 and is beyond the scope of this Class Environmental Assessment process.<br>Further, it was our assessment that both the Class EA and the adopted Secondary Plan conform with Provincial Law and Policies. | |
| 3 | **MRA Issues Letter - Section 1 Introduction:** | A rigorous hydrogeological study was undertaken to determine the sustainability of the proposed development water supply (see Golder, 2016 in Appendix J of the ESR). The study included extensive | |

| No | Issues and Concerns | Proponent Response | Status |
|---|---|---|---|
| | **Specifically, our concerns are:**<br>• **the availability over time of the amount of groundwater required to service this mega-development.** | field work and data analysis, including: the drilling and installation of 20 test wells and 13 observation well nests; performance of five aquifer tests; water quality sampling; WSC flow station measurements at three stations upstream, adjacent to and downstream of the proposed development, a review of the MOECC Water Well Information System Database well records including hundreds of borehole logs in the Midhurst area; the refinement and calibration of a numerical groundwater flow model and the simulation of a long-term impact assessment using pumping rates based on anticipated maximum takings during summer months. The study concluded that the water supply is indeed sustainable, and no adverse impacts are expected at existing water wells or surface water features. The study was reviewed by the MECP and Nottawasaga Valley Conservation Authority (NVCA).<br><br>In addition, it is acknowledged that in conjunction with the submission of the Permit to Take Water (PTTW) Application(s) to the MECP in the future, that additional hydrogeological studies and/or investigations would have to be completed. | |
| 4 | **MRA Issues Letter - Section 1 Introduction:**<br><br>**Specifically our concerns are:**<br>• **the long-term effects on residents and the Minesing Wetlands of drawing the proposed 19 million litres of water per day from the deep aquifers under Midhurst and discharging the resulting sewage effluent into downstream Willow Creek close to the unique and fragile Minesing Wetlands.** | The MECP are the governing authority with respect to discharge requirements for wastewater treatment plants (WWTPs) in the province of Ontario. The two documents that direct the discharge requirements for effluent to surface water in Ontario are:<br><br>1. Policies, Guidelines and Provincial Water Quality Objectives[1] which provides direction on the management of surface water and groundwater quality and quantity for the Province of Ontario, and<br><br>2. Deriving Receiving Water Based, Point-Source Effluent Requirements for Ontario Waters[2], which provides requirements for point-source discharges and the procedures for determining effluent requirements for an Environmental Compliance Approval (ECA).<br><br>The Willow Creek Assimilative Capacity Study (HESL 2018a[3] - Appendix M of the ESR) was completed following MECP's published policies and guidelines with the purpose of assessing the effects of treated sewage effluent on Willow Creek, and hence the Minesing Wetland located approximately 4 km downstream.<br><br>A plume dispersion model (CORMIX) was used to evaluate the size and shape of the mixing zone, and a far-field model (QUAL2K) was used to predict pollutant concentrations up to 5.4 km downstream of the discharge (and hence encompassing a portion of the Minesing Wetland). Modelling results predicted that:<br><br>• that complete mixing of the effluent is achieved within 360 m of Highway 26 (i.e. the point of discharge), approximately 3 km upstream of George Johnston Road;<br>• the Provincial Water Quality Objective (PWQO) for un-ionized ammonia is met within 225 m of | |

[1] Ontario Ministry of Environment and Energy 1994a. Policies, Guidelines, Provincial Water Quality Objectives. July 1994. ISBN 0-7778-8473-9 rev

[2] Ontario Ministry of Environment and Energy 1994b. Deriving Receiving Water Based Point Source Effluent Requirements for Ontario Waters. Procedure B-1-5 PIBS #3302. July 1994.

[3] Hutchinson Environmental Sciences Ltd. 2018a. Willow Creek Assimilative Capacity Study.

| No | Issues and Concerns | Proponent Response | Status |
|---|---|---|---|
| | | Highway 26; 3 km upstream of George Johnston Road;<br>• additional phosphorus and suspended solids loadings from the WWTP are minimal and will have no measurable impact on concentrations in Willow Creek (see p. 32 and p. 35 in the Final ACS (HESL 2018a – Appendix M of the ESR). and<br>• dissolved oxygen concentrations will remain above the PWQO throughout the mixing zone and into the Minesing Wetland.<br>The ACS (HESL 2018[3] – Appendix M of the ESR), the results of which were accepted by the MEPC, provides the analyses supporting the conclusion that the proposed WWTP and discharge of highly treated effluent poses no threat to the Minesing wetland. | |
| 5 | **MRA Issues Letter - Section 2 Non-compliance with Provincial Laws, Plans & Policies:**<br>**Provincial Policy Statement 2014 (PPS) is legally the most senior policy which must be adhered to in environmental matters. Other key Provincial planning laws and policies such as the Places to Grow Act (2005) and the Planning Act, R.S.O 1990, while important, must defer to the PPS in any conflict regarding the primacy of the environment, public health and public safety.**<br>**Midhurst Secondary Plan's Environmental Assessment (EA) does not meet this standard and is therefore non-compliant.**<br>**Unconvinced that "the EA is even legal", the "Special Rule" was created to allow, not** | These are Planning related matters which were dealt with through the adoption of the Midhurst Secondary Plan in 2012 and subsequent approvals by the County and the Ontario Municipal Board, all in accordance with the Planning Act. As such, these items are beyond the scope of this Class Environmental Assessment process. | |

| No | Issues and Concerns | Proponent Response | Status |
|---|---|---|---|
| | **mandate, the non-compliant Midhurst Secondary Plan to proceed.** | | |
| 6 | **MRA Issues Letter - Section 3 Source Water:**<br><br>**The MRA continues to have grave concerns:**<br><br>• **the many private wells already in Midhurst**<br>• **the cold water Willow Creek fishery upstream of the sewage treatment plant**<br>• **Willow Creek's short distance between the sewage treatment plant and the Minesing Wetlands**<br>• **the amount of groundwater available for the Minesing Wetlands due to largescale water-takings "upstream" for the new "city" and the impact on the shallower wells.**<br>• **home owners, farms and businesses located within the future extended Well Head Protection Areas (WHPAs), yet outside the area serviced by the water takings. The WHPAs must be enlarged in proportion to the projected water takings.**<br>• **the sustainability of the groundwater supply considering that this large-scale groundwater-taking will be the largest ever in Simcoe County.** | **Re: the many private wells already in Midhurst**<br><br>• The comment on the potential for impact on private wells in Midhurst has been addressed in Golder 2016 in Appendix J and BB of the ESR and is re-iterated later in this section.<br><br>**Re: the coldwater Willow Creek fishery upstream of the sewage treatment plant.**<br><br>The upstream coldwater Willow Creek fishery will not be impacted by treated effluent from the sewage treatment plant because effluent will travel downstream. Downstream cold water fish communities will also be protected through effluent objectives defined in the ACS (HESL 2018a – See Appendix M of the ESR), which are designed to ensure that 1) effluent is non-toxic, and 2) water quality in Willow Creek does not exceed Provincial Water Quality Objectives (PWQOs), since PWQOs are protective of all aquatic species, including cold water fish species, at all life stages.<br><br>**Re: the short distance between the sewage treatment plant and the Minesing Wetlands.**<br><br>The Assimilative Capacity Study (HESL 2018a) predicted that:<br><br>• complete mixing of the effluent is achieved within 360 m of Highway 26 (i.e. the point of discharge); approximately 3 km upstream of George Johnston Road;<br>• the Provincial Water Quality Objective (PWQO) for un-ionized ammonia is met within 225 m of Highway 26; approximately 3 km upstream of George Johnston Road;<br>• additional phosphorus and suspended solids loadings from the WWTP are minimal and will have no measurable impact on concentrations in Willow Creek (see p. 32 and p. 35 in the Final ACS (HESL 2018a – Appendix M of the ESR). dissolved oxygen concentrations will remain above the PWQO in the mixing zone and into the Minesing Wetland.<br><br>Therefore, there are no anticipated impacts to water quality within Willow Creek and Minesing Wetland, beyond what is predicted within the small mixing zone immediately downstream of Highway 26. Furthermore, it is anticipated that a requirement of the future Environmental Compliance Approval (ECA) for the Midhurst WWTP, will be that the undiluted wastewater effluent must be tested and shown to be non-acutely lethal prior to discharge into Willow Creek.<br><br>**Re: the amount of groundwater available for the Minesing Wetlands due to largescale water-takings "upstream" for the new "city" and the impacts on the shallower wells:**<br><br>• The amount of groundwater available to Willow Creek and Minesing Wetland, as described in Golder, 2016 and Golder, 2017[1] in Appendix J of the ESR, is re-iterated later in this section. | |

| No | Issues and Concerns | Proponent Response | Status |
|---|---|---|---|
| | | **Re: home owners, farms and businesses located within the future extended Well Head Protection Areas (WHPAs), yet outside the area serviced by the water takings. The WHPAs must be enlarged in proportion to the projected water takings.**<br>• The effect of Wellhead Protection Areas on surrounding land use is later in this section.<br>**Re: the sustainability of the groundwater supply considering that this large-scale groundwater-taking will be the largest ever in Simcoe County.**<br>• The sustainability of the proposed development water supply is addressed above with further detail provided in the response to subsequent comments below. | |
| 7 | **MRA Issues Letter - Section 3 Source Water:**<br>**Models lack the reliability of extensive field-measured data.** | The reliability of the groundwater model and its foundation upon field-measured data was previously addressed and is detailed in Golder, 2016 (and in particular Appendix M) as included in Appendix J of the ESR.<br>However, we re-emphasize the following:<br>The Existing Conditions groundwater flow model is based upon extensive field measured data, including the following local to Midhurst: the drilling and installation of 20 test wells and 13 observation well nests, performance of five aquifer tests, WSC flow station measurements at three stations upstream, adjacent to and downstream of the proposed development, and a review of the MOECC Water Well Information System Database well records including hundreds of borehole logs in the Midhurst area.<br>A rigorous model calibration process was undertaken that ultimately demonstrated that the recharge rates, hydraulic properties of the geologic units and simulated flow patterns of the Existing Conditions model are found to be in agreement with available field data cited above.<br>Further, we note that there is a precedence supporting the groundwater model used in the hydrogeological study. The original Kempenfelt Bay model, the foundation of the model used in Golder, 2016 (see Appendix J of the ESR) was also the hydrogeologic basis of the City of Barrie Tier Three Water Budget and Local Area Risk Assessment (AquaResource, 2013), a peer reviewed study that was a supporting tool for the MOECCs 2015 approval of the South Georgian Bay Lake Simcoe Source Protection Plan.<br>Assimilative Capacity Study (HESL 2018a – Appendix M of ESR) model predictions were based on:<br>• Twelve (12) years (2002-2014) of multi-season water quality data with more than 100 data points for each total phosphorus, total suspended solids, nitrate, total Kjeldahl nitrogen, and ammonia; collected by the NVCA from the PWQMN station located on Willow Creek at George Johnston Road (station 03005703002); coupled with<br>• Ten (10) years (2006-2015) of flow data (over 3,500 daily flows) from the Water Survey of Canada stream gauging station (02ED032) located on Willow Creek at Highway 26 which was used to derive the 7Q20 flows used in the ACS and in accounting for future changes in stream flow resulting from the potential for any baseflow losses from groundwater pumping. | |

| No | Issues and Concerns | Proponent Response | Status |
|---|---|---|---|
| | | Ten years of recent multi-season baseline data is in fact an extensive dataset, which provides reliability that the predictions made in the Assimilative Capacity Study are protective of aquatic life in Willow Creek and the Minesing Wetland. | |
| 8 | **MRA Issues Letter - Section 3 Source Water:**<br>**Ontario Geological Survey claims that shallower aquifers are not hydraulically separate from the deeper aquifers.** | The Ontario Geological Survey (OGS) does not make this claim regarding Midhurst. The OGS reference does not include a description of the stratigraphy of Midhurst. Furthermore, the OGS reference does not contradict the assertion that the upper aquifers are separated from lower aquifers by a confining layer. The report confirms the presence of "Laminated silts and clays that were deposited in low-lying areas on the underlying stratigraphic units [Thorncliffe Formation – Aquifers A3 and A4]. Fine-grained sediments are commonly capped by stratified sands and gravels [Aquifers A2 and A1]." | |
| 9 | **MRA Issues Letter - Section 3 Source Water:**<br>**Field testing for proposed water taking has been insufficient – relied on extrapolations.** | The methodology used is consistent with industry standards. Field testing was not insufficient.<br>The pumping tests all indicated steady state conditions at the end of the pumping period and extrapolation of these data is standard hydrogeological and modelling practise.<br>The Existing Conditions groundwater flow model is based upon extensive field measured data, including the following local to Midhurst: the drilling and installation of 20 test wells and 13 observation well nests, performance of five aquifer tests, WSC flow station measurements at three stations upstream, adjacent to and downstream of the proposed development, and a review of the MOECC Water Well Information System Database well records including hundreds of borehole logs in the Midhurst area.<br>A rigorous model calibration process was undertaken that ultimately demonstrated that the recharge rates, hydraulic properties of the geologic units and simulated flow patterns of the Existing Conditions model are found to be in agreement with available field data cited above. | |
| 10 | **MRA Issues Letter - Section 3 Source Water:**<br>**Consultants contradict themselves as to whether the proposed groundwater extraction will or won't affect the amount of groundwater reaching Willow Creek upstream of the sewage treatment plant.** | There is no inconsistency in the consultant's statements.<br>Golder concluded that there will be some baseflow loss (less than 10%) to Willow Creek (as per Golder, 2016 and Golder, 2017 in Appendix J of the ESR).<br>HESL evaluated the impact of this baseflow loss and determined that the loss will cause no significant adverse effect. A discussion of the potential effect of the estimated baseflow losses on natural environment receptors in the Willow Creek subwatershed is provided in the HESL report entitled *7Q20 Flow Assessment Update for Willow Creek at Highway 26 (Near Minesing) and Ecological Low Flow Assessment* (HESL, May 28, 2018 – Appendix L of ESR). HESL concluded that "the predicted flow reductions in Willow Creek and its tributaries associated with the proposed water taking to supply the Midhurst Secondary Plan Area will have no significant adverse effects on habitat and water temperature". | |
| 11 | **MRA Issues Letter - Section 3 Source Water:** | In June 2017 the draft Environmental Study Report (dESR) for the Midhurst Class EA was submitted to MECP's (formerly MOECC) Central Region Technical Support Section for their comprehensive review, | |

| No | Issues and Concerns | Proponent Response | Status |
|---|---|---|---|
| | **a. MOECC states that more studies are required at the Permit To Take Water (PTTW) Stage. MRA wants studies done as part of Class EA process.** | prior to the ESR being finalized and made public. On April 30, 2018 we received detailed review comments back from MECP (these comments are contained with Appendix CC of the ESR). In several locations throughout the MECP review comments, it is noted that the ministry expects that in conjunction with the Permit To Take Water (PTTW) applications for each well or groups of wells, that further studies and/or investigations will have to be completed.<br><br>Within our June 5, 2018 response letter to MECP (Appendix CC of the ESR) we acknowledged the comments and fully committed to completing the additional studies and/or investigations in conjunction with the future PTTW applications.<br><br>The MECPs comments regarding the need for additional work at the PTTW stage do not point to a deficiency in the study but rather that the work needs to be re-purposed and refined to reflect the construction phasing of the project and to meet PTTW Category 3 requirements.<br><br>An excerpt from Golder's response to the MECP is as follows (from Ainley's June 5, 2018 letter Appendix CC of the ESR):<br><br>"*We agree with the [MOECC Section 1.1 summary] and, in particular, that the potential effects of temporary construction dewatering should be addressed during the PTTW application stage and after the Class Environmental Assessment stage. We acknowledge MOECC's description of our work as a "good base" for future permitting actions*."<br><br>All water takings in Ontario exceeding 50 $m^3$/day are required to obtain a Permit To Take Water (PTTW) from the MECP. The Carson and Doran Neighbourhood's future construction activities and proposed water supply will require PTTWs prior to operation, although the initial water supply permit request may be for significantly less water taking than reported in Golder, 2016 (Appendix J of the ESR) as the subdivision will not be at full build-out. The groundwater model will be an important tool during the permitting review and approval process. In addition, and in consultation with the MECP, a monitoring program will be instituted to ensure that private water supplies and surface water features are not adversely impacted by the water taking.<br><br>It summary it is standard protocol in Ontario, that during the Class EA process Hydrogeological studies are competed to confirm the availability and suitability of a potential water source and then in conjunction with the submission of a PTTW application to the MECP, that further studies and/or investigations would have to be completed. | |
| **12** | **MRA Issues Letter - Section 3 Source Water:**<br><br>**b. Golder undertook no field monitoring of stream flow etc.** | Additional streamflow monitoring was not necessary to support the modelling because an extensive Willow Creek streamflow dataset was already available from the Water Survey of Canada (WSC). As first described in Appendix M of Golder, 2016 (Appendix J of the ESR) the streamflow dataset included:<br><br>• Three flow stations – one upstream, one within, and one downstream of Midhurst.<br>• Up to 20 years of daily streamflow data comprising thousands of individual flow measurements.<br><br>Through the model calibration process a high degree of correspondence was achieved between simulated | |

| No | Issues and Concerns | Proponent Response | Status |
|---|---|---|---|
| | | and measured average monthly baseflows (Appendix M of Golder, 2016 in Appendix J of the ESR). Therefore, the model was confirmed through the calibration results as an appropriate tool in the assessment of potential baseflow losses as a result of proposed development pumping. | |
| 13 | **MRA Issues Letter - Section 3 Source Water:**<br>**c. No combined testing of 11 new wells.** | The new wells are so far apart that mutual well field interference was very small and there was no interference with shallow wells, therefore combined pumping tests were not necessary to evaluate the water taking. The numerical model is the best tool to predict long-term (on the order of years) impacts. | |
| 14 | **MRA Issues Letter - Section 3 Source Water:**<br>**d. Golder updated model states that proposed water taking will result in a reduced flow of groundwater into Willow Creek – conflicting results from previous Golder assessment.** | Golder has consistently maintained that the proposed water taking will result in some baseflow loss (less than 10%) to Willow Creek (Golder, 2016 and Golder, 2017[1] in Appendix J of the ESR). | |
| 15 | **MRA Issues Letter - Section 3 Source Water:**<br>**e. Models can be flawed – "garbage in, garbage out". The track record of using large-scale groundwater models to predict stream flow reductions does not inspire confidence.** | It is difficult to directly address this comment as it does not provide any specific criticism or examples with respect to the ESR. However, as mentioned previously, the groundwater model described in Appendix M of Golder, 2016 (Appendix J of the ESR), relied on an extensive field program and government information sources to provide an extensive and high-quality dataset. The model underwent a calibration process that demonstrated that the model inputs / outputs were in agreement with this data.<br>The term "garbage in, garbage out" does not fairly characterize the rigorous approach and results of this study. In fact, the MECP themselves indicate that the "hydrogeological studies completed are a good base from which to complete a Hydrogeological Assessment as required by the "Technical Guidance Document for Hydrogeological Studies In Support of Category 3 Applications for Permit to Take Water" (MOECC, April 30 2018 letter in Appendix CC of the ESR). We agree with the MOECC with the understanding that a PTTW study would be required after the Class EA stage (Ainley's June 5 2018 letter in Appendix CC of the ESR).<br>Regarding the MRA comment: "The track record of using large-scale groundwater models to predict stream flow reductions does not inspire confidence." No reference is provided to any "track record". However, we note that large-scale models are often used to predict stream flow reductions in support of MOECC Source Water Protection studies as per the Technical Rules under the Clean Water Act. In particular, the South Georgian Bay Lake Simcoe Source Protection Plan utilized a regional Tier Three model to estimate baseflow losses as a result of future pumping in Barrie (AquaResource, 2013). | |

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## MRA - PART II ORDER RESPONSE

| No | Issues and Concerns | Proponent Response | Status |
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| 16 | **MRA Issues Letter - Section 3 Source Water:**<br>**f. Wellhead protection measures will have to be extended well beyond Springwater boundaries. Oro residents may face land use restrictions.** | Well head protection areas (WHPAs) often, and almost always, extend beyond municipal boundaries. However, it is the Well Head Protection Area 'A' (100 m radius) that is the primary impediment to farming in areas of low aquifer vulnerability. Nine of the eleven proposed wells (representing over 90% of the well capacity) are located such that WHPA 'A's are wholly contained within proposed development lands. The remaining two wells (to be located on Township lands west of Snow Valley Resort) are not adjacent to farming lands and should those two wells ultimately be required in the future; adequate well head protection will be ensured. For a further description of source water protection, the South Georgian Bay Lake Simcoe Source Protection Region documents can be consulted. | |
| 17 | **MRA Issues Letter - Section 3 Source Water:**<br>**g. Long-term groundwater pumping often negatively affects private wells.** | Field testing and groundwater modelling has indicated that unacceptable drawdown at private water supply wells is not anticipated (Golder, 2016 in Appendix J of the ESR and Golder, 2017[2] in Appendix BB "Special Council Meeting", of the ESR); however, during the Permit to Take Water application process this will be evaluated further to ensure no negative impacts to the wells within the zone of influence. The Permit to Take Water application is a standard process for all water takings in Ontario exceeding 50 $m^3$/day. | |
| 18 | **MRA Issues Letter - Section 3 Source Water:**<br>**h. How much groundwater loss is acceptable for a healthy, but sensitive coldwater fishery and other valuable ecological features in both Willow Creek and the Minesing Wetlands?** | This concern is addressed in HESL (2018b – Appendix L of the ESR) which was included as an appendix to the Final ACS (HESL 2018a – Appendix M of the ESR).<br>Our analysis showed that any predicted base flow losses are within MECP/MNRF and DFO thresholds which signifies that there is a low probability that effects on aquatic habitat and ecological features in Matheson, Black and Willow Creeks will be detectable<br>A variety of ecological flow guidelines have been developed to provide scientists and decision-makers with management tools for assessing potential flow alterations and any resulting impacts on aquatic features and functions (HESL 2018b – Appendix L of the ESR). Guidelines have been developed for various parts of Canada based on general hydrological and ecological traits of watercourses prevalent in those areas. Most guidelines are focused on predicted changes in surface water flows because of direct surface water taking, while fewer focus on predicted changes to streamflow resulting from losses of groundwater inflow to watercourses.<br>Fisheries and Oceans Canada (DFO 2013[4]) clearly states that flow alterations <10% of the instantaneous flow *"…have a low probability of detectable impacts to ecosystems that support commercial, recreational or Aboriginal fisheries based on "expert consensus"* and recommend that site-specific studies should be completed where flows are subjected to >10% flow alteration. The modelled baseflow losses for the Midhurst project were predicted on the basis of maximum permitted pumping rates during summer and are less than the 10% instantaneous flow guideline recommended by DFO and so there is a low probability that the losses will result in a) detectable changes in flow or b) impacts to aquatic life. The Monitoring and | |

[4] DFO. 2013. Framework for Assessing the Ecological Flow Requirements to Support Fisheries in Canada. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/017.

| No | Issues and Concerns | Proponent Response | Status |
|---|---|---|---|
| | | Adaptive Management Plan for the project also includes a) baseline data extending back to 2008, and b) site specific studies on ecological features, as described below.<br><br>The Ontario Ministry of Natural Resources (MNR) and Ontario Ministry of Environment (MOE) (MNR/MOE 2011[5]) compared consumptive water demand to water supply and developed thresholds which reflect Ontario's climate, including summer peak water demand. Surface water and groundwater stress levels were developed in accordance with monthly surface water level demands and both annual and monthly groundwater demands. They advise that additional assessment of threats to aquatic life is required if water demands exceed the thresholds. Monthly surface water and ground water demands of <20% and <25% respectively represent a low stress level and so the maximum demands predicted for the Midhurst SPA represent a low probability of stress to aquatic life.<br><br>MNR/MOE (2011) also developed more conservative stress thresholds for coldwater streams. An unacceptable impact is defined by a reduction in groundwater discharge of more than 20% of average monthly baseflow. Localized areas are assigned moderate risk if groundwater discharge is reduced between 10% - 20% of existing monthly baseflow. These thresholds are directly applicable to Midhurst as they represent the response of surface water to removal of groundwater, and not to direct surface water takings. Predicted baseflow losses in Black, Matheson and Willow Creeks are <10% and less than the above noted thresholds. The assessment of groundwater loss was focused on these three sensitive, coldwater creeks instead of the Minesing Wetland because future simulated aquifer drawdown was greater in these areas (Golder 2018[6] - Appendix J of ESR), providing a more sensitive/conservative assessment.<br><br>With respect to the comments on climate change, we have focused on the guidelines available at present and have implemented a comprehensive monitoring program of fish, water quality, water temperatures and wetted width (a surrogate for aquatic habitat) that will be continued through development and post-development as part of the Monitoring and Adaptive Management Plan. The Monitoring and Adaptive Management Plan will also include a variety of natural heritage-related triggers which will inform the need for mitigation as required. Ongoing monitoring and management will ensure that site-specific data reflect actual and not predicted conditions moving forward; this helps to distinguish between the uncertainty of future climate-related and project-related effects. | |
| **19** | **MRA Issues Letter - Section 3 Source Water:**<br><br>**i. Models designed for Source Water Protection purposes are unsuitable for deeper aquifers.** | Numerous models have been developed in support of MECP approved Source Water Protection plans for deep aquifer water supplies (City of Barrie, York Region, and Region of Waterloo are just a few examples). For major water takings the scale of the assessment is, for both technical necessity and meeting the MECP Technical Rules under the Clean Water Act, purposefully regional in order to encapsulate all potential effects within a subwatershed. | |

[5] MNR and MOE. 2011. Water Budget and Water Quantity Risk Assessment Guide, Drinking Water Source Protection Program.
[6] Golder. 2018. Hydrogeological Study, Midhurst Water Supply Exploration Program.

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## MRA - PART II ORDER RESPONSE

| No | Issues and Concerns | Proponent Response | Status |
|---|---|---|---|
| 20 | **MRA Issues Letter - Section 3 Source Water:**<br>**j. Recent findings of the OGS have been ignored – must be incorporated to draw accurate conclusions.** | The OGS reference does not include a description of the stratigraphy of Midhurst. Otherwise, the OGS work in Simcoe County does not contradict or identify materials different than those intersected in test well drilling (see Golder, 2016 in Appendix J of the ESR). | |
| 21 | **MRA Issues Letter - Section 3 Source Water:**<br>**k. Presence of nitrate in the deeper aquifers proves that they are connected to the shallow aquifers – contamination may take decades to be eliminated.** | Hydrogeological modelling and hydrogeological analysis completed by Golder for the Midhurst area acknowledges the connection of deep aquifers to shallow aquifers and shallow aquifers to precipitation. The movement of water from shallow to deep aquifers within a capture zone is required to maintain the sustainability of all groundwater takings, Midhurst is no different. The use of nitrogen-based fertilizer from farming will cease, resulting in less nitrogen recharging into the capture zones. Nitrate concentrations are currently below the Ontario Drinking Water Standard and water treatment to reduce nitrate further, in accordance with the Class EA, is part of the development application. Removal of nitrate in the proposed Water Treatment Plant is proposed and would continue until it is no longer required. | |
| 22 | **MRA Issues Letter - Section 3 Source Water:**<br>**l. The proposed new water supply for Midhurst will be larger than the groundwater used by Midland, Penetanguishene and Elmvale COMBINED. In fact, this will be the LARGEST municipal drinking water system relying solely on groundwater in all of Simcoe County. Note that Barrie and Alliston have to use a combined surface water/groundwater system because they found there wasn't enough groundwater to service and sustain growth.** | This assertion is misleading. Wasaga Beach has a well capacity of 360 L/sec and Angus Borden is well over 270 L/sec, both of which are larger than the proposed Midhurst Water Supply. Also it should be noted that the proposed well fields in Midhurst are separated from each other by between 2.5 to 9.8 kilometres (km). The Midland and Penetanguishene municipal wells, which service a population of 26,000, are closer together than the proposed Midhurst well fields. The Barrie groundwater supply system has 15 wells within 7 km of each other and 10 of these wells are within 4 km of each other. These wells in Barrie continue to provide water to the central and north pressure zones which services approximate half of Barrie's population of 147,000.<br>The City of Barrie added surface water in 2011 when the population of Barrie was 136,000 and the surface water plant was constructed to provide water to service annexed lands in Barrie's south pressure zone. The Alliston water supply was augmented with water from Georgian Bay to secure an expansion of the Honda automobile manufacturing plant in 1998. The groundwater supply system continues to operate.<br>All of the water supply systems in and adjacent to Simcoe County provide a sustainable water supply, many greater than the proposed Midhurst Water Supply and these all received Ministry approval based upon pumping tests with a duration of 72-hours or less. | |
| 23 | **MRA Issues Letter - Section 3 Source Water - Summary**<br>• **insufficient sustainable** | Section 4, 6, and 7 and Appendix M of Golder, 2016 in Appendix J of the ESR, demonstrate through aquifer testing and numerical modelling that sustainable groundwater resources are available.<br>The Assimilative Capacity Study (HESL 2018a – Appendix M of ESR) modelling predictions showed no | |

| No | Issues and Concerns | Proponent Response | Status |
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| | **groundwater for current users, traditional village growth and the proposed city of 30,000 over the longterm as stipulated in the MSP;**<br>• **the effects of such massive new groundwater-takings on our local environment and natural heritage are not negligible;** | effects after accounting for the effect of the new groundwater takings on the water quality of Willow Creek and the Minesing Wetland as all model predictions were made using a low-flow (7Q20) value that incorporated the predicted baseflow losses from future groundwater pumping. | |
| **24** | **MRA Issues Letter - Section 3 Source Water - Summary**<br>• **much more intensive study is needed now, not later, to answer these seminal issues;**<br>• **it is irresponsible to postpone answering such far-reaching and elemental questions about source water until the WTTP phase;**<br>• **the financial and environmental costs of not doing so could be catastrophic.** | In June 2017 the draft Environmental Study Report (dESR) for the Midhurst Class EA was submitted to MECP's (formerly MOECC) Central Region Technical Support Section for their comprehensive review, prior to the ESR being finalized and made public. On April 30, 2018 we received detailed review comments back from MECP (these comments are contained with Appendix CC of the ESR). In several locations throughout the MECP review comments, it is noted that the ministry expects that in conjunction with the PTTW applications for each well or groups of wells that further studies and/or investigations will have to be completed. Within Ainley's June 5, 2018 response letter to MECP (Appendix CC of the ESR) we acknowledged the comments and fully committed to completing the additional studies and/or investigations in conjunction with the future PTTW applications.<br>In response to this summary we re-iterate the following as detailed in Appendix J the ESR:<br>• The predicted impacts of the proposed development on the groundwater system are within acceptable limits.<br>• The intensive field program and subsequent modelling provide a sufficient basis to estimate potential future effects for consideration in the Class EA process.<br>• All required questions regarding source water protection in support of the Class EA have been addressed. | |
| **25** | **MRA Issues Letter - Section 4.2 Water Volume in Willow Cr and Minesing Wetlands**<br>**Concern re: groundwater recharge to Willow Creek and Minesing Wetlands – baseflow loss of 9.6%**<br>**Golder and HESL differ on the contention that aquifers 1 and** | Golder has maintained that there will be some baseflow loss (less than 10%) to Willow Creek (as per Golder, 2016 and Golder, 2017 in Appendix J of the ESR).<br>A discussion of the potential effect of the estimated baseflow losses on natural environment receptors in the Willow Creek sub watershed is provided in the HESL report entitled *7Q20 Flow Assessment Update for Willow Creek at Highway 26 (Near Minesing) and Ecological Low Flow Assessment* (HESL, May 28, 2018 – Appendix M of the ESR). HESL concluded that "the predicted flow reductions in Willow Creek and its tributaries associated with the proposed water taking to supply the Midhurst Secondary Plan Area will have no significant adverse effects on habitat and water temperature". This was elaborated in the responses above. | |

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## MRA - PART II ORDER RESPONSE

| No | Issues and Concerns | Proponent Response | Status |
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| | **2 are not connected to aquifers 3 and 4**<br><br>**Golder claims that 9.6% loss is acceptable – MOECC disagrees**<br><br>**One must also keep in mind that the Doran Road location is some 6 to 7km upstream from the WWTP so the reduced volume in the creek will have plenty of time to warm up under the summer sun before being diluted by effluent from the plant. This could have serious consequences for fish and other wildlife in the creek**<br><br>**Serious consequences to cold water fishery. Discrepancies in the proponents reports and the severe consequences of making a mistake leave plenty of room to question the accuracy of the predicted effects of water-taking on the wildlife of Willow Creek and the Minesing Wetlands** | In response to the comments regarding the connectivity of the upper and lower aquifers, see comments in elsewhere in this submission. | |
| **26** | **MRA Issues Letter - Section 4.3 Water Volume in Willow Cr and Minesing Wetlands**<br><br>**Conflicting views as to discharge points for aquifers 3 and 4. Lotimer's opinion (supported by OGS) is that all four aquifers flow to Minesing Wetlands – resulting in severe consequences. PTTW should** | Aquifers A3 and A4 are separated from Minesing Wetlands via a thick, low permeability confining layer. Whereas the potential for upward hydraulic gradients in Aquifer A3 / A4 are acknowledged, direct discharge to Minesing Wetlands is physically impossible in this geologic setting.<br><br>Golder's use of the terms "confined" and "separated from direct drawdown" does not suggest there is a complete isolation between deep and shallow aquifers but rather indicates that a pumping-induced hydraulic response initiated in Aquifers A3/A4 will have a relatively subdued effect in Aquifers A1/A2 as a result of the presence of low permeability aquitards (C1/C2) that lie between them.<br><br>Golder has acknowledged there will likely be some hydraulic connection between long-term pumping in the deep aquifers and water level and baseflow in the upper aquifers (see Appendix M of Golder, 2016 in Appendix J of the ESR). The distinction that needs to be recognized is that the connection is not a direct | |

| No | Issues and Concerns | Proponent Response | Status |
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| | **not even be contemplated until the feasibility of such a huge project is fully assessed. OGS currently conducting hydrogeological mapping of south and central Simcoe County – consider results before pursuing any further action on the MSP.** | "one to one" effect but is instead dampened as a result of the action of low permeability aquitards physically impeding (but not entirely preventing) flow or pressure response between deep and shallow aquifers.<br><br>Aquifer A3/A4 is known to exist directly adjacent to Nottawasaga Bay and likely extends underneath it, at some point "daylighting" through the lake bottom. Since Nottawasaga Bay (i.e. Lake Huron) is the ultimate discharge location (lowest water level) for the entire watershed it is logically inferred that some groundwater from these regionally extensive aquifers ultimately discharges into Nottawasaga Bay.<br><br>Nonetheless, we acknowledge that upward gradients likely occur underneath Minesing Wetland and some portion of water originating in A3/A4 eventually becomes surface discharge via a shallower unit directly connected to Willow Creek or Minesing Wetland. This is not disputed in our reporting, and, notably, this occurrence is reflected in our model construction and simulated results. There is some (limited) connection between pumping in Aquifer A3/A4 and the Willow Creek subwatershed as evidenced by the simulated baseflow loss occurring at this receptor (see Appendix M of Golder, 2016 in Appendix J of the ESR).<br><br>A discussion of the potential effect of the estimated baseflow losses on natural environment receptors in the Willow Creek subwatershed is provided in the HESL report entitled *7Q20 Flow Assessment Update for Willow Creek at Highway 26 (Near Minesing) and Ecological Low Flow Assessment* (HESL, May 28 2018 – Appendix L of ESR). HESL concluded that "the predicted flow reductions in Willow Creek and its tributaries associated with the proposed water taking to supply the Midhurst Secondary Plan Area will have no significant adverse effects on habitat and water temperature".<br><br>The OGS reference does not include a description of the stratigraphy of Midhurst. Otherwise, the OGS work in Simcoe County does not contradict or identify materials different than those intersected in test well drilling (Golder, 2016 in Appendix J of the ESR). Through its basis in extensive field data collection and subsequent calibration the model is an appropriate and sufficient impact assessment tool for use in this Class EA. | |
| **27** | **MRA Issues Letter - Section 4.4 Water Volume in Willow Cr and Minesing Wetlands**<br>**Highlight the Forest loss along the Mad River and Willow Creek in the Minesing Wetlands due to new development.**<br><br>**Notes that the marsh complex where the creek and the effluent would enter into the Minesing Wetlands supports a number of significant fish and** | The ACS (HESL 2018a[3]- Appendix M of ESR) concluded that there would be no detectable impacts on fish habitat and other ecologically sensitive features in the Minesing Wetland as a result of WWTP effluent discharge into Willow Creek.<br><br>The Minesing Wetland has an area of more than 6,000 hectares of which approximately 3,900 ha is owned or managed by the NVCA. The remainder is owned by the Province of Ontario, Simcoe County, local municipalities, other conservation organizations. The NVCA in recognizing the important stewardship role that they have in protecting the wetland, require that through the Minutes of Settlement, with the Midhurst Developers Group, that the development of the Midhurst Secondary Plan will:<br><br>a) Have a stormwater management system(s) to hold back the first 25 mm of storm runoff for a period of 48 hours;<br>b) Have a stormwater management system(s) to infiltrate back into the ground, close to the source, the first 20 mm of rainfall while also ensuring a healthy hydrologic cycle; | |

| No | Issues and Concerns | Proponent Response | Status |
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| | **wildlife functions.** | c) Reduce the Post-Development phosphorous loading to below Pre-Development loading levels, such that when the additional phosphorous load from the new Wastewater Treatment Plant (WWTP) is included, there shall be no net increase.<br><br>With the implementation of Low Impact Development (LID) measures on municipality owned property throughout the Midhurst Secondary Plan to meet the aforementioned requirements, the stormwater flows coming from the development lands will be greatly controlled and reduced such that the existing problems of silting and bank erosion within Willow Creek and ultimately into Minesing Wetland will not be exacerbated. | |
| 28 | **MRA Issues Letter - Section 5 Hine's Emerald Dragonfly**<br><br>**Alteration of aquatic wetland habitat and large-scale housing developments are generally incompatible with preserving the Hine's Emerald Dragonfly habitat.** | In response to previously identified concerns on the habitat of the Hine's Emerald Dragonfly (HED), a Technical Memorandum dated February 2017 was prepared by HESL (2017[7] - Appendix M of the ESR). The Technical Memorandum concluded that:<br><br>• "No physical disturbances associated with development of the MSPA will occur within 5 km of the regulated HED habitat and so there are no direct impacts.", and<br><br>• A hydrologic/hydrogeologic model (Golder 2017[8] - Appendix J of ESR) indicated maximum surface water level decreases of less than 1 mm in the Minesing Wetland over a ten-year period at full development build out.<br><br>Therefore, with respect to regulated HED habitat, the HED's use of the wetlands for egg-laying and larval development would not be affected as a result of water level changes.<br><br>Effluent assimilation mixing was described in Willow Creek Assimilative Capacity Study (HESL 2018a – See Appendix M of ESR) and 7Q20 Flow Assessment Update for Willow Creek (HESL 2018b – Appendix L of ESR) and it was determined that complete mixing of the effluent is achieved 360 m downstream of the point of discharge at Highway 26. Regulated Hine's Emerald Dragonfly (HED) habitat was mapped (Figures 1 and 2) and described in HESL 2017[9]. Category 1 habitat is defined as, "any part of a fen, marsh, seepage area, pond or other body of water, including a vernal or other temporary pool, that is being used, or has been used at any time in the past, by HED for egg laying or larval development", while Category 2 habitat includes, "any part of a wetland, watercourse, pond or other body of water, including a vernal or other temporary pool, up to the high water mark that is within 1600 metres of an area used for egg laying or larval development" (COSEWIC 2011)[10]. The closest Category 2 HED habitat in Willow Creek is located approximately 5 km downstream of the effluent discharge or 4.6 km downstream of the mixing zone. Furthermore, Category 1 HED habitat is located in a graminoid fen where groundwater flows predominantly | |

[7] Hutchinson Environmental Sciences Ltd. 2017. Memorandum to Joe Mullan, Re: Hine's Emerald Dragonfly Habitat in the Minesing Wetlands and the Midhurst Development.
[8] Golder. 2017. Report on Carson and Doran Neighbourhoods Water Supply – Midhurst Secondary Plan: Supplementary Hydrologic Modelling.
[9] Memorandum to Joe Mullan. February 7, 2017
[10] COSEWIC. 2011. COSEWIC assessment and status report on the Hine's Emerald in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Ix + 41 pp.

| No | Issues and Concerns | Proponent Response | Status |
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| | | north-west, indicating that Category 1 HED habitat is upstream of Willow Creek and any perceived impacts associated with wastewater (Post et al. 2015[11]).<br><br>A list of Best Management Practices for consideration of HED habitat was also identified within the Technical Memorandum dated February 2017 (Appendix M of the ESR) and will be implemented in the design of the proposed developments. | |
| 29 | **MRA Issues Letter - Section 6 Flooding & Drainage:**<br><br>**The annual flooding event (in Willow Creek) will be exacerbated if a wastewater treatment plant is permitted to add millions of litres of water per day to the creek only a few kilometers upstream of the wetlands.**<br><br>**Ainley did not suggest a solution such as municipal drain to alleviate flooding.**<br><br>**There will be more runoff, more sand and siltation and more flooding after the development.**<br><br>**The proponent aims to mitigate the effects of these damaging consequences from their proposed new development by employing LID technologies. LID means Low Impact, NOT No Impact.**<br><br>**There will be more run-off, more sand and siltation and more flooding after the** | Within Fact Sheet # 2 - Willow Creek and Minesing Wetland (Appendix Y of the ESR) it is noted "*Based upon 10 plus years of Willow Creek flow data, the flows within Willow Creek vary between a 7Q20 flow rate of 430 Litres per second (L/s) to a high of 24,000± L/s. The data also shows great variations within each specific season, depending upon the amount of precipitation that falls in a particular season.*" Therefore, given the annual peaks flows in Willow Creek are 24,000± L/s, the additional 143L/s of flow from the WWTP, after the buildout of the entire Midhurst Secondary Plan, will not adversely affect the flooding of Willow Creek.<br><br>In addition, through the Minutes of Settlement between the NVCA and Midhurst Developers Group stipulate that the development of the Midhurst Secondary Plan must:<br><br>a) Have a stormwater management system(s) to hold back the first 25 mm of storm runoff for a period of 48 hours;<br>b) Have a stormwater management system(s) to infiltrate back into the ground, close to the source, the first 20 mm of rainfall while also ensuring a healthy hydrologic cycle;<br><br>With the implementation of extensive Low Impact Development (LID) measures throughout the Midhurst Secondary Plan to meet the aforementioned requirements, the stormwater flows coming from the development lands will be greatly controlled and reduced such that the existing problems of silting, bank erosion and flooding within Willow Creek will not be exacerbated.<br><br>Finally, the annual flooding of Willow Creek and it tributaries, happens many kilometres downstream of the Midhurst Secondary Plan and is a well documented issue dating back 40 to 50 years. In relation to this annual flooding the Township in 2017 retained Kenn Smart of K. Smart and Associates (Drainage Engineer with extensive Municipal Drain experience) to investigate the matter associated with the annual flooding. In April 2018 Mr. Smart was appointed as the "Drainage Engineer" and asked to prepare a Scoping Study Report regarding the annual flooding of the Swaley Drain (tributary of the Willow Creek & Matheson Creek). Mr. Smart will prepare a preliminary report for potential works on the Swaley Drain along with an Environmental Study and report back to the Township. | |

[11] Post, R., McPhie, S., and J. Spoelstra. 2015. Hydrogeological and geochemical evaluation of the eastern Minesing Wetland in support of the Hine's Emerald Dragonfly (*Somatochlora hineana*). Nottawsaga Valley Conservation Authority.

| No | Issues and Concerns | Proponent Response | Status |
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| | **development. The additional run-off will be added to the net increase in water from the WWTP as explained in section 4.3 above.** | Given the existing flooding problems are kilometres downstream and that the Township has retained a Drainage Engineer to investigate the issues, we believe the issues are beyond the scope of this Class Environmental Assessment process. | |
| **30** | **MRA Issues Letter - Section 7 Wastewater Quality – Total Phosphorus:**<br><br>**Phase 1 proposed effluent phosphorus concentration of 0.05mg/L is 67% higher permitted level of 0.03mg/L. This will likely occur for 10 years until TP concentration will be reduced to comply with PWQO. How can this be acceptable?** | Section 2.0 of Water Management: Policies, Guidelines, Provincial Water Quality Objectives, (MOEE 1994a) states: *Provincial Water Quality Objectives (PWQO) are numerical and narrative criteria which serve as chemical and physical indicators representing a satisfactory level for surface waters (i.e. lakes and rivers) and, where it discharges to the surface, the ground water of the Province.* As such, the PWQO of 0.03 mg/L for total phosphorus applies to surface waters (i.e. Willow Creek and Minesing Wetland) and not the treated WWTP effluent.<br><br>Section 3.4 of MOEE 1994a allows for mixing zones, which they define *as an area of water contiguous to a point source where water quality does not comply with one or more PWQOs.* The MECP note that the concept of mixing zones recognizes that the cost of treating all waste discharges to the PWQO's may not be justified or technically feasible.<br><br>Effluent limits are to be based on the assimilative capacity of the receiver determined through site-specific receiving water assessments (MOEE 1994a); such as the Willow Creek Assimilative Capacity study (HESL 2018). The limits are incorporated into Environmental Compliance Approval (ECA) for the WWTP, which is a legally enforceable document.<br><br>An effluent limit of 0.05 mg/L for total phosphorus is therefore acceptable because:<br><br>1. the PWQO applies to surface waters, and not WWTP effluent;<br>2. the MECP allows for mixing zones in surface waters (where concentrations are above PWQOs);<br>3. the MECP recognizes that treating effluent to PWQOs is not always justifiable;<br>4. WWTP effluent limits are regulated by ECAs, which are legally enforceable documents;<br>5. the ACS study found that loading from the WWTP will not impair the current water quality in the creek. The proposed effluent limit of 0.03 mg/L for Full Build Out will reduce current downstream concentrations during some periods when background concentrations are currently elevated.<br><br>This was substantiated by MECP in their April 30, 2018 detailed review of the dESR (these comments are contained with Appendix CC of the ESR). With Section 2.4.1.v) of the ministry review it is noted that *"Although the analyses (with a TP discharge concentration of 0. 05mg/L) suggests that exceedances above the PWQO of 0.03 mg/L may result from the discharge, the assessment in our opinion is very conservative and the predicted exceedances marginal. It is also our opinion that the likelihood for effluent flows to be at the maximum design flow when stream flows are under extreme low flow conditions is low."*<br><br>Within Section 2.4.3 of the April 30, 2018 review comments from the MECP, associated with the dESR, it is noted that *"As presented above, the ministry finds that the proposed TP effluent concentration targets* | |

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| | | *are acceptable to protect Willow Creek. It is also our opinion that the TP load discharged from the plant (which could be up to a maximum of 134 kg/year) would be a very small fraction of the total load that is annually released into the downstream systems (Minesing Wetland) and unlikely to be of any concern."*<br><br>In addition, as highlighted within the Executive Summary of the ESR, the NVCA requires the Midhurst Secondary Plan, at each stage of development, to have a "no net increase" in Phosphorus and although the ministry noted it will not be necessary to include a Phosphorus offsetting program as part of the ECA for the WWTP, this is a requirement of the NVCA and therefore has been carried through to the recommendations within the ESR . This "no net increase" objective will be further discussed and finalized with the NVCA and the Township after completion of the Class EA in advance of the development proceeding. | |
| 31 | **MRA Issues Letter - Section 7 Wastewater Quality – Total Phosphorus:**<br><br>**MOECC stressed that the kind of SWM for the new/expanded roads should be stipulated and what criteria should be used.**<br><br>**Ainley's contention that transportation improvements are within existing community and therefore not bound by NVCA requirements is alarming. If not for MSP, there would be no need for transportation improvements. Any additional pollution resulting from road works made necessary by the MSP, must be included in any commitment for a zero phosphorus increase.** | Within Section 2.2 of the April 30, 2018 review comments from the MECP, associated with the dESR, it is noted that *"We acknowledge that section 7.9 and Appendix T-8 discuss the list of potential environmental impacts and suggested mitigation measures for the proposed transportation works. However, this contains only a two-page, high level identification of likely requirements/Best Management Plans (BMPs) to address issues or concerns related to the roadway improvement works. While it may be too early to develop detailed drainage and SWM plans for the road works at this stage, it is our opinion that the EA should clearly stipulate the kind of SWM that should apply for the new/expanded roads and what criteria should be used (as a minimum, achieving enhanced level of water quality control; addressing the need for peak flow control; would road works also be required to meet the 25 mm infiltration target discussed in the phosphorus budget work? etc).* Within Ainley's June 5, 2018 response letter to MECP (Appendix CC of the ESR) and within Section 7 of the ESR we fully acknowledged the "no net increase" and the "25mm infiltration" requirements associated with the Midhurst Secondary Plan developments and that during the detailed design stages, associated with the external transportation improvements identified in the Class EA, we are committed to including Low Impact Development (LID) measures, where possible, into the road reconstructions. | |
| 32 | **MRA Issues Letter - Section 7 Wastewater Quality – Total Phosphorus:**<br><br>**As a phosphorus offsetting** | In accordance with the Minutes of Settlement between the NVCA and Midhurst Developers Group the development of the Midhurst Secondary Plan is to have a "no net increase" in Phosphorus. Therefore; in our meeting with the NVCA in October 2017 and in Ainley's communication with NVCA on April 5, 2018 (Appendix CC of the ESR) we acknowledged that to achieve a "no net increase" some form of phosphorus | |

| No | Issues and Concerns | Proponent Response | Status |
|---|---|---|---|
| | **method, Ainley suggests the elimination of residential septic systems in Midhurst. However, Council passed a resolution stating that Midhurst residents will not be required to decommission their septic system and hook up to a new wastewater treatment plant.** | offsetting strategy would be required and that there are a number of options available, included but limited to, the following<br><br>• elimination of residential septic systems in Midhurst,<br>• watercourse improvements throughout the watershed<br>• agricultural improvements, etc.<br><br>In summary, we have not committed the Township to the elimination of septic systems in Midhurst, but instead identified the various types of phosphorus offsetting strategies that could be utilized to achieve the "no net increase" requirement. Further, we note in the ESR that the determination of which strategy(s) will actually be implemented will be determined in conjunction with the Township and NVCA | |
| 33 | **MRA Issues Letter - Section 7 Wastewater Quality – Total Phosphorus:**<br><br>**The above section demonstrates the proponent is prepared to:**<br><br>**(i) break commitment by 93Kg/year in Phase 1 of the development and 66 Kg/year at full buildout.** | In June 2017 the draft Environmental Study Report (dESR) for the Midhurst Class EA was submitted to MECP's (formerly MOECC) Central Region Technical Support Section for their comprehensive review, prior to the ESR being finalized and made public. On April 30, 2018 we received detailed review comments back from MECP (these comments are contained with Appendix CC of the ESR). With Section 2.4.1.v) of the ministry review comments it is noted that *"Although the analyses (with a TP discharge concentration of 0.05mg/L) suggests that exceedances above the PWQO of 0.03 mg/L may result from the discharge, the assessment in our opinion is very conservative and the predicted exceedances marginal. It is also our opinion that the likelihood for effluent flows to be at the maximum design flow when stream flows are under extreme low flow conditions is low."*<br><br>Within Section 2.4.3 of the April 30, 2018 review comments from the MECP, associated with the dESR, it is noted that *"As presented above, the ministry finds that the proposed TP effluent concentration targets are acceptable to protect Willow Creek. It is also our opinion that the TP load discharged from the plant (which could be up to a maximum of 134 kg/year) would be a very small fraction of the total load that is annually released into the downstream systems (Minesing Wetland) and unlikely to be of any concern."*<br><br>In addition, as highlighted within the Executive Summary of the ESR, the NVCA requires the Midhurst Secondary Plan, at each stage of development, to have a "no net increase" in Phosphorous and although the ministry noted it will not be necessary to include a Phosphorous offsetting program as part of the ECA for the WWTP, this is still a requirement of the NVCA and therefore it is a requirement of the Class EA. This "no net increase" objective will be further discussed and finalized with the NVCA and the Township after completion of the Class EA. | |
| 34 | **MRA Issues Letter - Section 7 Wastewater Quality – Total Phosphorus:**<br><br>**(ii) mislead the NVCA by failing to point out that any phosphorus resulting from** | Within Ainley's June 5, 2018 response letter to MECP (Appendix CC of the ESR) and within Section 7 of the ESR, we fully acknowledged the "no net increase" and the "25mm infiltration" requirements associated with the Midhurst Secondary Plan developments and note that during the detailed design stages, associated with the external transportation improvements identified in the Class EA, the Township and the Midhurst Developers Group are committed to including Low Impact Development (LID) measures, where possible, into the road reconstructions. | |

| No | Issues and Concerns | Proponent Response | Status |
|---|---|---|---|
| | **road works in support of the development, but inside the existing community, would be excluded from the Phosphorus Budget** | | |
| **35** | **MRA Issues Letter - Section 7 Wastewater Quality – Total Phosphorus:**<br>**(iii) force the municipality to break its commitments to the residents by forcing them to abandon their investment in septic systems and hook up to a new and otherwise unnecessary WWTP. Who will compensate residents for this expense?** | In accordance with the Minutes of Settlement between the NVCA and Midhurst Developers Group, the development of the Midhurst Secondary Plan is to have a "no net increase" in Phosphorus. Therefore; in our meeting with the NVCA in October 2017 and in Ainley's communication with NVCA on April 5, 2018 (Appendix CC of the ESR) we acknowledged that to achieve a "no net increase" some form of phosphorus offsetting strategy would most likely be required and that there are a number of options available, included but limited to, the following:<br>• elimination of residential septic systems in Midhurst,<br>• watercourse improvements throughout the watershed<br>• agricultural improvements, etc.<br>In summary, the ESR does not commit the Township to the elimination of septic systems in Midhurst, but instead identifies the various types of phosphorus offsetting strategies that could be utilized to achieve the "no net increase" requirement. Further, we note in the ESR that the determination of which strategy(s) will actually be implemented will be determined in conjunction with the Township and NVCA after finalization of the Class EA. | |
| **36** | **MRA Issues Letter - Section 7 Wastewater Quality – Total Phosphorus:**<br>**(iv) postpone consideration of a phosphorus offset strategy until after "the acceptance of the Class EA, at which time the net difference in phosphorus loading will be known".** | Only through the completion of the Class EA process are we able to accurately quantify the change in pre to post development phosphorus associated with the development of the Midhurst Secondary Plan. Therefore; it is essential that the Class EA process be completed first, such that the amount of phosphorus offsetting, is known and appropriate agreements for a phosphorus offsetting strategy can be developed in conjunction with the Township and NVCA. | |
| **37** | **MRA Issues Letter - Section 8 Conclusions:**<br>**1. Unconvinced that the EA is even legal** | It is our assessment that the Class EA conform with Provincial Law and Policies and is therefore legal. | |

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## MRA - PART II ORDER RESPONSE

| No | Issues and Concerns | Proponent Response | Status |
|---|---|---|---|
| 38 | **MRA Issues Letter - Section 8 Conclusions:**<br>**2. Unconvinced that "the health and safety of residents will be preserved. This is paramount"** | The Midhurst Class EA process followed the requirements of the Class EA Act. In particular, the ESR identifies servicing requirements related to water supply and distribution, wastewater collection and treatment and transportation improvement/upgrades to accommodate the development of the Midhurst Secondary Plan Area. Further all potential environmental impacts related to public health and safety and the environment have been identified and where necessary mitigation measures have been identified. | |
| 39 | **MRA Issues Letter - Section 8 Conclusions:**<br>**3. Unconvinced that "groundwater takings large enough to provide 19 million litres daily for a potable water system bigger than any other ground-water based system in all of Simcoe County are sustainable for the long term"** | The sustainability of the proposed development water supply has been previously addressed above. | |
| 40 | **MRA Issues Letter - Section 8 Conclusions:**<br>**4. Unconvinced that "private wells will not experience water shortages from the drawdown caused by pumping deeper inter-connected aquifers"** | Potential impacts to private wells has been addressed above. | |
| 41 | **MRA Issues Letter - Section 8 Conclusions:**<br>**5. Unconvinced that "Willow Creek's coldwater fishery will not be adversely affected"** | Our analyses (see HESL 2018a[3], HESL 2018b[4], as summarized above) confirm our conclusions that the coldwater fishery in Willow Creek will not be adversely affected. Ongoing monitoring and protection will be assured through the Monitoring and Adaptive Management Plan that is being prepared as part of submissions to the NVCA. | |
| 42 | **MRA Issues Letter - Section 8 Conclusions:**<br>**6. Unconvinced that "a sewage treatment plant discharging 12 million litres** | Within Fact Sheet # 2 - Willow Creek and Minesing Wetland (Appendix Y of the ESR) it is notes "*Based upon 10 plus years of Willow Creek flow data, the flows within Willow Creek vary between a 7Q20 flow rate of 430 Litres per second (L/s) to a high of 24,000± L/s. The data also shows great variations within each specific season, depending upon the amount of precipitation that falls in a particular season. Therefore, given the significant variations in the existing flows within Willow Creek, the additional 143L/s of flow from* | |

| No | Issues and Concerns | Proponent Response | Status |
|---|---|---|---|
| | **daily of treated effluent can do so with negligible harm to its receptors and the rare and sensitive inhabitants, both fauna and flora, of the fragile, unique Minesing Wetlands"** | *the Wastewater Treatment Plant, after the buildout of the entire Midhurst Secondary Plan, will not affect the characteristics of Willow Creek."*<br><br>Our analyses (see HESL 2018a[3], HESL 2018b[4], as summarized above) confirm our conclusions that that the effluent discharge meets all regulatory standards and that Willow Creek and the Minesing Wetland will not be adversely affected. Ongoing monitoring and protection will be assured through the Monitoring and Adaptive Management Plan that is being prepared as part of submissions to the NVCA.<br><br>Furthermore, the Assimilative Capacity Study (HESL 2018a) predicted that:<br><br>a) complete mixing of the effluent is achieved within 360 m of Highway 26 (i.e. the point of discharge); approximately 3 km upstream George Johnston Road;<br>b) the Provincial Water Quality Objective (PWQO) for un-ionized ammonia is met within 225 m of Highway 26; approximately 3 km upstream of George Johnston Road;<br>c) additional phosphorus and suspended solids loadings from the WWTP are minimal and will have no measurable impact on concentrations in Willow Creek (see p. 32 and p. 35 in the Final ACS (HESL 2018a).<br>d) dissolved oxygen concentrations will remain above the PWQO in the mixing zone and into the Minesing Wetland.<br><br>Therefore, there are no anticipated impacts to water quality within Willow Creek and Minesing Wetland, beyond what is predicted within the small mixing zone immediately downstream of Highway 26. | |
| **43** | **MRA Issues Letter - Section 8 Conclusions:**<br><br>**7. Unconvinced that "there will be no increased silting or bank erosion in Willow Creek due to lower or higher water levels, which would further harm the diminishing forest canopy"** | Within Fact Sheet # 2 - Willow Creek and Minesing Wetland (Appendix Y of the ESR) it is noted "*Based upon 10 plus years of Willow Creek flow data, the flows within Willow Creek vary between a 7Q20 flow rate of 430 Litres per second (L/s) to a high of 24,000± L/s. The data also shows great variations within each specific season, depending upon the amount of precipitation that falls in a particular season. Therefore, given the significant variations in the existing flows within Willow Creek, the additional 143L/s of flow from the Wastewater Treatment Plant, after the buildout of the entire Midhurst Secondary Plan, will not affect the characteristics of Willow Creek."*<br><br>From a stormwater management perspective, the Minutes of Settlement between the NVCA and Midhurst Developers Group stipulate that the development of the Midhurst Secondary Plan must:<br><br>c) Have a stormwater management system(s) to hold back the first 25 mm of storm runoff for a period of 48 hours;<br>d) Have a stormwater management system(s) to infiltrate back into the ground, close to the source, the first 20 mm of rainfall while also ensuring a healthy hydrologic cycle;<br>e) Reduce the Post-Development phosphorous loading to below Pre-Development loading levels, such that when the additional phosphorous load from the new Wastewater Treatment Plant (WWTP) is included, there shall be no net increase.<br><br>With the implementation of extensive Low Impact Development (LID) measures throughout the Midhurst Secondary Plan to meet the aforementioned requirements, the stormwater flows coming from the | |

| No | Issues and Concerns | Proponent Response | Status |
|---|---|---|---|
| | | development lands will be greatly controlled and reduced such that the existing problems of silting and bank erosion within Willow Creek will not be exacerbated. | |
| 44 | **MRA Issues Letter - Section 8 Conclusions:**<br><br>**8. Unconvinced that "a "net zero increase" in phosphorus loading can be achieved WITHOUT forcing over 1,000 Midhurst homes to hook up to the new wastewater treatment system and excluding run-off from new and expanded roads within the existing village"** | During a March 6, 2017 Meeting with the NVCA and the Township (Meeting Notes in Appendix B of the ESR) it was noted that existing septic systems, within 300m of Willow Creek, discharge approximately 2kg of phosphorus, per house to Willow Creek each year. Therefore, assuming a phosphorus offsetting requirement of 66kg per year and an offsetting ratio of 2:1 would equate to approximately 70 existing homes needing to be connected to the Midhurst Wastewater Treatment Plant, not over 1,000 as noted.<br><br>With regard to the external roads, within our Jun 5, 2018 response letter to MECP (Appendix CC of the ESR) and within Section 7 of the ESR we fully acknowledged the "no net increase" and the "25mm infiltration" requirements associated with the Midhurst Secondary Plan developments and that during the detailed design stages, associated with the external transportation improvements identified in the Class EA, we are committed to including Low Impact Development (LID) measures, where possible, into the road reconstructions. | |

**REFERENCES**


Ainley, 2018. Township of Springwater Midhurst Class EA (Water Wastewater & Transportation) Response to MOECC Comments dated April 30, 2017. June 5, 2018.

AquaResource, 2013. City of Barrie Tier Three Water Budget and Local Area Risk Assessment. Prepared for Lake Simcoe Region Conservation Authority. BarrieT3_RA_15074-527 R-0412 Final. May 2013.

Golder, 2016. Hydrogeological Study, Midhurst Water Supply Exploration Program. 13-1170-0040. June 2016. (May 2018 update for ESR).

Golder, 2017[1]. Report on Carson and Doran Neighbourhoods Water Supply – Midhurst Secondary Plan: Supplementary Hydrologic Modelling. 13-1170-0040. January 2017.

Golder, 2017[2]. Response to Lotimer and Associates Presentation "Midhurst Secondary Plan Development Proposal". April 21, 2017.

Lotimer, 2017. Midhurst Secondary Plan Development Proposal. March 8, 2017.

HESL, 2017. Response to Midhurst EA Submission from Michael Thorn. HESL. March 30, 2017.

HESL, 2018. 7Q20 Flow Assessment Update for Willow Creek at Highway 26 (Near Minesing) and Ecological Low Flow Assessment. May 28, 2018.

MOECC, 2018. RE: Midhurst Water, Wastewater and Transportation, Township of Springwater, Municipal Class Environmental Assessment Phases 3 and 4, Draft Environmental Study Report. April 30, 2018.

## Fact Sheet # 2: Willow Creek and Minesing Wetland

1) The Minesing Wetland spans an area of more than 6,000 hectares (15,000 acres) with an assemblage of fens, marshes, swamps and bogs supports a network of flora and fauna.

2) The Matheson Creek drainage area represents approximately 11% of the Minesing Wetland drainage area. Note Willow Creek is within the Matheson Creek watershed;

3) The phosphorus loading within the Minesing Wetland varies greatly each year and depends upon the amount and type of precipitation throughout the year. However, the current phosphorus loading within the Minesing Wetland has been estimated to be between 35,000 and 40,000 kg per year;

4) As identified in "Pollutant Target Loads: Lake Simcoe and Nottawasaga River Basins" Report dated June 2006 and prepared by the Louis Berger Group and Greenland International, Inc. the combined phosphorus loading entering the Minesing Wetland from the Matheson Creek watershed and the Black Creek watershed is over 3,800kg per year. Note the Midhurst Secondary Plan is completely within the Matheson Creek and Black Creek watersheds.

5) A detailed assessment of the cumulative loading of phosphorus from the Midhurst Secondary Plan (both Stormwater Management and the Wastewater Treatment Plant) discharging to Willow Creek and the Minesing Wetland has been completed.

   To facilitate this a phosphorus budget modelling tool was developed and adapted specifically for the Nottawasaga Valley Conservation Authority (NVCA), from the modelling tool that was developed for the Lake Simcoe Protection Plan (LSPP) by the Ministry of Environment and Climate Change (MOECC), along with the inclusion of new industry standards for Low Impact Development (LID) in Ontario.

   This phosphorus assessment concluded that with the extensive use of Low Impact Development (LID) measures throughout the Midhurst Secondary Plan, the traditional impact of stormwater from new development will be significantly reduced. In particular, the cumulative "net" phosphorus load after the buildout of the entire Midhurst Secondary Plan is approximately 66 kg/year, which (conservatively) represents less than 0.5% of the current phosphorus load flowing through the Minesing Wetland on an annual basis.

6) The combination of, the latest treatment technologies at the Wastewater Treatment Plant and assimilation processes in Willow Creek, will maintain un-ionized ammonia concentrations below the Provincial Water Quality Objectives (PWQO). Therefore,

## Fact Sheet # 2: Willow Creek and Minesing Wetland

Willow Creek or Minesing Wetland will not be negatively affected by ammonia from the Midhurst Secondary Plan.

7) Willow Creek currently exceeds the Provincial Water Quality Objective (PWQO) for Total Phosphorus of 0.03 mg/L. At Full Build Out of the Midhurst Secondary Plan, effluent will be treated to the PWQO of 0.03 mg/L and there will be no measurable increase in the creek as a result of the discharge.

8) Based upon 10 plus years of Willow Creek flow data that has been analyzed, the flows within Willow Creek vary between a 7Q20 flow rate of 430 Litres per second (L/s) to a high of 24,000± L/s. The data also shows great variations within each specific season, depending upon the amount of precipitation that falls in a particular season. Therefore, given the significant variations in the existing flows within Willow Creek, the additional 143L/s of flow from the Wastewater Treatment Plant, after the buildout of the entire Midhurst Secondary Plan, will not affect the characteristics of Willow Creek from fluvial geomorphological perspective.

9) Nitrogen forms will be treated to a very high standard in the WWTP. The effluent will be non-lethal to aquatic life as it leaves the plant, prior to any mixing with the creek. The effluent will mix with the creek after discharge and the resultant dilution and assimilation processes will quickly reduce ammonia concentrations so they will meet the water quality objective for un-ionized ammonia within 360m of the point of discharge. No significant impacts will occur within this 360m “mixing zone” which is allowed under MOECC Policy. Nitrate in the creek will be maintained below water quality objectives at all points. Water quality that is at or below an objective is suitable for indefinite exposure of the most sensitive life stages of the most sensitive aquatic life and is thus safe for aquatic life.

10) Dissolved oxygen concentrations will be maintained at 7.8 – 8.1 mg/L in Willow Creek, well above the requirements for aquatic life.

11) Effluent discharge will have a minimal effect on water temperatures in the creek. At Full Build Out, and minimum creek flows, the maximum water temperature increases will be 1.05 $^{o}$C in January and 0.85 $^{o}$C in July, without accounting for exchange of heat with the atmosphere. Temperatures will therefore remain within current ranges with no impacts to aquatic life.

12) At Full Build Out, the flow from the WWTP would make up 25% of the total flow of Willow Creek at 7Q20 low flows (i.e., 430 L/s). The discharge of effluent would result in an average increased water depth of 0.01 to 0.03 m and average increased velocity

## Fact Sheet # 2: Willow Creek and Minesing Wetland

of 0.01 m/sec, changes that would be virtually immeasurable in Willow Creek and would have no effects on erosion.

13) The Midhurst Developers Group is committed to working with the Nottawasaga Valley Conservation Authority (NVCA) to achieving a net-zero increase in phosphorus, if required.

In particular, if it is deemed necessary by the MOECC, a program similar to what was set up with the Developers group in the Tottenham area could be established. In the Tottenham scenario, an Expansion to the Wastewater Treatment Plant, which was necessary to accommodate new growth, was going to increase the amount of phosphorous being discharged to the Beeton Creek. Therefore, the local Developers were required by MOECC to provide monies to the NVCA for the implementation of a phosphorous offsetting program; whereby works would be undertaken by the NVCA, at key spots throughout the watershed, to reduce the amount of phosphorous entering the creek and therefore, offset the additional load from the expanded Wastewater Treatment Plant and ensuring no negative impact on the watershed.

## Reid Mitchell

**From:** Neil Hutchinson <Neil.Hutchinson@environmentalsciences.ca>
**Sent:** October-05-18 11:57 AM
**To:** Joe Mullan; Reid Mitchell
**Cc:** Hannan, Devin; Easton, John; Deborah Sinclair; Brent Parsons
**Subject:** Part II Order Response
**Attachments:** M130030-01-Mar-17-Midhurst WWTP thermal mixing model.pdf

Joe – Golder asked us to contribute to their memo on responses to MRA H-G concerns. One MRA question states

***MRA Comment:*** *The proposal to vastly increase the volume of water being drawn from A3 for the new development, will have the following severe consequences:*

- *It will further deprive the wetlands of a source of cold groundwater needed to sustain its health.*
- *The diversion of this cold groundwater from A3, through the new homes and WWTP into Willow Creek, will increase it's temperature.*
- *The cold, clean groundwater currently flowing into the wetlands, will be replaced by warmer water laced with treated effluent and flowing from a different upstream source.*
- *This is tantamount to pumping water from its downstream outflow point in the wetlands to a point upstream in Willow Creek - a point already the source of flooding. This will add 12 million litres of water per day, every day of the year, exacerbating the chronic springtime flooding in the area where the creek enters the wetlands. (See Section 6, "Flooding and Drainage").*

You will see that it raises the concern about thermal effects associated with WWTP discharge. We did not address this in the ACS or the ESR or any of the appendices to the ESR.
We did prepare a draft memo in March 2017 in response to NVCA questions but it was never finalized. So I finalized it with todays date and have attached it - it should be submitted as part of the Part II response

Neil

Hutchinson
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# Memorandum - DRAFT

**Date: March 1, 2017**

**To: Vimal Patel and Shauna Dudding**

**From: Tara Roumeliotis, Brent Parsons, Neil Hutchinson**

**Re: HESL J130030 Midhurst WWTP – Effluent Thermal Mixing Model**

## *Purpose of Technical Memorandum*

On May 29 2013, the Nottawasaga Valley Conservation Authority (NVCA) provided comment on the notice of "Study Commencement for Phase 3 and 4 of the Midhurst Water, Wastewater and Transportation Infrastructure Class Environmental Assessment (EA) for the Township of Springwater" in a letter to Springwater Township (Young to Sokach). One of the NVCA questions was "*Will there be thermal impacts to Willow* Creek [from the proposed Midhurst Wastewater Treatment Plant (WWTP) effluent discharge]?"

The purpose of this technical memorandum is to provide an understanding of the effect of the Midhurst WWTP effluent on temperatures in Willow Creek during all times of the year, at both Phase 1 and Full Build Out effluent flows. Willow Creek temperatures, downstream of the Midhurst WWTP outfall location, were calculated using: 1) A mass balance model (i.e., conservative approach) to estimate water temperatures after complete mixing of effluent with the creek; and 2) A CORMIX model of temperatures in the mixing zone, which was originally developed for the *Willow Creek Assimilative Capacity Study*, draft report (Hutchinson Environmental Sciences Ltd., May 2016) to examine total phosphorus and total ammonia nitrogen in Willow Creek. CORMIX is a software system developed by Cornell University for the analysis, prediction, and design of aqueous toxic or conventional pollutant discharges into diverse water bodies[1]. CORMIX specializes in analyzing the effluent plume in the mixing zone region (i.e., the region between the outfall and the point of complete mixing of the plume with Willow Creek). Surface heat exchange between the water and the atmosphere was incorporated into the CORMIX model, making the model a more accurate representation of creek water temperatures than the mass balance model. We have now updated our original February 9 response to the NVCA questions to incorporate the results of the final modelling presented herein. The CORMIX model provides better resolution of temperatures in the creek but does niot change the conclusions presented in the February 9 response.

## *Methodology*

Water temperature data for Willow Creek was obtained from the MOECC's Provincial Water Quality Monitoring Network (PWQMN) station located at George Johnson Road (2002 through 2014 data), which was supplemented with water quality data collected by HESL in 2013, 2014 and 2016. THE PWQMN sites do not collect daily temperature data as the sites are generally visited monthly. The average and 75$^{th}$

[1] *Doneker,, R.L. and Jirka, G.H. 2014. CORMIX User Manual.*

percentile water temperatures were therefore calculated for each month (Table 1). Effluent temperatures were provided from seasonal data from the Alcona (Innisfil) WWTP by Black & Veatch (P. Coleman, Black & Veatch, pers. communication, February 8, 2017). These were converted to monthly temperatures by assigning the months of November through March as winter temperatures, April through May and September through October as spring/fall temperatures, and June through August as summer temperatures (Table 1). Effluent will always be warmer than the creek although it will be cooler than the values shown in Table 1 in the summer months as the force mains between the WWTP and the outfall will be buried and thus cooled by exposure to cooler (than the effluent) subsurface temperatures.

**Table 1. Monthly Temperatures in Midhurst WWTP Effluent and Willow Creek**

| Month | Effluent (°C) | Average Willow Creek (°C) | 75th Percentile Willow Creek (°C) |
|---|---|---|---|
| January | 13.0 | 1.2 | 1.2 |
| February | 13.0 | 0.02 | 0.02 |
| March | 13.0 | 2.9 | 2.9 |
| April | 15.0 | 5.5 | 6.8 |
| May | 15.0 | 12.7 | 13.1 |
| June | 20.0 | 16.0 | 17.9 |
| July | 20.0 | 18.2 | 19.4 |
| August | 20.0 | 16.7 | 18.1 |
| September | 15.0 | 13.5 | 14.1 |
| October | 15.0 | 8.4 | 10.3 |
| November | 13.0 | 4.7 | 6.4 |
| December | 13.0 | 2.3 | 2.3 |

- Note: (1) There were no PWQMN data collected during the month of January. The average temperature for January was therefore calculated as the average between the months of December and February. (2) There was one temperature data entry for the months of December, February and March. Therefore the average and 75th percentile temperatures for these months are identical.

Daily minimum and median Willow Creek flows were calculated using the 10-year period of flow measurements available from the Water Survey of Canada (WSC) Station 02ED032 located on Willow Creek at Highway 26 approximately 300 m upstream of the proposed outfall location. The daily minimum flow was the single lowest flow measured for each date of the year, and the median flow was calculated as the median of all flows measured for each date of the year over the period of record (i.e., 2006 – 2016). Figure 1 shows the resulting minimum and median Willow Creek flows. Flows were highest in spring and lowest in the summer and early fall months.

Both models were run on a monthly time step using the 5th percentile (Figure 1) of the minimum daily flows measured each month as a conservative estimate of low flow.

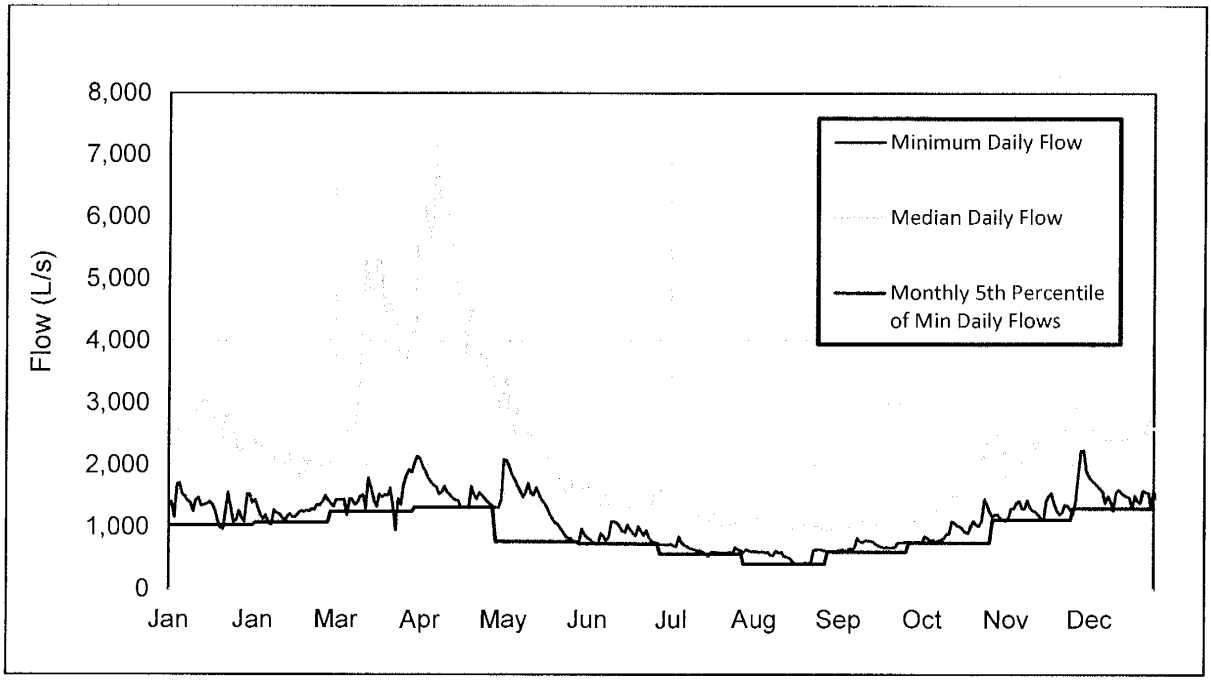



**Figure 1. Willow Creek Minimum and Median Daily Flows**

The CORMIX model inputs were those detailed in the *Willow Creek Assimilative Capacity Study*, draft report (Hutchinson Environmental Sciences Ltd., May 2016) with addition of a surface heat exchange coefficient for modelling temperature. The CORMIX user manual[2] suggests that, for conservative models, a value of 10 W/m$^2$,°C be used at low water temperatures and a value of value of 20 W/m$^2$,°C be used at high water temperatures. These values correspond to a wind speed of 0-2 m/sec - heat exchange would be greater at higher wind speeds. Following this, a surface heat exchange coefficient of 20 W/m$^2$,°C was used for the months of June through August, and a coefficient of 10 W/m$^2$,°C was used for all other months. A sensitivity analysis was also performed by adjusting the coefficient between 10 and 100 W/m$^2$,°C. The difference in the predicted downstream fully-mixed water temperature was 0.12°C using the high and low surface heat exchange coefficient, indicating that the model is minimally sensitive to changes in the coefficient.

***Mass Balance Model Results***

The resulting water temperatures in Willow Creek downstream of the proposed WWTP discharge as calculated by the mass balance (at both average and 75$^{th}$ percentile upstream water temperatures) are presented for Phase 1 and Full Build Out effluent flows of 74.7 L/s and 142.5 L/s in Figures 2 and 3 respectively, and in Table 2.

[2] *Doneker,, R.L. and Jirka, G.H. 2014. CORMIX User Manual.*

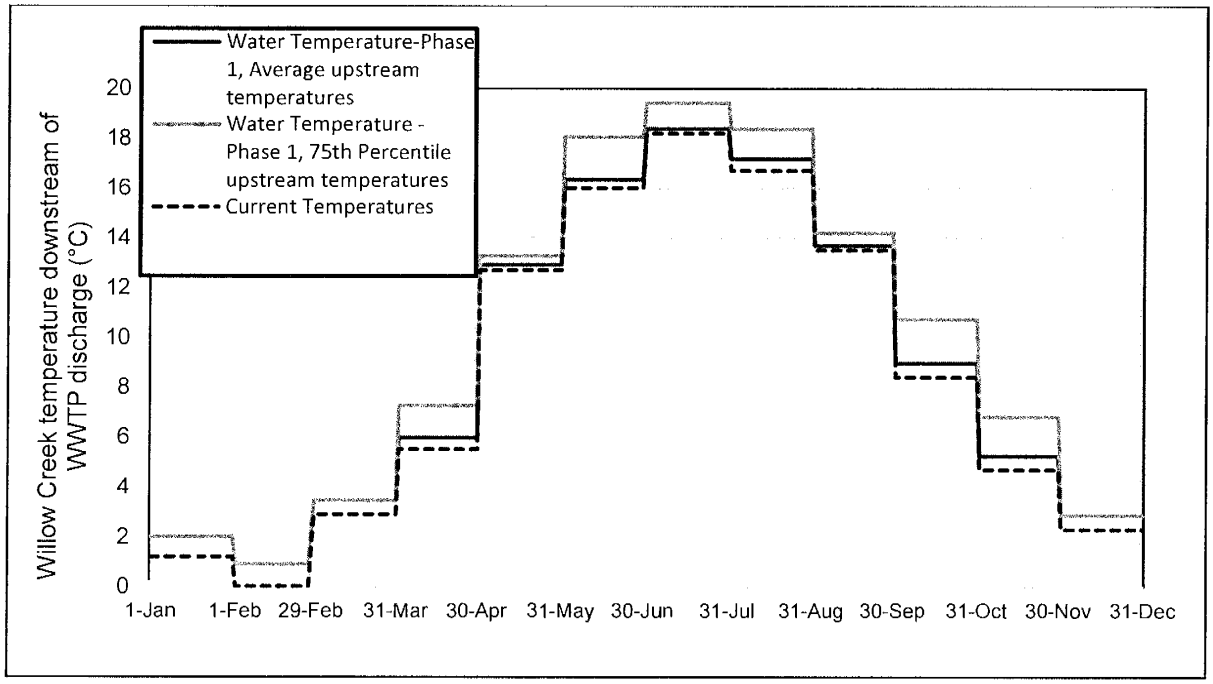



**Figure 2. Willow Creek Temperatures After Mixing with Midhurst WWTP (Phase 1), by Mass Balance Modelling**

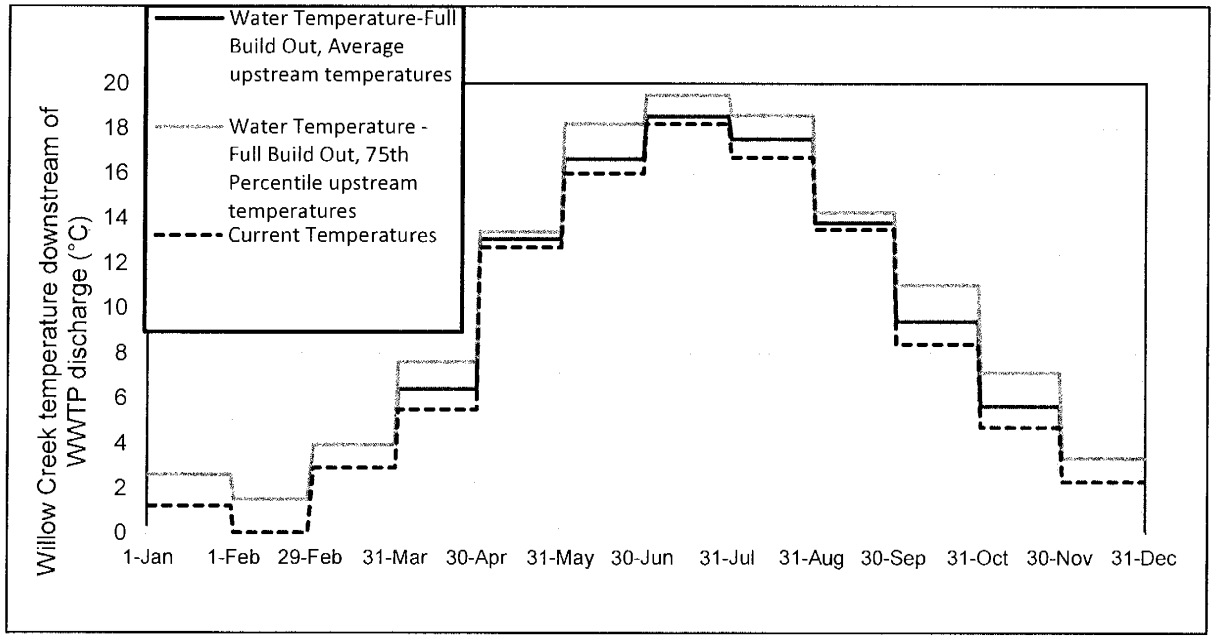



**Figure 3. Willow Creek Temperatures After Mixing with Midhurst WWTP (Full Build Out), by Mass Balance Modelling**

**Table 2. Monthly Fully-Mixed Water Temperatures in Willow Creek by Mass Balance Modelling**

| Month | Upstream Willow Creek Average Temp-erature (°C) | Upstream Willow Creek 75th percentile Temp-erature (°C) | Phase 1 | | Full Build Out | |
|---|---|---|---|---|---|---|
| | | | Downstream Temperature at Fully Mixed (°C) and average upstream temperatures | Downstream Temperature at Fully Mixed (°C) and 75th percentile upstream temperatures | Downstream Temperature at Fully Mixed (°C) and average upstream temperatures | Downstream Temperature at Fully Mixed (°C) and 75th percentile upstream temperatures |
| January | 1.2 | 1.2 | 2.0 | 2.0 | 2.6 | 2.6 |
| February | 0.02 | 0.02 | 0.9 | 0.9 | 1.5 | 1.5 |
| March | 2.9 | 2.9 | 3.5 | 3.5 | 3.9 | 3.9 |
| April | 5.5 | 6.8 | 6.0 | 7.3 | 6.4 | 7.6 |
| May | 12.7 | 13.1 | 12.9 | 13.3 | 13.1 | 13.4 |
| June | 16.0 | 17.9 | 16.3 | 18.0 | 16.6 | 18.2 |
| July | 18.2 | 19.4 | 18.4 | 19.4 | 18.5 | 19.5 |
| August | 16.7 | 18.1 | 17.2 | 18.4 | 17.5 | 18.6 |
| September | 13.5 | 14.1 | 13.7 | 14.2 | 13.8 | 14.3 |
| October | 8.4 | 10.3 | 9.0 | 10.7 | 9.4 | 11.0 |
| November | 4.7 | 6.4 | 5.2 | 6.8 | 5.7 | 7.1 |
| December | 2.3 | 2.3 | 2.9 | 2.9 | 3.4 | 3.4 |

- Note: There was one temperature data entry for the months of December, February and March. Therefore the average and 75th percentile temperatures for these months are identical. The temperature for January was calculated as the average between the months of December and February.

Effluent discharge will have minimal effect on water temperatures in Willow Creek. The maximum temperature increase was 1.5°C at Full Build Out in the month of February (Table 2). The maximum downstream temperature was calculated at 19.5°C at Full Build Out in the month of July with 75th percentile upstream water temperatures, an increase of 0.1°Cover upstream Willow Creek 75th percentile temperatures. The maximum summer increase was 0.8 °C in August, which raised the average creek temperature from 16.7 to 17.5 °C at Full Build Out (Table 2).

***CORMIX Model Results***

The CORMIX model was used to predict water temperatures in the initial mixing zone of Willow Creek downstream of the WWTP discharge. CORMIX is a mixing zone model and was used to predict temperatures within the discharge plume, as well as at the point of complete mixing between the effluent

and Willow Creek, downstream of the outfall. CORMIX accounts for the dynamics of effluent mixing with the stream water and for surface water heat exchange with the atmosphere.

The monthly fully-mixed downstream temperatures, at both a Phase 1 effluent flow of 74.7 L/s and a Full Build Out effluent flow of 142.5 L/s are presented in Table 3. At Full Build Out, the largest temperature increase was calculated to be 1.8°C in the month of January, with a resulting temperature of 1.8°C. The highest fully-mixed temperature was 19.5°C for the month of July calculated using 75$^{th}$ percentile upstream water temperatures, (a temperature increase of 0.1°C over current 75$^{th}$ percentile July water temperatures). The highest summer increase was for August average temperatures which increased by 1.1 °C to a final value of 17.8°C at full build out. There was good comparison between the mass balance model and the CORMIX model (Tables 2 and 3), with slightly warmer final temperatures predicted by CORMIX in the winter and summer months. These slight differences between the models were due to the fact that 1) the CORMIX model accounts for discharge conditions, flux characteristics (buoyancy, flows, momentum), and bank interaction; and 2) the CORMIX model included a surface heat exchange coefficient. The CORMIX model results should be used over the mass balance model since the CORMIX model is a more sophisticated model.

**Table 3. Monthly Fully-Mixed Water Temperatures in Willow Creek by CORMIX Modelling**

| Month | Upstream Willow Creek Average Temp-erature (°C) | Upstream Willow Creek 75$^{th}$ percentile Temp-erature (°C) | Phase 1 | | Full Build Out | |
|---|---|---|---|---|---|---|
| | | | Downstream Temperature at Fully Mixed (°C) and average upstream temperatures | Downstream Temperature at Fully Mixed (°C) and 75$^{th}$ percentile upstream temperatures | Downstream Temperature at Fully Mixed (°C) and average upstream temperatures | Downstream Temperature at Fully Mixed (°C) and 75$^{th}$ percentile upstream temperatures |
| January | 1.2 | 1.2 | 2.3 | 2.3 | 2.9 | 2.9 |
| February | 0.02 | 0.02 | 1.2 | 1.2 | 1.8 | 1.8 |
| March | 2.9 | 2.9 | 3.7 | 3.7 | 4.4 | 4.4 |
| April | 5.5 | 6.8 | 6.2 | 7.4 | 6.8 | 7.8 |
| May | 12.7 | 13.1 | 12.9 | 13.3 | 13.1 | 13.5 |
| June | 16.0 | 17.9 | 16.4 | 18.1 | 16.7 | 18.3 |
| July | 18.2 | 19.4 | 18.4 | 19.4 | 18.6 | 19.5 |
| August | 16.7 | 18.1 | 17.2 | 18.4 | 17.8 | 18.7 |
| September | 13.5 | 14.1 | 13.7 | 14.2 | 13.9 | 14.3 |
| October | 8.4 | 10.3 | 9.0 | 10.8 | 9.6 | 11.2 |
| November | 4.7 | 6.4 | 5.4 | 7.0 | 5.8 | 7.0 |
| December | 2.3 | 2.3 | 3.1 | 3.1 | 3.8 | 3.1 |

CORMIX predicted the point of complete mixing to typically occur between 320 m and 350 m downstream of the outfall. Tables 4 and 5 present the highest temperatures at the centreline of the plume at distances of 50 m and 100 m downstream of the outfall, calculated using average and 75$^{th}$ percentile upstream Willow Creek monthly temperatures, respectively. The plume width is also presented and expressed as a percentage, where 100% would represent a plume that had spread laterally across the entire width of Willow Creek.

**Table 4. Plume Water Temperatures and Percentage of Stream Width in Willow Creek by CORMIX Modelling at Average Upstream Water Temperatures**

| Month | Upstream Willow Creek Average Temperature (°C) | Phase 1 - Temperature at 50 m Downstream (°C) | Phase 1 - Temperature at 100 m Downstream (°C) | Full Build Out - Temperature at 50 m Downstream (°C) | Full Build Out- Temperature at 100 m Downstream (°C) |
|---|---|---|---|---|---|
| January | 1.2 | 3.9 (40%) | 3.2 (55%) | 4.6 (50%) | 4.0 (62%) |
| February | 0.02 | 2.8 (41%) | 2.1 (55%) | 3.1 (48%) | 2.5 (60%) |
| March | 2.9 | 4.9 (40%) | 4.3 (55%) | 6.4 (42%) | 5.5 (56%) |
| April | 5.5 | 7.4 (40%) | 6.8 (55%) | 8.4 (44%) | 7.7 (59%) |
| May | 12.7 | 13.2 (42%) | 13.1 (58%) | 13.6 (38%) | 13.4 (49%) |
| June | 16.0 | 16.9 (43%) | 16.7 (58%) | 17.7 (47%) | 17.3 (49%) |
| July | 18.2 | 18.7 (43%) | 18.6 (58%) | 19.0 (51%) | 18.9 (63%) |
| August | 16.7 | 17.6 (54%) | 17.5 (68%) | 18.4 (66%) | 18.2 (74%) |
| September | 13.5 | 14.0 (42%) | 13.8 (58%) | 14.2 (50%) | 14.1 (62%) |
| October | 8.4 | 10.0 (42%) | 9.5 (58%) | 11.1 (46%) | 10.5 (59%) |
| November | 4.7 | 6.5 (40%) | 6.0 (55%) | 6.9 (49%) | 6.5 (63%) |
| December | 2.3 | 4.3 (40%) | 3.7 (55%) | 5.9 (42%) | 5.0 (56%) |

**Table 5. Plume Water Temperatures and Percentage of Stream Width in Willow Creek by CORMIX Modelling at 75th Percentile Upstream Water Temperatures**

| Month | Upstream Willow Creek 75th Percentile Temperature (°C) | Phase 1 - Temperature at 50 m Downstream (°C) | Phase 1 - Temperature at 100 m Downstream (°C) | Full Build Out - Temperature at 50 m Downstream (°C) | Full Build Out- Temperature at 100 m Downstream (°C) |
|---|---|---|---|---|---|
| January | 1.2 | 3.9 (40%) | 3.2 (55%) | 4.6 (50%) | 4.0 (62%) |
| February | 0.02 | 2.8 (41%) | 2.1 (55%) | 3.1 (48%) | 2.5 (60%) |
| March | 2.9 | 4.9 (40%) | 4.3 (55%) | 6.4 (42%) | 5.5 (56%) |
| April | 6.8 | 8.4 (40%) | 8.0 (55%) | 9.1 (44%) | 8.6 (59%) |
| May | 13.1 | 13.5 (42%) | 13.4 (58%) | 13.9 (38%) | 13.7 (49%) |
| June | 17.9 | 18.4 (43%) | 18.3 (58%) | 18.8 (47%) | 18.6 (49%) |
| July | 19.4 | 19.6 (43%) | 19.5 (58%) | 19.7 (51%) | 19.6 (63%) |
| August | 18.1 | 18.8 (54%) | 18.7 (68%) | 19.2 (66%) | 19.0 (74%) |
| September | 14.1 | 14.5 (42%) | 14.4 (58%) | 14.5 (50%) | 14.4 (62%) |
| October | 10.3 | 11.4 (42%) | 11.1 (58%) | 12.2(46%) | 11.8 (59%) |
| November | 6.4 | 7.6 (40%) | 7.4 (55%) | 7.8 (49%) | 7.4 (63%) |
| December | 2.3 | 4.3 (40%) | 3.7 (55%) | 5.9 (42%) | 5.0 (56%) |

- Note: There was one temperature data entry for the months of December, February and March. Therefore the average and 75th percentile temperatures for these months are identical. The temperature for January was calculated as the average between the months of December and February.

The highest temperatures in the plume were experienced in the month of July. At full build out effluent flows and 75th percentile upstream water temperatures, a peak temperature of 19.7°C was predicted azt the centreline of the plume at 50 m downstream of the outfall (Table 5). At this point, the plume would extend approximately 51% laterally across the width of the creek. (Note that the entire plume at 50 m downstream is not 19.7°C in temperature, but instead this is the highest temperature, at the centreline of the plume at a distance of 50 m downstream). Temperature at the edge of the plume (at 51% of the creek width) would be the same as that upstream of the outfall because the plume has not mixed with the entire creek width. At a downstream distance of 100 m in the month of July, the plume spread to 63% of the width of Willow Creek, and was predicted to have a peak temperature of 19.6°C at this point. The maximum lateral extent of the plume occurred in August at Full Build Out (i.e., 74% at 100 m downstream).

***Thermal Impact on Fish and Other Aquatic Species***

The predicted increases in temperature in Willow Creek downstream of the outfall are minimal. The Provincial Water Quality Objective (PWQO) for water temperature is, "*The natural thermal regime of any body of water shall not be altered so as to impair the quality of the natural environment. In particular, the diversity, distribution and abundance of plant and animal life shall not be significantly changed.*" (MOE 1994[3]). We reviewed the thermal tolerances of resident trout species as representative coldwater organisms and thus, sensitive indicators of the thermal environment in Willow Creek. We have captured Brown Trout within Willow Creek in our surveys (B. Parsons, HESL, pers. comm.) and MNRF have indicated that others have collected them in Willow Creek as well. Brook Trout have a lower thermal tolerance than Brown Trout and were included in fish species lists of Willow Creek provided by NVCA and MNRF. We have not captured Brook Trout in field surveys within Willow Creek, however, and Scientific Collection results provided by MNRF, as well as our own observations indicate Brook Trout are predominantly located in tributaries to Willow Creek and not in the main stem.

Water temperature appears to be the most important factor separating trout streams from non-trout streams (Stoneman and Jones, 2000[4]). The habitat requirements of brown trout are essentially the same as brook trout but they can remain active and thriving in slightly higher temperatures; the upper range of which has been reported as 24°C (Brynildson et al 1963[5]) or 25°C (Hasnain et al. 2010[6]). Elliot and Elliot (2010[7]) produced a growth model to assess the impacts of climate change and resulting changes to water temperature on Brown Trout. They found that water temperatures would have to increase by 4°C in winter and spring or 3°C in summer and fall before they had a marked negative impact on growth.

**Conclusion**

The CORMIX and mass balance models predicted:

- a maximum downstream fully mixed Willow Creek temperature increase from 18.2°C to 18.6°C at average upstream Willow Creek water temperatures,
- a maximum downstream fully mixed Willow Creek temperature increase from 19.4°C to 19.5°C at 75$^{th}$ percentile upstream Willow Creek water temperatures, and
- a maximum increase in any season of 1.8°C.

These predictions were made for a rare 5$^{th}$ percentile low flow condition as a conservative estimate of change - flows will be higher and temperature changes smaller 95% of the time. These temperature

[3] *Ontario Ministry of the Environment. Water Management Policies Guidelines and Water Quality Objectives of the Ministry of Environment and Energy, July 1994. ISBN 0-7778-8473-9 rev.*

[4] *Stoneman, C.L. and Jones, M.L. 2000. The influence of habitat features on the biomass and distribution of three species of southern Ontario stream salmonids. Transactions of the American Fisheries Society 129: 639-657.*

[5] *Brynildson, O. M., Hacker, V. A. and Klich, T. A. 1963. Brown Trout, Its Life History, Ecology and Management. Wisconsin Conservation Department.*

[6] *Hasnain, SS., Minns, K.M., Shuter, B.J. 2010. Key Ecological Temperature Metrics for Canadian Freshwater Fishes. Applied Research and Development Branch, Ontario Ministry of Natural Resources*

[7] *Elliot, J.M., and Elliott, J.A. 2010. Temperature requirements of Atlantic salmon, brown trout and Arctic charr: predicting the effects of climate change. Journal of Fish Biology. 77(8) 1793-1817.*

changes resulting from the WWTP discharge will have no detrimental effect on growth rates or any other aspect of the cold water community in Willow Creek.

*"Supporting and Preserving Our Rural Community"*

Hon. Rod Phillips, Minister for the Environment, Conservation and Parks

December 31, 2018

Dear Minister Phillips,

Re: *Addendum* to Part II Order request concerning the EA for Midhurst Secondary Plan - Springwater Township, Simcoe County

Acting on advice from your Environmental Assessment and Permissions Branch, we have reviewed the Proponent's comments regarding MRA's Part II Order request, which are available to the public at MECP's Barrie office.

MRA's response is attached herein, together with relevant supplementary information and further details needed for a full assessment of the Midhurst Secondary Plan.

It is mind-boggling to think that ***any*** government could ignore so many compelling studies and environmentally protective regulations, dating as far back as an earlier PC government's *Provincial Policy Statement* in 1996, to pave the way for such a superfluous, wrongly located and egregious housing development.

We trust that we now have a government with the integrity and fortitude to value public interests, the environment and agricultural businesses more than the aspirations of developers, who continue to make false claims regarding a shortage of land for new housing. The Ontario Professional Planning Institute and others have plenty of evidence to show there is ample land *already approved for development* to support Ontario's housing needs to 2041.

We appreciate your diligent assessment of our appeal and look forward to answering any questions you may have.

Yours sincerely,

Sandy Buxton, MRA President
David Strachan, MRA Treasurer and Past-President

3 Silverwood Crescent, Midhurst ON L9X 0P3

# Part II Order Request - Addendum

*MRA's appraisal of Proponent's comments*
*dated October 26, 2018*

## Environmental Study Report

*for*

## Midhurst Secondary Plan

**Midhurst Ratepayers' Association**

*December 31, 2018*

*December 31, 2018*

# MRA Response to Proponent's comments re Part II Order request

We have now had time to reviewed Ainley's comments on behalf of the Proponent and have found an all too familiar pattern: criticisms and concerns made by affected residents have yet again either been disregarded or discredited. Ainley mainly lifts excerpts from their draft ESR rather than adding new material. Details are provided herein.

In our opinion, the Proponent still fails to address resident's issues.

It is important to note that, whenever given the opportunity, Springwater residents have voted for a largely anti-MSP (Midhurst Secondary Plan) Council every time since 2008, when the MSP was adopted without meaningful public input. In 2014, that included the Mayor and the Deputy Mayor and several Councillors. In 2018, the new Mayor is the former Deputy Mayor (same views) and several new Councillors clearly in favour of agricultural and environmental protection.

Moreover, the MRA enjoys undiminished support locally and farther afield. We now have 48,000+ supporters.

It's clear the MSP is not wanted, except by the developers who stand to earn $4 BILLION + dollars from it.

Below, we've summarised our main issues with the MSP in the form of essential but unanswered questions, followed by our response to Ainley's comments.

Two (2) additional sections have been added to provide supplementary facts concerning the irregular MSP.

## Key UNANSWERED questions regarding the Midhurst Secondary Plan

ONLY a Council unprepared to answer the following basic questions could reasonably entertain, in all good conscience, a housing development the size of the MSP for a small, rural unserviced village :

1. Why do we need an additional 30,000 people in a rural Township of only 19,000?

2. Where will these people work?

3. Do existing Springwater residents want this scheme? If so, what are the net benefits?

4. This development will put several local farms out of business and permanently destroy 1,800 acres of class 1 and 2 agricultural land. How will this affect the remaining farms?

5. What will be the effect of 5,000 additional vehicles on the existing local road system and the provincial highways?

6. What will it cost to provide - AND maintain thereafter - drinking water, wastewater, police, fire, transportation, library, schools, and medical, recreational, garbage and snow removal services for the new City of Midhurst? Will additional development charges cover these costs? How much will property taxes have to rise over how long a period? What will be the new level of Springwater debt?

## Review of Proponent's Response and Summary of Unresolved Concerns

The section numbers below are taken directly from the MRA's Part II Order request. The Proponent, however, chose to use an alternate numbering system. We have tried to provide Ainley's relevant numbers in brackets.

### 1. INTRODUCTION (*Proponent Nos. 1 - 4)*

Our concern regarding the **need** for such a mega-development was acknowledged, but disregarded as "*being beyond the scope of the EA.*"

Ainley (representing the Proponent) maintains it was "*our assessment that both the Class EA and the adopted Secondary plan conform with Provincial Law and Policies*".

This statement runs counter to the following facts:

- Paragraph 2.3 of the 2005 *Provincial Policy Statement (PPS),* in effect when the MSP was adopted, makes it clear that:

**"*Prime agricultural areas* shall be protected for long-term use for agriculture".**

- In 2008, Simcoe County wrote three (3) letters to Springwater Township confirming non-compliance of the MSP with the Provincial policies.

- In October 2011, the Province wrote a similar letter to the County, confirming MSP is non-compliant.

***(****See* ***Appendix 3.4*** *of the MRA Part II Order request for more examples of irregularities. Confirmation of the facts can be found in the original 2005 and 2006 government documents).*

Ainley's response refers back to the 2016 Golder report and other studies contained in the DRAFT ESR (dESR). There is nothing new in their comments. They reiterate that further studies will be conducted at the Permit to Take Water (PTTW) stage, which will be too late - as we have documented in our Request.

**2. NON-COMPLIANCE WITH PROVINCIAL LAWS AND POLICIES** *(Proponent's No. 5)*

Ainley confuses the 2005 PPS with the 2014 PPS. Section 4.2 of the 2014 PPS states the following:

*"4.2 In accordance with section 3 of the Planning Act, a decision of the council of a municipality, a local board, a planning board, a minister of the Crown and a ministry, board, commission or agency of the government, including the Municipal Board, in respect of the exercise of any authority that affects a planning matter, "shall be consistent with" **this** Provincial Policy Statement.*

*Comments, submissions or advice that affect a planning matter that are provided by the council of a municipality, a local board, a planning board, a minister or ministry, board, commission or agency of the government "shall be consistent with" **this** Provincial Policy Statement".*

[**Bold** added by MRA]

The quotations cited in Section 2 of MRA's Part II Order request, were made by Rodney Northey, certified specialist in Environmental Law at Gowling WLG. As an internationally renowned expert in his field, his legal opinions relating to the DRAFT ESR do not warrant dismissal.

**3. SOURCE WATER** *(Proponent Nos. 6 - 24)*

Ainley offers very few *new a*rguments in its response to this section. Instead, the focus is on excerpts from the DRAFT ESR and blanket reassurances that any outstanding concerns will be dealt with *LATER* at the PTTW stage or, *EVEN LATER,* through regular monitoring once the development is completed.

## 4. WATER VOLUME IN WILLOW CREEK AND THE MINESING WETLANDS

*(Proponent Nos. 25 - 27)*

### 4.2 WILLOW CREEK WATER FLOW - conflicting reports and threats to wildlife

*(Proponent's No. 25)*

- Golder claims that aquifers A1 & A2 are "**hydraulically separated**" from aquifers A3 & A4. *The import of this assertion is that water drawn from A3/A4 would not affect the amount of water in A1/A2. As such, water-taking from A3/A4* ***would not reduce*** *the level of water in Willow Creek which is fed from A1/A2.*

- *Golder also states the flow of water in Willow Creek* ***will be reduced*** *due to water pumping from aquifers A3/A4.*

These two statements contradict each other - either A1/A2 are hydraulically separated from A3/A4 OR they are not. This contradiction cannot stand.

It is important to keep in mind that our Part II Order request demonstrates that there will be threats to the environment in either case:

***In the first scenario,*** the majority of threats will be to the Minesing Wetlands chiefly due to increased water volume i.e. if there is no reduction in water level in Willow Creek, the full output of the WWTP will be a net gain to the Wetlands of 12 million litres of water per day, every day of the year. ***See also Sections 4.3, 4.4 and 6.***

***In the second scenario,*** threats will be mainly to local wells and the wildlife in Willow Creek because of the reduced water volume in Willow Creek and resulting temperature increase.

Golder's alternative fact ***(second bullet)*** states that the reduction in water volume in Willow Creek will be less than 10% and that this will be insignificant. The Ministry, however, has stated it does not agree with the Proponent "*that a 10% loss in baseflow would be insignificant*". This presumably means there would be some jeopardy to wildlife.

If A1/A2 and A3/A4 are only partially hydraulically separated, the threats will be spread among the Wetlands, the Creek and the wells.

### 4.3 Aquifers A3 and A4 and their potential to increase flooding

*(Proponent No. 26)*

Ainley seems to have missed the main concern expressed in Section 4.3, namely that the addition of water pumped from A3/A4 into Willow Creek in the form of treated sewage effluent, will result in increased flooding.

Ainley acknowledges that "*upward gradients likely underneath Minesing Wetlands and some portion of water originating in A3/A4 eventually becomes surface discharge via a shallower unit directly connected to Willow Creek or Minesing Wetland*". They go on to say that "*There is some (limited) connection between pumping in Aquifer A3/A4 and the Willow Creek sub-*

*watershed as evidenced by the simulated base flow loss occurring at this receptor.*" (*DRAFT ESR reference given)*.

The above is a contradiction to the Golder claim that "*The target regional aquifers are believed to discharge directly into the Nottawasaga Bay.*"

Regardless of the ultimate discharge point, groundwater pumped from A3/A4 and discharged into Willow Creek ***upstream*** of the Wetlands, would constitute a net gain in water to the wetland system. This greater volume of water, compounded by the increase in water run-off and siltation from such a large housing development and its many new roads, would obviously exacerbate the already extensive springtime flooding in the George Johnson Road area and in the Minesing Wetlands.

### 4.4 Minesing Wetlands *(Proponent No. 27)*

Ainley reiterates its goal of a zero net increase in phosphorus and describes the use of LID techniques to mitigate the harmful effects of water run-off from the development. However, these comments do not address the main issues exposed in MRA's Section 4.4.

Section 4.4 is concerned with protecting deciduous trees in the Minesing Wetlands from drowning. Ainley's claim that the target aquifers A3 and A4 "flow under the Minesing Wetland with ultimate discharge to Georgian Bay" exacerbates this problem. As already mentioned, MRA's hydrogeologist disputes this statement. That said, intercepting this groundwater to provide potable water for the development and then discharging it as treated effluent into Willow Creek upstream of the Wetlands will add to the surface water entering the Wetlands by up to 12 million L/day. This is not an insignificant quantity.

- It is the **cumulative effect** of adding 12 million litres of water per day ***every day of the year*** (4.3 billion litres) which is the issue. The deadly combination of extra siltation, extra water and a shallow gradient throughout the Minesing Wetlands will further impede drainage from the wetlands, thereby further upsetting an already fragile ecological balance.

- Even today, the Minesing Wetlands cannot absorb the annual spring run-off, thereby causing flooding and dying trees.

- LID or no LID, increased run-off from the mega-development will add even more water to the Creek and, therefore, to the Wetlands.

- When winter inevitably brings ice jams and log jams, how will the already saturated Wetlands handle the 24,000 L/s peak flow (per Golder) from Willow Creek, plus the extra water and siltation?

The proposal to discharge effluent from a WWTP servicing 10,000 homes directly into Willow Creek flies in the face of previous scientific reports, which have confirmed that 60 years of this

type of practice has been responsible for the significant decline in forest cover in the Wetlands*.

** See "60 years of forest change in the Minesing Wetlands". We urge the Ministry to consult this important work and its many references.*

https://minesingwetlandsfriends.files.wordpress.com/2013/12/minesing_forestloss_may8_14_final.pdf

**5. HINE'S EMERALD DRAGONFLY - One Endangered Species** *(Proponent No.28)*

Water volume and quality remain serious concerns for the future of this endangered creature, found ONLY in the Minesing Wetlands.

**6. FLOODING AND DRAINAGE** *(Proponent No. 29)*

Ainley's response to Section 6, gives us pause because it does not jibe with the governance philosophy of Springwater Township.

Can the legal Proponent (Township of Springwater) seriously consider flooding issues in and around the Minesing Wetlands - which will only be exacerbated by the MSP - "*beyond the scope of this Class Environmental Assessment process?*"

Does the Township bear no responsibility for protecting the Minesing Wetlands, which is one of its major tourist attractions e.g. Canoe trips, wildlife sanctuary, Fort Willow, Nine Mile Portage, etc.? Please refer to these links for more information:

https://minesingwetlands.ca
https://www.nvca.on.ca/recreation/ConservationAreas/MinesingWetlands

**7. WASTEWATER QUALITY - TOTAL PHOSPHORUS** *(Proponent Nos. 30 - 36).*

a) Ainley's claim that new phosphorus amounts due to transportation improvements outside the development area need not be counted towards NVCA's Condition of Approval of zero net increase in phosphorus is problematic. These enhancements are needed *solely because of* the proposed mega-development. It stands to reason, therefore, that the ensuing phosphorus *MUST* be included in the calculations used to satisfy NVCA's demand.

b) Ainley's comment that 134 Kg of phosphorus is *"a very small fraction of the total load that is annually released into the downstream system and unlikely to be of any concern"* misses the point.

There are *many* other sources contributing "small fractions" of phosphorus into the system. All development contributes to the chronic degradation of the Minesing Wetlands. Hence, NVCA's requirement for *NO* net increase in phosphorus.

c) Ainley's phrase that *"only through completing the Class EA process are we able to accurately quantify the change in pre to post development phosphorous",* discredits the earlier claim that the project will create 134 Kg of phosphorus per year. 134 Kg is a precise figure to use.

d) As for eliminating septic systems in Midhurst, this solution - already vetoed by Council - would only marginally alleviate the phosphorus problem. The attached graph shows that septic systems are responsible for only a very small fraction of the total *phosphorus in the system.*

*NOTE: this graph was part of the 2006 Assimilative Capacity Studies conducted by the Intergovernmental Action Plan for the NVCA. Willow Creek was one of twelve rivers/creeks studied.*

8**. CONCLUSIONS for Sections 1 - 7.** *(Proponent Nos. 37 - 44).*

Most of Ainley's comments with respect to MRA's conclusions have already been addressed. However Proponent's comment No. 44 is new and deserves a response.

Ainley refers to a meeting held on March 6, 2017 between NVCA and the Township, during which it was stated that homes within 300m of Willow Creek discharge approximately 2Kg of phosphorus per year into the creek. Using this number Ainley deduces that only about 70 homes would need to be connected to the Midhurst WWTP and "not over 1,000 as noted." However Ainley does not explain how it would be practical to connect just the homes along the length of the creek and not the others.

In any case the above is moot because, as noted in 7 d) and in the accompanying IGAP graph, septic systems contribute only a small amount of phosphorus to Willow Creek.

## 9. AGRICULTURAL CONCERNS - SUPPLEMENTARY ISSUE

Agricultural concerns were not highlighted in MRA's Part II Order request largely because of Ainley's March 3, 2013 answer to a question posed by a Springwater resident at the October 2012 PIC:

***Question:*** *"Are these Springwater farmlands truly "a reasonable choice for the location of urban development ?"*

**Ainley:** *"This Class EA is solely related to identifying the Water, Wastewater & Transportation Infrastructure necessary to support the development of the Midhurst Secondary Plan. The referenced May, 2008 Agricultural Assessment Report (prepared by AgPlan Limited) was prepared in support of the Development Applications that were going through the Secondary Plan process at the time".*

AgPlan's report concluded that, *"Springwater Township has better agricultural lands than those found in the Midhurst Secondary Plan area. Poorer agricultural lands such as the Midhurst Secondary Plan area provide a reasonable choice for the location of urban development".*

However, MSP lands have been classified by the Canada Land Inventory as mostly Class 1 with the remainder chiefly Class 2. Soil in the Doran Road area ( MSP Neighbourhood 2), for example, is vasey sandy loam, which has excellent properties for both water retention and drainage.

This a serious discrepancy.

Despite expectations of other opinions, the AgPlan report was never peer-reviewed, nor were studies conducted concerning the effects of development on the remaining farms.

See the attached letter from local dairy farmer Robert Wright and a map showing the location of his farm. See also the Wrico Holstein dairy farm YouTube link below:

https://www.youtube.com/watch?v=QE8PDsb7R80

Mr. Wright and his family are now worried about farm access for his heavy equipment, proximity of the mega-development, runoff polluting his feed crops, and new well-head protection regulations restricting what he can do on his prosperous, multi-generation farm.

Also attached is a letter from the Simcoe County Federation of Agriculture, expressing their concerns.

## 10. CHRONOLOGY OF MSP - SUPPLEMENT

### Background

**January 19, 2012** - Liberal Minister of Infrastructure created a "Special Rule" to permit [(*NOT MANDATE)* Phase 1 of the MSP. In so doing, the Ontario Government ignored many of their own policies, regulations and studies.

Springwater Township's Official Plan was approved by the Ontario PC Government in 1998. The Midhurst Secondary Plan (MSP) was adopted by the Township in 2008.

One of the MSP's most glaring deviations from Ontario policy was to ignore the **standard planning horizon of 20 years**, as set out in 1.1.2 of the PPS and in 2.1.1 of Springwater's Official Plan. Instead, the MSP specified an extraordinary "long-term planning horizon".

**1996** Director of Planning/co-author of the Springwater Official Plan, Larry Cotton, drew demarkation lines on a map of Midhurst. This map became Schedule A8 of the Official Plan. The purpose of these lines was to *"delineate the area requiring detailed study through the Secondary Plan process."* Mr. Cotton said, *"It was recognized that the Official Plan would provide the overall policy to protect agricultural lands within the follow-up Secondary Plan"*, which was expected to remain *"consistent with the intent of the Official Plan".*

There never was a ***Municipal Comprehensive Review*** to determine a Midhurst "settlement area".

The **Ontario PC Government** introduced the ***Provincial Policy Statement in 1996.***

**1998** **Springwater's Official Plan** was **approved directly by the PC provincial government**. The OP contains strict policies for the protection of wetlands, agricultural lands and lands of natural heritage. Section 8.6.2.1 states: *"The area set out on Schedule A-8 generally identifies the study area within which the contemplated Secondary Plans will set out future growth opportunities"*.

That Study Area was to include all of the above land designations and also Springwater Provincial Park. **It is inconceivable that the province would have approved the Official Plan** had these land -use policies and restraints not been in place.

**2001** **Ontario PC Government** introduced the *Oak Ridges Moraine Conservation Act*

**2005** **The *Provincial Policy Statement (PPS), section 2.3.1*** states that ***Prime agricultural areas*** shall be protected for long-term use for agriculture.

***Places to Grow Act.***

**2006** ***Intergovernmental Action Plan (IGAP)*** **for Simcoe County.**

It states:

a. The County has more than enough land already approved for development to last through 2031.
b. Most new growth should be directed to the City of Barrie, with some growth being distributed throughout the rest of the County.

**The *Growth Plan for the Greater Golden Horseshoe.*** It is full of development restrictions to protect farmland, discourage urban sprawl and reduce long distance commutes.

**2008** County wrotes two (2) letters to the Township explaining why the MSP is non-compliant with County and Provincial policies. Nevertheless, **Springwater adopted t he MSP.**
County wrote a 3rd letter to Township - County cannot approve MSP until compliant.

***MSP remained stalled for three years***

**2011** County suddenly approved the MSP.
Province appealed County decision to the OMB.

**2012** Minister for Infrastructure created a "*Special Rule*" - O. Reg. 8/12 (amendment to O.Reg. 311/06).

October - McGuinty prorogued legislature
November - Office of Development facilitator orchestrated a series of letters from Township, County and Province to expedite the MSP.
The Province withdrew its OMB appeal.

**2013** Amendment O. Ref 22/13 - *Lands for Urban Uses* requirement dropped - "Extra Special Rule"
New Premier - Kathleen Wynne
MRA appeared at several OMB hearings. MRA denied opportunity to speak and dismissed by OMB.

**2014** MRA met with PC MPPs Jim Wilson, Jim McDonnell and Rod Jackson at Queens Park
Springwater elected new mayor Bill French and new council.
New council largely opposed to the MSP

**2016** At the OMB, County initially sided with Springwater to deny developers 20,000 more people for Midhurst mega-development.

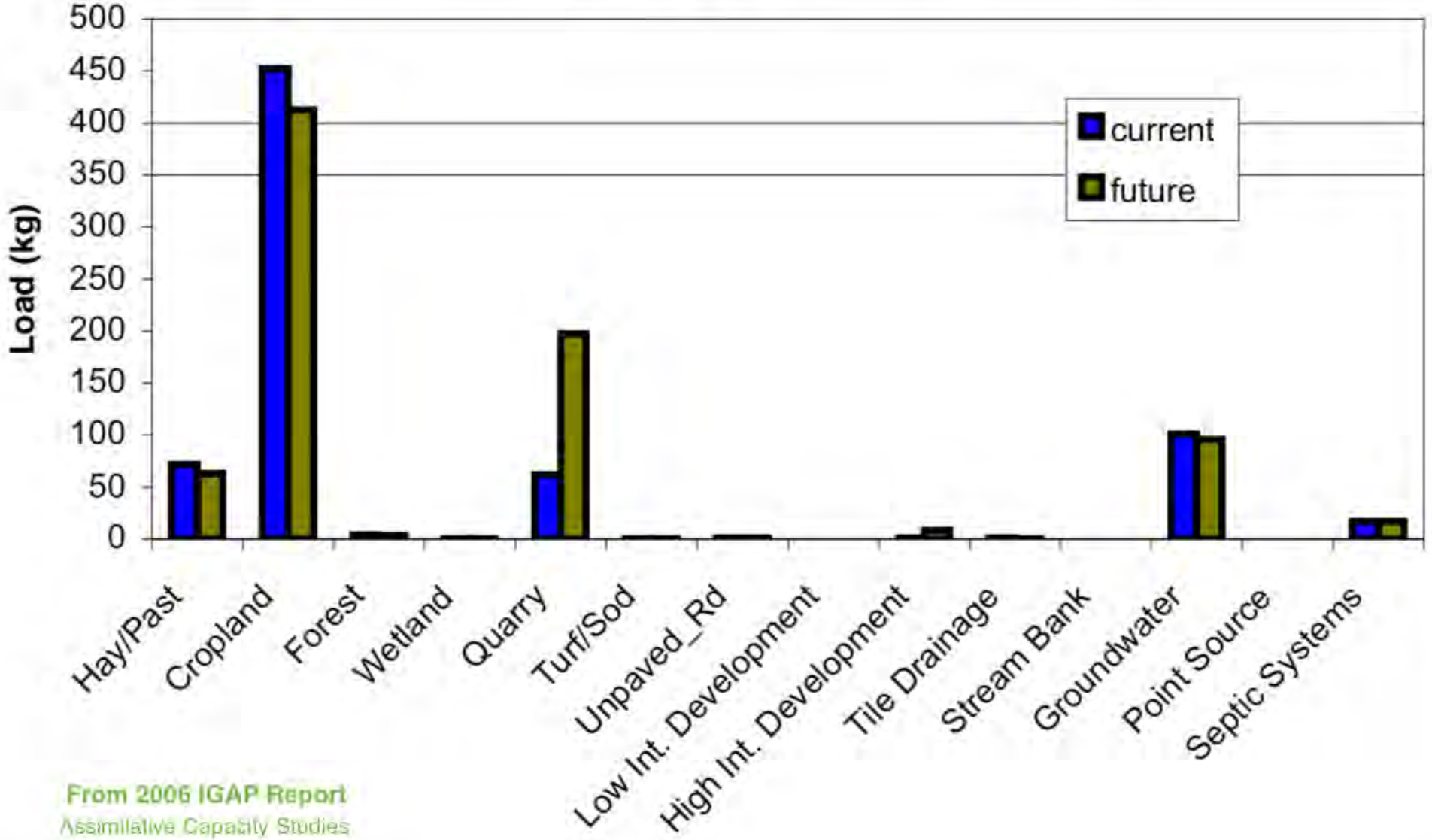
Four months later - County made a deal with the developers and gave them some of the requested population. This was the County's 3rd flip-flop regarding its MSP decisions.

**2018** Province elected new PC Government.

Springwater voters elected a new Council and Mayor - mostly environmentally-friendly and opposed to the MSP.

**MRA has volumes of lobbying letters from the developers, which were used to persuade weak provincial, county and municipal governments to capitulate to their demands.**

# Phosphorous Loading Sub-watershed Sources
## Willow Creek




From 2006 IGAP Report
Assimilative Capacity Studies
Fig. 6.8

Robert Wright
2064 Russell Rd. R.R. # 1
Midhurst , Ont.
L0L 1X0
H : 705 722-4763
C: 705 716-4515
Email : wrico82@yahoo.ca

Simcoe Cty. Federation of Agriculture Mar. 1 ,2012.

I'am writng to you in regards to my concerns regarding the Midhurst Secondary Plan and the impact it will have on agriculture . Stages 1 , 2 and 3 of the plan's development are all located on actively farmed land . There is no attempt or consideration given to developing the non –agricultural land between the existing settlements of Carson Rd. , Patty Dunn Hill , Midhurst , McGowan Pl. , Briarwood Ct. , Hillview Cr. , Mills Ct. and the recreational facilities off Hwy. 26 . In fact the Township Council has designated these areas" Environmental Protection Areas 1 and 2 " so that any development must begin on actively farmed land . If you reference google maps you will quickly see that the only environmental concern is that this land would have to be cleared of trees to build on , as opposed to the wide open fields of stages 1 , 2 and 3 . This is a direct contradiction to avoiding urban sprawl and protecting farmland . Ironically the land the new Springwater Municipal Office is built on would now be an " Environmental Protection Area ". The above mentioned developments required the clearing of trees and for some reason this is now no longer an option . Stages 1 , 2 and 3 are located the furthest from the recreational facilities on Hwy # 26 and Springwater Provincial Park requiring the new residents of Midhurst to drive rather than walk or bicycle to use these facilites . Stages 1 , 2 and 3 are also located on the boundaries of the secondary plan and therefore development will not grow out from the existing settlement area but leapfrog and immediately effect the agricultural land it borders .

The class 1 ,2 ,3 farm land on the east side of the plan is already surrounded by natural boundaries . To the north wetlands , to the east Hwy # 400 , to the south Little Lake and to the west Midhurst . The Secondary plan effectively divides this area in half . The proposed four lane commuter roads will further divide the remaining agricultural lands into thirds . The proposed straightening of Forbes Rd. and Craigs Sideroad to connect Hwy # 400 and # 27 will take the required land out of agricultural land , not land in the Secondary Plan . These actions will destroy the viability of the remaining farms on the east side of Midhurst .

Numerous test wells were drilled inside the Secondary Plans boundaries but the quality of water was not acceptable . The well of choice is located at the bottom of a hill on Russell Rd. outside the boundaries of the Plan . Nine hundred acres of active farmland

slopes towards this well . What kind of restrictions will be imposed on agriculture if this well is allowed to be the source of drinking water for thirty-five thousand people ? How will this effect the viability of existing farms and the aquafur that supplies their water ?

The proposed handling of runoff water is to build a containment reservoir on Craigs Sideroad and then allow it to seep out to the north across agricultural land . This is totally unacceptable and when I have confronted the developments engineer at two information sessions have not received a satisfactory answer . The handling of waste water seems to be an ongoing plan with no answers .

The Midhurst Secondary Plan will also effect the local agriculture infrastructure . Last year I spent approximately seven hundred thousand dollars locally for feed , fertilizer , seed , herbicides , machinery repairs , hardware , financing , trucking , fuel etc. Hugh Partridge's dairy/cash crop farm is of similar size to mine so you can double that figure plus add the other horse , beef and cash crop farmers in this pocket and it will have an effect on the businesses that provide services to agriculture .

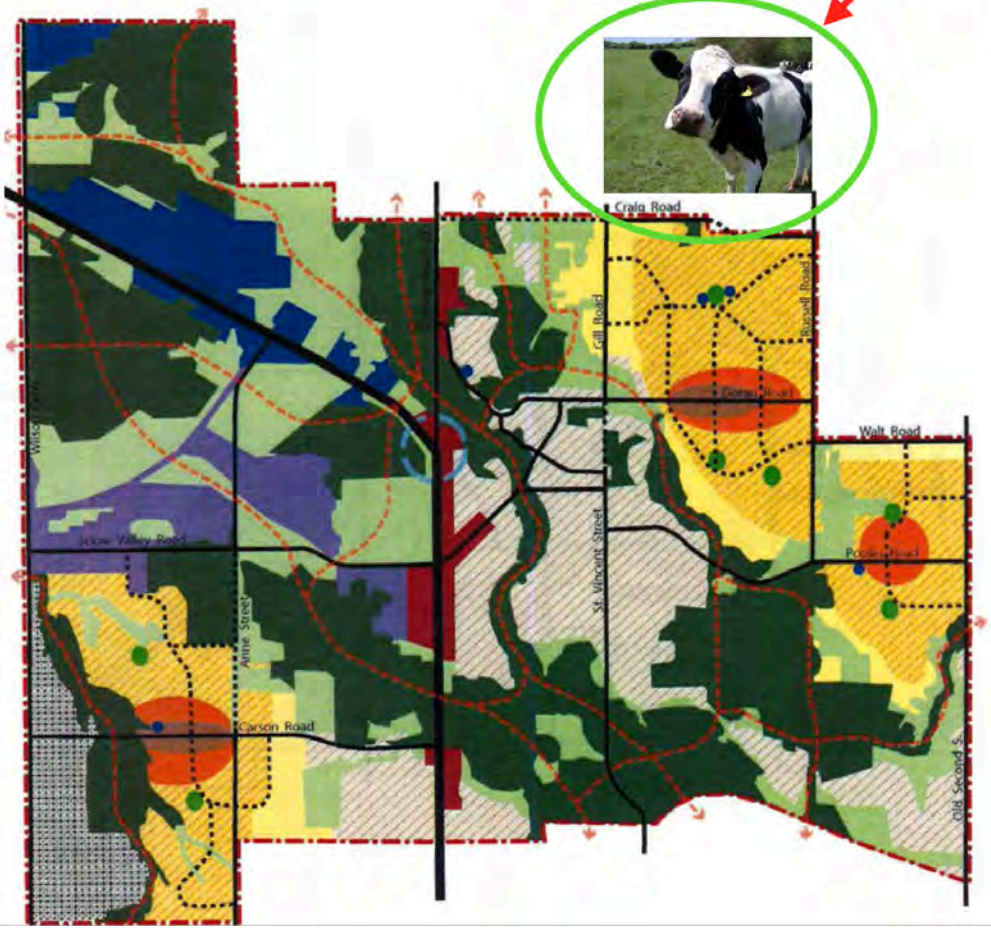
I am asking the Simcoe Cty. Federation of Agriculture to oppose the Midhurst Secondary Plan . It does not prevent urban sprawl , it does not protect farmland , it does not protect source water and it does not respect the viability of food producing farms

Sincerely

Robert Wright

Location of
Wrico Holstein
Farm






MIDHURST SETTLEMENT AREA
SECONDARY PLAN

TOWNSHIP OF SPRINGWATER
October 29, 2008

## Schedule A - Land Use

- Commercial / Mixed Use
- Administration / Government
- Employment
- Environmental Protection Area I
- Environmental Protection Area II
- Midhurst Village
- Midhurst Transition Residential
- Midhurst Low Density Residential
- Midhurst Medium Density Residential
- Midhurst High Density Residential / Mixed Use
- Future Development Potential
- Park
- School / Institutional
- Provincial Highway
- Primary Road
- Potential Primary Road
- Settlement Area Boundary
- Environmental Connections / Potential Trails
- Future Intersection Improvements

0 50 250 500 750 1000 m

Simcoe County Federation of Agriculture

ADMINISTRATIVE CENTRE MIDHURST, ONT. LOL 1X0 (705) 726-9300 Ext. 1224

**Township of Springwater Council**
2231 Nursery Road
Minesing, ON LOL 1Y2
Phone: (705) 728-4784

RECEIVED & SHARED
MAY 24 2012

May 9th, 2012

To Mayor Linda Collins, Deputy Mayor Dan Mclean and Members of Springwater Council

Regarding: **Midhurst Development Plan/Proposal**

The Simcoe County Federation of Agriculture role is an advocacy group operated by farmers that develops and consolidates positions on issues within the County which will improve the welfare of individual farmers and the agriculture industry. We represent approximately 1400 members in Simcoe County. Our board consists of many sectors of agronomy. We meet the first Thursday of the month at the White Pine Board room, Midhurst ON. Some of the items currently the SCFA also are involved with:

- Involvement/input with the Ontario Federation of Agriculture, Canadian Federation of Agriculture regarding policies and how we relate to our government-Municipal, Provincial and Federal levels.
- Investigation into problems with agricultural properties
- Education-Farm Safety Workshops "Keep Kids Safe", "Ag info days", "Farmer Comes to Town", scholarships etc.
- Consumer awareness, "Food Freedom Day"
- Public relations, Events and Fellowship

We are writing to Springwater Council in response to concerns brought to our attention by our associates regarding the Midhurst Secondary Plan. After meeting with Springwater staff, presentation by former councilor with members of Midhurst citizens group and evaluating the documentation the SCFA understands and recognizes the concerns brought forward. The SCFA would like to share our concerns with Springwater Council.

**Background**

Currently the Midhurst Community in the Township of Springwater has a population of approximately 3,500 people in 1,130 residential units. It has a small commercial area, and an active, thriving farm settlement. The expansion of the Settlement boundaries, as approved in 1996 and again expanded in 1998, gathered a significant acreage of excellent farmland. The reasoning behind this is very vague flexibility in the future was the mentioned by a former councilor. At the time a population increase of 3,000 was estimated. This figure had grown to 8,000 by 2004 studies. In 2008 in keeping with the Provincial densification wishes planners tell us the Springwater Council approved and is now estimated to approach 30,000. Discussions with Planners state growth could exceed these #'s. All use the same land area. It is a mystery how such divergent population estimates can be proposed when the only variables are time and authors. This does little to engender confidence in the planning process, particularly when one observes from the farming community and sees the difficulties such changes can/will bring.

**Loss of Farmland**

> *"Curbing Sprawl- The Growth Plan for the Greater Golden Horseshoe, 2006, contains policies to control urban sprawl, build better suburbs, make more efficient use of land and infrastructure, and protect farmland and green spaces. The Plan does this by focusing development in existing cities and towns, redeveloping and revitalizing downtowns, and supporting development around transit stations." Growth Plan for the Greater Golden Horseshoe, 2006-Ministry of Infrastructure*

When meeting with planner Mr. Brent Spagnol in February of 2012 inquiries were made for evaluation of farmland and quantities of agriculture land being loss due to development. Mr. Spagnol has provided an estimate- 645 Hectares of class one to four Agricultural Land would be lost. Division of each class-1-4 was not provided nor the overall acreage of the proposed development. The SCFA have been shown diagrams that show mostly class one, two and three land being developed. As these lands are removed from production capacity for generations to come, the ability of our members to supply domestically produced foods is greatly diminished and causes an undue reliance on imported foods.

In a recent United Nations Report they estimate 9 billion people to feed by 2040. 3 billion will be living in hunger. We need to ensure Food Stability for Future Generations. Efforts need to be made to ensure supplies will meet demands by preserving farmland.

**Economic Impact of Removing Farmland**

> *"Ontario's agri-food industry is highly adaptable and diverse. It represents the second largest industry in Ontario, with $32.7 billion in processing alone and representing 700,000 jobs in 2008." OMAFRA website 2009*

> *"Every Ontario farmer produces enough food to feed 120 people each year. The risks may be high, but Ontario farmers are proud of their essential role in feeding their neighbours and the economy." Bette Jean Crews, President, Ontario Federation of Agriculture*

New crop prices are setting new benchmarks for agriculture producers. This is a standard rotation and does not include value added ventures such as, livestock, horticulture, fuel, fibre, agri tourism, specialty crops or premiums paid etc.:

| | | |
|---|---|---|
| Corn | 4 Tonnes per acre-average yield | @$235 Tonne = $940. per acre |
| | 5 Tonnes =good crop | @$235 Tonne =$1175. per acre |
| | 100 Acres of corn produces 400 to 500 Tonnes of corn | |
| | $94,000 to $117,500 gross minus input costs. | |

*prices vary greatly throughout year old crop 2010 high low local estimate $180. to $320. per tonne

| | | |
|---|---|---|
| Soybeans | 40 Bushel per acre-average yield | @$13.50 Bushel=$540. per acre |
| | 50 Bushel per acre =good crop | @$13.50 Bushel=$675. per acre |
| | 100 Acres of soybean produces 40,000 to 50,000 bushel | |
| | $54,000 to $67,500 gross minus input costs. | |

*prices vary greatly throughout year old crop 2010 high low local estimate 12 to 13 dollar a bushel

| | | |
|---|---|---|
| Soft Red | 75 Bushel per acre-average yield | @$5.50 Bushel=$412.50 per acre |
| Winter Wheat | 100 Bushel per acre =good crop | @$5.50 Bushel=$550.00 per acre |
| | 100 Acres of wheat produces 75,000 to 100,000 Bushel | |
| | $41,250 to $55,000. gross minus input costs. | |

*prices vary greatly throughout year old crop 2010 high low estimate $5.50 to $ 6.50

One member put forward that he spent $700,000.—last year, locally for feed, fertilizer, seed, herbicides, machinery repairs, hardware, financing, trucking, and fuel. This is a very important sector and agriculture lands have been called the Employment engine of Ontario. The continue removal of Agriculture lands will have deep impacts in Springwater and the Province.

**Flawed Phasing**

> *"The Midhurst urban expansion is a classic example of how flawed urban planning can destroy a viable agricultural community." Property and Land Use Report-SCFA 2012*

The order in which development is slated to occur does not seem to follow reasonable or good planning principles. Proper infilling within the community of Midhurst would seem to be a much better choice and would have less impact on the quality farmland creating, "A Complete Community." Instead the proposal before the township, the furthest development location from the proposed sewage treatment facility and on the far eastern boundary seems to be assigned to be first. This also is the location of the highest class agriculture in the area.

Infrastructure costs would decrease with more practical infilling within Midhurst. And unlike the residential and commercial costs to residents/taxpayers the financial support for infrastructure to farmers is negligible.

**Simcoe County**

Simcoe County is one of the fastest growing regions in Canada. It was left out of the Greenbelt and government officials at the Municipal and Provincial levels seem to be in great support of developers. Leapfrog growth in Simcoe County is putting agricultural land at great risk and being targeted openly by developers. Simcoe County faces huge growth pressures. The proposed dramatic increase of the area's population is leading to quick decisions with little public input. Who at the Province and Municipal government is ensuring agricultural land will be protected? Under what policy? Where is the involvement of the public in such a substantial undertaking?

In October 2011 County Councillor Robert Keffer and dairy farmer from Bradford tried to pull the Midhurst Secondary Plan for discussion. As reported on aware-simcoe.ca, Keffer's wish to discuss the matter at County Council was thwarted by CAO Mark Aitken, who told him that as the matter fell under delegated authority, there could be "no discussion" at county council. An examination of By-law 5478 reveals that Keffer was within his rights to ask for the matter to be discussed. The bylaw stipulates "THAT all delegated powers and actions provided for in this By-law are subject to the condition that County Council retains the option of exercising its authority to approve or comment on any application at its discretion." The fact that debate was blocked off is regrettable, given the nature of the proposed development, which will bring irrevocable change to the community of Midhurst, pave over Class I and II agricultural lands in an exceptionally fertile area.

The Federation has requested development of an agricultural committee at the County of Simcoe to provide farmer input to relevant policies and procedures including Land Use matters. Currently other counties have implemented similar committees to ensure involvement with the farming community. Terms of Reference are under discussion with the anticipation that beneficial dialogue on mutual issues will occur.

**Transportation**

Significant changes to the road network are proposed, including two 4-lane avenues that will intersect with Highway 400. As currently proposed, these roads will be built on land outside the settlement boundary, further consuming good farm land. Traffic from a +30,000 community will be intense. Movement of farm machinery across or along a 4 lane road will be problematic. Such movement is already a challenge as machines have grown to match farm acreage but there has been no similar improvement in road systems.

While the exact conflicts between the remaining farm operations and the urban community are not always predictable, the surety of friction is. Many a time the Federation hears of close calls experienced by farm families

on busy hi-ways. So much so that main routes are avoided during peak travel times. Planting, Haying and Harvest time in particular are difficult to work around commuter and holiday (weekend) schedules-the risks are great especially with commuters' not experienced with slow moving vehicle signs and who do not accommodate the width of farm machinery while passing.

**Water/Source Water Protection**

The Midhurst Secondary Plan has changed in its methods of dealing with Water and Waste water/sewage. Most farmers prior to deciding on where to locate would ensure a good water resource a priority. The Location of a well within the development would seem wise. However Robert Wright, dairy Farmer and longtime resident states, "numerous test wells were drilled inside the Secondary Plans boundaries but the quality of water was not acceptable. The well of choice is located at the bottom of a hill on Russell Rd. outside the boundaries of the Plan. Nine hundred acres of active farmland slopes towards this well. What kind of restrictions will be imposed on agriculture if this well is allowed to be the source of drinking water for thirty thousand people? How will this affect the viability of existing farms and the aquifer that supplies their water?"

Why was this not considered prior to drilling the well? We await these answers from Springwater and the Ministry of the Environment. We hope a new water source would be considered to prevent source water protection creating adverse effects on farmers. In addition taking more farmland out of production and placing more restrictions upon them.

**Waste Water/Sewage**

Midhurst has no sewage treatment facility presently as it is serviced by domestic septic systems. Presently it has inadequate waste water capacity. Plans have been considered including communal septic systems with waste water being brought to drinking water standards and placed into injection wells to replenish the aquifer. This was considered since the aquifer could not replenish itself with the pumping rates and the size of the development. Now plans include a Sewage treatment facility being built, 10 pumping stations and effluent placed into Willow Creek which is a low volume stream and a cold water fishery. The Community of Midhurst is greatly concerned. This stream in turn flows through the Minesing Swamp to Nottawasaga River and into Georgian Bay. The impacts to the Creek are unknown.

The vast distance from the development is problematic. As a result this plan will impose major infrastructure expenses and ongoing long term cost. We have many communities surrounding that have access to water as well as sewage capacity with added benefits of other necessary infrastructure. This should be considered prior to approval of developments.

**In Closing**

The Midhurst Secondary Plan does not comply with the Ontario Provincial Objectives of long term protection of Farmland. The Midhurst Secondary Plan is not a sustainable or competent use of our land resources as it targets the best class 1, 2, 3 Farmland and will have negative impacts on the remaining farming community. Realignment of the settlement boundaries to better protect farmland would show closer adherence to the Provincial Policy Statement and good land use practices.

Open public participation and a more reasonable time frame to plan huge projects such as these should be considered. Mapping sent to households affected would be a beneficial practice. Pertinent info regarding plans be on display at the Township office would be advantageous to the taxpayer, especially those with no internet services or those not using computers.

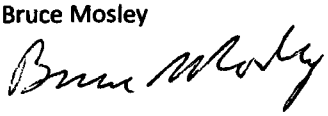
The Simcoe County Federation of Agriculture would like to thank staff for meeting with us to explain information known about the development. We hope council will revisit this plan. We ask to be kept abreast of upcoming meetings, OMB hearings, deadline dates.

The well head at the bottom of Russell Rd is a great concern and we would like to be copied the Environmental Assessment info for this well or other supply well being considered.

The Federation would like to be included on issues related to the development in Springwater in general and the Midhurst Secondary Plan in particular.

President of the Simcoe County Federation of Agriculture,

Bruce Mosley



cc.
Premier Dalton McGuinty,
Ontario Municipal Board,
Ontario Federation of Agriculture
Minister Bob Chiarelli & the Minister of Infrastructure,
Minister Ted McMeekin & the Ontario Ministry Agriculture Food & Rural Affairs,
Minister Jim Bradley & the Ministry of the Environment
Nottawasaga Conservation Authority
Severn Sound Environmental Association
President Mark Wales and the Ontario Federation of Agriculture
Source Water Protection Committee
City of Barrie
County of Simcoe
Township of Adjala-Tosorontio
Township of Bradford West Gwillimbury
Township of Clearview
Town of Collingwood
Township of Essa
Town of Innisfil,
Town of Midland
Township of New Tecumseth,
Township of Oro-Medonte,
Town of Penetanguishene
Township of Ramara
Township of Severn
Township of Springwater
Township of Tay
Township of Tiny
Town of Wasaga Beach
M.P.P.s Jim Wilson, Garfield Dunlop, Julia Munro
M.P. s Kellie Leitch, Bruce Stanton, Patrick Brown, Peter Van Loan

Executive Summary

Midhurst Secondary Plan May 9th 2012

The Midhurst urban expansion is a classic example of how flawed urban planning can destroy a long standing and viable agricultural community.

The Simcoe County Federation of Agriculture is very concerned about the loss of 645 Hectares or 1594 acres of class one to four agricultural land(As estimated by Springwater Township staff) that would be lost if the current proposed development plan for Midhurst should be executed .

Some concerns raised by the public, SCFA Members and the Federation Board include:

- Loss of Farmland
- Economic Impacts of Loss of Farmland
- Impacts and Restrictions on remaining Farmers
- Flawed Phasing
- Water, Source Water Protection, Waste Water/Sewage
- Financial implications to the taxpayers of Springwater and the County of Simcoe
- Lack of meaningful public input
- Transportation Corridors, Traffic Congestion

Local Farmers have raised these concerns to Springwater Council but have seemingly been disregarded.

While the exact conflicts between the remaining farm operations and the urban community are not always predictable, the surety of friction is. What may assist and perhaps benefit our community in these conflicts? The Federation has requested development of an agricultural committee at the County of Simcoe to provide farmer input to relevant policies and procedures including Land Use matters. Currently other counties have implemented similar committees to ensure involvement with the farming community. Terms of Reference are under discussion with the anticipation that beneficial dialogue on mutual issues will occur.

The Midhurst Secondary Plan does not comply with the Ontario Provincial Objectives of long term protection of Farmland. The Midhurst Secondary Plan is not a sustainable or competent use of our land resources as it targets the best class 1, 2, 3 Farmland and will have negative impacts on the remaining farming community. Realignment of the Settlement Boundaries to better protect farmland would show closer adherence to the Provincial Policy Statement and good land use practices.

The Simcoe County Federation of Agriculture is not opposed to development, however not to the detriment of farmers and farmland. More sustainable options are available.

The Simcoe County Federation of Agriculture (SCFA) believes that the highest and best use of arable land is for agriculture. Land capable of supporting agriculture activity ensures a safe, sustainable supply of food/fuel/fibre for Ontario, Canada and the World.

**Ministry of the Environment and Climate Change**

Environmental Assessment and Permissions Branch

135 St. Clair Avenue West
1st Floor
Toronto ON M4V 1P5
Tel.: 416 314-8001
Fax: 416 314-8452

**Ministère de l'Environnement et de l'Action en matière de changement climatique**

Direction des évaluations et des permissions environnementales

135, avenue St. Clair Ouest
Rez-de-chaussée
Toronto ON M4V 1P5
Tél : 416 314-8001
Téléc. : 416 314-8452

Ontario

October 3, 2018

Rick and Michele Bowman
[redacted]

Dear Mr. and Ms. Bowman:

Thank you for your correspondence sent on September 9, 2018 to the Minister of the Environment, Conservation and Parks regarding the Midhurst Water, Wastewater, and Transportation Servicing Phase 3 and 4 Environmental Study Report proposed by the Township of Springwater.

It is the understanding of the Ministry of the Environment, Conservation and Parks that the project was developed under the Master Plan procedures of the Municipal Class Environmental Assessment. The project contains multiple individual undertakings that are classified as Schedule C projects in the environmental study report.

The various undertakings within the Master Plan include:

- New water system(s) to service the proposed growth within the Midhurst Secondary Plan including new wells, water treatment facility, high lift pumps or booster stations, water storage, reservoirs and distribution systems including transmission mains;
- A new wastewater treatment and collection system (including sanitary collection systems, pump stations, treatment plant and effluent outfall) to service the proposed growth within the Midhurst Secondary Plan with the capability of servicing the existing Midhurst area, if required;
- Upgrading/Reconstruction of existing roads and intersections throughout the existing community;
- Construction of a new Craig Road (2 lanes) from County Road 27 to Russell Road including a direct connection to Forbes Road; and
- Upgrading of the Forbes Road and Highway 400 Interchange.

These undertakings are detailed in the Project's environmental study report that can be accessed here:
http://www.springwater.ca/UserFiles/Servers/Server_229/File/Municipal%20Services/Planning%20and%20Development/Midhurst%20Secondary%20Plan/Environmental%20Assessment/Midhurst%20Class%20EA%20-%20ESR%20-%20V1.pdf

The Municipal Class Environmental Assessment requires that requests for a Part II Order must be in the context of specific projects, and not for the Project Master Plan Study Report itself, or a secondary plan. Please note that the Midhurst Secondary Plan is a separate and distinct process under the Planning Act, and is beyond the scope of this Master Plan.

In your letter, you identified concerns with the potential increase of carbon dioxide emissions and impacts to groundwater in the study area. We require your clarification as to which class environmental assessment project(s) you are referencing in your correspondence. We ask that you clarify which project(s) you are concerned with by **October 15, 2018**. You can contact Callee Robinson, Project Evaluator, directly at 416-314-0286 or at Callee.Robinson@ontario.ca.

Thank you for taking the time to share your concerns with the project.

Yours sincerely,

Kristina Rudzki.

Kristina Rudzki
Supervisor, Project Review Unit
Environmental Assessment and Permissions Branch

c: Heather Coleman, Township of Springwater
Joe Mullan, the Ainley Group

Ontario Ministry of the Environment and Climate Change

# Part II Order Request

## General Information and Instructions

### General

Anyone who has outstanding environmental issues that have not been addressed through the Class Environmental Assessment process can request the Minister of the Environment and Climate Change to make an order under Part II of the Environmental Assessment Act. This is known as requesting a Part II Order.

A Part II Order request should be submitted after the proponent has issued the Notice of Completion for a Class Environmental Assessment for a project. The request should be submitted within the review period/comment period outlined in the Notice of Completion.

The Ministry recommends that you follow the process set out below before submitting a Part II Order request:

- Participate in the consultation opportunities provided to the public within the Class Environmental Assessment process
- Engage in discussions with the proponent to try to address and resolve your concerns

A Part II Order request should not be submitted for the sole purpose of delaying, stopping, or frustrating the planning and implementation of an undertaking proceeding under a Class Environmental Assessment process. The Minister may consider the efforts of the requester to resolve the concerns directly with the proponent when deciding whether to make an order.

Questions regarding the completion and submission of this form should be directed to a Customer Service representative at the Client Services and Permissions Branch at 416-314-8001 or 1-800-461-6290.

## Step 1 - Get the Facts

- Class Environmental Assessments are used for projects that the Ministry of the Environment and Climate Change considers routine, with predictable and manageable effects on the environment.
- A Part II Order request will not stop a project from proceeding. The Minister has four options when deciding a Part II Order request:
  - To request mediation between you and the proponent to help address your concerns before making a decision
  - To deny the request
  - To deny the request but require the proponent to fulfill additional conditions before the project can proceed, such as further studies or more public consultation
  - To require the proponent to conduct a higher review of the project through an Individual Environmental Assessment; this happens only in rare and exceptional cases.
- Key factors that the Minister may consider when looking at a Part II Order request are:
  - whether the project has the potential to pose significant adverse effects on the environment
  - how the project is significantly different from other projects in its class
  - whether the process for the Class Environment Assessment was adequate.

To learn more about Class Environmental Assessments visit https://www.ontario.ca/page/class-environmental-assessments-approved-class-ea-information.

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## Step 2 – Statement of Participation

☑ I have raised my concerns with the project proponent

Describe how and when you raised your concerns with the proponent and the proponent's response

SEE PART II ORDER REQUEST attachment 1

☑ I was unable to have my concerns resolved by the project proponent

Describe what concerns remain outstanding and why these concerns could not be resolved through discussions with the proponent.

SEE PART II ORDER REQUEST attachment 2

☑ My unresolved concerns relate to:

- ☑ potential environment impacts
- ☑ how the project is significantly different from other projects in its class
- ☑ the adequacy of the process for the Class Environment Assessment
- ☐ other (specify)

Describe

SEE ALL Attachments.
SEE PART II ORDER REQUEST attachment 2.

☑ The proponent has issued the Notice of Completion for the project

☑ This request is being made within the review/comment period outlined in that notice

2018/06/19 (Start Date (yyyy/mm/dd)) to 2018/09/18 (End Date (yyyy/mm/dd))

☑ I hereby declare that, to the best of my knowledge, the information contained in this form and the information submitted in support of this form is complete and accurate.

| Last Name | First Name | Date (yyyy/mm/dd) |
|---|---|---|
| BOWMAN | MICHELE | 2018/09/18 |

With all Part II Order requests, the Ministry maintains a public file that is available for viewing by any member of the public upon request. Personal and other information from your request, such as name, address, and telephone number and your concerns with the project will form part of the public record. If you wish for your information to be excluded from the public file, you can advise the Ministry by checking the box in the declaration below. Even if you request that your information be excluded, your contact information may still be obtained by members of the public if the Ministry is required to disclose the information under the *Freedom of Information and Protection of Privacy Act*.

☑ Please exclude my personal information from the public file (select if you wish to be excluded).

## Step 3 – Provide Identifying Information

If you are certain making a Part II Order Request is the right approach for you, complete the following information:

Requester Name

| Last Name | First Name |
|---|---|
| Bowman | Michele |

Requester Type

☑ Individual

☐ On behalf of Person/Group (specify) _____

☐ Other (specify) _____

**Current Address**

| Unit Number | Street Number | Street Name | PO Box |
|---|---|---|---|
| — | [redacted] | [redacted] | — |

| City/Town | Province | Country | Postal Code |
|---|---|---|---|
| [redacted] | [redacted] | [redacted] | [redacted] |

| Concession | Rural Route |
|---|---|
| — | — |

| Telephone Number | Fax Number | Email Address (if available) |
|---|---|---|
| [redacted] | — | [redacted] |

Name of proposed Project (as it appears on the Notice of Completi

SPRINGWATER TWP DRAFT ENVIRONMENTAL STUDY REPORT

Name of Proponent (as it appears on the Notice of Completion if available)

TOWNSHIP OF SPRINGWATER

## Step 4 – Making Your Request

By submitting this form, you are requesting a Part II Order by the Minister.

Confirm what outcome you are seeking from the Minister by making this request.

I want the Minister to:

☑ Refer the matter to mediation to help me and the proponent address my concerns

☑ Impose additional conditions before the project can proceed

Describe what conditions you think would be appropriate and how they would address your concerns.

SEE ATTACHMENTS

☑ To require the proponent to conduct a higher review of the project through an Individual Environmental Assessment

Describe how an Individual Environmental Assessment would address your concerns in a way that the Class Environmental Assessment does not:

SEE ATTACHMENTS.

If applicable, provide any other relevant information related to this request you would like to share.

## Step 5 – Submitting Your Request

Please send the completed form and any supporting information you would like to provide to all three of the following:

Minister
Ministry of the Environment and Climate Change
Ferguson Block, 77 Wellesley St. W, 11th Floor
Toronto ON M7A 2T5
Fax: 416-314-8452
Minister.MOECC@ontario.ca

Director, Environmental Assessment and Permissions Branch
Ministry of the Environment and Climate Change
135 St. Clair Ave W, 1st Floor
Toronto ON M4V 1P5
MOECCpermissions@ontario.ca

Project Proponent
The email or mailing address for the project proponent can be found on the Notice of Completion for the project.

PARTICULAR

NOTE ATTACHMENTS ARE NOT CONSECUTIVE AND IN NO ORDER

**Step 6 – Attachments**

| Description | File name |
|---|---|
| 1. PREFERRED TRANSPORTATION IMPROVEMENT EA 3+4 | Attachment 5 – 1 pg |
| CLASS EA WASTE WATER + TRANSPORTATION PH 1+2 REPORT | Attachment 5a – 4 pg |
| Plans | Attachment 3-4-4a-6 pg |
| LID fact sheet | Attachment 3a-6-6a-6 pg (note no attachment 6b- deleted) |
| Part II Order Request | Part II Order Request Michele Bowman |
| Comment Response | Attachment Ainley Response Letters. - 5pg |
| MIDHURST 20/20 OVERVIEW | Attachment Midhurst Overview - 8pg |
| PART II ORDER REQUEST STATEMENT OF PARTICIPATION | STATEMENT OF PARTICIPATION ATTACHMENT 1 - 1pg |
| PART II ORDER REQUEST STATEMENT OF PARTICIPATION | STATEMENT OF PARTICIPATION ATTACHMENT 2 - 4pg |
| NOTICE OF COMPLETION | NOTICE of COMPLETION pg 1+2 |

Part II Order Request/

Rick & Michele Bowman [redacted]

Attachment 1

To Government of Ontario/Ministry of Environment,

Step 2 – Statement of Participation

I have raised my concerns by attending and commenting at many council meetings from 2013 to present

I have sent numerous emails to

- Ainely & Associates (Township Engineer specifically Joe Mullan)
- Township of Springwater Planning specifically Brent Spagnol
- Township of Springwater Council Ward 5 Jack Hanna
- Township of Springwater Mayor French
-

Specific meetings I have attended

- Public Meeting May 29, 2013
- Legal Advice meeting September 17, 2013
- EA update January 7 2015
- PIC October 18, 2016 (response attached (2))
- Public Comments to Council March 8, 2017
- Draft ESR April 19, 2017
- Ainley Group pres. May 16, 2018
- Open House June 18 2018

Additional meetings held by the Midhurst Ratepayers Association as well as climate and environmental impact meetings held to inform existing residents.

I presented a delegation at the Special Council Meeting/Midhurst Secondary Plan Environmental Assessment. Mar 8, 2017. At 45:39 minutes to 58:31 minutes.

https://www.youtube.com/watch?v=yXUuByEsS0E

The delegation addresses the traffic issues created by the proposed density within the North and South Doran Developments in what is known as Neighborhood 2.

The Draft Plan of subdivision dated April 22. 2014 on the township link does not show my home and therefore many plans have surfaced showing traffic lights and turning circles at our property. Text shows “Block Park” which can be confusing for agencies reviewing. See attached letter and plans.

Part II Order Request/

Rick & Michele Bowman [redacted]

Attachment 2

To Government of Ontario/Ministry of Environment,

Step 2 – Statement of Participation

**Unresolved Concerns in relation to: Midhurst Secondary Plan in particular north and South Doran Developments.**

**Potential Environmental Impacts:**

**Carbon Dioxide Emissions and Significant Groundwater Recharge Area Impacted by Density.**

- Population/Density proposed creates the excessive traffic projections within a community that has no jobs or public transit.

- This community has few jobs and those that are here are misleading in numbers. The largest employer is a Public School Board where the main building is located in Springwater Township however their staff work largely OUTSIDE Springwater Township.

- The Neighborhood 2 Development as a whole will create 4861 units (per OMB decision documents) which could possible create upwards of 10,000 commuters located within what exists as two farm fields.

- The OMB decision (PL131125) page 25 notes the non-residential zoned properties provide less than 100 jobs. Note too that there are no jobs projected in stage 2.

- Neighborhood 2 in its entirety is residential with future teaching positions in the projected school possibly providing 30-40 of those projected jobs.

- The amount of carbon dioxide emissions and ground water pollution this commuter city will create will have adverse effects on the neighboring farmland with air quality and traffic on a road that right now moves tractors and farm equipment.

- Salt and sand required to keep the projected lanes along Russell Road clear during winter months will affect the neighboring farm land outside the settlement boundary.

- Commercial/retail area located as it is on both North Doran and South Doran will draw in 400 series traffic adding more emissions to the area.

- This development creates a commuter city. The North and South Doran developments are parallel to 400 series highway with a projected total of 1250 multiple dwelling units including a future block that could add substantially more. See attachments.

- A four lane Russell road will not promote biking and walking on the trail proposed alongside Russell Road since most people will not want to ride alongside what would seem like a highway. It wouldn't feel safe to family's.

- South Doran Development is within a significant Groundwater Recharge Area. See attachment.

**Project significantly different from other projects**

- **6/9 settlement Boundaries have no Multiple Dwelling Units within Springwater Township where North and South Doran have 1250 MDU possibly more creating excessive emissions effecting air and ground water runoff. See map attached.**
- No existing infrastructure
- No existing police, fire, hospital.
- Neighborhood 2 is substantially Multiple Dwelling Units/Blocks (MDU) in comparison to other neighborhoods within Springwater Twp.
- No public transportation.
- If there was public transportation the closest jobs are retail.
- No jobs (north of Barrie-not close for any manufacturing facility, rural farm land on the edge of Muskoka which is recreation, travel and cottagers)
- See attachments.

**Adequacy of the process for the Class EA**

- This Development is substantially larger than any other the Township of Springwater has seen to date. The EA is not seeing the future Engineering of this development however the EA has to recognize any development this large will certainly have environmental impact. This EA process in my view has done nothing to lessen that impact on the existing village whether it be traffic or otherwise. The storm water management alone will not be accomplished with the density of units and the size of lots with the amount of traffic and run off associated with it. Low Impact Development (LID) has been defined by Urban Centers. Rural areas require a different definition in my opinion therefore the EA fails in this regard.

- I am a resident who has participated however you will see by the questions I have asked during the process were not asked properly in order to protect myself or get good results. I am not legally versed or environmentally educated so we rely on the agencies in place. In a project this large many items have been missed.

- I have requested many times the main road for this development be within the development itself. Benefit is; this main artery would be loaded by traffic on both sides. This would deter 400 series traffic from travelling through the village and creating excessive travel within this boundary. It would also deter the 400 series traffic from bypassing the congestion through the Duckworth street area within neighboring Barrie. Right now this is the bulk of the traffic on this road. It would eliminate the need for traffic lights at Russell and Doran Roads allowing the existing farmers to continue to travel along a road free of traffic lights and traffic from outside the community. The adequacy of the EA is difficult to judge when they do not live in the area and are possibly unaware of the environment in areas that cannot be put on paper as statistics.

  The EA process I believe is there to protect the environment and indirectly protect the existing residents and their environment. This Development is so large that I don't believe any agency could see every detail. There are three generations of residents trying to protect this area many of whom are farmers. None are opposed to development however this is excessive in terms of traffic and ground water impacts. Because we are not versed in Planning or Engineering we are unable to protect this areas environment.

Please call me should anything I have submitted may not be clear. Michele Bowman [redacted]. I will undoubted return any calls.

Attachment 3
SHOWING HOW DENSITY AND RESULTANT TRAFFIC FOR MIDHURST IS HIGHER THAN ANY OTHER DEVELOPMENT IN TWP.

Township of Springwater

# Current & Potential Residential Growth: 2018

MDU - MULTIPLE DWELLING UNIT
SDU - SINGLE DWELLING UNIT

N

Registered Subdivision (Building Permit Eligible)
Draft Plan Approved
OPA Complete (No Draft Plan Approval)
Active Applications in Process

172 MDU
421 SDU

146 MDU
475 SDU

Green Meadows (Hedbern)
103 SDUs - To replace Pro-Elm 2.

Elmvale Meadows - Phase 2 Stage 3
34 SDUs

Sarjeant Lands
114 SDUs

Woods/Beacock
12 Townhomes

Kerr Street Apartments
6 Apartments

Scarlett Line
15 SDUs

NOTE:

Heritage Village
346 SDUs
146 Townhomes

Heritage Village
Redline Revision for
Unit Yield Reduction

Sajed
50 Detached Bungalows
14 Unit Apartment Condominum

Train Avenue
23 Apartments

Maple Ridge
20 SDUs

Gallo
30 Townhomes
13 Bungalofts

Gallo
Phase 1 - 75 SDUs

Gallo
Phase 2 - 75 SDUs

Stone/Coughlin
18 Townhomes

Fergusonvale Estates
15 SDUs

Elmvale Developments
69 Townhomes

Ravines of Matheson Creek
28 SDUs

Wye River Estates
Phase 1 - 43 SDUs
Phase 2 - 28 SDUs

Springlakes
Adult Life Community
800 SDUs

"0" MDU
35 SDU

"0" MDU
828 SDU

Midhurst Heights
992 SDUs
149 Bungalow Townhomes
211 Regular Townhomes
82 Apartment Units
6 Future Development Blocks

Marshall
11 SDUs

Johns
217 SDUs

Bell/Rusdor/Coutts
569 SDUs
341 Townhomes

Estates of Anten Mills
76 SDUs

"0" MDU
87 SDU

NOTE:

Micks
Redline Revision for
Unit Yield Reduction

Micks
339 SDUs

Wright
212 SDUs
102 Townhomes

"0" MDU
"0" SDU

Coutts-Jones
488 SDUs
293 Townhomes

Walton
101 SDUs

Vespra Valley Estates Phase 3
13 SDUs

Midves II
52 SDUs
66 Apartments

Cameron Estates
87 SDUs

Carson Ridge Estates
50 SDUs

Snow Valley Highlands - Phase 5
17 SDUs

"0" MDU
156 SDU

Rome
315 SDUs
114 Townhomes

Carson Trail
95 SDUs
74 Townhomes

D. Hickling
791 SDUs

D. Hickling
Redline Revision
for Unit Yield
Reduction

NOTE:

A. & R. Hickling
506 SDUs
186 Townhomes

374 MDU
1757 SDU

Stonemanor Woods (Yorkwood) - Phase 1
347 SDUs

Stonemanor Woods (Yorkwood) - Phase 2A
106 SDUs

Stonemanor Woods (Yorkwood) - Phase 2B
98 SDUs

Stonemanor Woods (Yorkwood) - Phase 2C
119 SDUs

"0" MDU
670 SDU

1250 MDU
2931 SDU

TOO MANY TOWNHOUSES IN ONE LOCATION. (48%)

For additional information please contact the Planning Department at planning@springwater.ca or 705-728-4784 x, 2019.

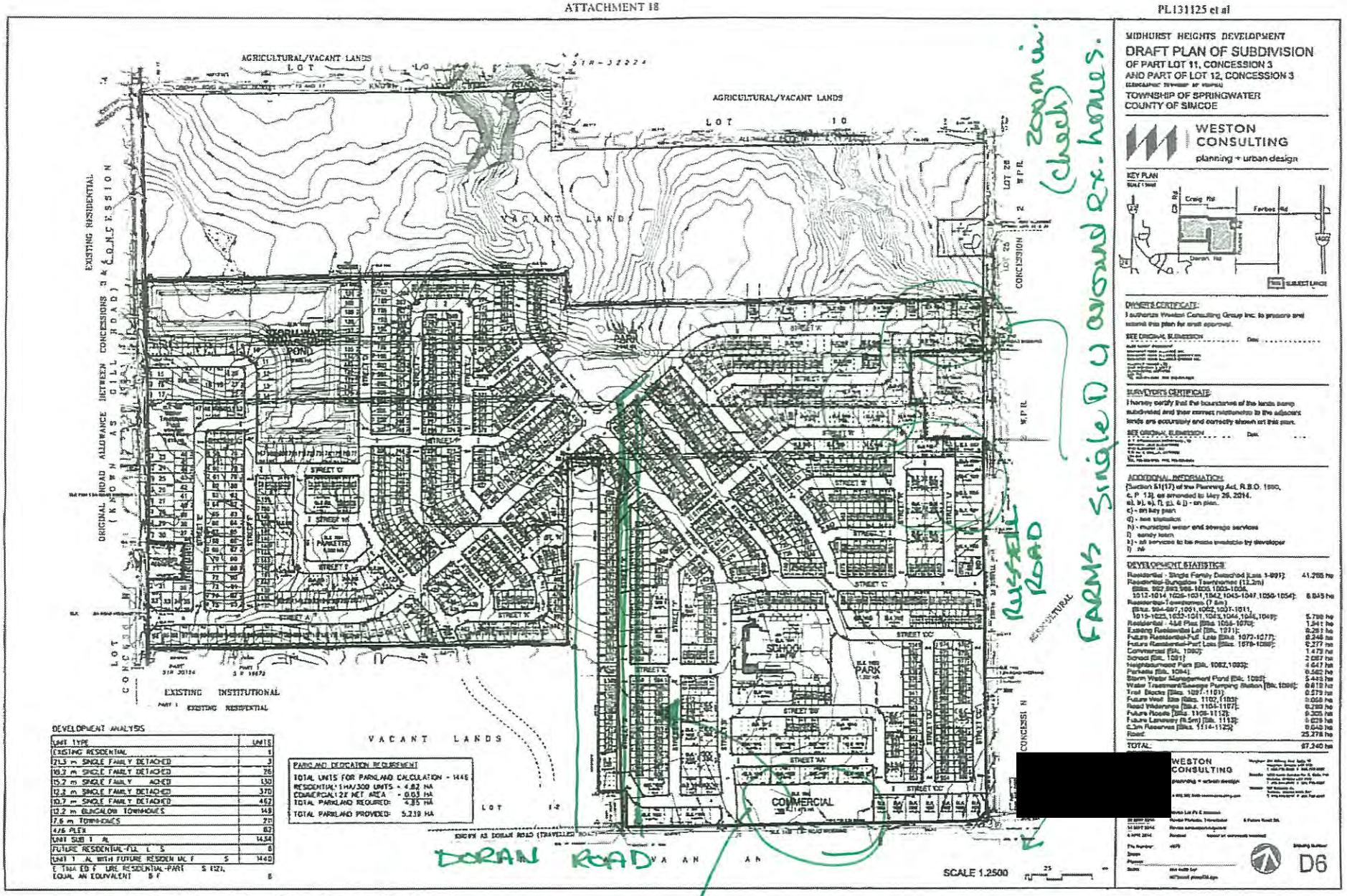
Please note unit yields are subject to change throughout the approval process.
(Last Reviewed: September 4, 2018)

0 1.25 2.5 5 Kilometers

entire length of Russell Townhomes. North Doran.

ATTACHMENT 18

PL131125 et al




DEVELOPMENT ANALYSIS

| UNIT TYPE | UNITS |
|---|---|
| EXISTING RESIDENTIAL | 3 |
| 21.3 m SINGLE FAMILY DETACHED | 3 |
| 18.2 m SINGLE FAMILY DETACHED | 76 |
| 15.2 m SINGLE FAMILY ACHED | 130 |
| 12.8 m SINGLE FAMILY DETACHED | 370 |
| 10.7 m SINGLE FAMILY DETACHED | 462 |
| 12.2 m BUNGALOW TOWNHOUSES | 148 |
| 7.6 m TOWNHOUSES | 211 |
| 4/6 PLEX | 82 |
| UNIT SUB T AL | 1454 |
| FUTURE RESIDENTIAL-FUL L S | 8 |
| UNIT T AL WITH FUTURE RESIDEN UC F S | 1440 |
| E TWA ED F URE RESIDENTIAL-PART S (121, EQUAL AN EQUIVALENT B F | 8 |

PARKLAND DEDICATION REQUIREMENT

TOTAL UNITS FOR PARKLAND CALCULATION - 1446
RESIDENTIAL 1 HA/300 UNITS - 4.82 HA
COMMERCIAL 2% NET AREA - 0.63 HA
TOTAL PARKLAND REQUIRED: 4.35 HA
TOTAL PARKLAND PROVIDED: 5.239 HA

MIDHURST HEIGHTS DEVELOPMENT

DRAFT PLAN OF SUBDIVISION
OF PART LOT 11, CONCESSION 3
AND PART OF LOT 12, CONCESSION 3
(GEOGRAPHIC TOWNSHIP OF VESPRA)
TOWNSHIP OF SPRINGWATER
COUNTY OF SIMCOE

WESTON CONSULTING
planning + urban design

KEY PLAN

OWNER'S CERTIFICATE:

I authorize Weston Consulting Group Inc. to prepare and submit this plan for draft approval.

SEE ORIGINAL SUBMISSION ..... Date: .....

SURVEYOR'S CERTIFICATE:

I hereby certify that the boundaries of the lands to be subdivided and their correct relationship to the adjacent lands are accurately and correctly shown on this plan.

SEE ORIGINAL SUBMISSION ..... Date: ...

ADDITIONAL INFORMATION

(Section 51(17) of the Planning Act, R.S.O. 1990, c. P. 13, as amended to May 29, 2014.
a), b), e), f), g), & j) - on plan.
c) - on key plan
d) - see schedule
h) - municipal water and sewage services
i) - sandy loam
k) - all services to be made available by developer
l) - nil

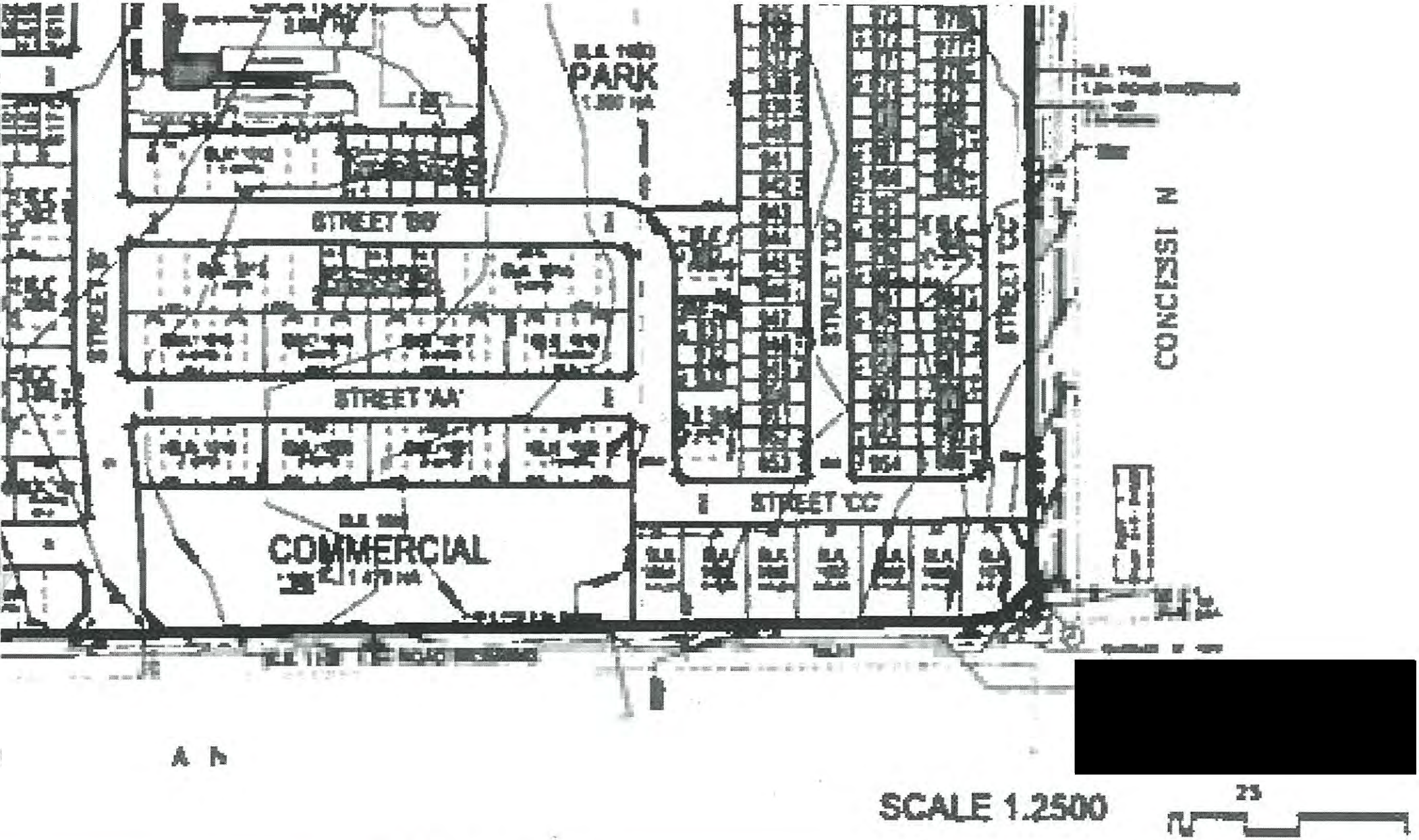
DEVELOPMENT STATISTICS

| | |
|---|---|
| Residential - Single Family Detached (Lots 1-891): | 41.265 ha |
| Residential - Single/Semi Townhomes (12.2m) (Blks. 892,893,986-1005,1009-1036, 1012-1014,1026-1031,1042,1045-1047,1050-1054): | 6.845 ha |
| Residential - Townhomes (7.6m) (Blks. 894-897,1001,1002,1037-1041, 1015-1025,1033-1041,1043,1044,1048,1049): | 5.799 ha |
| Residential - 4&6 Plex (Blks. 1055-1070): | 1.341 ha |
| Existing Residential Lot (Blk. 1071): | 0.251 ha |
| Future Residential-Full Lots (Blks. 1072-1077): | 0.246 ha |
| Future Residential-Part Lots (Blks. 1078-1086): | 0.277 ha |
| Commercial (Blk. 1000): | 1.479 ha |
| School (Blk. 1001) | 2.057 ha |
| Neighbourhood Park (Blk. 1002,1003): | 4.647 ha |
| Parkette (Blk. 1004): | 0.592 ha |
| Storm Water Management Pond (Blk. 1005): | 5.443 ha |
| Water Treatment/Sewage Pumping Station (Blk. 1006): | 0.618 ha |
| Trail Blocks (Blks. 1087-1101): | 0.279 ha |
| Future Well Site (Blks. 1102,1103): | 0.058 ha |
| Road Widenings (Blks. 1104-1107): | 0.280 ha |
| Future Roads (Blks. 1108-1112): | 0.305 ha |
| Future Laneway (6.5m) (Blk. 1113): | 0.029 ha |
| 0.3m Reserves (Blks. 1114-1125): | 0.040 ha |
| Road: | 25.278 ha |
| TOTAL: | 97.340 ha |

WESTON CONSULTING
planning + urban design

D6

Draft Plan of Subdivision for Midhurst Rose Alliance Inc Lands


PARK
STREET 'BB'
STREET 'AA'
STREET 'CC'
COMMERCIAL
CONCESSI N
SCALE 1:2500

| No. | Conditions |
|---|---|

NOT AS DENSE IN POPULATION AS THE SOUTH DORAN DEVELOPMENT

**DRAFT PLAN**

1. This approval applies to the proposed draft plan of subdivision located at Part Lot 11, Concession 3 Vespra as in RO1343811, together with RO1343811 (PIN No. 58360-0007 (LT)); Part Lot 11 & 12, Concession 3 Vespra as in RO581105 (PIN No. 58360-0009 (LT)); Part Lots 11 & 12, Concession 3 Vespra being Part 1 on Reference Plan 51R-36114, save and except Part 1 on Reference Plan 51R-36610 (PIN No. 58360-0156 (LT)); Part Lot 11, Concession 3 Vespra as in RO1385820 (PIN No. 58360-0005 (LT)); Part Lot 12, Concession 3 Vespra; being Part 1 on Reference Plan 51R-36115 (PIN No. 58360-0154 (LT)); Springwater, Township of Springwater, County of Simcoe, prepared by Weston Consulting dated May 27, 2014, which includes the following:

    - 991 Low Density Single Detached Residential Lots (Lots 1 - 991)
    - 149 Bungalow Townhomes Residential Units (Blocks 992, 993, 998-1000,1003-1006, 1012-1014, 1026-1031, 1042, 1045-1047, 1050-1054)
    - 211 Residential Townhomes (Blocks 994-997, 1001, 1002, 1007-1011, 1015-1025, 1032-1041, 1043, 1044, 1048, 1049)
    - Residential 4 & 6 Plex (Blocks 1055-1070)
    - Future Residential-Full Lots (Blocks 1072-1077)
    - 6 Future Residential-Part Lots (Blocks 1078-1089)
    - 1 Existing Residential Lot (Block 1071)
    - 1 Block for Commercial Use (Block 1090)
    - 1 School Block (Block 1091)
    - 2 Blocks for Neighbourhood Parks (Block 1092, 1093)
    - 1 Block for Neighbourhood Parkette (Block 1094)
    - Stormwater Management Pond (Block 1095)
    - Water Treatment/Sewage Pumping Station (Block 1096)
    - Future Well Sites (Blocks 1102, 1103)
    - Trail Blocks (Blocks 1097-1101)
    - Future Roads (Blocks 1108-1112)
    - Road Widening (Blocks 1104-1107)
    - Future Laneway (Block 1113)
    - 0.3 metre Reserves (Blocks 1114-1125)
    - 30 Streets (Streets "A" to "Z", AA-DD)

**HEADINGS**

2. The headings inserted in these draft plan conditions are inserted for convenience only and shall not be used as a means of interpreting these draft plan conditions.

THE AREAS CIRCLED ARE ALL MULTY STORIED MULTIPLE DWELLING BLOCKS. PURPLE BLOCK IS RESIDENTIAL ABOVE COMMERCIAL.

Attach 4a

[redacted]

* DIFFERENT PLAN THAN RECEIVED BY OMB.

NOTE
NO SCHOOL BLK. AS WELL

**SCHEDULE OF LAND USE**

| LOT/BLOCK | LAND USE | UNITS | BLOCKS | AREA (ha) |
|---|---|---|---|---|
| Lots 28-35, 49-51 | SFD Residential 18.3m (A units) | 7 | 7 | 0.63 |
| Lots 19-22, 25-27, 36-48, 52-56, 324-327 | SFD Residential 15.25m (B units) | 34 | 34 | 2.19 |
| Lots 1-12, 23-24, 57-60, 79-106, 155-158, 247-254, 269-283, 310-314, 318-323, 328-394 | SFD Residential 12.8m (C units) | 118 | 118 | 4.97 |
| Lots 61-78, 107-108, 139-246, 259-268, 284-309, 315-317 | SFD Residential 9.75m (D units) | 177 | 177 | 5.05 |
| Blocks 335-361 | On Street Townhouse Residential (3 DTH) | 208 | 27 | 4.93 |
| Blocks 362-402 | On Street Townhouse Residential (3 DTH) | 448 | 64 | 11.30 |
| Block 426 | Mixed Use / Commercial | | 1 | 0.75 |
| Blocks 427-433 | Park | | 11 | 3.21 |
| Block 438 | Open Space | | 1 | 8.07 |
| Blocks 439-450 | Walkways | | 12 | 0.42 |
| Blocks 451-452 | Road Widenings | | 2 | 1.49 |
| | Roads | | | 15.98 |
| TOTAL | Totals | 992 | 452 | 53.05 |

**SCHEDULE OF LAND USE**
**LANDS UNDER APPEAL BY MMAH**

| LOT/BLOCK | LAND USE | UNITS | BLOCKS | AREA (ha) |
|---|---|---|---|---|
| Lots 453-455, 464, 467-469, 576-578, 638, 644-645, 652-658, 676-677, 679-680, 790-791, 796-797 | SFD Residential 18.3m (A units) | 69 | 51 | 5.02 |
| Lots 456-463, 465-466, 470-472, 478, 581-584, 573-575, 579-580, 599-600, 608-614, 622-623, 636-637, 639-643, 646-647, 666, 672-675, 681, 695-692, 740, 745-749, 782-784 | SFD Residential 15.25m (B units) | 90 | 69 | 5.56 |
| Lots 473-477, 479-482, 499-507, 548-555, 560-570, 590-596, 601-607, 615-621, 634-635, 648-651, 662-665, 693-696, 706-717, 727-739, 781-782 | SFD Residential 12.8m (C units) | 120 | 120 | 6.37 |
| Lots 483-498, 508-547, 556-559, 700-705, 718-726 | SFD Residential 9.75m (D units) | 66 | 66 | 2.31 |
| Blocks 786-790 | On Street Townhouse Residential (3 DTH) | 15 | 2 | 0.36 |
| Blocks 792-801 | On Street Townhouse Residential (3 DTH) | 30 | 4 | 0.80 |
| Blocks 802-807 | Parks | | 6 | 2.40 |
| Blocks 808-809 | Open Space | | 2 | 11.21 |
| Block 810 | Walkways | | 1 | 0.04 |
| Block 811 | Storm Water Management Pond | | 1 | 4.47 |
| Block 812 | Pumping Station | | 1 | 0.23 |
| Block 813 | Road Widening | | 1 | 0.11 |
| | Roads | | | 8.07 |
| TOTAL | Totals | 379 | 351 | 41.43 |

RELATED FILE NUMBERS:
Neighbourhood 2 - Rusdor/Bell/Coutts DRAFT PLAN

Springwater Zoning File ZB-20131-008
OMB Zoning Appeal File PL131125
Springwater Subd. File SU-2013-01
County Subd. File SP-T-1003
OMB Subd. Appeal File PL101066

*Related file numbers are for discussion purposes only and are subject to change.*

Please submit any comments to mspliaisongroup@springwater.ca and include "Neighbourhood 2 – Rusdor/Bell/Coutts" in the subject line.

# DRAFT PLAN OF SUBDIVISION
Bell-Rusdor-Coutts
**SP-T-1001**

Part of Lot 13 & 14,
Concession 3
Township of Springwater
County of Simcoe

**Prepared for:**
Midhurst Development Doran Road Inc.
3130 Skyview Avenue East, Suite 300
Mississauga, Ontario, L4W 5Z6

**KEY PLAN**

**OWNER'S AUTHORIZATION**
I hereby authorize Malone Given Parsons Ltd. to prepare and submit this Draft Plan of Subdivision to the County of Simcoe.

SEE ORIGINAL — 1754886 Ontario Inc. — SEE ORIGINAL — Date

**OWNER'S AUTHORIZATION**
I hereby authorize Malone Given Parsons Ltd. to prepare and submit this Draft Plan of Subdivision to the County of Simcoe.

SEE ORIGINAL — 1755971 Ontario Inc. — SEE ORIGINAL — Date

**ADDITIONAL INFORMATION**
AS REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT, CHAPTER P.13(R.S.O. 1990).
(a),(e),(f),(g),(j),(l) - As shown of the Draft Plan.
(b),(c) - As shown on the Draft and Key Plan.
(d) - Land to be used in accordance with the Schedule of Land Use.
(i) - Sand.
(h),(k) - Full municipal services to be provided.

**SURVEYOR'S CERTIFICATE**
I hereby certify that the boundaries of the lands to be subdivided as shown on this Plan and their relationship to the adjacent lands are accurately and correctly shown.

SEE ORIGINAL — Paul Edward, Ontario Land Surveyor, RPE Surveying Ltd. — SEE ORIGINAL — Date


**Prepared by:**
MALONE GIVEN PARSONS LTD.
140 Renfrew Drive, Suite 201
Markham, Ontario, L3R 6B3
Tel: (905) 513-0170
www.mgp.ca
mbtw watchorn


Scale: 0 50 100m
Date: April 22, 2013
Project No.: 12-1239

| Date | Revision |
|---|---|
| | |

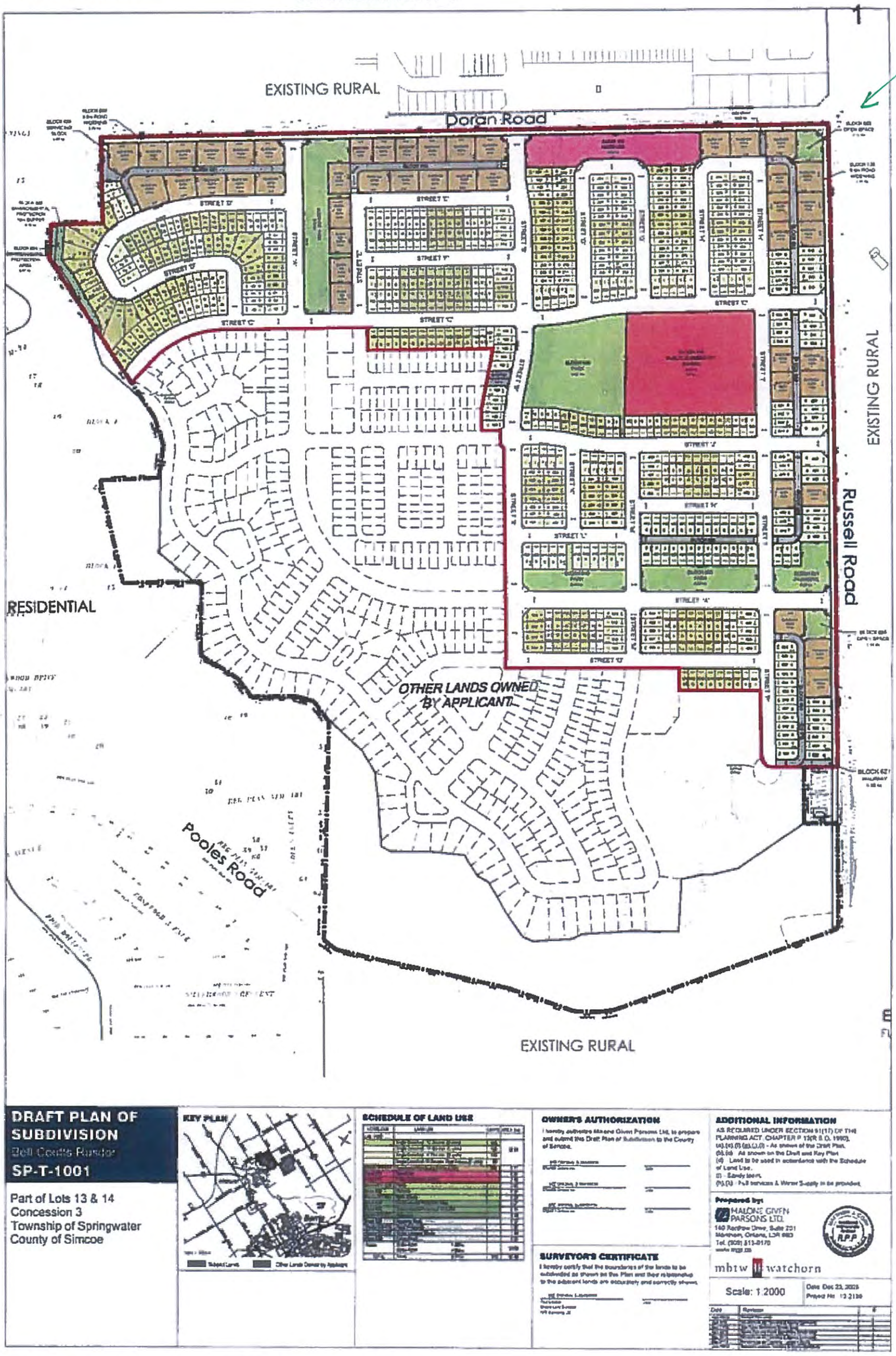
Attach 4

THIS PLAN SUBMITTED TO OMB. DIFFERS FROM PLAN (SEE ATTACHMENT 4a) SUBMITTED AND SHOWN AS THE DRAFT PLAN OF SUBDIVISION ON TWP. WEBSITE

PL131125 et al

ATTACHMENT 3

EXHIBIT 2




Draft Plan of Subdivision for Bell-Coutts-Rusdor Lands

Attachment 3a + Attachment 6b



## Fact Sheet # 4: Low Impact Development (LID)

1) Low Impact Development (LID) is an innovative stormwater management approach with a basic principle that is modeled after nature: manage rainfall at the source using uniformly distributed decentralized micro-scale controls. LID's goal is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source.

   Techniques are based on the premise that stormwater management should not be seen as stormwater disposal. Instead of conveying and managing / treating stormwater in large, costly end-of-pipe facilities located at the bottom of drainage areas, LID addresses stormwater through a variety of methods through a typical new development. These landscape features, known as Integrated Management Practices (IMPs), are the building blocks of LID. Almost all components of the urban environment have the potential to serve as an IMP. This includes not only open space, but also rooftops, streetscapes, parking lots, sidewalks, and medians. LID is a versatile approach that can be applied equally well to new development, urban retrofits, and redevelopment / revitalization projects.

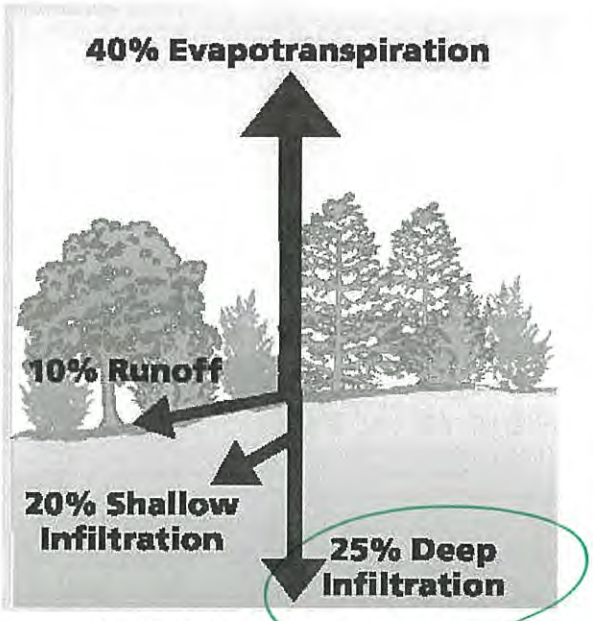
2) **LID Provides many environmental and economic Benefits**

   - Improved Water Quality. Stormwater runoff can pick up pollutants such as oil, bacteria, sediments, metals, hydrocarbons and some nutrients from impervious surfaces and discharge these to surface waters. Using LID practices will reduce pollutant-laden stormwater reaching local waters. Better water quality increases property values and lowers government clean-up costs.
   - Improved Groundwater Recharge. Runoff that is quickly shunted through storm sewers into Storm ponds and ultimately in water courses cannot soak into the ground. LID practices retain more rainfall on-site, allowing it to enter the ground and be filtered by soil as it seeps down to the water table.
   - Reduced Number of Costly Flooding Events. In communities that rely on ditches and drains to divert runoff to local waterways, flooding can occur when large volumes of stormwater enter surface waters very quickly. Holistically incorporating LID practices reduces the volume and speed of stormwater runoff and decreases costly flooding and property damage. Restored Aquatic Habitat. Rapidly moving stormwater erodes stream banks and scours stream channels, obliterating habitat for fish and other aquatic life. Using LID practices reduces the amount of stormwater reaching a surface water system and helps to maintain natural stream channel functions and habitat.

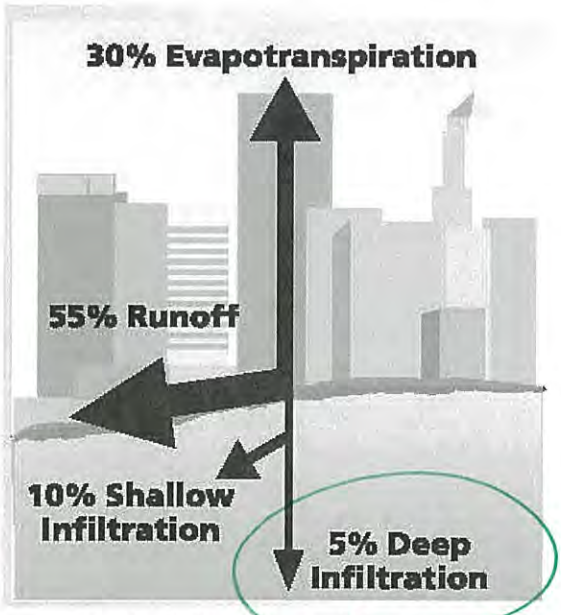
## Fact Sheet # 4: Low Impact Development (LID)

- Enhanced Neighborhood Beauty. Traditional stormwater management infrastructure includes unsightly pipes, outfalls, concrete channels and fenced basins. Using LID broadly can increase property values and enhance communities by making them more beautiful, sustainable and wildlife friendly.

When implemented broadly, LID can also mitigate the urban heat island effect (by infiltrating water running off hot pavements and shading and minimizing impervious surfaces), mitigate climate change (by sequestering carbon in plants), save energy (from green roofs, tree shading, and reduced/ avoided water treatment costs), reduce air pollution (by avoiding power plant emissions and reducing ground-level ozone), increase property values (by improving neighborhood aesthetics and connecting the built and natural environments), and increase groundwater recharge, potentially slowing or reversing land and well field subsidence.




Typical Pre-Development Stormwater Flows



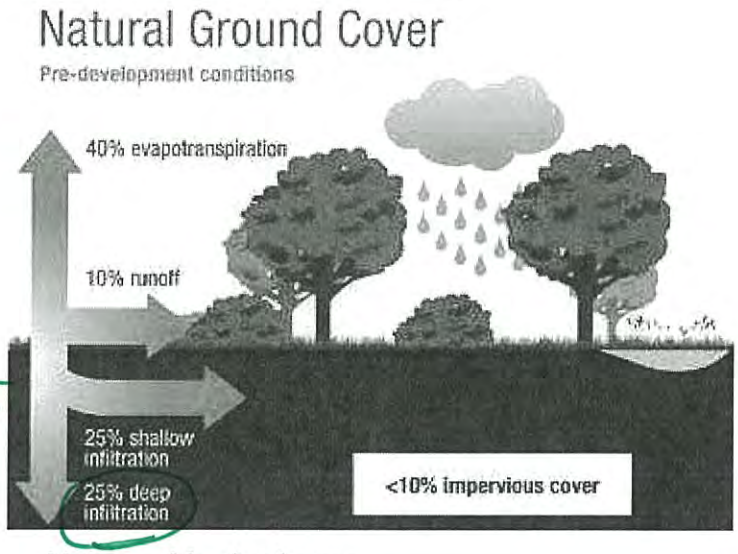

Typical Post-Development Stormwater Flows with No LIDs

## Fact Sheet # 4: Low Impact Development (LID)

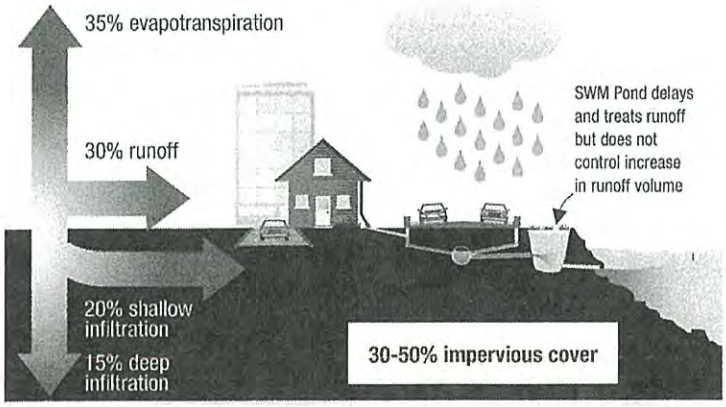
WHAT IS THE SPECIFIC NATURAL GROUND RUN OFF FOR SOUTH DORAN DEV.?

**Typical Natural Ground Pre-Development**

SINCE IT IS A SIGNIFICANT GROUND WATER RECHARGE AREA.

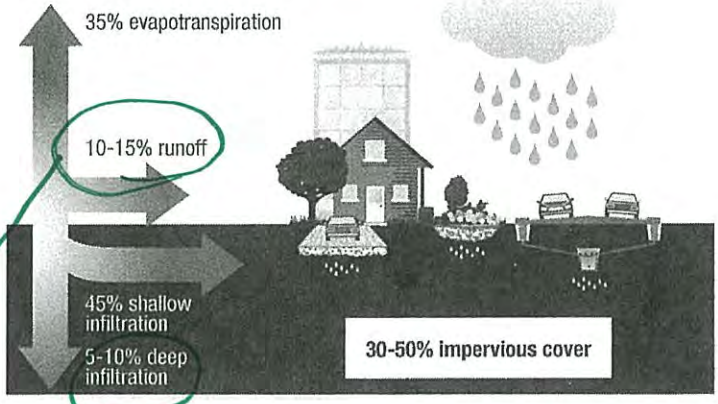



**Typical Urban Development without LID's**




∴ HOW IS THIS IMPACTED?

**Typical Urban Development with LID's**




ALL RUN OFF WHEN DEVELOPMENT DENSE/ASPHALT

WHAT AFFECT ON GROUND WATER RECHARGE?

## Fact Sheet # 4: Low Impact Development (LID)

3) Although not mandated by MOECC requirements, LIDs are being heavily promoted by most Conservation Authorities including Nottawasaga Valley (NVCA), Credit Valley (CVC), Toronto Region (TRCA) and Lake Simcoe (LSRCA) for new developments.

4) LIDs will be implemented throughout the Midhurst Secondary Plan to achieve:

- The ability of the stormwater management system to hold back the first 25 mm of storm runoff for a period of 48 hours.
- Reduce the Post-Development phosphorous loading to below Pre-Development loading levels, such that when the additional phosphorous load from the new Wastewater Treatment Plant (WWTP) is included, there shall be no net increase.
- The ability of the stormwater management system to infiltrate back into the ground, close to the source, the first 20 mm of rainfall while also ensuring a healthy hydrologic cycle.

5) In summary the implementation of Low Impact Development measures through the Midhurst Secondary Plan is an environmentally sound technology and economically sustainable approach to reduce the impacts of development and help to protect the local environment, protect public health, and improve community livability.

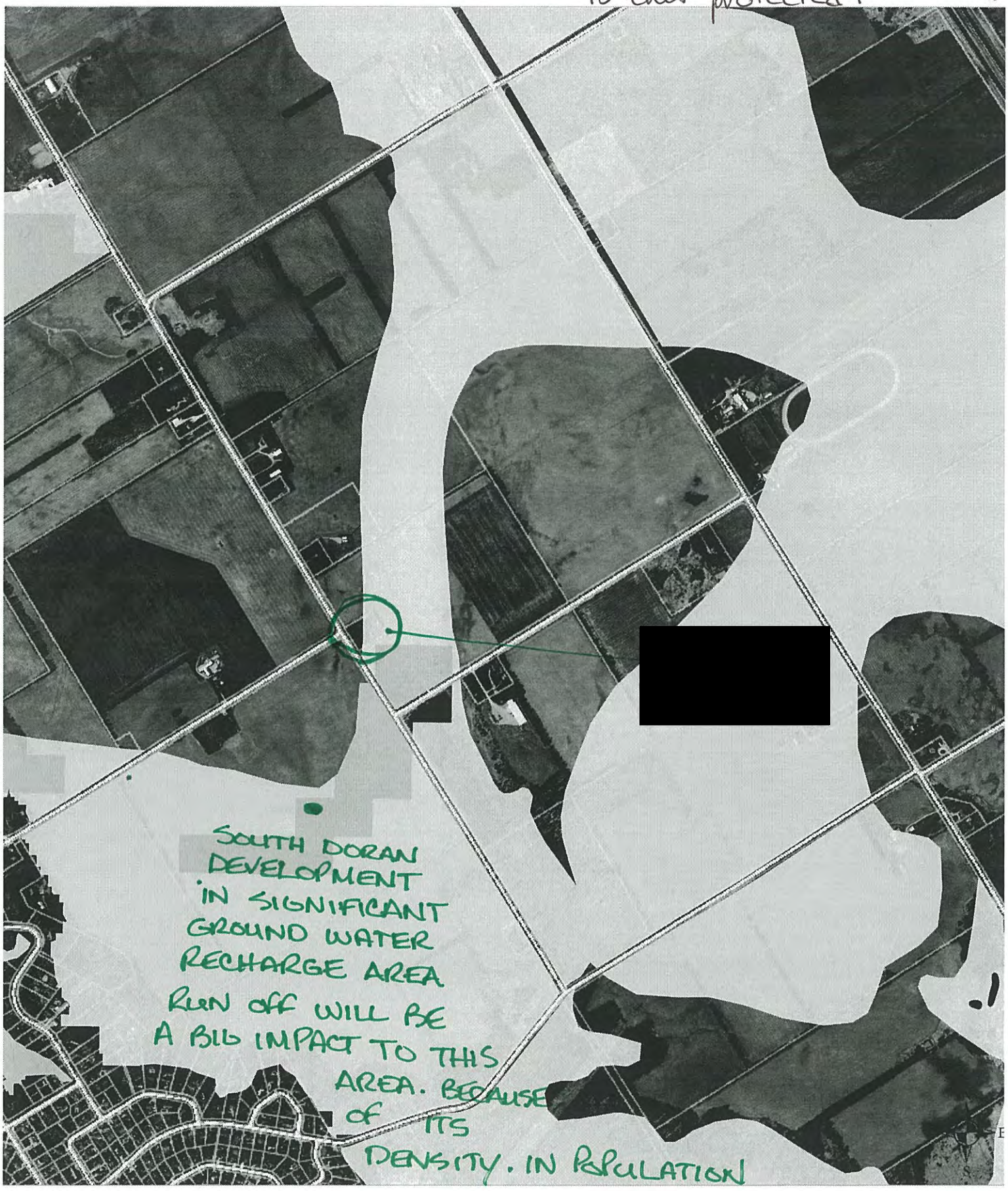
HOW IS THIS ACCOMPLISHED AND MONITORED BY MOE?

SOAKAWAY PITS PROPOSED BUT NOT MONITORED AND ARE THE OWNERS RESPONSIBILITY.

SCHOOLS HAVE THESE IN PLACE AND THEY ARE FAILING WITH THE STORMS WE HAVE.

# County of Simcoe - Web Map

significant ground water recharge is this protected?

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0 0.275 0.55 1.1 km

1:18,056

COUNTY OF SIMCOE

September 12,

Attachment 6

# County of Simcoe - Web Map

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1:18,056

COUNTY OF SIMCOE

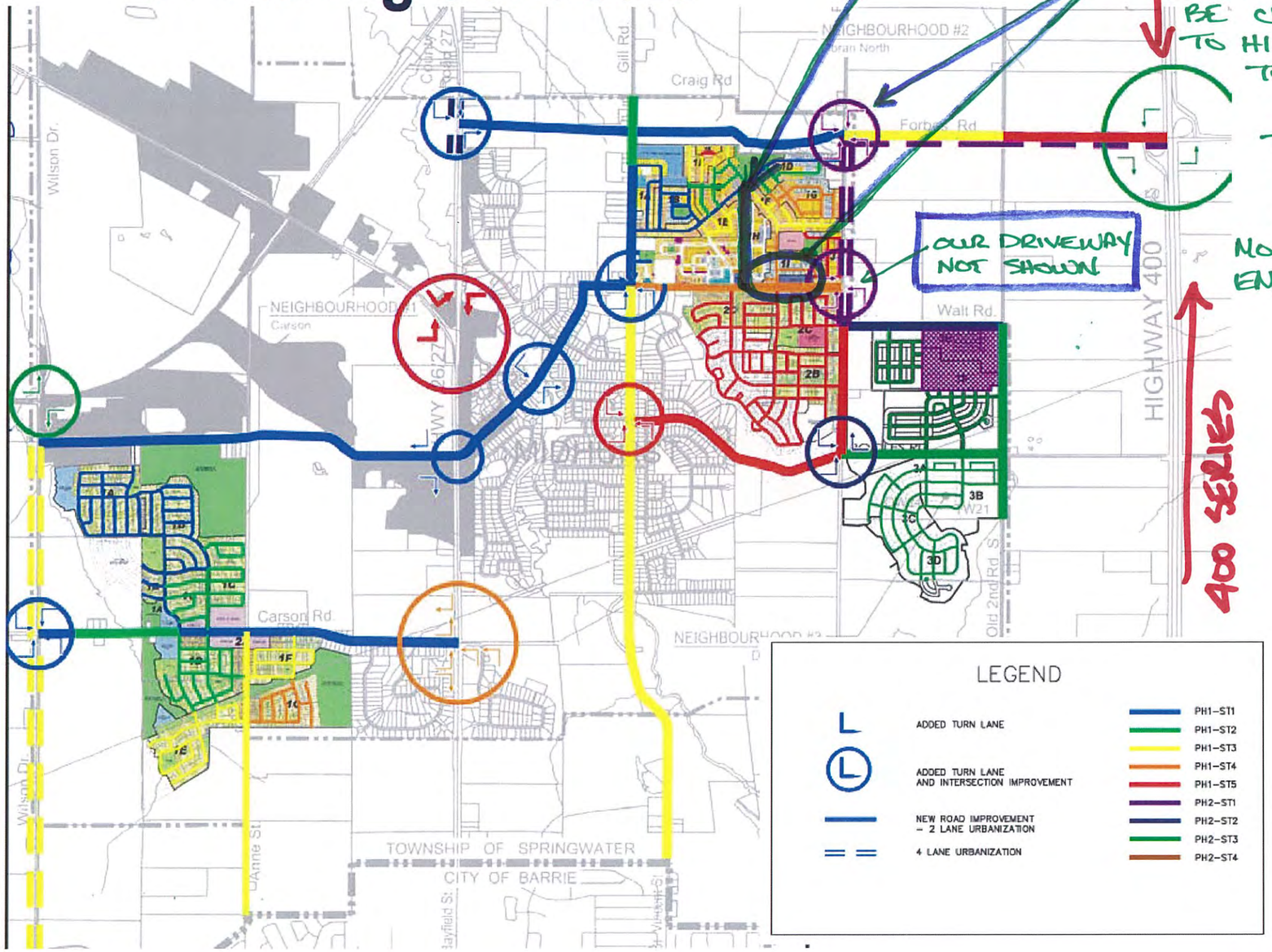
September 12, 2018

Attach to

Attachment 5

# Preferred Transportation Improvements & Phasing Schedule

- Using the proposed Development Phasing Information, traffic modelling and analysis determined when the various roads needed to be reconstructed and or upgraded;
- In conjunction with this traffic modelling and analysis, we also considered the need for active transportation (sidewalks and/or bike lanes) and/or new Infrastructure;

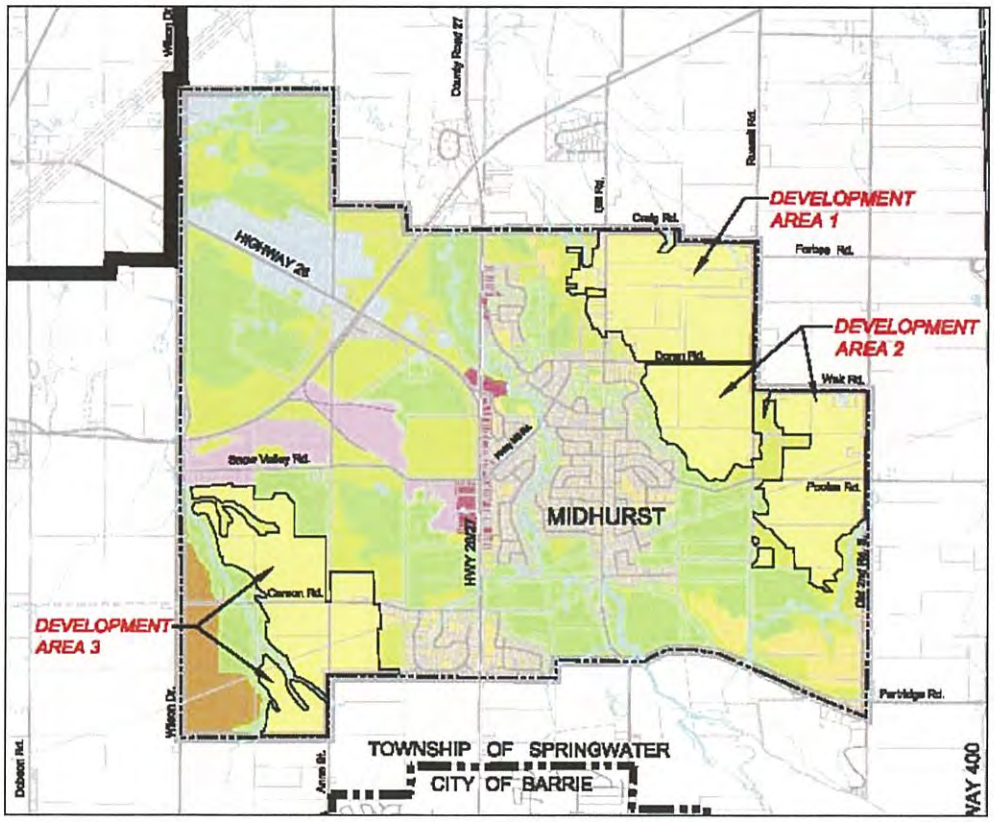


Attachment 5a

Township of Springwater

# Class Environmental Assessment Study for the Midhurst Water, Wastewater and Transportation Master Plan

# Phase 1 and 2 Report




**Ainley Group**
Consulting Engineers and Planners
280 Pretty River Parkway,
Collingwood, Ontario
L9Y 4J5

Telephone: 705-445-3451
Fax: 705-445-0968
www.ainleygroup.com

*File: 208017*
*July 2009*

# 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

MAJORITY MDU + RETAIL COMMERCIAL

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 |

COMMUTER TRAFFIC / 400 SERIES HIGHWAY

∴ REMAINING 15847 pp Commuting

10,000 is conservati

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

MAJORITY SINGLE FAMILY UNITS. SFA.

## Water Demands

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

| | |
|---|---|
| Average Day Demand | = 9,357 m³/d |
| Maximum Day Demand | = 16,843 m³/d |
| Storage volume | = 8,855 m³ |

## Wastewater Flows

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

| | |
|---|---|
| Average Daily Flow rate | = 10,600 m³/d |
| Peak Day Flow rate | = 28,081 m³/d |

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

| | |
|---|---|
| Average Daily Flow rate | = 12,314 m³/d |
| Peak Day Flow rate | = 32,075 m³/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

THIS IS OUR DRIVEWAY.

The following intersection/interchange improvements are recommended:

- Gill Road with Craig Road
- Pooles Road with Russell Road — DEAD END.
- Carson Road with Anne Street
- Partial interchange with Highway 400 at Pooles Road

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, ON, L9Y 4J5
Tel: (705) 445-3451 ▪ Fax: (705) 445-0968
E-mail collingwood@ainleygroup.com

March 3, 2017

Ms. Michelle Bowman
[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. Bowman:

On behalf of the Township of Springwater, we wish to thank you for your interest in the above-mentioned Class EA. We have reviewed your comments which were received following the October 18, 2016 Public Information Centre (PIC). Your comments/requests have been summarized and our responses are provided following each comment.

- *Live at the corner of Russell and Doran and the driveway would be part of the revisions to this intersection.* TURNING CIRCLE RECOMMENDED AS PREFERRED THEN SIGNALIZATION — NEITHER ACCEPTABLE.

After reviewing the comments received the Recommended Alternative for the intersection of Russel Road and Doran Road is Signalization.

- *I am outside the settlement boundary and am impacted in every way with this development. As will be the existing rural residents who walk, drive farm equipment and ride horses along Russell Road. Stop this revision and re-route through the settlement.*

The widening of Russell Road to 4 lanes is not needed until after Phase 2 proceeds which is anticipated after 2031. Also, we do not anticipate any property takings along the east side of Russell Road in front of your property. IGNORES MY COMMENT

- *Our lot behind the turning circle noting it was super imposed on 2002 County of Simcoe Mapping. Scroll under imagery to 2016 and you will not see the barn and silo.* INCORRECT.

AINLEY USING OUTDATED MAPPING - MAKES ANY PROPOSAL
The mapping associated with the proposed Alternative has been updated with the 2016 aerial imagery.

Thank you again for your interest in this Class EA.

Should you have any questions please do not hesitate to contact the undersigned.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P.Eng.
President & CEO

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, ON, L9Y 4J5
Tel: (705) 445-3451 ▪ Fax: (705) 445-0968
E-mail collingwood@ainleygroup.com

March 3, 2017

Mr. Rick Bowman
[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. Bowman:

On behalf of the Township of Springwater, we wish to thank you for your interest in the above-mentioned Class EA. We have reviewed your comments which were received following the October 18, 2016 Public Information Centre (PIC). Your comments/requests have been summarized and our responses are provided following each comment.

- *Concept of turning circle in front of his house is not acceptable. How much of our land will need to be taken to accommodate this?*

After reviewing the comments received the Recommended Alternative for the intersection of Russel Road and Doran Road is Signalization. In addition, we do not anticipate the need for any property acquisition on the east side of Russel Road in front of your property.

Thank you again for your interest in this Class EA.

Should you have any questions please do not hesitate to contact the undersigned.

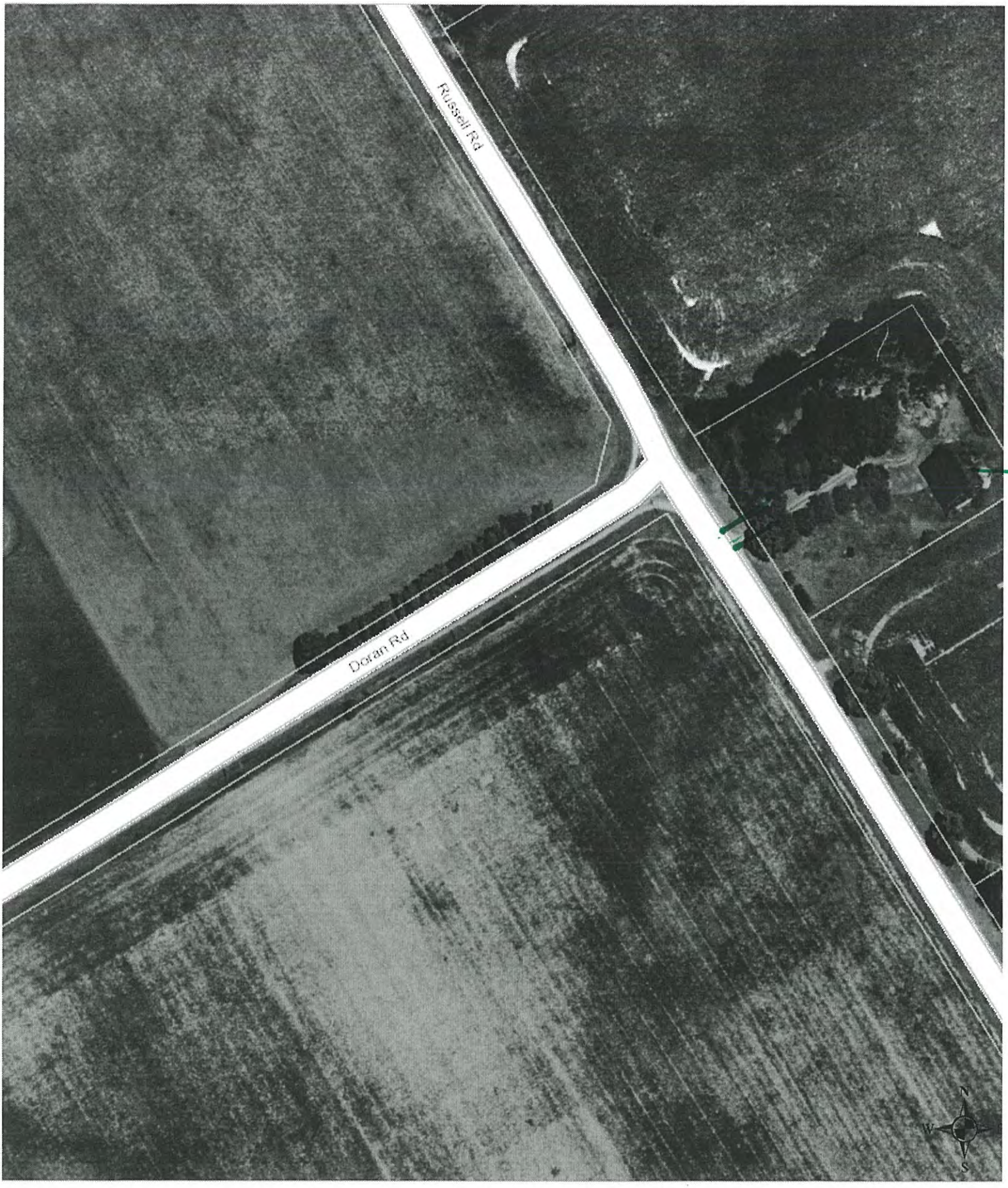
Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P.Eng.
President & CEO

# County of Simcoe - Web Map

2002 Plan used.




2422 Russell Rd

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0 0.035 0.07 0.14 km

1:2,257

COUNTY OF SIMCOE

September 12, 2018

# County of Simcoe - Web Map

2016 map shows our home

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1:2,257

COUNTY OF SIMCOE

September 12,

Township of Springwater

# Midhurst 20/20

## Overview of the Midhurst Secondary Plan

SPRINGWATER.CA
THIS IS WHATS AVAILABLE ON LINE

May 2013

# Bringing Clarity to the Midhurst Secondary Plan

Over a significant period of time, there has been wide ranging discussion regarding the Midhurst Secondary Plan (MSP). In order to determine if the Plan conformed to Provincial Policy and County of Simcoe Official Plan, the Ontario Ministry of Municipal Affairs and Housing (MMAH) appealed the Midhurst Secondary Plan to the Ontario Municipal Board (OMB). Common to any legal proceedings, communication was minimized during these proceedings. Part of the lack of clarity around the MSP occurred with the appeal by the MMAH. This document and associated materials as well as Township of Springwater sanctioned meetings will bring clarity to issues surrounding the MSP.

## History of MSP

Approximately 10 years ago the Township of Springwater began its work on the Midhurst Secondary Plan for the Midhurst Settlement Area. Settlement Areas are identified areas in municipalities where historic growth has occurred and where future growth is planned.

**Background:**

- A settlement area for Midhurst was first developed in 1983 under the Township of Vespra.
- In 1992, the Township of Vespra started to review their Official Plan. Midhurst was identified as the primary growth centre in the Vespra Plan.
- In 1993, through the approval of the new Vespra Official Plan, the need for a Secondary Plan was identified for the Midhurst Settlement Area prior to any significant growth.
- In 1996 a Growth Management Strategy was undertaken, which outlined the Settlement Area that we see today – Elmvale and Midhurst were identified as locations for most of the future growth for Springwater.
- February 19, 1998, the Township of Springwater Official Plan was approved establishing the Settlement Area Boundaries for Midhurst.
- The Official Plan also required that a Secondary Plan along with supplemental studies and a public process be undertaken prior to considering any significant development.
- In 2004, Springwater started a process to update its Official Plan including the Midhurst Settlement Area.

The Ontario Municipal Board (OMB) is a legal tribunal where disputes regarding certain municipal decisions are resolved.

- The Township of Springwater had numerous public meetings and open houses to present ideas and solicit feedback from residents. These included:
    - Public Information Meeting on May 6, 2004
    - Midhurst Stakeholder Meeting November 10, 2005
    - Resident Facilitation Meeting March 30, 2006
    - Public Community Design Session November 15 and 16, 2007
    - Design Workshop August 5, 2008
    - Statutory Public Open House August 28, 2008
    - Statutory Public Meeting September 8, 2008

- A Phase 1 and Phase 2 Class Environmental Assessment (EA) study was commenced in June of 2008 and completed in July of 2009.
- The Class EA identified:
    - Water, sewer and transportation servicing opportunities and challenges
    - Potential alternatives and preferred alternatives

- Council approved the Midhurst Secondary Plan on November 3, 2008.
- County of Simcoe approved the Midhurst Secondary Plan with modifications on October 12, 2011.
- MSP was appealed to the OMB by the MMAH as well as five individual landowners.

## Why was the Midhurst Secondary Plan Appealed to the Ontario Municipal Board by the Ontario Ministry of Municipal Affairs and Housing (MMAH)?

Provincial and County of Simcoe policies govern growth in Springwater. These include:

- Provincial Policy Statement
- Growth Plan for the Greater Golden Horseshoe (Places to Grow)
- Simcoe County Official Plan

The MMAH appealed the MSP to ensure it is consistent with the Provincial and County policies as noted above.

There were five private appeals related to how the secondary plan designates their specific properties. These are considered "site specific" appeals.

An **appeal** to a plan is not the same as being **opposed** to a plan. An appeal allows time for an issue to be brought to a higher planning authority (OMB) to enable discussion, and potentially, the development of a resolution.

## Ontario Ministry of Municipal Affairs and Housing (MMAH) Withdraws Part of Their Appeal to the MSP

On November 28, 2012, the appeal was withdrawn by the MMAH because the plan was deemed consistent with Provincial policy. The withdrawal of the appeal allows for the release of 300 hectares (741 acres) of land for residential development. This withdrawal also allows all industrial, commercial and institutional lands to be developed.

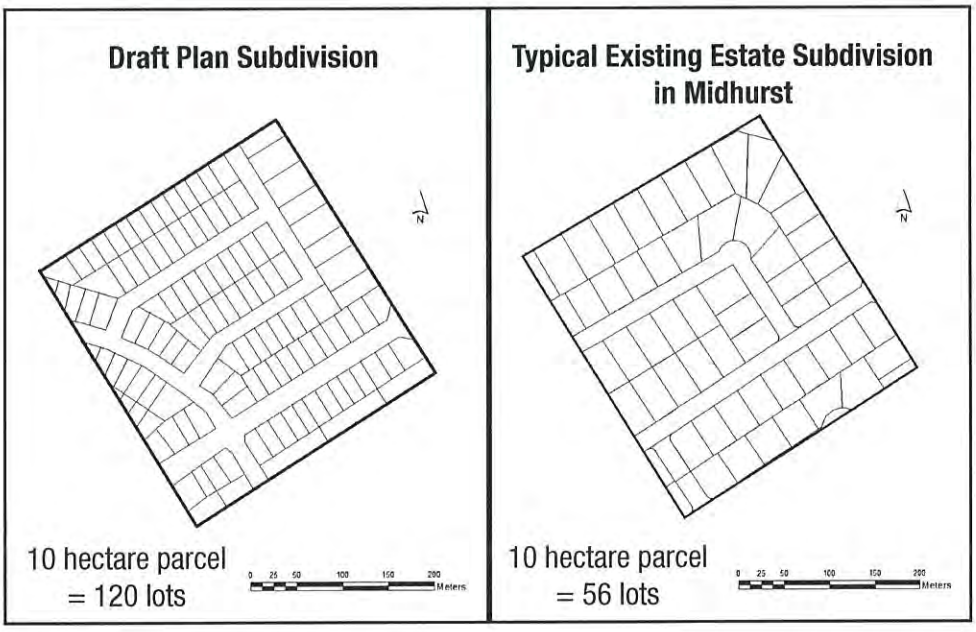
The remainder of the lands in the MSP will be released for development when additional population is required and allocated by the County of Simcoe. It is anticipated that future allocations will not occur for approximately 15–25 years.

As of November 28, 2012, the Midhurst Secondary Plan is in effect. As recently as March 2013, the OMB determined that no further appeals of the Midhurst Secondary Plan would be permitted.

## New Density Standards Established by Provincial Policy

Historically, residential development in Midhurst consisted of large lots on septic systems. Provincial policy establishes new density and servicing standards for development.

New development will now be on both sewer and water services. For efficient use of services, higher densities are required. Higher densities will also reduce the need for unnecessary consumption of farmland. Provincial policy also requires a range of housing types and sizes so that more housing is available.



148ha + 152ha / EA phase 3+4
page 3

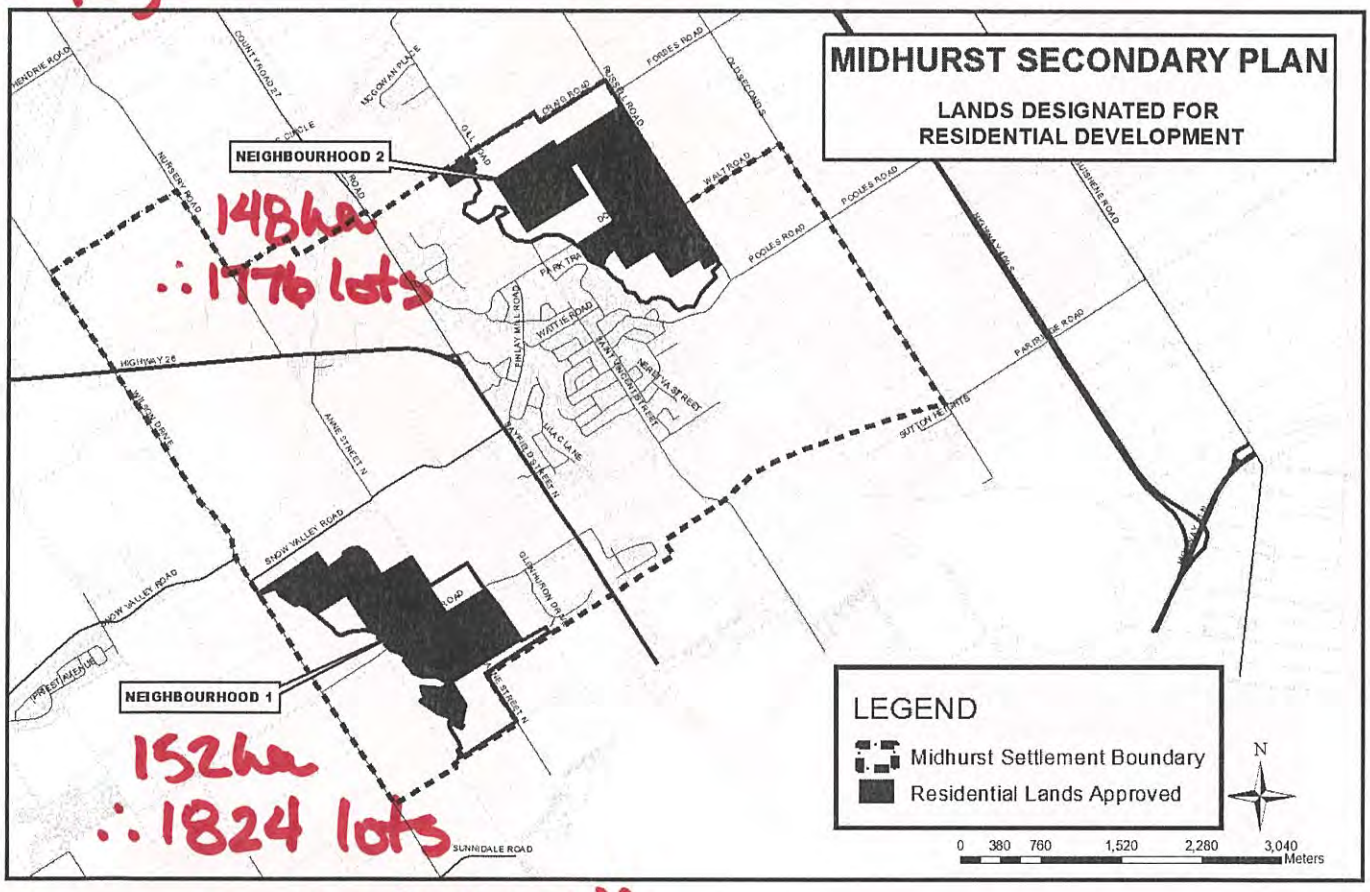


## The Midhurst Secondary Plan is a Long Range Plan

The Midhurst Secondary Plan is clear that development will occur over a long period of time. The first phase allows for 3,850 homes (225 hectares of land area). Before additional growth is permitted, Springwater Council must be satisfied that enough homes are being sold and jobs are being created to justify the development of the second phase. Again, it is anticipated that the second phase would not occur for approximately 15–25 years.

The map below illustrates the 300 hectares of land that is permitted to develop.

per page 4 10ha = 120 lots




EXISTING CONDITIONS
148ha = 829 lots
152ha = 851 lots



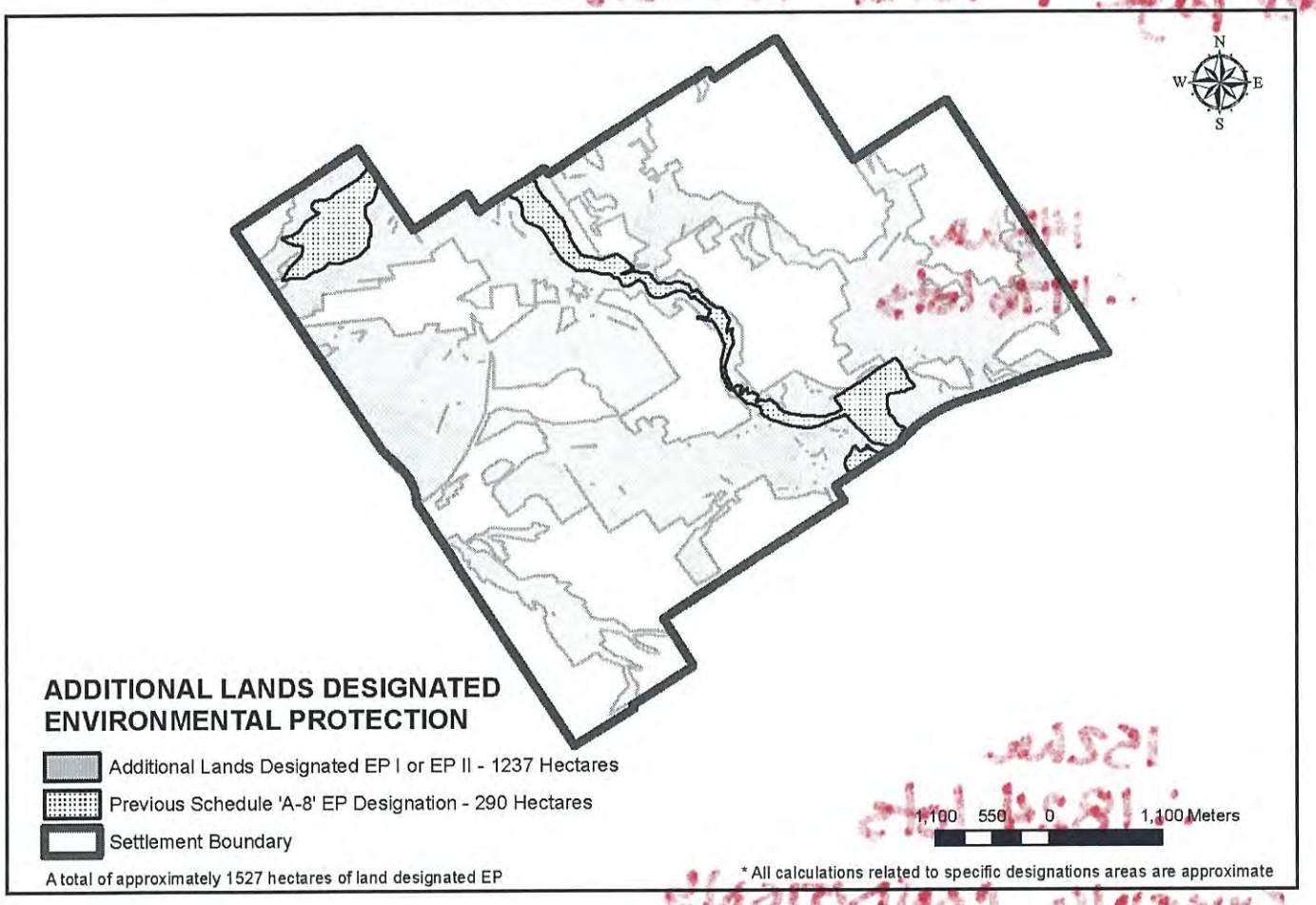
Township of Springwater

# Protection of the Environment is a Top Priority

While developing the MSP a top priority was to protect all environmentally significant lands. Through consultation with the Ontario Ministry of the Environment and the Nottawasaga Valley Conservation Authority, 1,527 hectares of land was designated for environmental protection to preserve natural heritage features and provide for environmental corridors.

**MIDHURST SECONDARY PLAN**

Additional Lands Designated Environmental Protection



PRINT TRAFFIC STUDY PLAN USING CRAIG RD. EXTENSION.

## How will the Midhurst Secondary Plan Impact the Existing Road Network?

Some upgrades to existing roads, including the construction of new roads, will be required as a result of increased traffic. Some of the upgrades include urbanization and reconstruction of parts of: Pooles Road, Russell Road, Doran Road, St. Vincent Street, Findlay Mill, Gill Road, Snow Valley, Carson Road, Anne Street and Wilson Road. These roads will remain as two lane roads. The work being done focuses on improvements to the road layout, construction of curbs and storm sewers.

New roads proposed include Craig Road from Russell Road to County Road 27, extension of St. Vincent Street north, widening of County Road 27 from County Road 26 to Craig Road and the widening of Wilson Road.

## Creation of the Resident Liaison Group

A liaison group is being formed to provide input on the environmental assessment process and subdivision applications related to the Midhurst Secondary Plan.

Township of Springwater

**Township of Springwater**
2231 Nursery Road
Minesing, Ontario
705-728-4784
**www.springwater.ca**

May 2013

The Township of Springwater
Midhurst Water, Wastewater & Transportation
Class Environmental Assessment (Phase 4)

**Revised Notice of Completion of Environmental Study Report (ESR) & Open House**

The Township of Springwater is continuing with Phase 4 of the Class Environmental Assessment (Class EA) Planning Process to determine the specific water, wastewater and transportation infrastructure requirements to accommodate the future growth within the Midhurst Secondary Plan, in accordance with the "Midhurst Master Plan – Phase 1 & 2 - Water, Wastewater & Transportation, dated July 2009." The Master Plan, which is available on the Township's website at www.springwater.ca/msp_ea, identified the infrastructure that will be required and also concluded that Phases 3 and 4 of the Class EA process needed to be completed.

Phase 4 of the Class EA process will follow the planning and design process for Schedule 'C' projects as described in the Municipal Class Environmental Assessment Document (October 2000 as amended in 2007, 2011 & 2015), published by the Municipal Engineer's Association. However, in order to augment the Class EA process, the Township has determined that a Phase 4 Public Open House should be held in conjunction with the public review period.

The draft Environmental Study Report (ESR) has been completed and by this Notice, is being placed in the public record for review and comment. Subject to comments received as a result of this Notice (and Open House) and the receipt of necessary approvals, the Township intends to proceed with the design and construction of the identified servicing infrastructure including:

- New water system(s) to service the proposed growth within the Midhurst Secondary Plan including new wells, water treatment facility, high lift pumps or booster stations, water storage reservoirs and distribution systems including transmission mains;
- New Wastewater Treatment & Collection System (including sanitary collection systems, pump stations, treatment plant and effluent outfall) to service the proposed growth within the Midhurst Secondary Plan with the capability of servicing the existing Midhurst area, if required;
- Upgrading/Reconstruction of existing roads and intersections throughout the existing community;
- Construction of a new Craig Road (2 lanes) from County Rd. 27 to Russel Road including a direct connection to Forbes Road; and
- Upgrading of the Forbes Road and Highway 400 Interchange.

The Environmental Study Report is currently available on the Township website at www.springwater.ca/msp_ea, along with a hard copy being available at the Township of Springwater Administration Centre.

The formal public review period associated with the draft Environmental Study Report (ESR) has been increased to 90 days (Tues. Jun. 19 to Tues. Sept. 18, 2018). In addition, an Open House is arranged for **6:00pm to 9:00pm on Monday, June 18, 2018** at Snow Valley Resort (2632 Vespra Valley Road). The purpose of this Open House is to provide an overview of the material within the Environmental Study Report. This Open House will predominantly be an informal drop in format and Display Boards will be available with representatives of the Project Team to answer individual questions in a one-on-one format, relating to the proposed Water, Wastewater & Transportation Infrastructure. A formal presentation will be made between **7:30pm to 8:00pm** followed by a question and answer period.

If you have any outstanding concerns about this project, please address them to the following individuals prior to 4:00pm on Tuesday, September 18, 2018:

Ms. Heather Coleman
Director of Public Works
Township of Springwater
2231 Nursery Road, Minesing, ON L9X 1A8
Email: midhurst.classea@springwater.ca

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Pky, Collingwood, ON L9Y 4J5
Email: midhurst.classea@ainleygroup.com

If concerns regarding this project cannot be resolved in discussion with the Township, the person with the concern(s) may request that the Minister of the Environment and Climate Change (MOECC) order a change in the project status and require a higher level of assessment under an Individual Environmental Assessment process (referred to as a Part II Order). To submit such a request, please

IMG_2452.jpg



send a completed *"Part II Order Request form"*, available on the Township and/or MOECC website, along with any supporting information to all three of the following individuals:

Minister
Ministry of the Environment
and Climate Change
Ferguson Block, 77
Wellesley St. W, 11th Floor,
Toronto, ON M7A 2T5
Minister.MOECC@ontario.ca

Director, Environmental
Assessment and Permissions
Branch
Ministry of the Environment and
Climate Change
135 St. Clair Ave W, 1st Floor
Toronto, ON M4V 1P5
MOECCpermissions@ontario.ca

Ms. Heather Coleman
Director of Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON L9X 1A8
midhurst.classea@springwater.ca

If no requests are received **by 4:00pm on Tuesday, September 18, 2018,** the Township may proceed to carry out design and construction of the project as presented in the planning documentation.

Please note that all personal information included in a Part II Order submission – such as name, address, telephone number and property location – is collected, maintained and disclosed by the Ministry of the Environment and Climate Change for the purpose of transparency and consultation. The information is collected under the authority of the Environmental Assessment Act or is collected and maintained for the purpose of creating a record that is available to the general public as described in s.37 of the Freedom of Information and Protection of Privacy Act. Personal information you submit will become part of a public record that is available to the general public unless you request that your personal information remain confidential. For more information, please contact the Ministry's Freedom of Information and Privacy Coordinator at 416-327-1434.

This revised notice is issued on June 15, 2018.

9/18/2018

https://mail.google.com/mail/u/0/#inbox/165ecd2c75dc34c6?projector=1&messagePartId=0.1

**Ministry of the Environment and Climate Change**

Environmental Assessment and Permissions Branch

135 St. Clair Avenue West
1st Floor
Toronto ON M4V 1P5
Tel.: 416 314-8001
Fax: 416 314-8452

**Ministère de l'Environnement et de l'Action en matière de changement climatique**

Direction des évaluations et des permissions environnementales

135, avenue St. Clair Ouest
Rez-de-chaussée
Toronto ON M4V 1P5
Tél : 416 314-8001
Téléc. : 416 314-8452

Ontario

October 3, 2018

Rick and Michele Bowman
[redacted]

Dear Mr. and Ms. Bowman:

Thank you for your correspondence sent on September 9, 2018 to the Minister of the Environment, Conservation and Parks regarding the Midhurst Water, Wastewater, and Transportation Servicing Phase 3 and 4 Environmental Study Report proposed by the Township of Springwater.

It is the understanding of the Ministry of the Environment, Conservation and Parks that the project was developed under the Master Plan procedures of the Municipal Class Environmental Assessment. The project contains multiple individual undertakings that are classified as Schedule C projects in the environmental study report.

The various undertakings within the Master Plan include:

- New water system(s) to service the proposed growth within the Midhurst Secondary Plan including new wells, water treatment facility, high lift pumps or booster stations, water storage, reservoirs and distribution systems including transmission mains;
- A new wastewater treatment and collection system (including sanitary collection systems, pump stations, treatment plant and effluent outfall) to service the proposed growth within the Midhurst Secondary Plan with the capability of servicing the existing Midhurst area, if required;
- Upgrading/Reconstruction of existing roads and intersections throughout the existing community;
- Construction of a new Craig Road (2 lanes) from County Road 27 to Russell Road including a direct connection to Forbes Road; and
- Upgrading of the Forbes Road and Highway 400 Interchange.

These undertakings are detailed in the Project's environmental study report that can be accessed here:
http://www.springwater.ca/UserFiles/Servers/Server_229/File/Municipal%20Services/Planning%20and%20Development/Midhurst%20Secondary%20Plan/Environmental%20Assessment/Midhurst%20Class%20EA%20-%20ESR%20-%20V1.pdf

The Municipal Class Environmental Assessment requires that requests for a Part II Order must be in the context of specific projects, and not for the Project Master Plan Study Report itself, or a secondary plan. Please note that the Midhurst Secondary Plan is a separate and distinct process under the Planning Act, and is beyond the scope of this Master Plan.

In your letter, you identified concerns with the potential increase of carbon dioxide emissions and impacts to groundwater in the study area. We require your clarification as to which class environmental assessment project(s) you are referencing in your correspondence. We ask that you clarify which project(s) you are concerned with by **October 15, 2018**. You can contact Callee Robinson, Project Evaluator, directly at 416-314-0286 or at Callee.Robinson@ontario.ca.

Thank you for taking the time to share your concerns with the project.

Yours sincerely,

Kristina Rudzki.

Kristina Rudzki
Supervisor, Project Review Unit
Environmental Assessment and Permissions Branch

c: Heather Coleman, Township of Springwater
Joe Mullan, the Ainley Group

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## BOWMAN - PART II ORDER RESPONSE

| | |
|---|---|
| **PROPONENT:** | **Township of Springwater** |
| **PROJECT TITLE:** | **Midhurst Phase 3 & 4 Class EA (Water, Wastewater & Transportation)** |
| **PROJECT LOCATION:** | **Midhurst Secondary Plan Area – Township of Springwater, ON** |
| **PREPARED BY:** | **Joe Mullan, P.Eng. - Ainley Group** |
| **DATE SUBMITTED TO MECP** | **October 26, 2018** |
| **PHONE # and E-MAIL:** | **(705) 445-3451, mullan@ainleygroup.com** |

| Issues and Concerns | Proponent Response | Status |
|---|---|---|
| **Concern about plan for signalized intersection at Russel Road and Doran Road – immediately adjacent to her property.**<br><br>**Draft Plan dated April 22, 2014 does not show her house. Can be confusing for review agencies.** | The Draft Plan of Subdivision was complied by the Developers representatives for the purpose of obtaining Planning approval, which is a separate and distinct process and unrelated to the Class Environmental Assessment process.<br><br>In response to a concern raised by Ms. Bowman, following the Oct 18, 2016 PIC, regarding the aerial mapping being used within the Class EA in the vicinity of the Bowman property, we updated the aerial mapping as noted in our Mar. 3, 2017 correspondence with Ms. Bowman (Appendix Y of the ESR). | We have communicated with Ms. Bowman throughout the Class EA process regarding her issues and unfortunately, we do not feel any further communication with her will change her mind on any of her issues. |
| **Secondary plan population/density creates excessive traffic – no jobs or public transportation. 10,000 commuters located within two farm fields.** | Concerns related to population, density & jobs are Planning related matters which were dealt with through the adoption of the Midhurst Secondary Plan in 2012 and subsequent approvals by the County and the Ontario Municipal Board, all in accordance with the Planning Act. As such these items are beyond the scope of this Class Environmental Assessment process.<br><br>In accordance with the traffic modelling and analysis that was completed in the Class EA (Section 7 of the ESR) the proposed traffic will not be excessive and can be accommodated with the proposed transportation improvements identified. Further, the Class EA discusses the possibility of a future public transit network and confirms that the proposed road network could accommodate public transit should the Township wish to implement a transit system in the future. | |
| **Amount of carbon dioxide emissions and groundwater pollution will have adverse effects on neighbouring farmland – air quality and traffic on road that currently moves tractors and farm equipment.** | The proposed transportation network (Section 7 of the ESR) are designed to facilitate efficient traffic movement and therefore will minimize emissions from future traffic. Further it is noted that Russell Road currently handles all types of vehicular traffic - not just "…tractors and farm equipment."<br><br>The Bowman's were notified that the proposed widening of Russell Road will not occur until Phase 2 (after 2031) and that the taking of property along the east side of Russell Road in front of the Bowman | |

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## BOWMAN - PART II ORDER RESPONSE

| Issues and Concerns | Proponent Response | Status |
|---|---|---|
| | property is not required.<br><br>Traffic mitigation measures are presented in Appendix T 8 of the ESR including measures to protect groundwater from pollution.<br><br>It is not anticipated that the farm activities in the area will be affected by the proposed traffic on Russell Road. | |
| **Salt and sand will affect neighbouring farm land.** | Transportation mitigation measures are presented in Appendix T 8 of the ESR. | |
| **Proposed commercial area will draw traffic from Hwy 400.**<br><br>**Development will create commuter city – 1250 proposed multiple dwelling units which is greater density than other neighbourhoods in the Township.** | The make up of the Draft Plan of Subdivision(s) and in particular the location and type of commercial or multiple unit dwellings are Planning related matters which were dealt with through the adoption of the Midhurst Secondary Plan in 2012 and subsequent approvals by the County and the Ontario Municipal Board, all in accordance with the Planning Act. As such these items are beyond the scope of this Class Environmental Assessment process. | |
| **Four lane Russell Road will not promote biking or walking – unsafe.** | The proposed transportations improvements proposed for Russel Road include a multi-use trial that will be set back from the travelled portion of the roadway; therefore, creating separation from the pedestrians/cyclists and the vehicles utilizing Russell Road.<br><br>In addition, through the development of the subdivisions, the Township will ensure that connecting trails/sidewalks are constructed between Russel Road and the internal subdivision to allow for safe pedestrian movement in the area. | |
| **Different from other projects. No existing infrastructure and servicing (police, fire and hospital)** | The purpose of the Class EA is to identify, assess and select the best servicing solutions for water supply and treatment, wastewater treatment and effluent disposal and transportation upgrades to satisfy the Midhurst Secondary Plan. Although this may be perceived to be different from other projects in the Township, such a servicing study is common among un-serviced communities throughout the Province.<br><br>With regard to other municipal services (Fire, Emergency Services, Recreation, Library, etc.) the Township updated their Development Charges Bylaw in the spring of 2018 and included the Midhurst Secondary Plan growth projections, to ensure that all municipal services (hard & soft) are properly planned for. | |
| **EA has done nothing to lessen environmental impact on existing village.** | As noted above, the purpose of the Class EA is to identify, assess and select the best servicing solutions for water supply and treatment, wastewater treatment and effluent disposal and | |

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## BOWMAN - PART II ORDER RESPONSE

| Issues and Concerns | Proponent Response | Status |
|---|---|---|
| **Stormwater management will not be accomplished with density of units and size of lots with amount of traffic and associated run off. LID's are defined for urban centres but not for rural areas. EA fails in this regard.** | transportation upgrades to satisfy the Midhurst Secondary Plan. In that regard, it is considered that the proposed servicing projects which have been identified in the ESR do in fact lessen the environmental impact. Stormwater management and LIDs will be designed to Provincial Standards and Regulations.<br><br>It is believed that one of Ms. Bowman's concerns (as outlined on her marked-up copy of Fact Sheet # 4) is related to groundwater recharge. It is acknowledged that pre-development infiltration estimates highlighted on the Fact Sheet will be changed with the urban development. However, the NVCA require the development of the Midhurst Secondary Plan will:<br><br>a) Have a stormwater management system(s) to hold back the first 25 mm of storm runoff for a period of 48 hours;<br>b) Have a stormwater management system(s) to infiltrate back into the ground, close to the source, the first 20 mm of rainfall while also ensuring a healthy hydrologic cycle;<br><br>With the implementation of Low Impact Development (LID) measures on municipality owned property throughout the Midhurst Secondary Plan, to meet the aforementioned requirements, the stormwater flows will be infiltrated back into the ground close to the source. | |
| **Project is too large – many items have been missed.** | This is a Planning related matter which was dealt with through the adoption of the Midhurst Secondary Plan in 2012 and subsequent approvals by the County and the Ontario Municipal Board, all in accordance with the Planning Act. As such this item is beyond the scope of this Class Environmental Assessment process.<br><br>It is considered that no items have been missed with respect to the environmental impact associated with the provision of the proposed Water, Wastewater & Transportation servicing. | |
| **Requests that main road be located within development lands – no widening of Russell Road. Would eliminate need for traffic signals at Russell Rd and Doran Road.** | Roads such as Doran Road, Russell Road and Forbes Road are the original north-south and east-west grid roads and naturally form the collector and arterial road system for the overall area. The various subdivisions will have their minor collectors that connect to these key roads. As the various subdivision link to these roads they evolve into major collector and arterial roads.<br>The creation of the "major" north-south collector through the subdivisions, in lieu of upgrading Russell Road, would not be efficient, given the large number of residential driveways and side streets that intersect with Street A. In addition, this route would not provide an efficient transportation network to allow traffic to quickly access Hwy 400 which is the regional north-south link that will be utilized by a large majority of the vehicles travelling south of the Bayfield Street & Hwy 400 intersection and beyond.<br><br>Please note most of the vehicles wishing to travel to the northern portion of Barrie (north of the Bayfield Street & Hwy 400 intersection) will utilize the existing roads through Midhurst and not utilize Russell Road. | |

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## BOWMAN - PART II ORDER RESPONSE

| Issues and Concerns | Proponent Response | Status |
|---|---|---|
| **The project will cause groundwater impacts as the South Doran development is within a significant Groundwater Recharge Area. What is the specific natural groundwater runoff for the area and how is it impacted by the population density?** | See the previous comment relating to the groundwater recharge and the use of LID's. | |
| **Re: LIDs – "How is this accomplished and monitored" by MECP? LIDs are not monitored and are the responsibility of the property owners. Schools currently have LIDs and they are failing.** | In parallel with the completion of this Class EA, an Adaptive Monitoring and Management Plan is being developed, in conjunction with the NVCA, as part of the Midhurst Overall Drainage Plan. Baseline monitoring was initiated by Gartner Lee Limited in 2008 to characterize existing conditions in various watercourses that could be impacted by the development. Building on the data collected in 2008, Hutchinson (HESL) expanded the monitoring program and have collected baseline data since 2014. Baseline sampling is ongoing. Sampling includes collection and interpretation of water quality, flows, benthic invertebrates and fisheries at 16 sampling stations to identify any changes to surface water from the proposed methods of stormwater management, wastewater management or groundwater drawdown, and provide guidance for the design and any necessary mitigation of the future developments.<br><br>In addition, a large majority of the LID's will be within the Municipal owned property (road allowances park blocks, SWM blocks, etc.) such that they can be properly maintained by the Municipality. | |
| **Concerned about close proximity of her house to proposed townhouses.**<br><br>**Too many multi storied, multiple dwellings in Doran South**<br><br>**Draft Plan of Subdivision (Bowman attachments 4 and 4a) is different than plan submitted to OMB.**<br><br>**There is no school block shown on Draft Plan of Subdivision for Doran Road south development area.** | These are Planning related matters which were dealt with through the adoption of the Midhurst Secondary Plan in 2012 and subsequent approvals by the County and the Ontario Municipal Board, all in accordance with the Planning Act. As such these items are beyond the scope of this Class Environmental Assessment process. | |
| **There are many items that have been missed – relies on Agencies to review.** | Numerous review agencies have been circulated throughout the completion of the Class EA and have had a chance to review the Draft ESR. In particular, the MOECC conducted an extensive review | |

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## BOWMAN - PART II ORDER RESPONSE

| Issues and Concerns | Proponent Response | Status |
|---|---|---|
| | of the Draft ESR from April 2017 until April 2018 and provided a detailed letter (Appendix CC of the ESR) outlining the review comments. | |
| **Oct 15, 2018 Follow-Up Email from Ms. Bowman to Ms. Callee Robinson at MECP**<br><br>**Notes that the Class EA Phase 1 & 2 Report (published July 2009) referred to the development lands north of Doran Road and west of Russell Road as "Development Area 1", but that the current ESR refers to the same area as "Development Area."**<br><br>**Notes that the Class EA Phase 1 & 2 Report (published July 2009) referred to the development lands south of Doran Road and west of Russell Road and the development lands south of Walt Road and east of Russell Road as "Development Area 2", but that the current ESR refers to the same area as "Development Area."**<br><br>**Whereas on the Township website and Planning related Maps refer to both of these areas as "Neighbourhood 2".**<br><br>**Notes that the Class EA Phase 1 & 2 Report (originally published July 2009) referred to the development lands south of Snow Valley and west of Hwy 26 as "Development Area 3", but that the current ESR refers to the same area as "Development Area."**<br><br>**Whereas on the Township website and Planning related maps refer to this area as "Neighbourhood 1"** | When the Master Plan Phase 1 & 2 (see attachment No. 1) was initiated in 2008 (the report was finalized in Jul 2009) the Planning associated with the Secondary Plan had not been finalized and as such the Planning maps (see attachment no. 2) had not been created.<br><br>When we initiated the current Class EA Phase 3 & 4 process in 2013, the Secondary Plan had been approved and Planning related mapping (see attachment No. 2) had been created and the labelling of the development areas was slightly different from the 2009 Master Plan, as identified by Ms. Bowman. However, we felt it important to keep consistency between the Master Plan Report and Phase 3 & 4 Report; therefore, we continued to utilize the materials (maps, development projections, water and wastewater, flows, etc.) from the Master Plan, where appropriate. | |

## Fact Sheet # 4: Low Impact Development (LID)

**1)** Low Impact Development (LID) is an innovative stormwater management approach with a basic principle that is modeled after nature: manage rainfall at the source using uniformly distributed decentralized micro-scale controls. LID's goal is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source.

Techniques are based on the premise that stormwater management should not be seen as stormwater disposal. Instead of conveying and managing / treating stormwater in large, costly end-of-pipe facilities located at the bottom of drainage areas, LID addresses stormwater through a variety of methods through a typical new development. These landscape features, known as Integrated Management Practices (IMPs), are the building blocks of LID. Almost all components of the urban environment have the potential to serve as an IMP. This includes not only open space, but also rooftops, streetscapes, parking lots, sidewalks, and medians. LID is a versatile approach that can be applied equally well to new development, urban retrofits, and redevelopment / revitalization projects.

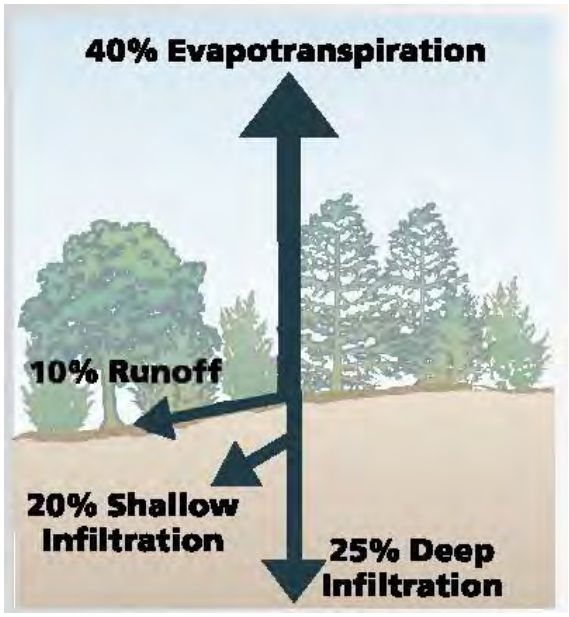
**2) LID Provides many environmental and economic Benefits**

- Improved Water Quality. Stormwater runoff can pick up pollutants such as oil, bacteria, sediments, metals, hydrocarbons and some nutrients from impervious surfaces and discharge these to surface waters. Using LID practices will reduce pollutant-laden stormwater reaching local waters. Better water quality increases property values and lowers government clean-up costs.
- Improved Groundwater Recharge. Runoff that is quickly shunted through storm sewers into Storm ponds and ultimately in water courses cannot soak into the ground. LID practices retain more rainfall on-site, allowing it to enter the ground and be filtered by soil as it seeps down to the water table.
- Reduced Number of Costly Flooding Events. In communities that rely on ditches and drains to divert runoff to local waterways, flooding can occur when large volumes of stormwater enter surface waters very quickly. Holistically incorporating LID practices reduces the volume and speed of stormwater runoff and decreases costly flooding and property damage. Restored Aquatic Habitat. Rapidly moving stormwater erodes stream banks and scours stream channels, obliterating habitat for fish and other aquatic life. Using LID practices reduces the amount of stormwater reaching a surface water system and helps to maintain natural stream channel functions and habitat.

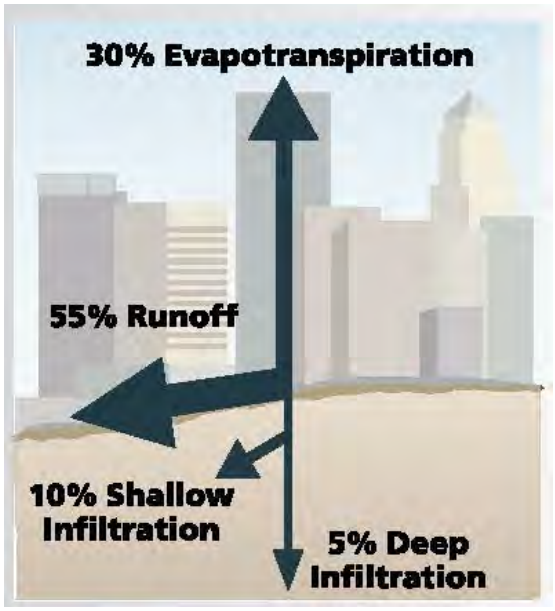
## Fact Sheet # 4: Low Impact Development (LID)

- Enhanced Neighborhood Beauty. Traditional stormwater management infrastructure includes unsightly pipes, outfalls, concrete channels and fenced basins. Using LID broadly can increase property values and enhance communities by making them more beautiful, sustainable and wildlife friendly.

When implemented broadly, LID can also mitigate the urban heat island effect (by infiltrating water running off hot pavements and shading and minimizing impervious surfaces), mitigate climate change (by sequestering carbon in plants), save energy (from green roofs, tree shading, and reduced/ avoided water treatment costs), reduce air pollution (by avoiding power plant emissions and reducing ground-level ozone), increase property values (by improving neighborhood aesthetics and connecting the built and natural environments), and increase groundwater recharge, potentially slowing or reversing land and well field subsidence.




Typical Pre-Development Stormwater Flows

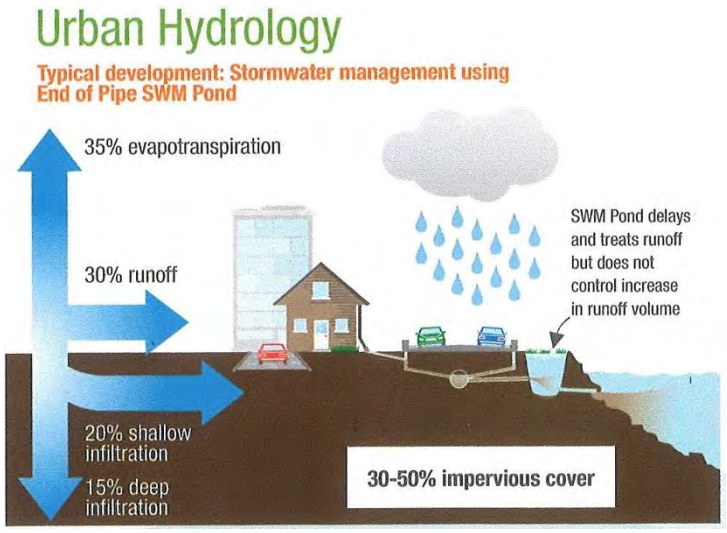



Typical Post-Development Stormwater Flows with No LIDs

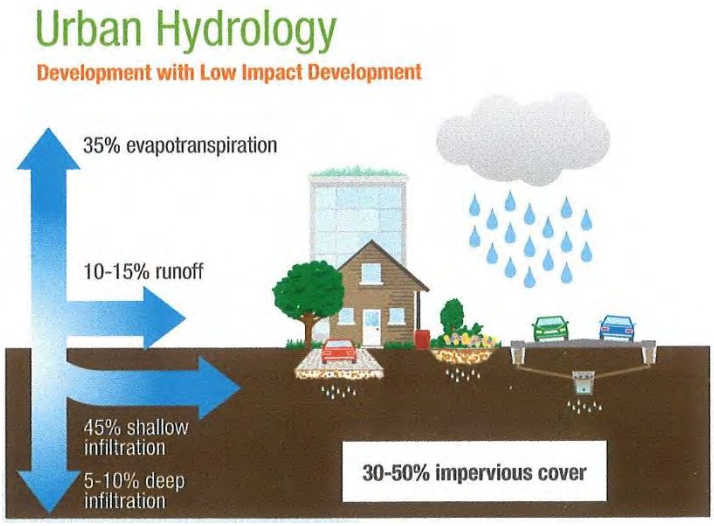
## Fact Sheet # 4: Low Impact Development (LID)

**Typical Natural Ground Pre-Development**

**Typical Urban Development without LID's**




**Typical Urban Development with LID's**



## Fact Sheet # 4: Low Impact Development (LID)

**3)** Although not mandated by MOECC requirements, LIDs are being heavily promoted by most Conservation Authorities including Nottawasaga Valley (NVCA), Credit Valley (CVC), Toronto Region (TRCA) and Lake Simcoe (LSRCA) for new developments.

**4)** LIDs will be implemented throughout the Midhurst Secondary Plan to achieve:

- The ability of the stormwater management system to hold back the first 25 mm of storm runoff for a period of 48 hours.
- Reduce the Post-Development phosphorous loading to below Pre-Development loading levels, such that when the additional phosphorous load from the new Wastewater Treatment Plant (WWTP) is included, there shall be no net increase.
- The ability of the stormwater management system to infiltrate back into the ground, close to the source, the first 20 mm of rainfall while also ensuring a healthy hydrologic cycle.

**5)** In summary the implementation of Low Impact Development measures through the Midhurst Secondary Plan is an environmentally sound technology and economically sustainable approach to reduce the impacts of development and help to protect the local environment, protect public health, and improve community livability.

**Reid Mitchell**

**From:** Michele Bowman <[redacted]>
**Sent:** November-05-18 2:54 PM
**To:** Callee.Robinson@ontario.ca
**Cc:** mullan@ainleygroup.com; heather.coleman@springwater.ca; mitchell@ainleygroup.com
**Subject:** Re: Part II Order Request - Midhurst Water, Wastewater, and Transportation Class EA

Hello Callee,
Thank you for your response. I do understand that the class environmental assessment process is a separate and distinct process from the Midhurst Secondary Plan. However the Midhurst Secondary Plan is what generates the concerns noted in my Part II Order Response. The traffic created by the density in the areas (North and South Doran Road lands) noted in my emails above creates excessive carbon dioxide emissions in an area that holds no future jobs or public transit making these lands a commuter subdivision with excessive CArbon Dioxide Emissions along side a 400 series highway adding to it's congestion.

These lands have greater density than any other settlement boundary within Springwater Township (relating again to the Midhurst Secondary Plan). Please refer to the Current and Potential Growth: 2018 noted as attachment 3.

Intensifying this issue is the fact these same lands are lands that are located within a Simcoe County "Wellhead Protection Area". Low Impact Development has been proposed however this type of stormwater control relies on the property owner to provide maintenance which the Township of Springwater can not guarantee will be completed. There is minimal green space and yard space proposed for this area. Property owner's always build a shared fence line that runs right down the swale line between properties as well as landscaping preventing the stormwater management design to be effective. Please refer to Well Head Protection Plan from Simcoe County noted as attachment same.

The letter you have attached from Ainley and Associates does not note anything with regards to Doran and Russell area in terms of the proposed four lanes of traffic. This was part of a presentation and a report done earlier than October 26, 2018. The letter you have attached only gives a synopsis of what is happening in the area of North and South Doran and does n't provide a complete picture or the impact on the environment in this area.

I do understand that Part II Order may not be clear. Please contact me should you have any questions.

Kindest regards,
Michele Bowman
[redacted]

On Mon, Oct 29, 2018 at 11:28 AM Robinson, Callee (MECP) <Callee.Robinson@ontario.ca> wrote:

> Hi Michele,

Thank you for your response.

To clarify, The class environmental assessment process is a separate and distinct process from the Midhurst Secondary Plan. The class environmental assessment is a process that the municipality must complete under the Environmental Assessment Act, to plan their water, wastewater, and transportation servicing for a certain area and evaluate any potential environmental impacts. The proposed projects include:

- New water system(s) to service the proposed growth within the Midhurst Secondary Plan including new wells, water treatment facility, high lift pumps or booster stations, water storage, reservoirs and distribution systems including transmission mains;

- A new wastewater treatment and collection system (including sanitary collection systems, pump stations, treatment plant and effluent outfall) to service the proposed growth within the Midhurst Secondary Plan with the capability of servicing the existing Midhurst area, if required;

- Upgrading/Reconstruction of existing roads and intersections throughout the existing community;

- Construction of a new Craig Road (2 lanes) from County Road 27 to Russell Road including a direct connection to Forbes Road; and

- Upgrading of the Forbes Road and Highway 400 Interchange.

I have attached a list of the specific road, water, and wastewater infrastructure projects that are proposed for this undertaking, and was hoping that you could clarify which of those projects you are requesting a Part II Order for.

Under the Municipal Class Environmental Assessment, a Part II order request cannot be submitted for a master plan and must be requested in the context of specific projects. I believe the site plans which you've referenced are related to the secondary plan.

If you have any questions at all, please feel free to give me a call and I would be happy to explain further.

Thanks,

**Callee Robinson** | Project Evaluator

Project Review Unit | Environmental Assessment and Permissions Branch

Ministry of the Environment, Conservation and Parks

416-314-0286

Please consider the environment before printing this email.

If you have any accommodation needs or require communication supports or alternate formats, please let me know.

Si vous avez des besoins en matière d'adaptation, ou si vous nécessitez des aides à la communication ou des médias substituts, veuillez me le faire savoir.

**From:** Michele Bowman [mailto:[redacted]]
**Sent:** October-15-18 8:04 AM
**To:** Robinson, Callee (MECP)
**Cc:** mullan@ainleygroup.com; heather.coleman@springwater.ca
**Subject:** Re: Part II Order Request - Midhurst Water, Wastewater, and Transportation Class EA

Hi Callee,

Thank you for your response and time spent reviewing this request.

I have looked at the ESR from the Springwater Website as well as the link you have provided what I have found is noted below.

Bell-Coutts-Rusdor Lands (Located within the Significant Ground Water Recharge Area)

SP-T-1001

Part of Lots 13 & 14, Conc. 3, Springwater Township.

Known as Neighbourhood 2

Additional references for this site are:

Springwater Zoning file ZB-20131-008

Springwater Subdivision file SP-T-1003 as attached

In EA report phase 1 and 2 it is referred to as Development Area 2 in the ESR it is noted as Development Area

Midhurst Heights (Midhurst Rose Alliance Obrien Inc.)

SP-T-0904

SP-T-0705

SP-T-0703

There are 8 case numbers for this site north of Doran Road. I have only found 3 Site Plan references.

Part of lots 11 & 12, Conc. 3, Springwater Township.

In EA report phase 1 and 2 it is referred to as Development Area 1 in the ESR it is noted as Development Area

However it is important to note that the Springwater website shows a map with Carson Road Developments as Neighbourhood 1 and North and South Doran Road Developments as Neighbourhood 2.

Kindest Regards,

Michele Bowman

On Wed, Oct 3, 2018 at 11:22 AM Robinson, Callee (MECP) <Callee.Robinson@ontario.ca> wrote:

Hi Michele,

Further to my previous letter, please see the attached clarification letter. We ask that you respond by **October 15th.**

Please let me know if you have any questions.

Thanks,

**Callee Robinson** | Project Evaluator

Project Review Unit | Environmental Assessment and Permissions Branch

Ministry of the Environment, Conservation and Parks

416-314-0286

Please consider the environment before printing this email.

If you have any accommodation needs or require communication supports or alternate formats, please let me know.

Si vous avez des besoins en matière d'adaptation, ou si vous nécessitez des aides à la communication ou des médias substituts, veuillez me le faire savoir.

---

**From:** Robinson, Callee (MECP)
**Sent:** September-19-18 3:27 PM
**To:** [redacted]
**Cc:** Joe Mullan; Heather Coleman
**Subject:** Part II Order Request - Midhurst Water, Wastewater, and Transportation Class EA

Hello,

Please see the attached letter for your records.

Thanks,

**Callee Robinson** | Project Evaluator

Project Review Unit | Environmental Assessment and Permissions Branch

Ministry of the Environment, Conservation and Parks

416-314-0286

Please consider the environment before printing this email.

If you have any accommodation needs or require communication supports or alternate formats, please let me know.

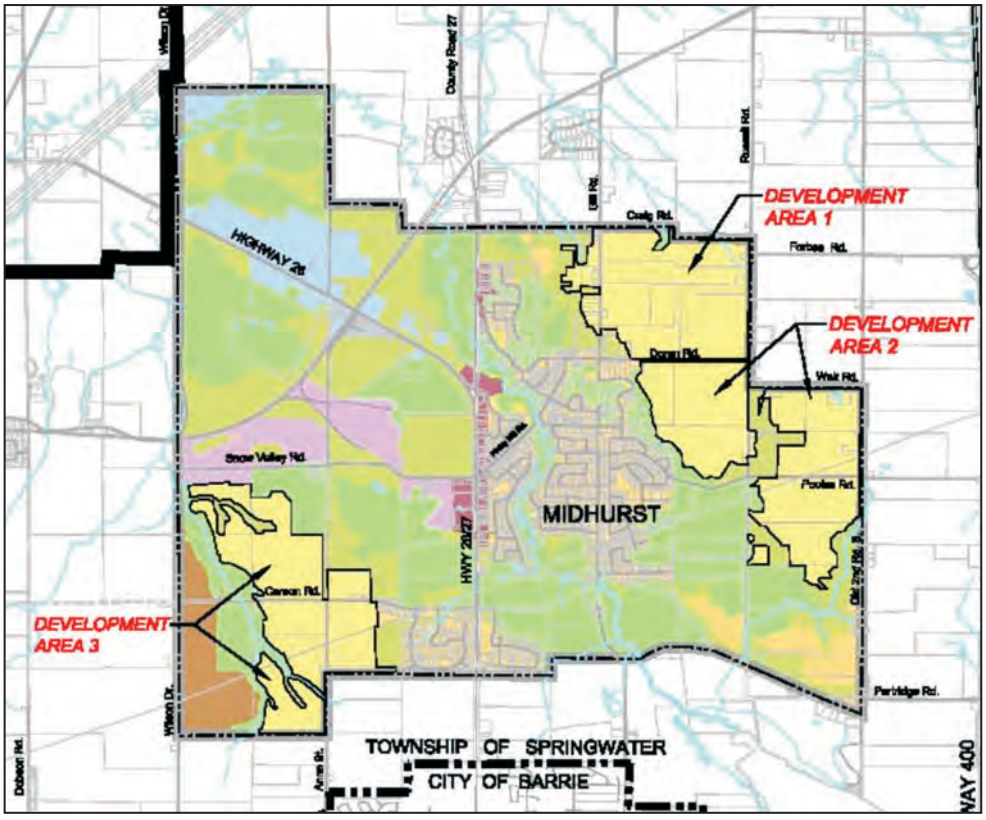
Si vous avez des besoins en matière d'adaptation, ou si vous nécessitez des aides à la communication ou des médias substituts, veuillez me le faire savoir.

**Bowman - Part II Order Response**
**Attachment No. 1**

## Township of Springwater

# Class Environmental Assessment Study for the Midhurst Water, Wastewater and Transportation Master Plan

# Phase 1 and 2 Report




**Ainley Group**
Consulting Engineers and Planners
280 Pretty River Parkway,
Collingwood, Ontario
L9Y 4J5

Telephone: 705-445-3451
Fax: 705-445-0968
www.ainleygroup.com

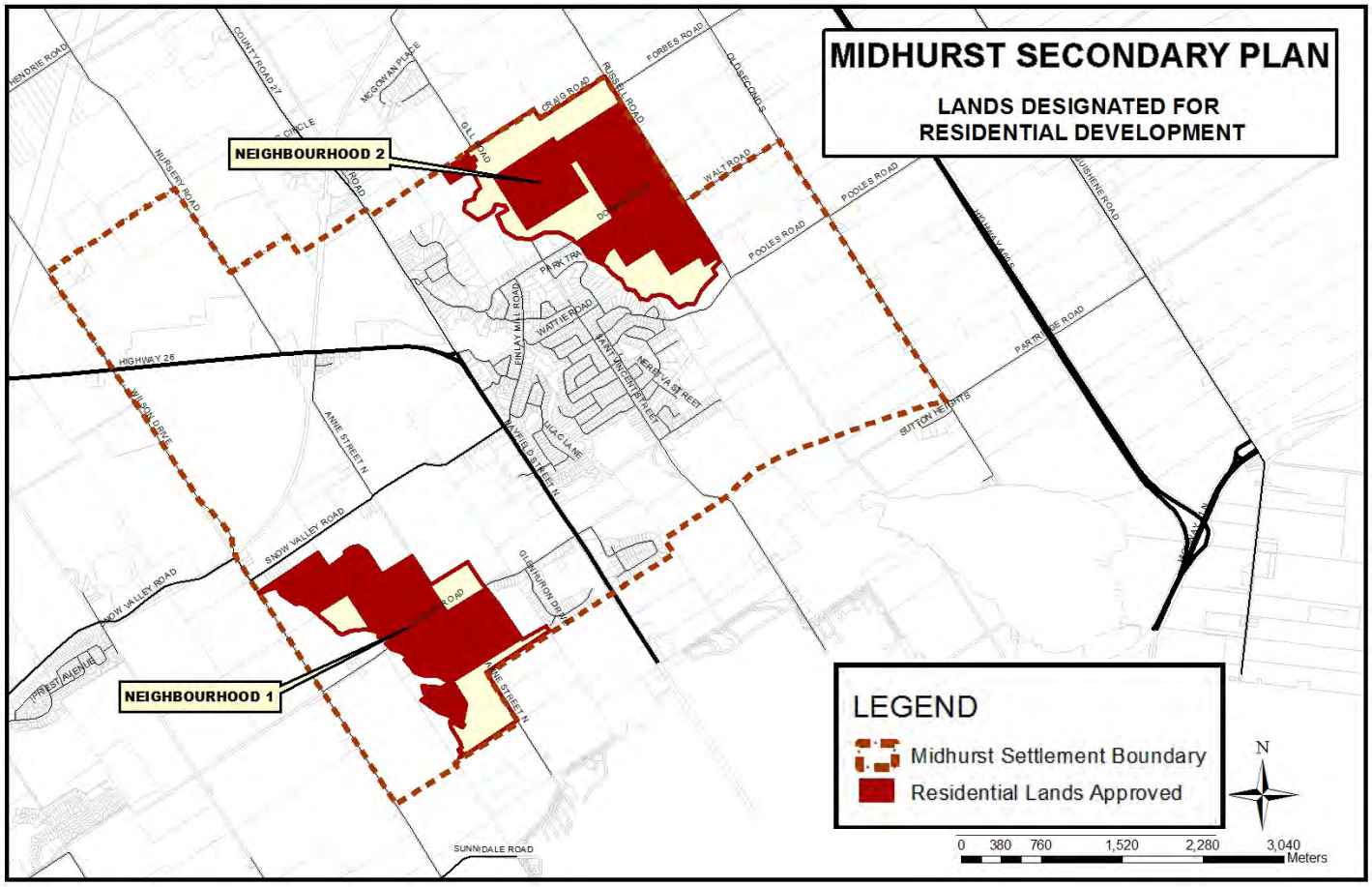
***File: 208017***
***July 2009***

Volume 1 of 2

# The Midhurst Secondary Plan is a Long Range Plan

The Midhurst Secondary Plan is clear that development will occur over a long period of time. The first phase allows for 3,850 homes (225 hectares of land area). Before additional growth is permitted, Springwater Council must be satisfied that enough homes are being sold and jobs are being created to justify the development of the second phase. Again, it is anticipated that the second phase would not occur for approximately 15–25 years.

The map below illustrates the 300 hectares of land that is permitted to develop.



Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, ON, L9Y 4J5
Tel: (705) 445-3451 ▪ Fax: (705) 445-0968
E-mail collingwood@ainleygroup.com

March 3, 2017

Mr. Rick Bowman
[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. Bowman:

On behalf of the Township of Springwater, we wish to thank you for your interest in the above-mentioned Class EA. We have reviewed your comments which were received following the October 18, 2016 Public Information Centre (PIC). Your comments/requests have been summarized and our responses are provided following each comment.

- *Concept of turning circle in front of his house is not acceptable. How much of our land will need to be taken to accommodate this?*

After reviewing the comments received the Recommended Alternative for the intersection of Russel Road and Doran Road is Signalization. In addition, we do not anticipate the need for any property acquisition on the east side of Russel Road in front of your property.

Thank you again for your interest in this Class EA.

Should you have any questions please do not hesitate to contact the undersigned.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P.Eng.
President & CEO

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, ON, L9Y 4J5
Tel: (705) 445-3451 ▪ Fax: (705) 445-0968
E-mail collingwood@ainleygroup.com

March 3, 2017

Ms. Kate Bowman
[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. Bowman:

On behalf of the Township of Springwater, we wish to thank you for your interest in the above-mentioned Class EA. We have reviewed your comments which were received following the October 18, 2016 Public Information Centre (PIC). Your comments/requests have been summarized and our responses are provided following each comment.

- *I don't think a turning circle or four lanes on Russell Road is appropriate. Our home is outside the settlement boundary we're impacted the most. Tractors, horses cyclists, walkers are on Russell Road daily.*

After reviewing the comments received the Recommended Alternative for the intersection of Russel Road and Doran Road is Signalization. The widening of Russell Road to 4 lanes is not needed until after Phase 2 proceeds which is anticipated after 2031.

Also, we do not anticipate any property takings along the east side of Russell Road.

Thank you again for your interest in this Class EA.

Should you have any questions please do not hesitate to contact the undersigned.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P.Eng.
President & CEO

Ministry of the Environment, Conservation and Parks

Office of the Minister

777 Bay Street, 5th Floor
Toronto ON M7A 2J3
Tel.: 416-314-6790

Ministère de l'Environnement, de la Protection de la nature et des Parcs

Bureau du ministre

777, rue Bay, 5e étage
Toronto (Ontario) M7A 2J3
Tél. : 416.314.6790

Ontario

357-2019-859

NOV 2 0 2019

Allison Graham
[redacted]

Dear Ms. Graham:

Thank you for your interest in the Midhurst Water, Wastewater, and Transportation Master Plan Class Environmental Assessment (Master Plan) as proposed by the Township of Springwater (Township). I welcome your comments on this Master Plan.

On September 10, 2018, you requested that the Township be required to prepare an individual environmental assessment for the projects contained within the Midhurst Water, Wastewater, and Transportation Master Plan. I am taking this opportunity to inform you that I have decided that elevating the project to an individual environmental assessment is not required.

In making this decision, I have given careful consideration to the Master Plan documentation, the provisions of the Municipal Class Environmental Assessment, the issues raised in your request, and relevant matters to be considered in subsection 16(4) of the Environmental Assessment Act.

Despite my not requiring an individual environmental assessment be prepared, in reviewing the requests and the Master Plan documentation, I have decided to impose conditions with respect to the projects in the Master Plan regarding species at risk, source water protection, and air quality impacts. These conditions are outlined in the attached letter to the Township.

I am satisfied that the issues raised in the Part II Order requests can be addressed by the work that is required to be carried out as a result of the conditions I have imposed and through additional permitting and approvals.

With this decision having been made, the Township can now proceed with the projects in the Master Plan subject to the conditions I have imposed, and any permits or approvals that are required. The Township must ensure it implements the projects in the manner they were developed and designed, as set out in the Master Plan documentation, and inclusive of all mitigating measures, and environmental and other provisions therein.

Again, I would like to thank you for participating in the Municipal Class Environmental Assessment process and for bringing your concerns to my attention.

Sincerely,

Jeff Yurek
Minister of the Environment, Conservation and Parks

Attachment

c: Heather Coleman, Director of Public Works, Township of Springwater

Lydia Bojeczko, MPP Liaison & Strategic Communications Advisor, Ministry of the Environment Conservation and Parks

EA File No. 18077 – Midhurst Water, Wastewater, and Transportation Master Plan Class Environmental Assessment

Ontario

Ministry of the Environment and Climate Change

# Part II Order Request

## General Information and Instructions

### General

Anyone who has outstanding environmental issues that have not been addressed through the Class Environmental Assessment process can request the Minister of the Environment and Climate Change to make an order under Part II of the Environmental Assessment Act. This is known as requesting a Part II Order.

A Part II Order request should be submitted after the proponent has issued the Notice of Completion for a Class Environmental Assessment for a project. The request should be submitted within the review period/comment period outlined in the Notice of Completion.

The Ministry recommends that you follow the process set out below before submitting a Part II Order request:

- Participate in the consultation opportunities provided to the public within the Class Environmental Assessment process
- Engage in discussions with the proponent to try to address and resolve your concerns

A Part II Order request should not be submitted for the sole purpose of delaying, stopping, or frustrating the planning and implementation of an undertaking proceeding under a Class Environmental Assessment process. The Minister may consider the efforts of the requester to resolve the concerns directly with the proponent when deciding whether to make an order.

Questions regarding the completion and submission of this form should be directed to a Customer Service representative at the Client Services and Permissions Branch at 416-314-8001 or 1-800-461-6290.

## Step 1 - Get the Facts

- Class Environmental Assessments are used for projects that the Ministry of the Environment and Climate Change considers routine, with predictable and manageable effects on the environment.
- A Part II Order request will not stop a project from proceeding. The Minister has four options when deciding a Part II Order request:
  - To request mediation between you and the proponent to help address your concerns before making a decision
  - To deny the request
  - To deny the request but require the proponent to fulfill additional conditions before the project can proceed, such as further studies or more public consultation
  - To require the proponent to conduct a higher review of the project through an Individual Environmental Assessment; this happens only in rare and exceptional cases.
- Key factors that the Minister may consider when looking at a Part II Order request are:
  - whether the project has the potential to pose significant adverse effects on the environment
  - how the project is significantly different from other projects in its class
  - whether the process for the Class Environment Assessment was adequate.

To learn more about Class Environmental Assessments visit https://www.ontario.ca/page/class-environmental-assessments-approved-class-ea-information.

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## Step 2 – Statement of Participation

☑ I have raised my concerns with the project proponent

Describe how and when you raised your concerns with the proponent and the proponent's response

This Part II order request relates to the Class environmental assessment (Class EA) regarding the wastewater treatment plan proposed with respect to the Midhurst Secondary Plan (MSP) in Springwater Township.

I emailed the proponent on November 6, 2016 expressing concern about the potential negative effects of pharmaceuticals and other household chemicals that will not be removed by the proposed wastewater treatment plant and, as a result, will be in the effluent proposed to be released into Willow Creek which currently provides about 11 percent of the inflow into the ecologically significant Minesing Wetands which are designated as Provincially Significant Wetlands (PSW) and a provincially significant life science Area of Natural and Scientific Interest (ANSI). I noted that the Minesing Wetlands consists of forested swamps, thicket swamps, marshes and fens. The Mad River and Willow Creek meet in the Nottawasaga River in the core of the Wetlands. The Wetlands is a habitat for more than 30 species of fish, a stopover habitat for numerous migratory birds including the sandhill crane, home to various rare indigenous birds including the blue-winged warbler, the blue-grey gnatcatcher, and the golden-winged warbler, and the only habitat in Canada for the Hines Emerald Dragonfly which is classified as endangered in the Species at Risk Act.

I observed that many questions were unanswered - apparently even unasked - by the Class EA process. For example, given that many pharmaceuticals, and other household chemicals, including endocrine disrupting compounds (EDCs), will not be removed from the effluent, will those chemicals settle in the slow moving water in the Wetlands, if so where, and with what effect, short-term and long-term, upon the plants and indigenous species such as the Hines Emerald Dragonfly which live in or near the water from Willow Creek? Will there be a dramatic concentrated effect near the mouth of Willow Creek - if so, for what distance, in what direction, and with what effect? Will there be an effect deeper in the Wetlands - if so, where, over what area, and with what effect? Shouldn't the potential harmful effect of pharmaceuticals and other chemicals in the effluent upon the Wetlands and its wildlife be studied carefully before these chemicals are discharged into the Wetlands on a continual daily basis?

I also requested the proponent to voluntarily elevate the class EA to an individual assessment given the special nature of the Minesing Wetlands which distinguishes the MSP from other wastewater treatment plant proposals that do not discharge into an environment that is as ecologically unique and potentially vulnerable to chemical pollutants.

The proponent's response was: (1) I should read the proponent's Fact Sheet entitled "Pharmaceuticals and Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs)"; (2) Class EAs have an extensive track record of addressing complicated matters ; and (3) the MOECC has the authority to elevate the assessment to an individual assessment at the end of the Class EA process.

☑ I was unable to have my concerns resolved by the project proponent

Describe what concerns remain outstanding and why these concerns could not be resolved through discussions with the proponent.

The proponent's response did not adequately address my concerns.

In the Fact Sheet referenced by the proponent, the proponent relied upon a 2011 World Health Organization (WHO) report entitled, "Pharmaceuticals in Drinking Water" for the proposition that pharmaceuticals in water do not present a danger to the environment in the Minesing Wetlands. The WHO report, however, explicitly states, "Scope: This report...does not discuss the potential impacts on aquatic ecosystems or the broader physical environment." The WHO report focused solely on human consumption of water containing pharmaceuticals. The effect of pharmaceuticals in water upon other species of life and upon the environment generally was explicitly excluded from the scope of the report.

The proponent's fact sheet also concedes that some studies indicate that there are endocrine-related effects on growth and development from exposures in fish and wildlife. Those studies found intersex effects upon fish which may be reduced but not eliminated by superior treatment of wastewater effluent. Yet, the proponent did not address the implications of the studies other than to observe that the MOECC has not established acceptable levels of PPCPs and EDCs in water or wastewater.

In the Notice of Completion, the proponent included the Fact Sheet discussed above and another Fact Sheet entitled, "Willow Creek and the Minesing Wetland."

The "Minesing Wetland" fact sheet, however, said nothing about the potential effect of pharmaceuticals and EDCs on life in the Wetlands.

The proponent also included in the Notice of Completion, and relied upon, a report from Hutchinson Environmental Services Ltd. (HESL) entitled, "Hine's Emerald Dragonfly Habitat in the Minesing Wetlands and the Midhurst Development."

This report states, "there will be no interaction between the Midhurst Secondary Plan Area (MSPA) activities with the water quality in the HED [Hines Emerald Dragon Fly] habitat area as the development areas are > 5 km distant. Treated municipal water effluent will be discharged to Willow Creek, which does not interact with the HED habitat area. The proposed effluent limits will maintain total phosphorus, dissolved oxygen and un-ionized ammonia concentrations within their respective PWQOs in Minesing Creek (HESL 2016) and will not, therefore, impact aquatic life." The report, however, provides no evidential foundation for the claim that because the effluent will travel 5 kilometres from the wastewater plant it will not affect water quality in the HED habitat area. Nor does the report provide any evidential foundation for its bald claim that the effluent will not interact with the HED habitat area. In fact, other studies have shown that the water from Willow Creek does travel through the Wetlands and, as a result, may well interact with the HED habitat. It follows, therefore, that wastewater effluent discharged into Willow Creek may well affect water quality in the HED habitat. The report proceeds to mention that Wisconsin, another HED habitat, recommends, as a best practice to protect the HED, the proper disposition of pharmaceuticals. The HESL report claims that this best practice is, "Already implemented through municipal sewer use bylaws, provincial regulations and educational programs." That is not accurate. The report concludes that the development of the MSPA does not threaten the HED or its habitat because the MSPA is more than 5 kilometres distant and because best practices have been or will be implemented in the design of the MSPA as appropriate. That is also inaccurate.

The Mayor of Springwater wrote to the Minister of MOECC in late 2016 asking about provincial funding for research on the impact of potential discharges of effluent containing pharmaceuticals from the planned Midhurst wastewater treatment plant into Willow Creek. Minister Murray responded on April 18, 2017, "should citizens or other stakeholders have outstanding concerns with....potential environmental impacts, they will have an opportunity at the conclusion of the Class EA planning process to request that the Township prepare an indivdual Environmental Assessment." Minister Murray wrote to the Mayor again on May 18, 2017 stating that MOECC was involved in "the assessment of ecosystem impacts from exposure to pharmaceuticals" and continued to "monitor new research on emerging contaminants in the environment, as well as directing our own research to determine the necessity of standards and guidelines for these chemicals". Given the internationally-recognized ecological significance and the potential vulnerability of the Minesing Wetlands, the Midhurst Secondary Plan wastewater treatment plan is significantly different from other projects in its class; the potential harm from pharmaceuticals and other chemicals, including endocrine-disrupting compounds, in wastewater flowing into the Minesing Wetlands requires an individual EA.

☑ My unresolved concerns relate to:

- ☑ potential environment impacts
- ☑ how the project is significantly different from other projects in its class
- ☑ the adequacy of the process for the Class Environment Assessment
- ☐ other (specify)

Describe

☑ The proponent has issued the Notice of Completion for the project

☑ This request is being made within the review/comment period outlined in that notice

2018/06/15 (Start Date (yyyy/mm/dd)) to 2018/09/18 (End Date (yyyy/mm/dd))

☑ I hereby declare that, to the best of my knowledge, the information contained in this form and the information submitted in support of this form is complete and accurate.

| Last Name | First Name | Date (yyyy/mm/dd) |
|---|---|---|
| Graham | Allison | 1986/04/19 |

With all Part II Order requests, the Ministry maintains a public file that is available for viewing by any member of the public upon request. Personal and other information from your request, such as name, address, and telephone number and your concerns with the project will form part of the public record. If you wish for your information to be excluded from the public file, you can advise the Ministry by checking the box in the declaration below. Even if you request that your information be excluded, your contact information may still be obtained by members of the public if the Ministry is required to disclose the information under the *Freedom of Information and Protection of Privacy Act*.

☑ Please exclude my personal information from the public file (select if you wish to be excluded).

## Step 3 – Provide Identifying Information

If you are certain making a Part II Order Request is the right approach for you, complete the following information:

Requester Name

| Last Name | First Name |
|---|---|
| Graham | Allison |

Requester Type

☑ Individual

☐ On behalf of Person/Group (specify) _____

☐ Other (specify) _____

**Current Address**

| Unit Number | Street Number | Street Name | PO Box |
|---|---|---|---|
| | [redacted] | [redacted] | |

| City/Town | Province | Country | Postal Code |
|---|---|---|---|
| [redacted] | [redacted] | [redacted] | [redacted] |

| Concession | Rural Route |
|---|---|
| | |

| Telephone Number | Fax Number | Email Address (if available) |
|---|---|---|
| | | [redacted] |

Name of proposed Project (as it appears on the Notice of Completion if available)
Midhurst Secondary Plan

Name of Proponent (as it appears on the Notice of Completion if available)
The Township of Springwater

## Step 4 – Making Your Request

By submitting this form, you are requesting a Part II Order by the Minister.

Confirm what outcome you are seeking from the Minister by making this request.

I want the Minister to:

☐ Refer the matter to mediation to help me and the proponent address my concerns

☐ Impose additional conditions before the project can proceed

Describe what conditions you think would be appropriate and how they would address your concerns.

☑ To require the proponent to conduct a higher review of the project through an Individual Environmental Assessment

Describe how an Individual Environmental Assessment would address your concerns in a way that the Class Environmental Assessment does not:
As discussed above, the Class EA has left important questions unanswered about the potential effects of pharmaceuticals and other chemicals, including EDCs, upon the environment in the Minesing Wetlands, including potential effects upon rare and endangered species therein such as, for example, the HED. As a result, a much more detailed environmental assessment is needed.

If applicable, provide any other relevant information related to this request you would like to share.

## Step 5 – Submitting Your Request

Please send the completed form and any supporting information you would like to provide to all three of the following:

Minister
Ministry of the Environment and Climate Change
Ferguson Block, 77 Wellesley St. W, 11th Floor
Toronto ON M7A 2T5
Fax: 416-314-8452
Minister.MOECC@ontario.ca

Director, Environmental Assessment and Permissions Branch
Ministry of the Environment and Climate Change
135 St. Clair Ave W, 1st Floor
Toronto ON M4V 1P5
MOECCpermissions@ontario.ca

Project Proponent
The email or mailing address for the project proponent can be found on the Notice of Completion for the project.

| Step 6 – Attachments | |
|---|---|
| **Description** | **File name** |
| 1. | |

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, ON, L9Y 4J5
Tel: (705) 445-3451 ▪ Fax: (705) 445-0968
E-mail collingwood@ainleygroup.com

March 3, 2017

Ms. Allison Graham
[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. Graham:

On behalf of the Township of Springwater, we wish to thank you for your interest in the above-mentioned Class EA. We have reviewed your comments which were received following the October 18, 2016 Public Information Centre (PIC). Your comments/requests have been summarized and our responses are provided following each comment.

- *A representative of AAL stated before the meeting that the proposed "state of the art" sewage treatment will not remove a large number of pharmaceuticals from the effluent that will be pumped into Willow Creek and flow into the Minesing Wetlands. Unfortunately, "state of the art" sewage treatment does not remove many potentially hazardous pharmaceuticals and household chemicals. Pharmaceuticals and household chemicals are not removed by current "state of the art" tertiary sewage treatment. Will those chemicals settle in the slow moving water in the Wetlands? Where will the chemicals settle? And with what effect, short-term and long term, upon the plants and indigenous and transient birds, first and other animals? Will there be a dramatic concentration effect near the mouth of Willow Creek - if so for what distance, in what direction and with what effect? Will there be an effect deeper into the Wetlands - if so, where, over what area and with what effect? Shouldn't the potential effect of pharmaceuticals and household chemicals be studied? There are no provincial or federal regulations. Isn't that a good reason to raise this issue directly with the governments in an effort to protect the Minesing wetlands?*

Please refer to the attached Fact Sheet # 3 associated with Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs).

- *Has the Township considered whether it should seek to elevate the streamlined provincial Class assessment process into the more stringent provincial individual assessment process to ensure that greater attention is given to these significant environmental concerns? Has the Township considered seeking an assessment by the Canadian Environmental Assessment Agency for the same reason?*

The Class Environmental Assessment process is a Provincially regulated process and has an extensive proven track record of dealing with and resolving very complicated matters. Further, the Minister of the Environment & Climate Change (MOECC) at the end of the Class EA process could elevate this file to the individual assessment process.

- *Have consultations taken place with all aboriginal groups affected by the possible effects upon the Wetlands of pharmaceuticals and household chemicals in the effluent?*

Notifications and consultations have taken place with the applicable aboriginal groups.

Thank you again for your interest in this Class EA.

Should you have any questions please do not hesitate to contact the undersigned.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P.Eng.
President & CEO

## Fact Sheet # 3: Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs)

1) Pharmaceuticals and Personal Care Products (PPCPs) can originate from numerous sources, but primarily come from humans. When humans take medications only a portion is absorbed by the body. In addition, PPCPs can come from fragrances, shampoos, laundry and dishwashing detergents and other consumer products.

2) Endocrine Disruptors Compounds (EDCs) are chemicals, both natural and man-made, that at certain doses, can interfere with the endocrine (or hormone) system in mammals. Endocrine disruptors may be found in many everyday products– including plastic bottles, metal food cans, detergents, flame retardants, food, toys and cosmetics.

3) There are currently no Federal and/or Provincial regulations in Canada relating to the levels of PPCPs and EDCs in wastewater and/or drinking water. In addition, neither the US Environmental Protection Agency nor the equivalent agencies in Europe and Asia have any regulations for PPCPs and EDCs in wastewater and/or drinking water.

4) The effects of the PPCPs and EDCs on the environment continue to be investigated by the United States Environmental Protection Agency (US EPA) and many other scientists and organizations around the world to determine the levels that exist in our water systems and whether those levels, present any potential danger to the environment. To date the levels that have been found are extremely low concentrations (usually parts per trillion). One part per trillion is equal to one drop of water in 26 Olympic-size swimming pools.

5) PPCPs and EDCs are found throughout the world in all bodies of water influenced by human and/or animal wastewater, including rivers and streams, groundwater coastal marine environments, and many drinking water sources.

6) The detection of a compound in water does not mean that adverse health effects will or are likely to occur. In fact, no relationships have been established between PPCPs and EDCs in water and adverse effects in humans. Some studies indicate that there are endocrine-related effects on growth and development from environmental exposures in fish and wildlife. However, the US EPA and the Ministry of Environment and Climate Change (MOECC) have not established acceptable levels of PPCPs and EDCs in water or wastewater.

7) Given the very low concentrations in which they are generally found detection of PPCPs and EDCs is the major challenge. It is only due to recent advances in

## Fact Sheet # 3: Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs)

analytical techniques and instrumentation that have allowed for the reportable measurement of concentrations at such low levels.

8) In 2011 the World Health Organization (WHO) Undertook a Study on "Pharmaceuticals in Drinking Water." This Study was a working group of leading experts from USA, Switzerland, Australia, England, Canada, Singapore, Denmark, Japan and Italy. The Study the involved three human health risk assessments (USA, UK and Australia). The major findings of this Study were:

   a) Trace concentrations of pharmaceuticals in surface water impacted by wastewater discharges are extremely low (only detectable in last decade);

   b) Substantial margins of safety (more than 1000 fold) suggest adverse health impacts are very unlikely;

   c) From a treatment perspective, pharmaceuticals are not unusual organic chemicals. Therefore, treatment removal rates are reasonably predictable based upon the physical and chemical properties of the compounds;

   d) Conventional Biological Wastewater treatment processes with coagulation, filtration and chlorination can remove about 50% of these compounds, whereas advanced wastewater treatment processes (similar to what is being proposed in Midhurst), such as ozonation, membrane treatment and advanced oxidation, can generally achieve much higher removal rates (and in some cases up to 100%) compared with conventional treatment processes;

   e) Current levels of exposure do not warrant development of formal guidelines;

   f) There is also a lack of standardized sampling and analysis protocols to support monitoring studies.

   g) Consideration should be given to preventative measures such as "Take Back" programs, regulations, public education encouraging proper disposal to minimize pharmaceuticals in the environment.

## Fact Sheet # 3: Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs)

One of the main recommendations of the WHO study was:

*"The substantial margin of safety for consumption of very low concentrations of pharmaceuticals in drinking-water suggests that appreciable adverse impacts on human health are very unlikely. As such, concerns over pharmaceuticals should not divert attention and valuable resources of water suppliers and regulators from other priorities, such as pathogenic microbial water quality issues. The low risk to human health from current levels of exposure in drinking-water suggests that development of formal guideline values for pharmaceuticals in the WHO Guidelines for Drinking-water Quality and the installation of specialized treatment processes to reduce trace concentrations of pharmaceuticals are not warranted."*

9) A study on the "*Reduction of Intersex in a Wild Fish Population in Response to Major Municipal Wastewater Treatment Plant Upgrades" was* published in the "*Environmental Science and Technology"* magazine in December 2016 by team of researchers from the University of Waterloo, University of McMaster and Environment and Climate Change Canada. The study, which was based upon 10 years of data, found that the microorganisms used to remove ammonia in the wastewater treatment process also reduced the levels of endocrine disrupters in the water, which caused the intersex occurrences in fish to dramatically decline.

   Within the study, intersex in fish downstream of municipal Wastewater Treatment Plants (WWTPs) was studied in the Grand River, in southern Ontario. Consistent high rates of intersex in male rainbow darter have been reported for several years in the Grand River, in close proximity to two WWTPs. The larger WWTP (Kitchener) recently underwent significant upgrades that included the conversion from a carbonaceous activated sludge to nitrifying activated sludge treatment process. This created a unique opportunity to assess whether upgrades designed to improve effluent quality could also remediate the intersex previously observed in wild fish. Multiple years (2007−2012) of intersex data on male rainbow darter collected before the upgrades at sites associated with the WWTP outfall were compared with intersex data collected in post-upgrade years (2013−2015). These upgrades resulted in a reduction from 70 to 100% intersex incidence (pre-upgrade) to <10% in post-upgrade years. Although the cause of intersex remains unknown, indicators of effluent quality including nutrients, pharmaceuticals, and estrogenicity improved in the effluent after the upgrades.

   This study demonstrated that investment in WWTP upgrades improved effluent quality and was associated with an immediate change in biological responses in the receiving environment.

## Fact Sheet # 3: Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs)

Having long-term data of the fish population, before and after the wastewater treatment upgrades makes this a truly unique study," said Mark Servos, Canada Research Chair in Water Quality Protection in the University of Waterloo's Department of Biology. "The changes to Kitchener's wastewater treatment system have had a much larger positive impact then we had anticipated."

Upgrades to a wastewater treatment plant along Ontario's Grand River led to a 70 per cent drop in fish that have both male and female characteristics within one year and a full recovery of the fish population within three years, according to researchers at the University of Waterloo.

10) The advanced Wastewater Treatment process that is being proposed for Midhurst will provide one of the best barriers available in the industry and as such will significantly minimize PPCPs and EDCs within the wastewater, entering Willow Creek.

11) Inappropriate disposal practices, such as flushing unwanted or excess drugs down the toilets or discarding them into household waste, are very common and are a main contributor to pharmaceuticals in wastewater and other environmental media, such as surface waters and landfill leachate.

    As this issue is global in nature, organizations like the World Health Organization (WHO) have continued to stress the need for countries to develop programs for the retrieval and proper disposal of unused or expired pharmaceuticals.

    Therefore, it is important that policies promoting safe disposal or regulations governing disposal practices for unwanted or excess drugs be developed, at the Provincial and/or Federal level. Such programs or regulations would reduce the amount of pharmaceuticals entering water bodies. In addition, takeback programs, guidance and enhanced consumer education will support efforts for the proper disposal of medicines and reduce the impact of pharmaceuticals entering our water sources.

Hutchinson
Environmental Sciences Ltd.

1-5 Chancery Lane, Bracebridge, ON P1L 2E3 | 705-645-0021

# Technical Memorandum

**Date:** **February 7, 2017**

**To:** **Joe Mullan (Ainley and Associates)**

**From:** **Neil Hutchinson, Brent Parsons**

**Re:** **Hine's Emerald Dragonfly Habitat in the Minesing Wetlands and the Midhurst Development**

The Hine's Emerald Dragonfly (HED; *Somatochlora hineana*) is listed as endangered federally and provincially and its habitat is protected and regulated under Ontario's *Endangered Species Act* (2007). It is found in Wisconsin, Michigan, Illinois, Missouri and in one section of the Minesing wetland in Ontario and is considered rare throughout its range (COSEWIC 2011). This memo reviews the characteristics of the HED habitat and the proposed Midhurst Development to determine the potential for interaction of the development with regulated HED habitat.

The development of the Midhurst Secondary Plan (the "Midhurst Development") is >5 km from the regulated HED habitat in the Minesing wetland (Figure 1) and so there is no potential for direct effects on habitat. HED habitat is associated with areas of groundwater upwelling however, and so this memo examines how groundwater pumping for water supply to the development may interact with HED habitat and reviews the management activities that will assure there is no impact to HED or its habitat.

Areas of potential interference to HED habitat were determined by delineation of regulated HED habitat based on a literature review of publicly available HED habitat documentation. This information was combined with post-development surface water levels for the Minesing Wetlands, as modelled by Golder Associates Ltd. (Golder's) hydrological/hydrogeological model for the Midhurst development (Golder 2017).

***Species and Habitat Description***

Females lay eggs in moist sediment or shallow water and eggs hatch into larvae that live in the wetland for 3-5 years before crawling up emergent vegetation, shedding their exoskeleton and emerging as adults. This likely occurs between early and mid-June in Ontario (COSEWIC 2011). The larvae are associated with Digger Crayfish (*Fallicambarus fodiens*) because crayfish burrows provide refuge against drought conditions in summer and freezing conditions in winter. Adults live up to 4 to 5 weeks, with males generally occurring in seepage areas and fens and females in dry meadow habitat (Pulfer et al. 2013; USFWS 2013).

Habitat in the Minesing Wetlands in the vicinity of the HED observations is characterized as calcareous wetlands with groundwater high in bicarbonate, carbonate and alkalinity, and vegetation in a wet/saturated state dominated by grasses and fed primarily from intermittent seeps of groundwater (COSEWIC 2011; Post et al. 2015).

***Species Occurrences***

The first HED discovery in Canada occurred on June 20, 2007 in the Minesing Wetlands when Chris Evans captured an adult male HED (COSEWIC 2011). Additional HED were observed during focused surveys (238 person hours) of 28 sites during 2007, 2008 and 2009, including the observation of larvae on July 7, 2008 while pumping water into crayfish burrows.

We searched the Natural Heritage Information Centre (NHIC) for records of species occurrences of HED in the area noted in COSEWIC (2011). A number of 1 km x 1 km grids contained an occurrence of HED, with the latest observation dated June 22, 2009. A study by Post et al. (2015) focuss only on a description of monitoring efforts and groundwater well locations within "areas of known co-occurrence of HED and digger crayfish" and did not include document any additional observations of HED. These wells were the most precise locations of known Ontario HED habitat identified in our literature review and were used in our delineation of regulated habitat (Figure 1).

***Habitat Regulation***

HED habitat is protected under Ontario's *Endangered Species Act*. Ontario Regulation 242/08 describes HED habitat as the following:

- Category 1

  Any part of a fen, marsh, seepage area, pond or other body of water, including a vernal or other temporary pool, that is being used, or has been used at any time in the past, by HED for egg laying or larval development.

  Areas classified as Category 1 have the lowest tolerance to alteration.

- Category 2

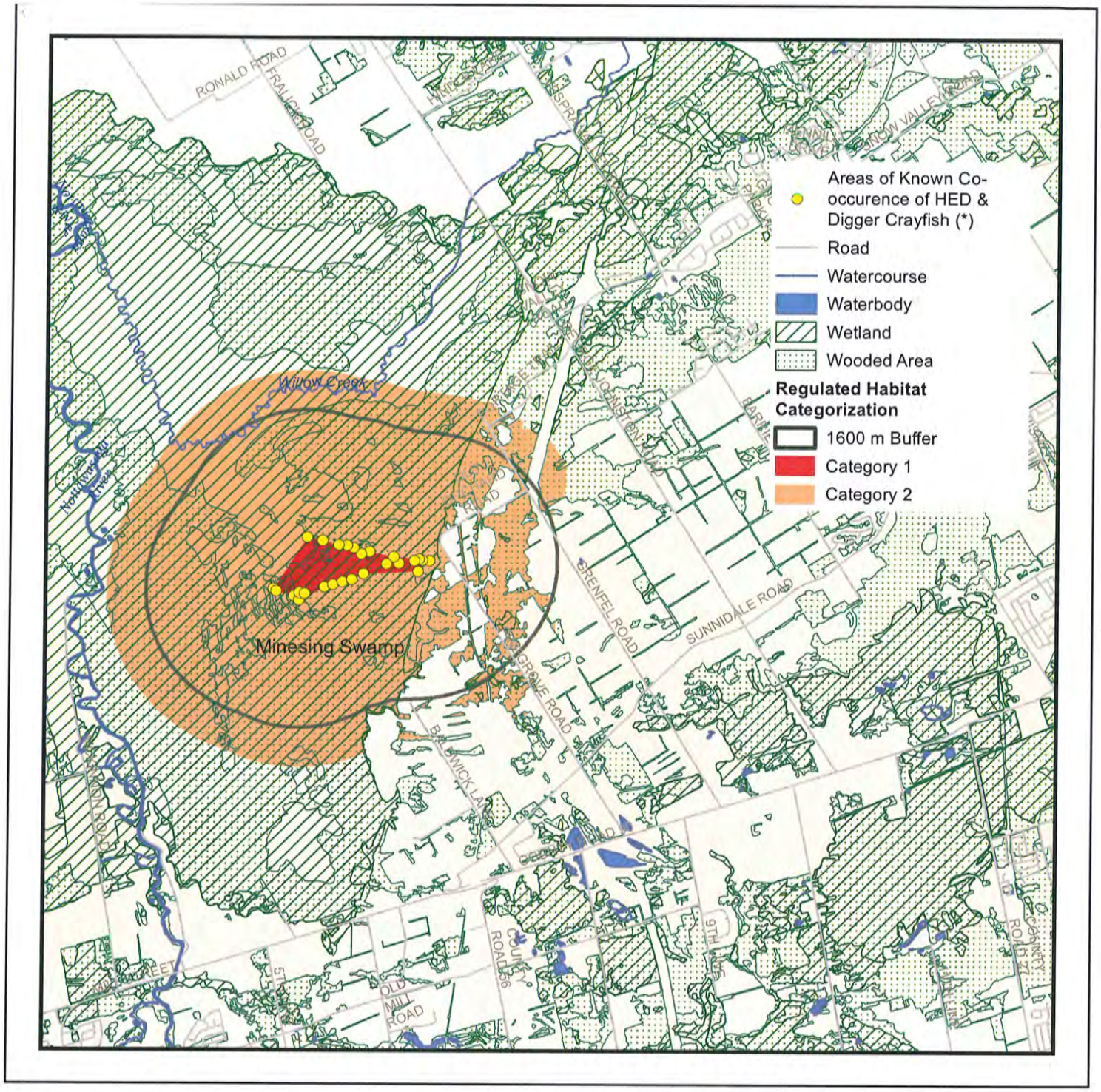
  Any part of a wetland, watercourse, pond or other body of water, including a vernal or other temporary pool, up to the high water mark, that is within 1600 metres of an area used for egg laying or larval development.

  AND

  Any area that does not have an impervious surface and that is within 500 metres of the wetland or aquatic features described in #2. Areas that do not allow water infiltration into the soil (e.g., roads and buildings) are not included in the 500 m area.

  Areas classified as Category 2 have a moderate tolerance to alteration.

Category 1 and 2 regulated HED habitat is presented in Figure 1 based on areas of known co-occurrence of HED and digger crayfish (Post et al. 2015). All regulated Category 1 and 2 habitat areas are >4 km from the boundaries of the Midhurst Secondary Plan Area (MSPA, Figure 2).



(*)Post, R., McPhie, St., and J. Spoelstra. 2015. Hydrogeological and Geochemical Evaluation of the Eastern Minesing Wetland in Support of the Hine's Emerald Dragonfly (Sometochlora hineana). Nottawasaga Valley Conservation Authority.

N

0 0.5 1 2 km

**Figure 1:**
Regulated Hine's Emerald Dragonfly Habitat in the Minesing Wetlands

**Project:** Midhurst Secondary Plan
**Project #:** 130030

Project Lead: Brent Parsons
Prepared by: Eric Dilligeard
Data Source: HESL,Ontario Land
Coordinate System: NAD 1983 UTM Zone 17N

May 2, 2016

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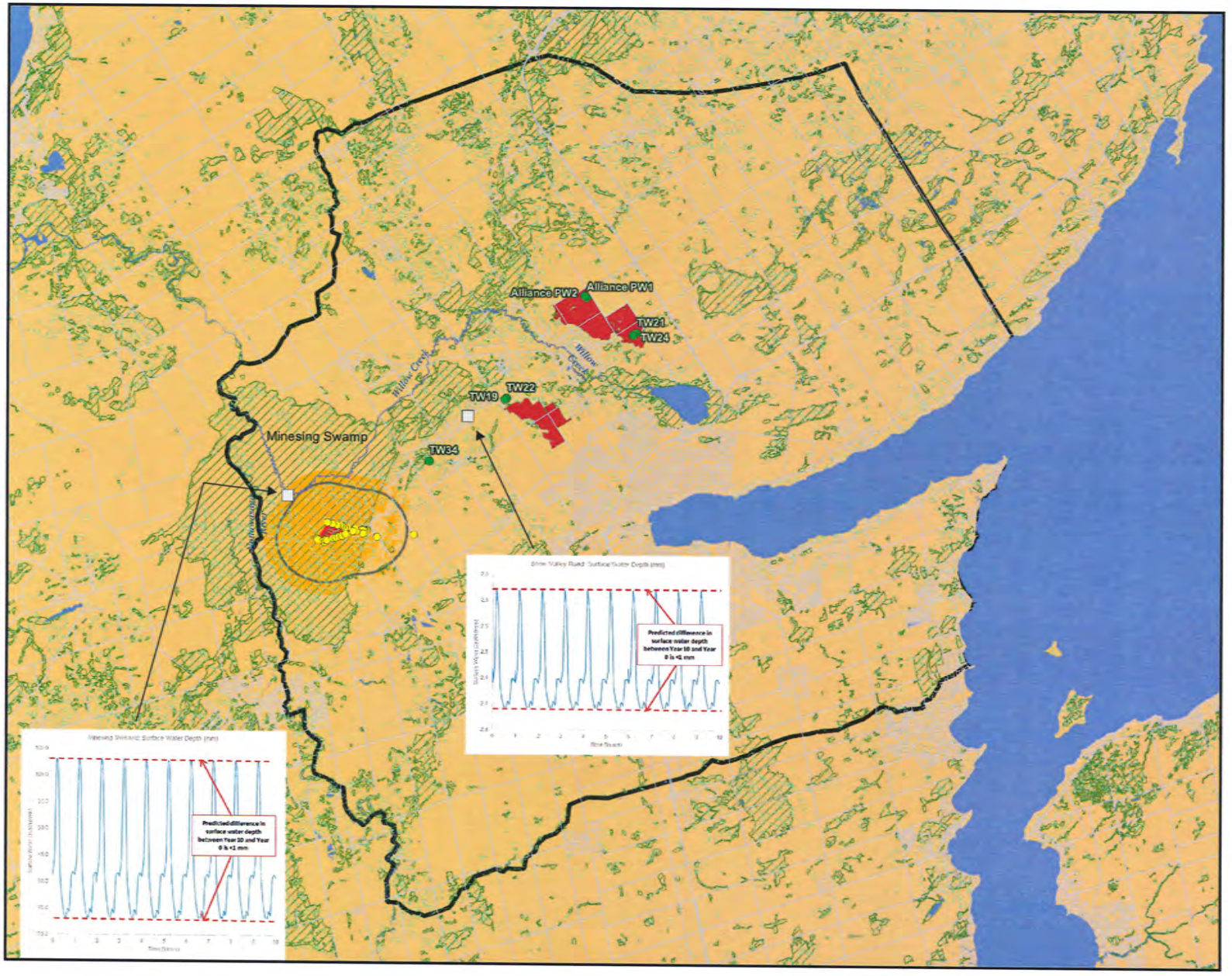


**Figure 2:**
Regulated Hine's Emerald Dragonfly Habitat and Golder Hydrological/Hydrogeological Model Results

- Surface Water Model Sites
- Pumping Well
- Areas of Known Co-occurence of HED & Digger Crayfish
- Road
- Watercourse
- Wooded Area
- Waterbody
- Golder Model Domain
- Wetland
- Proposed Carson, Doran and Midhurst Heights Neighbourhood Boundaries

**Regulated Habitat Categorization**

- 1600 m Buffer
- Category 1
- Category 2

**Prepared by:** Eric Dilligeard
**Data Source:** HESL, Golder Associates, Ontario Land
**Coordinate System:** NAD 1983 UTM Zone 17N

**Project Lead:** Brent Parsons
**Project:** Midhurst Secondary Plan
**Project#:** 130030

May 2, 2016

Hutchinson
Environmental Sciences Ltd.

Activities generally deemed incompatible with regulated habitat include alteration of aquatic or wetland habitat including changes to water quality, flows, levels, or vegetation characteristics (COSEWIC 2011). Specific threats and how these threats relate to the Minesing Wetlands include:

- Groundwater and Surface Water Levels - The impacts of the MSPA supply wells on surface water levels in and around the Minesing wetlands were predicted to be minimal by Golder's hydrological/hydrogeological model. These predictions are detailed below.
- Groundwater/Surface Water Quality - There will be no interaction of the MSPA activities with water quality in the HED habitat area as the development areas are >5km distant. Treated municipal wastewater effluent will be discharged to Willow Creek, which does not interact with the HED habitat area. The proposed effluent limits will maintain total phosphorus, dissolved oxygen and un-ionized ammonia concentrations within their respective PWQOs in Minesing Creek (HESL 2016) and will not, therefore, impact aquatic life.
- Invasion of Non-native Species - The spread of invasive non-native plant species, particularly European Common Reed (*Phragmites australis ssp. australis*) and Glossy Buckthorn (*Frangula alnus*) into the Minesing Wetlands, could threaten HED habitat but the spread will not be influenced by or altered by interactions with the Midhurst Development.
- Climate Change - Climate change and its effects on weather patterns will not be influenced by or altered by interactions with the Midhurst Development. The stormwater management plan for the development will infiltrate the first 20mm of runoff from storm events to promote groundwater recharge.

***Predicted Changes in Streamflow and Surface Water Levels in and around the Minesing Wetlands due to Future Groundwater Pumping Activities***

A hydrologic/hydrogeologic model was built by Golder Associates Ltd. (Golder 2017) to assess changes, if any, in surface water levels and flows at the Minesing Wetland as a result of proposed water supply pumping from development of the Midhurst Secondary Plan. The model encompassed a total area of 746 $km^2$ including approximately 90% of the Willow Creek Watershed, the proposed development area and all proposed water supply wells for these neighbourhoods, existing municipal supply wells in Midhurst and the City of Barrie, and other regional takings within the model area. Particular focus was given to Willow Creek and the Minesing Wetlands. The calibrated model was run for 10-year simulations and steady-state (annual average) simulations at Post-Development conditions. The model report, which includes details of the model development and results, is provided as a companion document to this memorandum (Appendix A *Report on Carson and Doran Neighbourhoods Proposed Water Supply: Supplementary Hydrologic Modelling* (Golder, January 2017).

An annual average streamflow reduction of 3% was simulated with a maximum decline of 5% occurring during summer at the Minesing Wetland. However, when inflow from the Nottawasaga River upstream of the model domain and discharge from the proposed upstream wastewater treatment plant at Willow Creek and Highway 26 were considered, these losses comprised less than 1% of the wetland's total flow and are thus considered negligible. Modelled surface water level changes in the Minesing Wetland and Snow Valley area showed a reduction of approximately 1 millimetre (mm) or less and are considered inconsequential (Golder, 2017).

***Recommendations***

Table 1 describes Best Management Practices that have been used to protect the largest known HED population in Wisconsin (i.e., The Ridges Sanctuary 2013). These have been or will be implemented in the design for the Midhurst Secondary Plan Area (SPA), as additional protective measures.

**Table 1. Best Management Practices to Protect HED Population in Wisconsin and Recommended Action Items for the Midhurst Secondary Plan Area**

| Item | Best Management Practice | Comments/Recommended Action Items for Midhurst SPA |
|---|---|---|
| 1 | Eliminate pesticide and synthetic fertilizer usage on residential lawns, recreational fields and public spaces immediately adjacent to known habitat. | Not Applicable - The Midhurst Secondary Plan (MSP) areas are over 5 km from any regulated HED habitat and there is no pathway for transport. |
| 2 | Maintain private onsite wastewater treatment systems in rural lands through inspections, maintenance and awareness | Not Applicable - Collection of municipal effluent and treatment at the proposed WWTP will achieve a superior degree of treatment and greater assurance and regulation than what is achieved through private on-site systems |
| 3 | Properly dispose of pharmaceuticals and hazardous waste | Already implemented through municipal sewer use bylaws, provincial regulations and educational programs |
| 4 | Follow manure application standards | Not Applicable on developed lands |
| 5 | Develop and implement a Storm Water Management Plan to control erosion on construction sites | No construction is proposed within 5 km of the regulated area. Stormwater and Sediment and Erosion Control Plans have been or will be developed for the MSP areas. |
| 6 | Install storm water infiltration systems to mitigate impervious surface runoff | Already Implemented - The Low Impact Development techniques proposed for the Midhurst Development will infiltrate the first 20 mm of precipitation from all storms, or ~90% of the annual precipitation to maintain groundwater recharge; |
| 7 | Protect groundwater from the impacts of development with conservation easements | Not Necessary - The development areas are >5 km from the regulated habitat areas. Low Impact Development techniques will maintain groundwater recharge. |
| 8 | Groundwater protection through accurate delineation of locations supplying groundwater to HED larval wetlands | Already Implemented - See Figure 2 and Golder (2017). |

***Conclusions and Recommendations***

HED habitat is protected under the *Endangered Species Act* which includes the provision that no person shall damage or destroy the habitat of an endangered or threatened species. Our review concludes that development of the MSPA does not threaten the HED or its habitat:

- No physical disturbances associated with development of the MSPA will occur within 5 km of the regulated HED habitat and so there are no direct impacts,
- A hydrologic/hydrogeologic model (Golder 2017) indicated maximum surface water level decreases of less than 1 mm in the Minesing Wetland over a ten-year period at full development build out. Therefore, with respect to regulated HED habitat, the HED's use of the wetlands for egg-laying and larval development would not be affected as a result of water level changes.
- A series of Best Management Practices have been or will be implemented in the design for the Midhurst Secondary Plan Area (SPA), as appropriate, as additional protective measures.

We will continue to monitor the ecological literature and local information on the HED to maintain our knowledge of current conditions.

***References***


COSEWIC. 2011. COSEWIC assessment and status report on the Hine's Emerald Dragonfly *Somatochlora hineana* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 41 pp

Golder Associates. 2017. Midhurst Ontario: Report on Carson and Doran Neighbourhoods Proposed Water Supply Groundwater Modelling. January 2017.

Hutchinson Environmental Sciences Ltd. 2016. Willow Creek Assimilative Capacity Study, Final Report. April 2016.

Post, R., McPhie, St., and J. Spoelstra. 2015. Hydrogeological and Geochemical Evaluation of the Eastern Minesing Wetland in Support of the Hine's Emerald Dragonfly (*Sometochlora hineana*). Nottawasaga Valley Conservation Authority.

Pulfer, T.L., C.G. Evans, D. Featherstone, R. Post, J.I. McCarter, and J.F. Laverty. 2013. Recovery Strategy for the Hine's Emerald (*Somatochlora hineana*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. vi + 27 pp.

The Ridges Sanctuary, 2013. Best Management Practives to Protect Groundwater at Hine's Emerald Dragonfly Larval Sites in Door County, Wisconsin. Cooperative Agreement between the USFWS and the Ridges Sanctuary.

USFWS. 2013. Hine's Emerald Dragonfly, Somatochlora hineana (Odonata: Corduliidae) 5-Year Review: Summary and Evaluation. Chicago Ecological Services Field Office. Barrington, Illinois – May 2013

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## GRAHAM - PART II ORDER RESPONSE

| | |
|---|---|
| **PROPONENT:** | **Township of Springwater** |
| **PROJECT TITLE:** | **Midhurst Phase 3 & 4 Class EA (Water, Wastewater & Transportation)** |
| **PROJECT LOCATION:** | **Midhurst Secondary Plan Area – Township of Springwater, ON** |
| **PREPARED BY:** | **Joe Mullan, P.Eng. - Ainley Group** |
| **DATE SUBMITTED TO MECP** | **October 26, 2018** |
| **PHONE # and E-MAIL:** | **(705) 445-3451, mullan@ainleygroup.com** |

| Issues and Concerns | Proponent Response | Status |
|---|---|---|
| **Concern about the potential negative effects of pharmaceuticals and other household chemicals including EDCs that will not be removed by the proposed WWTP and, as a result, will be in the effluent proposed to be released into Willow Creek. Should be studied carefully.** | During the completion of the Class EA, and subsequent to Phase 3 PIC in October 2016, Fact Sheets were prepared to respond to several issues that were raised by members of the public. Fact Sheet # 3 (Appendix Y of the ESR) was prepared to inform and educate the public regarding Pharmaceuticals and Personal Care Products (PPCPs) as well as Endocrine Disrupting Compounds (EDCs) within the effluent from the Wastewater Treatment Plant (WWTP).<br><br>Given that there are currently no Federal and/or Provincial regulations in Canada relating to the levels of PPCPs and EDCs in wastewater and/or drinking water and that the proposed Midhurst Wastewater Treatment Plant will meet all Provincial regulations, we believe we have adequately addressed this issue in the ESR. | We have communicated with Ms. Graham and others throughout the Class EA process regarding these issues and unfortunately, we do not feel any further communication with her will change her mind on any of her issues. |
| **Concern about impact on habitat for numerous species including the Hines Emerald Dragonfly.** | In response to previously identified concerns on the habitat of the Hine's Emerald Dragonfly (HED), a Technical Memorandum dated February 7, 2017 was prepared by HESL (2017[1]; contained within Appendix M of the ESR). The Technical Memorandum concluded that 1) "*No physical disturbances associated with development of the MSPA will occur within 5 km of the regulated HED habitat and so there are no direct impacts.*", and 2) A hydrologic/hydrogeologic model (Golder 2017[2]), contained within Appendix J of the ESA, indicated maximum surface water level decreases of less than 1 mm in the Minesing Wetland over a ten-year period at full development build out. Therefore, with respect to regulated HED habitat, the HED's use of the wetlands for egg-laying and larval development would not be affected as a result of water level changes.<br><br>Effluent assimilation mixing was described in Willow Creek Assimilative Capacity Study (HESL 2018a) and 7Q20 Flow Assessment Update for Willow Creek (HESL 2018b) and it was determined that complete mixing of the effluent is achieved 360 m downstream of the point of discharge in Willow Creek at Highway 26, such that water quality meets all provincial and federal water quality objectives for safe exposure of aquatic life. Regulated Hine's | |

[1] Hutchinson Environmental Sciences Ltd. Feb 7, 2017. Technical Memorandum Re: Hine's Emerald Dragonfly Habitat in the Minesing Wetlands and the Midhurst Development.
[2] Golder. 2017. Report on Carson and Doran Neighbourhoods Water Supply – Midhurst Secondary Plan: Supplementary Hydrologic Modelling.

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## GRAHAM - PART II ORDER RESPONSE

| Issues and Concerns | Proponent Response | Status |
|---|---|---|
| | Emerald Dragonfly (HED) habitat was mapped (Figures 1 and 2) and described in HESL 2017[1]. Category 1 habitat is defined as, "any part of a fen, marsh, seepage area, pond or other body of water, including a vernal or other temporary pool, that is being used, or has been used at any time in the past, by HED for egg laying or larval development", while Category 2 habitat includes, "any part of a wetland, watercourse, pond or other body of water, including a vernal or other temporary pool, up to the high water mark that is within 1600 metres of an area used for egg laying or larval development" (COSEWIC 2011)[3]. The closest Category 2 HED habitat in Willow Creek is located approximately 5 km downstream of the effluent discharge or 4.6 km downstream of the mixing zone. Furthermore, Category 1 HED habitat is located in a graminoid fen where groundwater flows predominantly north-west, indicating that Category 1 HED habitat is upstream of Willow Creek and any potential effects from the wastewater (Post et al. 2015[4]).<br><br>A list of Best Management Practices for consideration of HED habitat was also identified within the Technical Memorandum and will be implemented in the design of the proposed developments. | |
| **Will those chemicals settle in the slow moving water in the wetlands? If so, where and with what effect, short-term and long-term?** | Within Fact Sheet #3 (Appendix Y of the ESR) it is noted that the detection of a compound in water does not mean that adverse health effects will or are likely to occur. In fact, no relationships have been established between PPCPs and EDCs in water and adverse effects in humans.<br><br>As noted above there are currently no Federal and/or Provincial regulations in Canada relating to the levels of PPCPs and EDCs in wastewater and/or drinking water. Further, levels are found to be extremely low and therefore, detection is a major challenge. However, advanced treatment processes (including the membrane treatment process proposed for the Midhurst Wastewater Treatment Plant) can achieve high removal rates (in some cases up to 100%).<br><br>In summary, the proposed Midhurst Wastewater Treatment Plant will greatly reduce the already extremely low concentrations of PPCPs and EDCs in the wastewater effluent and as such it is anticipated that there will be no short or long term impacts to Willow Creek and the Minesing Wetlands. | |
| **Will there be a dramatic concentrated effect near the mouth of Willow Creek? If so, for what distance, in what direction and with what effect?** | Within Fact Sheet #3 (Appendix Y of the ESR) it is noted that "The advanced Wastewater Treatment process that is being proposed for Midhurst Wastewater Treatment Plant will provide one of the best barriers available in the industry and as such will significantly minimize PPCPs and EDCs within the wastewater from entering Willow Creek. Therefore, there will not be dramatic concentrated effect at the effluent discharge point in Willow Creek. | |
| **Will there be an effect deeper in the wetlands? If so, where, over what area and with what effect?** | As noted above, there will not be a dramatic concentrated effect at the effluent discharge point in Willow Creek; therefore, there will not be an effect deeper in the Minesing Wetlands. | |

[3] COSEWIC. 2011. COSEWIC assessment and status report on the Hine's Emerald in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Ix + 41 pp.
[4] Post, R., McPhie, S., and J. Spoelstra. 2015. Hydrogeological and geochemical evaluation of the eastern Minesing Wetland in support of the Hine's Emerald Dragonfly (*Somatochlora hineana*). Nottawasaga Valley Conservation Authority.

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## GRAHAM - PART II ORDER RESPONSE

| Issues and Concerns | Proponent Response | Status |
|---|---|---|
| **Proponent's previous responses did not adequately address my concerns.** | Through the previous responses we have provided to Ms. Graham, including the preparation of Fact Sheet # 3 (Appendix Y of the ESR) we believe we have adequately responded to the concerns raised. | |
| **WHO report (pharmaceuticals) does not discuss the potential impacts on aquatic ecosystems of the broader physical environment.** | Fact Sheet #3 (Appendix Y of the ESR) referenced a study the "Reduction of Intersex in a Wild Fish Population in Response to Major Municipal Wastewater Treatment Plant Upgrades" which was published in the "Environmental Science and Technology" magazine in December 2016 by a team of researchers from the University of Waterloo, University of McMaster and Environment and Climate Change Canada.<br><br>This study, which was based upon 10 years of data, concluded that upgrading conventional Wastewater Treatment processes to advanced Wastewater Treatment processes significantly improved effluent quality and that upgrades to wastewater treatment plants along Ontario's Grand River led to a 70 per cent drop in fish that have both male and female characteristics within one year and a full recovery of the fish population within three years.<br><br>Also, as noted in Fact Sheet # 3 (Appendix Y of the ESR) "The advanced Wastewater Treatment process that is being proposed for Midhurst WWTP will provide one of the best barriers available in the industry and as such will significantly minimize PPCPs and EDCs within the wastewater from entering Willow Creek." | |
| **Proponent did not address the implications of the studies other than to observe that the MOECC has not established acceptable levels of PPCPs and EDCs in water or wastewater.** | Observation is noted. | |
| **Fact Sheet on Minesing Wetlands said nothing about the potential effect of pharmaceuticals and EDCs on life in the wetlands.** | Fact Sheet #3 (Appendix Y of the ESR) referenced a study the "Reduction of Intersex in a Wild Fish Population in Response to Major Municipal Wastewater Treatment Plant Upgrades" which was published in the "Environmental Science and Technology" magazine in December 2016 by a team of researchers from the University of Waterloo, University of McMaster and Environment and Climate Change Canada.<br><br>This study, which was based upon 10 years of data, concluded that upgrading conventional Wastewater Treatment processes to advanced Wastewater Treatment processes significantly improved effluent quality and that upgrades to a wastewater treatment plants along Ontario's Grand River led to a 70 per cent drop in fish that have both male and female characteristics within one year and a full recovery of the fish population within three years.<br><br>Also, as noted in Fact Sheet # 3 (Appendix Y of the ESR) "The advanced Wastewater Treatment process that is being proposed for Midhurst WWTP will provide one of the best barriers available in the industry and as such will significantly minimize PPCPs and EDCs within the wastewater from entering Willow Creek." | |
| **The HESL Report on Hine's Emerald Dragonfly provides no** | Please see earlier responses regarding Hine's Emerald Dragonfly habitat and treated effluent. | |

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## GRAHAM - PART II ORDER RESPONSE

| Issues and Concerns | Proponent Response | Status |
|---|---|---|
| **evidential foundation for the claim that because the effluent will travel 5 km, it will not affect water quality in the Dragonfly habitat area. Nor does it provide evidence that the effluent will not interact with the Dragonfly habitat area.** | | |
| **HESL claims that use of Best Practice methods will protect habitat along with fact that the habitat is 5 km distant from the WWTP– "That is not accurate".** | Please see earlier responses regarding Hine's Emerald Dragonfly habitat and treated effluent. | |

## Fact Sheet # 3: Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs)

1) Pharmaceuticals and Personal Care Products (PPCPs) can originate from numerous sources, but primarily come from humans. When humans take medications only a portion is absorbed by the body. In addition, PPCPs can come from fragrances, shampoos, laundry and dishwashing detergents and other consumer products.

2) Endocrine Disruptors Compounds (EDCs) are chemicals, both natural and man-made, that at certain doses, can interfere with the endocrine (or hormone) system in mammals. Endocrine disruptors may be found in many everyday products– including plastic bottles, metal food cans, detergents, flame retardants, food, toys and cosmetics.

3) There are currently no Federal and/or Provincial regulations in Canada relating to the levels of PPCPs and EDCs in wastewater and/or drinking water. In addition, neither the US Environmental Protection Agency nor the equivalent agencies in Europe and Asia have any regulations for PPCPs and EDCs in wastewater and/or drinking water.

4) The effects of the PPCPs and EDCs on the environment continue to be investigated by the United States Environmental Protection Agency (US EPA) and many other scientists and organizations around the world to determine the levels that exist in our water systems and whether those levels, present any potential danger to the environment. To date the levels that have been found are extremely low concentrations (usually parts per trillion). One part per trillion is equal to one drop of water in 26 Olympic-size swimming pools.

5) PPCPs and EDCs are found throughout the world in all bodies of water influenced by human and/or animal wastewater, including rivers and streams, groundwater coastal marine environments, and many drinking water sources.

6) The detection of a compound in water does not mean that adverse health effects will or are likely to occur. In fact, no relationships have been established between PPCPs and EDCs in water and adverse effects in humans. Some studies indicate that there are endocrine-related effects on growth and development from environmental exposures in fish and wildlife. However, the US EPA and the Ministry of Environment and Climate Change (MOECC) have not established acceptable levels of PPCPs and EDCs in water or wastewater.

7) Given the very low concentrations in which they are generally found detection of PPCPs and EDCs is the major challenge. It is only due to recent advances in

## Fact Sheet # 3: Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs)

analytical techniques and instrumentation that have allowed for the reportable measurement of concentrations at such low levels.

8) In 2011 the World Health Organization (WHO) Undertook a Study on "Pharmaceuticals in Drinking Water." This Study was a working group of leading experts from USA, Switzerland, Australia, England, Canada, Singapore, Denmark, Japan and Italy. The Study the involved three human health risk assessments (USA, UK and Australia). The major findings of this Study were:

   a) Trace concentrations of pharmaceuticals in surface water impacted by wastewater discharges are extremely low (only detectable in last decade);

   b) Substantial margins of safety (more than 1000 fold) suggest adverse health impacts are very unlikely;

   c) From a treatment perspective, pharmaceuticals are not unusual organic chemicals. Therefore, treatment removal rates are reasonably predictable based upon the physical and chemical properties of the compounds;

   d) Conventional Biological Wastewater treatment processes with coagulation, filtration and chlorination can remove about 50% of these compounds, whereas advanced wastewater treatment processes (similar to what is being proposed in Midhurst), such as ozonation, membrane treatment and advanced oxidation, can generally achieve much higher removal rates (and in some cases up to 100%) compared with conventional treatment processes;

   e) Current levels of exposure do not warrant development of formal guidelines;

   f) There is also a lack of standardized sampling and analysis protocols to support monitoring studies.

   g) Consideration should be given to preventative measures such as "Take Back" programs, regulations, public education encouraging proper disposal to minimize pharmaceuticals in the environment.

## Fact Sheet # 3: Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs)

One of the main recommendations of the WHO study was:

*"The substantial margin of safety for consumption of very low concentrations of pharmaceuticals in drinking-water suggests that appreciable adverse impacts on human health are very unlikely. As such, concerns over pharmaceuticals should not divert attention and valuable resources of water suppliers and regulators from other priorities, such as pathogenic microbial water quality issues. The low risk to human health from current levels of exposure in drinking-water suggests that development of formal guideline values for pharmaceuticals in the WHO Guidelines for Drinking-water Quality and the installation of specialized treatment processes to reduce trace concentrations of pharmaceuticals are not warranted."*

9) A study on the "*Reduction of Intersex in a Wild Fish Population in Response to Major Municipal Wastewater Treatment Plant Upgrades" was* published in the "*Environmental Science and Technology"* magazine in December 2016 by team of researchers from the University of Waterloo, University of McMaster and Environment and Climate Change Canada. The study, which was based upon 10 years of data, found that the microorganisms used to remove ammonia in the wastewater treatment process also reduced the levels of endocrine disrupters in the water, which caused the intersex occurrences in fish to dramatically decline.

   Within the study, intersex in fish downstream of municipal Wastewater Treatment Plants (WWTPs) was studied in the Grand River, in southern Ontario. Consistent high rates of intersex in male rainbow darter have been reported for several years in the Grand River, in close proximity to two WWTPs. The larger WWTP (Kitchener) recently underwent significant upgrades that included the conversion from a carbonaceous activated sludge to nitrifying activated sludge treatment process. This created a unique opportunity to assess whether upgrades designed to improve effluent quality could also remediate the intersex previously observed in wild fish. Multiple years (2007−2012) of intersex data on male rainbow darter collected before the upgrades at sites associated with the WWTP outfall were compared with intersex data collected in post-upgrade years (2013−2015). These upgrades resulted in a reduction from 70 to 100% intersex incidence (pre-upgrade) to <10% in post-upgrade years. Although the cause of intersex remains unknown, indicators of effluent quality including nutrients, pharmaceuticals, and estrogenicity improved in the effluent after the upgrades.

   This study demonstrated that investment in WWTP upgrades improved effluent quality and was associated with an immediate change in biological responses in the receiving environment.

## Fact Sheet # 3: Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs)

Having long-term data of the fish population, before and after the wastewater treatment upgrades makes this a truly unique study," said Mark Servos, Canada Research Chair in Water Quality Protection in the University of Waterloo's Department of Biology. "The changes to Kitchener's wastewater treatment system have had a much larger positive impact then we had anticipated."

Upgrades to a wastewater treatment plant along Ontario's Grand River led to a 70 per cent drop in fish that have both male and female characteristics within one year and a full recovery of the fish population within three years, according to researchers at the University of Waterloo.

10) The advanced Wastewater Treatment process that is being proposed for Midhurst will provide one of the best barriers available in the industry and as such will significantly minimize PPCPs and EDCs within the wastewater, entering Willow Creek.

11) Inappropriate disposal practices, such as flushing unwanted or excess drugs down the toilets or discarding them into household waste, are very common and are a main contributor to pharmaceuticals in wastewater and other environmental media, such as surface waters and landfill leachate.

    As this issue is global in nature, organizations like the World Health Organization (WHO) have continued to stress the need for countries to develop programs for the retrieval and proper disposal of unused or expired pharmaceuticals.

    Therefore, it is important that policies promoting safe disposal or regulations governing disposal practices for unwanted or excess drugs be developed, at the Provincial and/or Federal level. Such programs or regulations would reduce the amount of pharmaceuticals entering water bodies. In addition, takeback programs, guidance and enhanced consumer education will support efforts for the proper disposal of medicines and reduce the impact of pharmaceuticals entering our water sources.

Ministry of the Environment, Conservation and Parks

Office of the Minister

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357-2019-859

NOV 2 0 2019

Daniel B. Artenosi
Overland LLP
[redacted]

Dear Mr. Artenosi:

Thank you for your interest in the Midhurst Water, Wastewater, and Transportation Master Plan Class Environmental Assessment (Master Plan) as proposed by the Township of Springwater (Township). I welcome your comments on this Master Plan.

On September 18, 2018, you requested on behalf of Carson Trail Estates Inc., that the Township be required to prepare an individual environmental assessment for the projects contained within the Midhurst Water, Wastewater, and Transportation Master Plan. I am taking this opportunity to inform you that I have decided that elevating the project to an individual environmental assessment is not required.

In making this decision, I have given careful consideration to the Master Plan documentation, the provisions of the Municipal Class Environmental Assessment, the issues raised in your request, and relevant matters to be considered in subsection 16(4) of the Environmental Assessment Act.

Despite my not requiring an individual environmental assessment be prepared, in reviewing the requests and the Master Plan documentation, I have decided to impose conditions with respect to the projects in the Master Plan regarding species at risk, source water protection, and air quality impacts. These conditions are outlined in the attached letter to the Township.

I am satisfied that the issues raised in the Part II Order requests can be addressed by the work that is required to be carried out as a result of the conditions I have imposed and through additional permitting and approvals.

With this decision having been made, the Township can now proceed with the projects in the Master Plan subject to the conditions I have imposed, and any permits or approvals that are required. The Township must ensure it implements the projects in the manner they were developed and designed, as set out in the Master Plan documentation, and inclusive of all mitigating measures, and environmental and other provisions therein.

Again, I would like to thank you for participating in the Municipal Class Environmental Assessment process and for bringing your concerns to my attention.

Sincerely,

Jeff Yurek
Minister of the Environment, Conservation and Parks

Attachment

c: Heather Coleman, Director of Public Works, Township of Springwater

Lydia Bojeczko, MPP Liaison & Strategic Communications Advisor, Ministry of the Environment Conservation and Parks

EA File No. 18077 – Midhurst Water, Wastewater, and Transportation Master Plan Class Environmental Assessment

OVERLAND LLP

Overland LLP
**Daniel B. Artenosi**
[redacted]

September 18, 2018

**SENT VIA E-MAIL**

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Ms. Heather Coleman
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Dear Sirs and Madams:

**RE: Carson Trails Estate Inc.**
**Township of Springwater**
**Midhurst Water, Wastewater & Transportation (Phase 3 and 4) ESR**
**Request for Part II Order**

We are the solicitors for Carson Trails Estate Inc. ("**Carson**"), being the owner of the lands that are approximately 9.64 hectares and located at the northeast intersection of Anne Street and Carson Road (the "**Carson Trail Lands**") in the Township of Springwater (the **"Township"**). The Carson Trail Lands are within the Midhurst Secondary Plan Area and subject to the Midhurst Secondary Plan as adopted by Official Plan Amendment No. 38 (**"OPA 38"**).

As further described below, the Carson Trail Lands are designated for urban uses under OPA 38 (Midhurst Low Density Residential and Midhurst Transition Residential). The Carson Trail Lands are also subject to an application for draft plan of subdivision approval, which is currently before the Local Planning Appeal Tribunal.

We have reviewed the Midhurst Water, Wastewater & Transportation (Phase 3 and 4) Environmental Study Report prepared by Ainley Group (**"Ainley"**) dated June 2018, which is has been undertaken by the Township as proponent to determine the selection of preferred water, wastewater and transportation and servicing solutions to meet the needs of "the future development" (the **"Phase 3 and 4 ESR"**). At the outset, we note that "the future development"

[redacted]

is not itself a defined term in the Phase 3 and 4 ESR, and for the reasons discussed below, it is unclear what is included within this reference.

We submit that there are critical flaws in the Phase 3 and 4 ESR. On behalf of our client, we are writing to request that the Minister of the Environment and Climate Change order that the proponent comply with Part II of the *Environmental Assessment Act*, R.S.O. 1990, c. E-18, as amended (the **"EA Act"**) before proceeding with the undertaking set out in the Phase 3 and 4 ESR, in accordance with section 16 of the EA Act (the **"Part II Order Request"**).

However, on an interim basis, our client is committed to working with the proponent and interested parties to resolve the issues identified herein by way of mediation. We submit that this matter is an appropriate candidate for mediation, and we are requesting that the Minister refer this request for a Part II Order to mediation in accordance with Sections 8 and 16 of the EA Act.

## Background

OPA 38 was adopted by the Township on November 3, 2008 and approved, as modified, by the County of Simcoe (the "**County**") on October 12, 2011. The purpose of OPA 38 is to establish a Secondary Plan for the Midhurst settlement area, and it had the effect of re-designating land, including the Carson Trail Lands, for urban uses.

OPA 38 was appealed by the Ministry of Municipal Affairs and Housing, now the Ministry of Municipal Affairs (the "**Ministry**"), on October 28, 2011, primarily on the basis of the extent of the population contemplated under OPA 38 for the Midhurst settlement area. The appeal was filed prior to the release of Amendment No. 1 to the Growth Plan for the Greater Golden Horseshoe (the **"Growth Plan"**), which established a specific Growth Plan policy regime for the Simcoe Sub-Area, being the area comprised of the County of Simcoe and the Cities of Barrie and Orillia. In very general terms, Growth Plan Amendment No. 1 established a policy regime that limits growth within the Simcoe-Sub Area in accordance with Schedule 7 thereof. Growth Plan Amendment No. 1 also introduced Policy 6.3.2.3 that granted an additional population of 20,000 persons to allow the County to approve planning applications even where doing so would exceed the growth forecasts set out in Schedule 7 (the "**20,000 Policy**"). The 20,000 Policy had an expiry date of January 19, 2017, following which any unused portion of the 20,000 population would no longer be available.

On January 19, 2012, O.Reg. 8/12 and Growth Plan Amendment No. 1 came into force. O.Reg 8/12 set out transitional provisions for Growth Plan Amendment No.1. In particular, O.Reg. 8/12 established a transitional provision to allow official plan amendments that met certain criteria to be continued and disposed of in accordance with the Growth Plan as it existed prior to Growth Plan Amendment No. 1 (i.e. without any limitations on population otherwise imposed). The criteria included, amongst other matters, that the affected area released for development be no greater than 300 hectares.

On March 20, 2012, Carson submitted an application for approval of a draft plan of subdivision to develop the Carson Trail Lands as a residential subdivision comprised of 169 lots and one

mixed-use block in keeping with the planned function of these lands under OPA 38. On November 26, 2013, Carson appealed the application for approval to the Local Planning Appeal Tribunal (the "**Tribunal**"), formerly the Ontario Municipal Board, on the basis of a non-decision by County Council.

We understand that following the Ministry's appeal of OPA 38, the Township and the County sought the assistance of the Provincial Facilitator's office to seek a resolution of the Ministry's appeal. We further understand that Midhurst Development Doran Road Inc., Carson Road Development Inc., Midhurst Rose Alliance Inc, Midhurst Rose Alliance Cooney Inc. and Midhurst Rose Alliance O'Brian Inc. were invited to participate in this facilitation in their capacity as major landowners in the Midhurst Secondary Plan Area. We further understand that these private entities are related holding companies that are owned or controlled by two controlling interests: (1) Midhurst Development Doran Road Inc. and Carson Road Development Inc. being related entities (collectively referred to as **"Geranium"**); and, (2) Midhurst Rose Alliance Inc, Midhurst Rose Alliance Cooney Inc. and Midhurst Rose Alliance O'Brian Inc. being related entities (collectively referred to as **"Rose Alliance"**).

On November 28, 2012, the Ministry partially withdrew its appeal of OPA 38 as it applied to an area of land equal to 300 hectares. These lands were thereby approved for urban uses. These lands were individually owned by Geranium and Rose Alliance.

On behalf of Carson, we attempted to schedule a hearing of the draft plan of subdivision appeal in September 2015. This effort to schedule the matter for a hearing was opposed by the Township and the County. Amongst other reasons provided, the Township took the position that it would be inappropriate to schedule the hearing for the Carson Trail Lands outside of the comprehensive process respecting all lands within the Midhurst Secondary Plan Area, so that all parties with an interest in the development of the Carson Trail Lands and other lands not then approved for development, would have an opportunity to weigh in on matters such as timing, sequencing and phasing of development applications.

Between September 2015 and October 2016, the parties to the OPA 38 proceedings, including Carson, were engaged in a contentious process of litigation. The developer landowners were mutually aligned in their effort to bring remaining portions of OPA 38 into force. As part of this effort, Carson submitted a request for allocation under the 20,000 Policy for the Carson Trail Lands. Other landowners made similar requests for their lands. The County Council conducted a hearing on May 24, 2016. With the exception of one landowner who was allocated three units, the County Council refused the requests, including the request submitted by Carson.

Carson and other developer landowners sought to have the balance of the Ministry's appeal of OPA 38 scheduled for a hearing in reliance on the 20,000 Policy to support the growth planned under OPA 38. This request was opposed by the Township, the County and the Ministry. The County brought a motion seeking a determination of whether the OMB had jurisdiction to allocate additional population to the landowners under the 20,000 Policy.

The requests submitted by the landowners for a portion of the 20,000 were subsequently resolved through a settlement with the County. Under the settlement, the landowners were granted half of the units initially requested. This settlement was presented to the OMB in October 2016 as a basis to support the coming into force of additional portions of OPA 38. The

settlement was unopposed by the Township and the Ministry. The OMB ultimately allowed the Ministry's appeal of OPA 38, in part, and approved additional lands for urban uses, including the Carson Trail Lands, which is confirmed in its written decision issued on January 4, 2017.

**The Purpose of the Environmental Assessment Act**

The stated purpose of the Environmental Assessment Act is "the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management in Ontario of the environment." The "environment" is broadly defined to mean:

a. air, land or water
b. plant and animal life, including human life
c. the social, economic and cultural conditions that influence the life of humans or a community
d. any building, structure, machine or other device or thing made by humans
e. any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities, or
f. any part or combination of the foregoing and the interrelationships between any two or more of them,

in or of Ontario.

Within this overall legislative framework, the "parent" Municipal Class EA has been approved in order to enable the planning of municipal infrastructure in accordance with an approved procedure that is "designed to protect the environment." The Municipal Class EA is stated to provide "a reasonable mechanism for proponents to fulfill their responsibilities to the public for the provision of municipal services in an efficient, timely, economic and environmentally responsible manner."

Planning for municipal infrastructure under the Municipal Class EA dictates a methodology for assessing "environmental" impacts that is holistic and comprehensive. Carson submits that in its current form, the Phase 3 and 4 ESR is fundamentally flawed because it fails to meet this threshold. If these flaws are not corrected, Carson submits that the undertaking which is the subject of the Phase 3 and 4 ESR should be assessed in accordance with the full requirements under Part II of the EA Act.

1. **The Phase 3 and 4 ESR is flawed in that it assumed that only the 300 hectares owned by Geranium and Rose Alliance were available for development. As a result, the ESR arbitrarily restricted its consideration of the proposed phasing plan to a limited portion of lands designated for urban uses within the Midhurst Secondary Plan Area.**

The Township authorized Ainley to commence the Phase 3 and Phase 4 review at the end of January 2013. This decision followed the partial withdrawal of the Ministry's appeal of OPA 38 in November 2012, which had the effect of releasing for development 300 hectares of lands redesignated for urban uses.

It should be noted that our client was not consulted by the Ministry, the Township, the County or any other parties in the process/discussions that were had when the Ministry determined which lands would be included in the 300 hectares that were initially released. Carson does not know how these lands were selected, except that they were owned by Geranium and Rose Alliance.

In the Phase 3 and 4 ESR, Ainley purports to have relied on the partial release of lands (300 hectares) as the basis to justify its limited inclusion of only these lands in the initial development phasing and staging projection that is advanced in the ESR. However, following the OPA 38 Settlement, an additional 129.35 hectares, including the 9.64 hectares comprising the Carson Trail Lands, were approved as designated for urban uses. The OPA 38 Settlement was reached and approved by the OMB almost 2 years prior to the completion of the Phase 3 and 4 ESR.

Despite the approval of the OPA 38 Settlement by the OMB that designated an additional 129.35 hectare of land for urban uses, the text of the Phase 3 and 4 ESR purports that the initial phasing and staging plan should be limited to only the 300 hectares. The OMB settlement is not referred to in the Phase 3 and 4 ESR. The text of the Phase 3 and 4 ESR indicates that Ainley was not even aware that additional lands had been approved as designated for urban uses. This is evident from the following statements found at pages 1 and 21 of Volume One of the Phase 3 and 4 ESR:

> *On November 28, 2102, the Ontario Ministry of Municipal Affairs and Housing (MMAH) withdrew part of its appeal of the Midhurst Secondary Plan. As a result, 300 hectares out of the total 756 hectares proposed to be re-designated as urban in OPA 38 were cleared for development. At the present time, the remaining 456 hectares and all related policies to OPA 38 remain under appeal at the Ontario Municipal Board (OMB). A copy of the letter dated November 28, 2012 from the Ministry of the Attorney General is provided in Appendix 'A'.*
>
> ...
>
> *In summary, it is proposed that an equivalent of 5,000 units be developed on the initially approved 300 Ha., over 5 stages as Development Phase 1 (2,650 in the Carson Road area and 2,350 in the Doran Road area). Depending upon future MMAH decisions to release additional lands for development in the Secondary Plan area, it is proposed to develop a further 3,208 units (259 in the Carson Road area as well as 2,949 in the Doran Road area) for an overall total of 8,208 equivalent units.*

As noted above, these statements were made almost two years after the OPA 38 Settlement was reached and approved by the OMB.

Ainley purports to defend the proposed recommendations for phasing based on the status of OPA 38 for the underlying lands. In this manner, Ainley emphasizes the importance of the status of the underlying OPA 38 in determining phasing of development and infrastructure. This proposition is consistent with the position taken by the Township in September 2015 when it

objected to our request that the Carson draft plan of subdivision appeal be scheduled for a hearing. However, as clearly demonstrated in the above quotes, Ainley's recommendations for phasing are predicated on an erroneous understanding of the status of OPA 38.

In addition, this limited focus for phasing undermines the direct mandate set out in the Municipal Class EA to assess the environmental impacts of municipal infrastructure in a comprehensive manner. As stated above, "environment" includes the economic and social conditions that influence the life of humans or community. The sequencing of development is inextricably tied to the economic and social conditions that will ensue from the development of a new community in Midhurst.

2. **Despite the statement that the Phase 3 and 4 ESR was limited to the initial 300 hectares, the Phasing Plan includes lands owned by the Estate of Marie Louise Frankcom which were approved by the OMB in 2017.**

Section 7.4.1 of the Phase 3 and 4 ESR lists the developments contemplated within the Midhurst Settlement Area, which collectively add to a total unit count of 8208 (including residential and employment growth). Section 7.4.2 states that for the "three residential developments," development phasing is shown in Figure 7.4.1 and Table 7.4-1.

Figure 7.4.1 is comprised of a coloured map of the OPA 38 Secondary Plan Area. The areas in colour are proposed to be specifically identified for development at a particular phase. Despite the assertion in the Phase 3 and 4 ESR by Ainley that the initial phases for development are limited to the 300 hectares released from the Ministry's appeal of OPA 38 in 2012, the coloured lands identified in Figure 7.4.1 include lands owned by Estate of Marie Louise Frankcom that were only approved for urban uses by the OMB in 2017 as part of the OPA 38 Settlement. It is not clear exactly how these lands are to be incorporated into the overall phasing plan, although based on Figure 7.4.1 itself it would appear that they are to be incorporated into Phase 1. None of the lands owned by other landowners and approved as part of the OPA 38 Settlement with the County are shown in colour on Figure 7.4.1. It is entirely unknown how and when the Carson Trail Lands are intended to be developed under the proposed phasing plan despite the fact that they are ideally situated to form part of Phase 1 in Neighbourhood One (as discussed below).

Figure 7.4.1 also includes other lands not shown in colour but are nonetheless included within the OPA 38 planning area and designated for urban uses. These lands are generally not identified for any specific phase of development. The only exception to this are lands within Neighbourhood Three, which as of 2016 were owned by Geranium. These lands have a numerical overlay (3A, 3B, 3C, 3D) that do not correspond to the phases identified in Table 7.4-1. This would appear, however, to suggest that these lands are to form part of a future Phase 3, immediately after the Phase 2 lands (which are identified in Figure 7.4.1 and Table 7.4-1) have been developed. This would further appear to contemplate the development of a new Neighbourhood within the Secondary Plan Area, which will itself require new infrastructure, before lands within Neighbourhood One and Two have been fully developed.

The above observations raise a number of serious concerns. The proposed phasing of development should not be influenced by ownership interest, but rather by the dictates of good planning and engineering. As further described below, extending preferential treatment in this fashion would result in a development framework that does not conform to the growth management policies of OPA 38, the Growth Plan and the Provincial Policy Statement (2014). It is also unclear how the partial addition of lands approved under the OPA 38 Settlement to the coloured mapping are themselves intended to factor into the overall phasing plan for the Midhurst Secondary Plan.

The Phase 3 and 4 ESR contains material inconsistencies. On the one hand, the Phase 3 and 4 ESR states that the review is being limited to the initial 300 hectares approved in 2012, while on the other hand the ESR would appear to include either within Phase 1 or Phase 2 lands that were approved in 2017 by the OMB (i.e. lands that were not part of the original 300 hectares). The Phase 3 and 4 ESR further appears to gratuitously support a potential Third Phase of development in Neighbourhood Three before addressing the obvious question of when remaining lands within Neighbourhood One and Two will be developed. These are material defects in the Phase 3 and 4 ESR.

Although not accurately reflected in the text of the Class 3 and 4 ESR, the inclusion of these additional lands demonstrates that Ainley must be taken to accept that it is appropriate to assess, and in turn advance, a phasing of development program that includes lands beyond the initial 300 hectares. Carson agrees with this proposition, particularly where other landholdings are subject to active development applications, as is the case with the Carson Trail Lands.

The Municipal Class EA imposes an obligation on a proponent to consult with the public in respect of a proposed undertaking. This duty to consult required that Ainley, as the EA consultant, provide an accurate representation of what is proposed to be developed. The inconsistencies in the Phase 3 and 4 ESR set out above are material. Consequently, the proponent has not discharged its obligations to consult with the public under the Municipal Class EA process. This failure is compounded by the fact that the errors in the Phase 3 and 4 ESR are cryptically embedded in the ESR itself, and not easily discerned by members of the public who should be entitled to rely on statements by the EA consultant at face value.

### 3. The proposed undertaking does not conform to OPA 38 and the Growth Plan, and it is not consistent with the Provincial Policy Statement (2014)

In preparation of the Midhurst Secondary Plan, the Township completed a Master Servicing Plan in 2009 through the Phase 1 & 2 Municipal Class EA Process, which demonstrated servicing feasibility for the entire Secondary Plan Area, including the Carson Trail Lands.

The Midhurst Secondary Plan forms part of the Township of Springwater Official Plan. As set out in Section 16 of the *Planning Act*, R.S.O. 1990, c.P.13, as amended, an official plan "shall" contain "goals, objectives and policies established primarily to manage and direct physical change and the effects on the social, economic, built and natural environment of the municipality or part of it, or an area that is without municipal organization." In this manner, an

official plan addresses many of the same "environmental" matters that are under the purview of an environmental assessment.

Section 24 of the Planning Act directs that "despite any other general or special Act, where an official plan is in effect, no public work shall be undertaken and, except as provided in subsections (2) and (4), no by-law shall be passed for any purpose that does not conform therewith." A "public work" is defined as "any improvement of a structural nature or other undertaking that is within the jurisdiction of the council of a municipality or a local board." The Phase 3 and 4 ESR, including the works and phasing of development related thereto, are a public work required to conform to OPA 38.

Policy 9.2(c) of OPA 38 directs that Phase 1 of development within the Secondary Plan Area shall generally be directed between Neighbourhoods One and Two. The Carson Trail Lands are located within Neighbourhood One, at the northeast intersection of Carson Road and Anne Street. The Carson Trail Lands are kitty-corner the planned "Neighbourhood Centre", which is planned to be "a clearly definable focus" within Neighbourhood One. The Neighbourhood Centre is planned to include a range of small-scale retail and service commercial uses, urban squares, community facilities and a range of medium and higher density housing types. There is an obvious symbiotic relationship between the function and success of the Neighbourhood Centre and the proximity of nearby residential development. Given their proximity, the Carson Trail Lands will directly support the planned function of the Neighbourhood Centre.

Both Carson Road and Anne Street are identified as "Primary Roads" under OPA 38. Under the Phase 3 and 4 ESR, Carson Road is planned to have a right-of-way width of 28 metres. Carson Road currently has a right of way width of 20 metres, and will therefore require a widening to achieve its planned function. As illustrated in Figure 7.6.2 (Phasing Schematic) the widening of Carson Road for the portion that directly abuts the Carson Trail Lands is to be widened as part of Phase 1 Stage 1; that is, at the outset of infrastructure development/improvement within the Midhurst Secondary Plan. This widening will ostensibly require a land taking from the Carson Trail Lands at this very early stage. This land taking would be available to the Township for modest consideration through the development approval process. As stated, Carson has submitted an application for draft plan of subdivision and it has been actively attempting to advance the hearing of this appeal before the LPAT. If the Township seeks to acquire the lands required for the widening prior to the development of the Carson Trail Lands, it will be forced to expropriate at market value.

The Growth Management and Phasing Policies in OPA 38 are intended to achieve Provincial policy direction that promotes "sustainable, efficient, and cost-effective development and land use patterns." This direction for growth management is consistent with foundational principles found throughout the Growth Plan and Provincial Policy Statement 2014 which mandate that planning decisions optimize land use and infrastructure, including the cost to provide infrastructure. We submit that the underlying policy direction in OPA 38, the Growth Plan and the Provincial Policy Statement (2014) supports the inclusion of the Carson Trail Lands in Phase 1 of development. These lands are required to facilitate planned infrastructure in the first

phase of development and directly linked to supporting the planned function of the Neighbourhood Centre.

Even if the Carson Trail Lands are not required for the proposed road widening, the fact that they are immediately adjacent to Phase 1 infrastructure indicates that they ought to be included in Phase 1. Servicing will be available to service the Carson Trail Lands in the abutting right-of-way. All of the other three corners of the Carson Road and Anne Street intersection have received draft plan approval. The Carson Trail Lands are opposite lands that are included in Phase 1 of development. As a result, there is no rational basis to exclude the Carson Trail Lands from the First phase of development, let alone leave unanswered when and how these lands will factor into the overall phasing of development plan within the Secondary Plan Area.

The failure of the Phase 3 and 4 ESR to include the Carson Trail Lands in the First phase of development undermines the direction to achieve cost-effective development, and optimal use of land and infrastructure, contrary to the policy direction set out in OPA 38, the Growth Plan and the Provincial Policy Statement (2014).

## 4. Request for Mediation

Members of Carson attended public meetings held in respect of the Municipal Class EA. Carson's position regarding the appropriateness of including the Carson Trail Lands as part of Phase 1 has been communicated to representatives of the Township. In advance of the release of the Phase 3 and 4 ESR, Carson attempted to directly engage members of Council and members of the Midhurst Ratepayers Association on a development proposal that would provide significant community benefits as part of Phase 1.

For the reasons generally referred to above, Carson submits that in its current form the Phase 3 and 4 ESR contains critical flaws. Other landowners have conveyed similar concerns to Ainley through the EA review process; however, these concerns were summarily dismissed on the purported basis that they go beyond the scope of the EA process. Such response by Ainley ignores the policy directions set out in OPA 38, the Growth Plan and the Provincial Policy Statement 2014 to coordinate growth with the provision of services. As discussed above, there is also an inherent inconsistency in Ainley's position given that the Phase 3 and 4 ESR does in fact advance a phasing and sequencing of development plan.

Carson is committed to working with the proponent and interested parties to remedy these errors so that the undertaking may proceed to approval. The issues raised herein are appropriately addressed in the context of a mediation, where all interested parties are provided with an equal opportunity to meaningfully address their concerns.

Should you require any further information or documentation to constitute this request for a Part II Order, please contact the undersigned or, in his absence, Michael Cara at [redacted]

Yours truly,
**Overland LLP**

Daniel B. Artenosi
Per: Partner

Brad Teichman
Partner

Encl.
c. Barnet Kussner, Weirfoulds LLP, Legal Counsel to Township of Springwater

Ontario

Ministry of the Environment and Climate Change

# Part II Order Request

## General Information and Instructions

### General

Anyone who has outstanding environmental issues that have not been addressed through the Class Environmental Assessment process can request the Minister of the Environment and Climate Change to make an order under Part II of the Environmental Assessment Act. This is known as requesting a Part II Order.

A Part II Order request should be submitted after the proponent has issued the Notice of Completion for a Class Environmental Assessment for a project. The request should be submitted within the review period/comment period outlined in the Notice of Completion.

The Ministry recommends that you follow the process set out below before submitting a Part II Order request:

- Participate in the consultation opportunities provided to the public within the Class Environmental Assessment process
- Engage in discussions with the proponent to try to address and resolve your concerns

A Part II Order request should not be submitted for the sole purpose of delaying, stopping, or frustrating the planning and implementation of an undertaking proceeding under a Class Environmental Assessment process. The Minister may consider the efforts of the requester to resolve the concerns directly with the proponent when deciding whether to make an order.

Questions regarding the completion and submission of this form should be directed to a Customer Service representative at the Client Services and Permissions Branch at 416-314-8001 or 1-800-461-6290.

## Step 1 - Get the Facts

- Class Environmental Assessments are used for projects that the Ministry of the Environment and Climate Change considers routine, with predictable and manageable effects on the environment.
- A Part II Order request will not stop a project from proceeding. The Minister has four options when deciding a Part II Order request:
  - To request mediation between you and the proponent to help address your concerns before making a decision
  - To deny the request
  - To deny the request but require the proponent to fulfill additional conditions before the project can proceed, such as further studies or more public consultation
  - To require the proponent to conduct a higher review of the project through an Individual Environmental Assessment; this happens only in rare and exceptional cases.
- Key factors that the Minister may consider when looking at a Part II Order request are:
  - whether the project has the potential to pose significant adverse effects on the environment
  - how the project is significantly different from other projects in its class
  - whether the process for the Class Environment Assessment was adequate.

To learn more about Class Environmental Assessments visit https://www.ontario.ca/page/class-environmental-assessments-approved-class-ea-information.

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## Step 2 – Statement of Participation

☑ I have raised my concerns with the project proponent

Describe how and when you raised your concerns with the proponent and the proponent's response

Please see attached letter.

☑ I was unable to have my concerns resolved by the project proponent

Describe what concerns remain outstanding and why these concerns could not be resolved through discussions with the proponent.

Please see attached letter.

☑ My unresolved concerns relate to:

- ☑ potential environment impacts
- ☐ how the project is significantly different from other projects in its class
- ☑ the adequacy of the process for the Class Environment Assessment
- ☑ other (specify)

Describe

Please see attached letter.

☑ The proponent has issued the Notice of Completion for the project

☑ This request is being made within the review/comment period outlined in that notice

2018/06/18 (Start Date (yyyy/mm/dd)) to 2018/09/18 (End Date (yyyy/mm/dd))

☑ I hereby declare that, to the best of my knowledge, the information contained in this form and the information submitted in support of this form is complete and accurate.

| Last Name | First Name | Date (yyyy/mm/dd) |
|---|---|---|
| Artenosi | Daniel | 2018/09/18 |

With all Part II Order requests, the Ministry maintains a public file that is available for viewing by any member of the public upon request. Personal and other information from your request, such as name, address, and telephone number and your concerns with the project will form part of the public record. If you wish for your information to be excluded from the public file, you can advise the Ministry by checking the box in the declaration below. Even if you request that your information be excluded, your contact information may still be obtained by members of the public if the Ministry is required to disclose the information under the *Freedom of Information and Protection of Privacy Act*.

☐ Please exclude my personal information from the public file (select if you wish to be excluded).

## Step 3 – Provide Identifying Information

If you are certain making a Part II Order Request is the right approach for you, complete the following information:

Requester Name

| Last Name | First Name |
|---|---|
| Artenosi | Daniel |

Requester Type

☐ Individual

☑ On behalf of Person/Group (specify) On behalf of Carson Trail Estates Inc.

☐ Other (specify)

**Current Address**

| Unit Number | Street Number | Street Name | PO Box |
|---|---|---|---|
| [redacted] | [redacted] | [redacted] | |

| City/Town | Province | Country | Postal Code |
|---|---|---|---|
| Toronto | [redacted] | [redacted] | [redacted] |

| Concession | Rural Route |
|---|---|
| | |

| Telephone Number | Fax Number | Email Address (if available) |
|---|---|---|
| [redacted] | [redacted] | [redacted] |

Name of proposed Project (as it appears on the Notice of Completion if available)
Midhurst Water, Wastewater & Transportation Class Environmental Assessment (Phase 3 and 4) ESR

Name of Proponent (as it appears on the Notice of Completion if available)
The Township of Springwater

## Step 4 – Making Your Request

By submitting this form, you are requesting a Part II Order by the Minister.

Confirm what outcome you are seeking from the Minister by making this request.

I want the Minister to:

☑ Refer the matter to mediation to help me and the proponent address my concerns

☐ Impose additional conditions before the project can proceed

Describe what conditions you think would be appropriate and how they would address your concerns.

☑ To require the proponent to conduct a higher review of the project through an Individual Environmental Assessment

Describe how an Individual Environmental Assessment would address your concerns in a way that the Class Environmental Assessment does not:

Please see the attached letter.

If applicable, provide any other relevant information related to this request you would like to share.

## Step 5 – Submitting Your Request

Please send the completed form and any supporting information you would like to provide to all three of the following:

Minister
Ministry of the Environment and Climate Change
Ferguson Block, 77 Wellesley St. W, 11th Floor
Toronto ON M7A 2T5
Fax: 416-314-8452
Minister.MOECC@ontario.ca

Director, Environmental Assessment and Permissions Branch
Ministry of the Environment and Climate Change
135 St. Clair Ave W, 1st Floor
Toronto ON M4V 1P5
MOECCpermissions@ontario.ca

Project Proponent
The email or mailing address for the project proponent can be found on the Notice of Completion for the project.

| Step 6 – Attachments | |
|---|---|
| **Description** | **File name** |
| 1. Request for Part II Order - Carson Trail Lands | |

**Ministry of the Environment and Climate Change**

Environmental Assessment and Permissions Branch

135 St. Clair Avenue West
1st Floor
Toronto ON M4V 1P5
Tel.: 416 314-8001
Fax: 416 314-8452

**Ministère de l'Environnement et de l'Action en matière de changement climatique**

Direction des évaluations et des permissions environnementales

135, avenue St. Clair Ouest
Rez-de-chaussée
Toronto ON M4V 1P5
Tél : 416 314-8001
Téléc. : 416 314-8452

Ontario

October 3, 2018

Daniel Artenosi,
[redacted]

Dear Daniel Artenosi,

Thank you for your correspondence sent on September 18, 2018 to the Minister of the Environment, Conservation and Parks regarding the Midhurst Water, Wastewater and Transportation Servicing Phase 3 and 4 Environmental Study Report proposed by the Township of Springwater.

It is the understanding of the Ministry of the Environment, Conservation and Parks that the project was developed under the Master Plan procedures of the Municipal Class Environmental Assessment. The project contains multiple individual undertakings that are classified as Schedule C projects in the environmental study report.

The various undertakings within the Master Plan include:

- New water system(s) to service the proposed growth within the Midhurst Secondary Plan including new wells, water treatment facility, high lift pumps or booster stations, water storage, reservoirs and distribution systems including transmission mains;
- A new wastewater treatment and collection system (including sanitary collection systems, pump stations, treatment plant and effluent outfall) to service the proposed growth within the Midhurst Secondary Plan with the capability of servicing the existing Midhurst area, if required;
- Upgrading/Reconstruction of existing roads and intersections throughout the existing community;
- Construction of a new Craig Road (2 lanes) from County Road 27 to Russell Road including a direct connection to Forbes Road; and
- Upgrading of the Forbes Road and Highway 400 Interchange.

These undertakings are detailed in the Project's environmental study report that can be accessed here:
http://www.springwater.ca/UserFiles/Servers/Server_229/File/Municipal%20Services/Planning%20and%20Development/Midhurst%20Secondary%20Plan/Environmental%20Assessment/Midhurst%20Class%20EA%20-%20ESR%20-%20V1.pdf

The Municipal Class Environmental Assessment requires that requests for a Part II Order must be in the context of specific projects, and not for the Master Plan itself, or a secondary plan. You requested for the Minister to make an order requiring the Township to comply with Part II of the Environmental Assessment Act; however, you did not specify for which undertaking(s). Please note that the Midhurst Secondary Plan is a separate and distinct process under the Planning Act, and is beyond the scope of this Master Plan. Therefore, the issues you raised related to the secondary plan or official plan policies will not be considered through this process.

We ask that you clarify which project(s) you have environmental concerns with by **October 15, 2018**. You can contact Callee Robinson, Project Evaluator, directly at 416-314-0286 or at Callee.Robinson@ontario.ca.

Thank you for taking the time to share your concerns with the project.

Yours sincerely,

Kristina Rudzki
Supervisor, Project Review Unit
Environmental Assessment and Permissions Branch

c: Heather Coleman, Township of Springwater
Joe Mullan, the Ainley Group

Overland LLP
**Daniel B. Artenosi**
[redacted]

October 15, 2018

**SENT VIA E-MAIL**

Kristina Rudzki
Supervisor, Project Review Unit
Environmental Assessment and Permissions Branch
Kristina.Rudzki@ontario.ca

-and-

Callee Robinson
Project Evaluator
Environmental Assessment and Permissions Branch
Callee.Robinson@ontario.ca

Dear Ms. Rudzki and Ms. Robinson:

**RE: Carson Trails Estate Inc.**
**Township of Springwater**
**Midhurst Water, Wastewater & Transportation (Phase 3 and 4) ESR**
**Request for Part II Order dated September 18, 2018**

We are the solicitors for Carson Trails Estate Inc. ("**Carson**"). We are in receipt of your correspondence dated October 3, 2018 (the **"October 3rd Response"**) in response to the Request for Part II Order submitted on behalf of Carson on September 18, 2018 (the **"Part II Order Request"**). We are writing to provide a preliminary response to your request for information and some of the comments set out in the October 3rd Response.

At the outset, we confirm that the Part II Order Request is not being submitted as a request to review the Master Servicing Plan or the Midhurst Secondary Plan. As stated in the Part II Order Request, in preparation of the Midhurst Secondary Plan, the Township completed a Master Servicing Plan in 2009 through the Phase 1 & 2 Municipal Class EA Process, which demonstrated servicing feasibility for the entire Secondary Plan Area, including the Carson Trail Lands. This was and remains an appropriate starting point to inform future Phases of the EA Process.

Rather, the Part II Order Request is submitted in respect of the specific projects (undertakings) assessed under the Midhurst Water, Wastewater & Transportation (Phase 3 and 4) Environmental Study Report prepared by Ainley Group (**"Ainley"**) dated June 2018 (the **"Phase 3 and 4 ESR**"). These projects should be evaluated comprehensively, in order to facilitate development within the Midhurst Secondary Plan Area as a whole. There is a departure between the comprehensive nature of the review undertaken in support of the Master Servicing Plan under Phases 1 & 2 of the Municipal Class EA Process, and the selective review of lands assessed in support of the recommended phasing plan as set out in the Phase 3 and 4

[redacted]

ESR. Carson's interest is to ensure that all of the specific projects considered in the Phase 3 and 4 ESR are assessed on a comprehensive basis, which includes, amongst other considerations, how and when the proposed services and developments will be phased throughout the Midhurst Secondary Plan Area. The following projects are of specific concern to Carson:

1. the new water system(s) that is proposed to service growth within the Midhurst Secondary Plan Area, including, without limitation, the proposed distribution systems;
2. the new wastewater treatment and collection system, including, without limitation, the sanitary collection system, pump stations, treatment plant and effluent outfall, to service the proposed growth within the Midhurst Secondary Plan Area; and,
3. the proposed upgrading/reconstruction of existing roads and intersections.

We set out below an excerpt from the October 3rd Response found at page 2:

> *Please note that the Midhurst Secondary Plan is a separate and distinct process under the Planning Act, and is beyond the scope of this Master Plan. Therefore, the issues you raised related to the secondary plan or official plan policies will not be considered through this process.*

We respectfully submit that this statement raises a number of serious concerns and ask that this position be reconsidered.

At the outset, it is unclear what is intended by "the issues you raised related to the secondary plan or official plan policies." Is this statement referring to the submissions set out in the Part II Order Request that reinforce the substantive policy support for inclusion of the Carson Trail Lands as part of Phase 1? Or rather, is this statement referring to the submissions set out in the Part II Order Request that identify and respond to the erroneous understanding on the status of the Midhurst Secondary Plan relied upon by Ainley Group in its recommendations set out in the Phase 3 and 4 ESR? In order to ensure that Carson has a full and fair opportunity to respond to the above-noted comment in the October 3 Response, we request that this statement be clarified.

On a preliminary basis, we reiterate that the Phase 3 and 4 ESR purports to advance a phasing plan that is itself predicated on an erroneous understanding of the status of the Midhurst Secondary Plan. Two things follow from this:

1. Ainley Group, as the EA Consultant, accepts the inherent linkage between the phasing recommendations in the Phase 3 and 4 ESR and the Midhurst Secondary Plan. This is not a proposition created by Carson, but rather by Ainley Group.
2. At various points in the Phase 3 and 4 ESR, Ainley Group repeats its understanding that only 300 hectares of land within the Midhurst Secondary Plan have been approved for development. As detailed in the Part II Order Request, this statement is incorrect.

It would be fundamentally unfair and flawed to allow a foundational presupposition for the phasing recommendations to be unchallenged, particularly where the presupposition is incorrect. While Carson agrees that there should be an inherent linkage between the

recommendations set out in the Phase 3 and 4 ESR and the Midhurst Secondary Plan, to the extent that the Ministry disagrees with this proposition, that is itself a challenge to the recommendations set out in the Phase 3 and 4 ESR, which supports the request for a Part II Order.

The Planning Act sets out very clear directives on the purpose of an official plan, which is to "manage and direct physical change and the effects on the social, economic, built and natural environment." The Midhurst Secondary Plan forms part of the official plan policies for the Midhurst Secondary Plan Area. The Environmental Assessment Act is related in this regard, as it is intended to support the betterment of people in Ontario by providing for the protection, conservation and wise management of the environment, where "environment" is broad defined to include many of the same "environmental" matters that are to be managed by the official plan.

The Municipal Class EA process itself promotes an integrated process of "planning" under the Environmental Assessment Act and the Planning Act. "Planning" under both legislative frameworks is not intended to be isolated processes, nor are the results of either process intended to be determined in a silo. The policy directions set out in the official plan must inform the physical change within a community. To suggest that the official plan has no role in the Municipal Class EA process ignores the underlying statutory framework that governs planning in Ontario. To permit the projects contemplated under the Phase 3 and 4 ESR to be advanced without regard and direction from the underlying official plan policies that give rise to the need for these projects would further undermine the planning framework in Ontario, including the objectives of the Municipal Class EA.

**2. Request for Mediation**

The issues raised under the Part II Order Request are serious and require meaningful consideration by all interested parties. In this circumstance, we submit that the Part II Order Request should be referred to mediation as requested by Carson in the Part II Order Request.

We await your clarification as set out above. In the meantime, should you require any further information or documentation, please contact the undersigned and Michael Cara at [redacted]

Yours truly,
**Overland LLP**

Daniel B. Artenosi
Per: Partner

for: Brad Teichman
Partner

Encl.

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## CARSON TRAILS PART II ORDER RESPONSE

| | |
|---|---|
| **PROPONENT:** | **Township of Springwater re: Carson Trails request** |
| **PROJECT TITLE:** | **Midhurst Phase 3 & 4 Class EA (Water, Wastewater & Transportation)** |
| **PROJECT LOCATION:** | **Midhurst Secondary Plan Area – Township of Springwater, ON** |
| **PREPARED BY:** | **Joe Mullan, P.Eng. - Ainley Group** |
| **DATE SUBMITTED TO MECP** | **October 26, 2018** |
| **PHONE # and E-MAIL:** | **(705) 445-3451, mullan@ainleygroup.com** |

| Issues and Concerns | Proponent Response | Status |
|---|---|---|
| **The term "future Development" is not itself a defined term in the ESR – and it is unclear what is included this reference.** | The term "future development" refers to all development within the Midhurst Secondary Plan, which includes the Carson Trail lands. | As we had not received any communication from Carson Trails, prior to the submission of the Part II Order Request, we have not followed up with them. |
| **1. The Phase 3 & 4 ESR is flawed in that it assumed that only 300 ha owned by Geranium and Rose Alliance were available for development. The ESR arbitrarily restricted its consideration of the proposed phasing plan to a limited portion of lands designated for urban uses within the MSP area.**<br><br>**An additional 129.35 ha were approved for urban use but this was not considered in ESR.** | The service area associated with the Class EA includes the entire Midhurst Secondary Plan, in accordance with the Township's Official Plan. Further, the current Phase 3 & 4 Class EA is an continuation of the Phase 1 and 2 Master Plan (approved Jul 2009), which identified a projected growth of 8,208 new equivalent units (7,858 new residential units and 350 equivalent employment units) within the Midhurst Secondary Plan Area.<br><br>For reference, we also attach the applicable pages from the Phase 1 & 2 Master Plan dealing with the identification of the service area and includes a Schedule from the Township's Official Plan.<br><br>Therefore; the Carson Trails Lands are included in the Class EA and as such the Class EA is not flawed. | |
| **Ainley's recommendations for phasing are predicated on an erroneous understanding of the status of OPA 38.**<br>**In addition, this limited focus for phasing undermines the direct mandate set out in the Municipal** | The concern related to when development can proceed is a Planning related matter in accordance with the Planning Act. As such this item is outside the scope of the Class Environmental Assessment process. | |

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## CARSON TRAILS PART II ORDER RESPONSE

| Issues and Concerns | Proponent Response | Status |
|---|---|---|
| **Class EA to assess the environmental impacts of municipal infrastructure in a comprehensive manner. As stated above, "environment" includes the economic and social conditions that influence the life of humans or community. The sequencing of development is inextricably tied to the economic and social conditions that will ensue from the development of a new community in Midhurst.** | | |
| **2. Despite the statement that the Phase 3 and 4 ESR was limited to the initial 300 ha., the phasing plan includes lands owned by the Estate of Marie Louise Frankcom which were approved by the OMB in 2017. None of the lands owned by other landowners and approved as part of the OPA 38 Settlement are shown in colour on Fig 7.4.1 of the ESR. It is not known when the Carson Trail lands are intended to be serviced under the proposed phasing plan. Ideally suited to form part of Phase 1.** | As noted above, the Class EA allows for the development of the entire of the Midhurst Secondary Plan.<br><br>The concern related to when development can proceed is a Planning related matter in accordance with the Planning Act. As such this item is outside the scope of the Class Environmental Assessment process. | |
| **The proposed phasing should not be influenced by ownership interest but rather by the dictates of good planning and engineering.**<br><br>**The inclusion of these additional lands demonstrates that Ainley must be taken to accept that it is appropriate to assess, and in turn** | The concern related to phasing of development within the Midhurst Secondary Plan is a Planning related matter in accordance with the Planning Act. As such this item is outside the scope of the Class Environmental Assessment process. | |

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## CARSON TRAILS PART II ORDER RESPONSE

| Issues and Concerns | Proponent Response | Status |
|---|---|---|
| **advance, a phasing of development program that includes lands beyond the initial 300 hectares. Carson agrees with this proposition, particularly where other landholdings are subject to active development applications, as is the case with the Carson Trail Lands** | | |
| **The Municipal Class EA imposes an obligation on a proponent to consult with the public in respect of a proposed undertaking. Consequently, the proponent has not discharged its obligations to consult with the public under the Municipal Class EA process.** | As noted within the attached Table B and documented throughout the ESR, an extensive communications plan was developed for this Class EA, which included multiple Public Information Centres (PIC's), open Council Meetings, Notices & Advertisements in local newspapers & Township website and the creation of Resident Liaison Committee which purpose was to keep the public and interested parties engaged and updated throughout the Class EA process.<br><br>It should be noted that throughout the Class EA process representatives of Carson Trails did not contact or communicate with Ainley regarding the Class EA process, until the recent submission of the Request for Part II Order. | |
| **3. The proposed undertaking does not conform to OPA 38 and the growth plan and it is not consistent with the Provincial Policy Statement (2014).** | We disagree with this comment, as the service area associated with the Class EA includes the entire Midhurst Secondary Plan, in accordance with the Township's Official Plan. | |
| **Widening of Carson Rd. (in the immediate vicinity of the Carson Trail lands) is required by the ESR, as part of Phase 1, Stage 1 development.<br>This supports the inclusion of the Carson Trail lands in Phase 1.** | The concern related to widening on Carson Road and the claim that Carson Trails needs to be included in Phase 1 Stage 1 is a Planning related matter in accordance with the Planning Act. As such this item is outside the scope of the Class Environmental Assessment process. | |
| **Members of Carson attended public meetings held in respect of the Municipal Class EA.<br>Carson's position regarding the appropriateness of including the Carson Trail Lands as part of** | We are unsure who the Carson Trails was in communication with at the Township and/or the Midhurst Ratepayers Association, but as noted above Ainley have not received any communication from Carson Trails throughout the Class EA process, until the recent submission of the Request for a Part II Order. | |

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

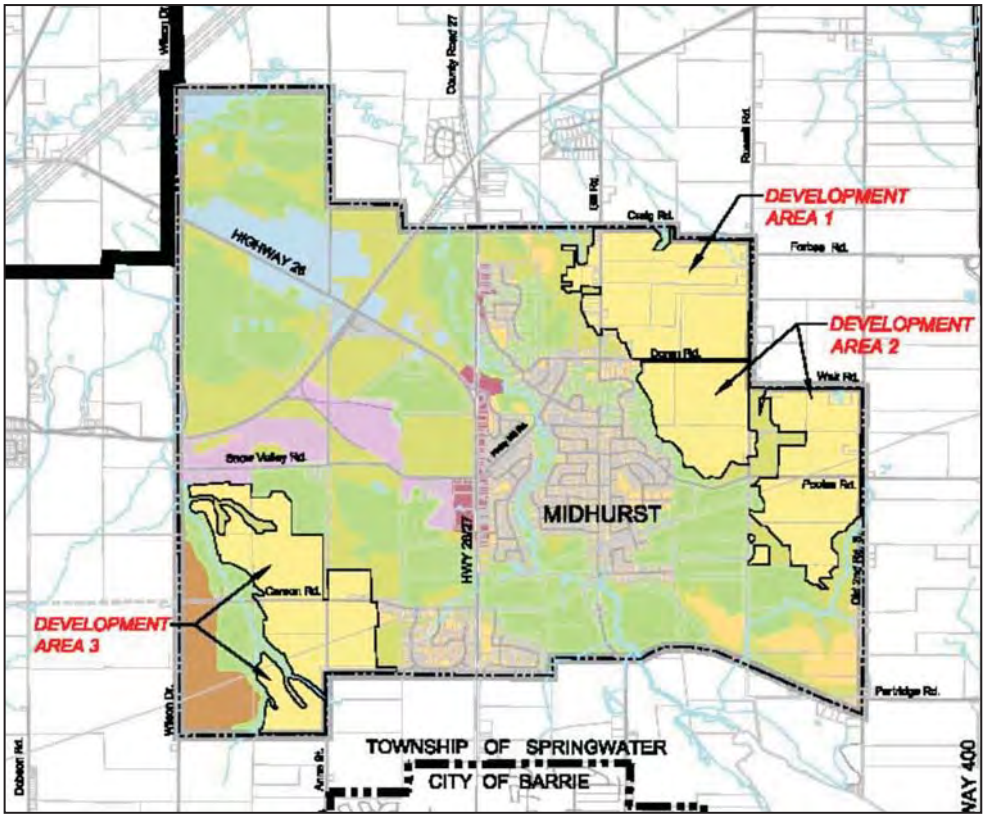
## CARSON TRAILS PART II ORDER RESPONSE

| Issues and Concerns | Proponent Response | Status |
|---|---|---|
| **Phase 1 has been communicated to representatives of the Township. In advance of the release of the Phase 3 and 4 ESR, Carson attempted to directly engage members of Council and members of the Midhurst Ratepayers Association on a development proposal that would provide significant community benefits as part of Phase 1.** | | |

Township of Springwater

# Class Environmental Assessment Study for the Midhurst Water, Wastewater and Transportation Master Plan

# Phase 1 and 2 Report




**Ainley Group**
Consulting Engineers and Planners
280 Pretty River Parkway,
Collingwood, Ontario
L9Y 4J5

Telephone: 705-445-3451
Fax: 705-445-0968
www.ainleygroup.com

***File: 208017***
***July 2009***

**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.

## 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

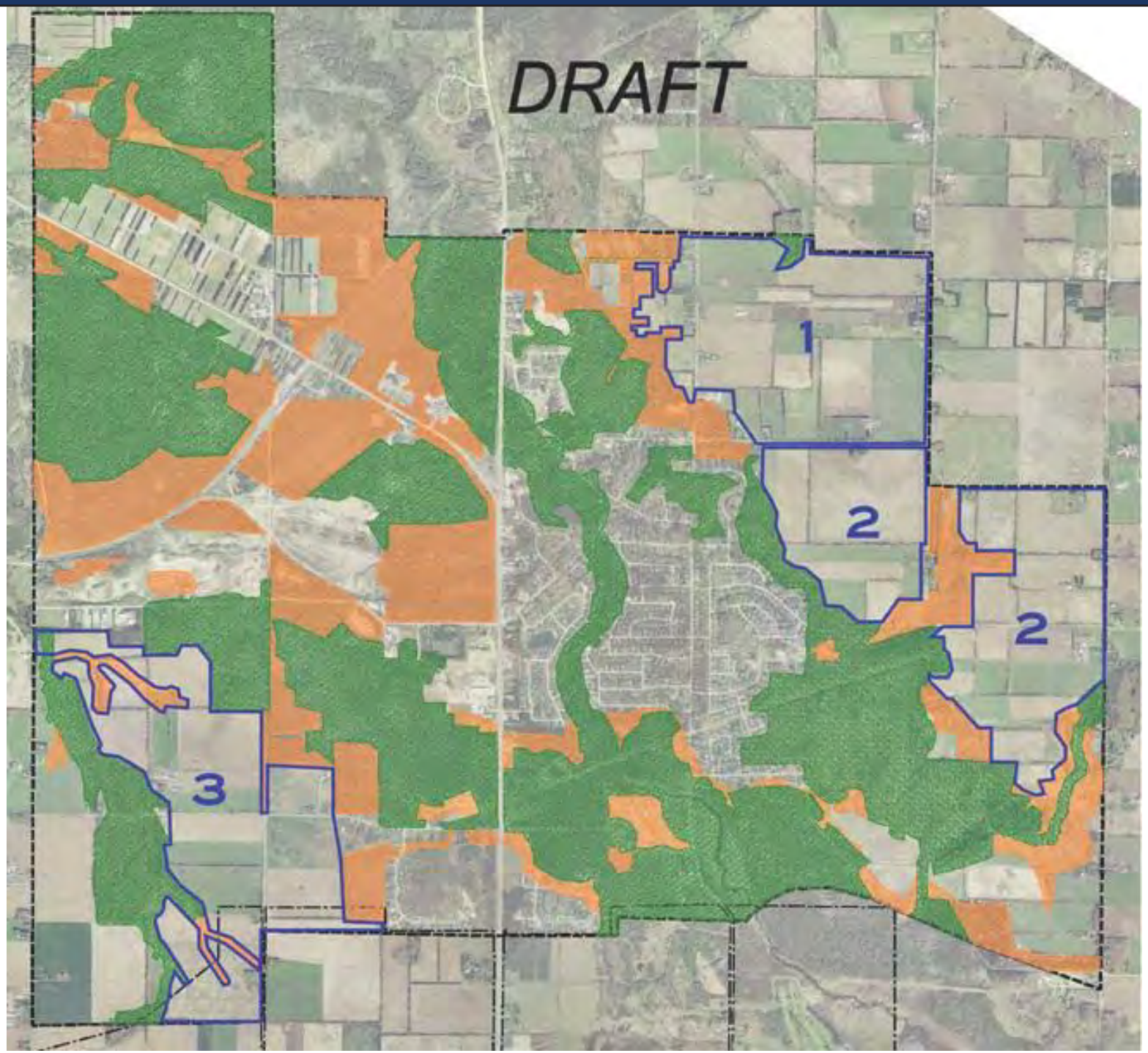
It is noted that subsequent to the completion of the Midhurst Secondary Plan, revisions were made to the descriptions of the originally defined "Growth Option Areas". The revised Areas are as shown on the enclosed (overleaf) copy of Schedule B as reprinted from the Midhurst Secondary Plan. In summary,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

- Original Area 1 is now referred to as Neighourhood 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

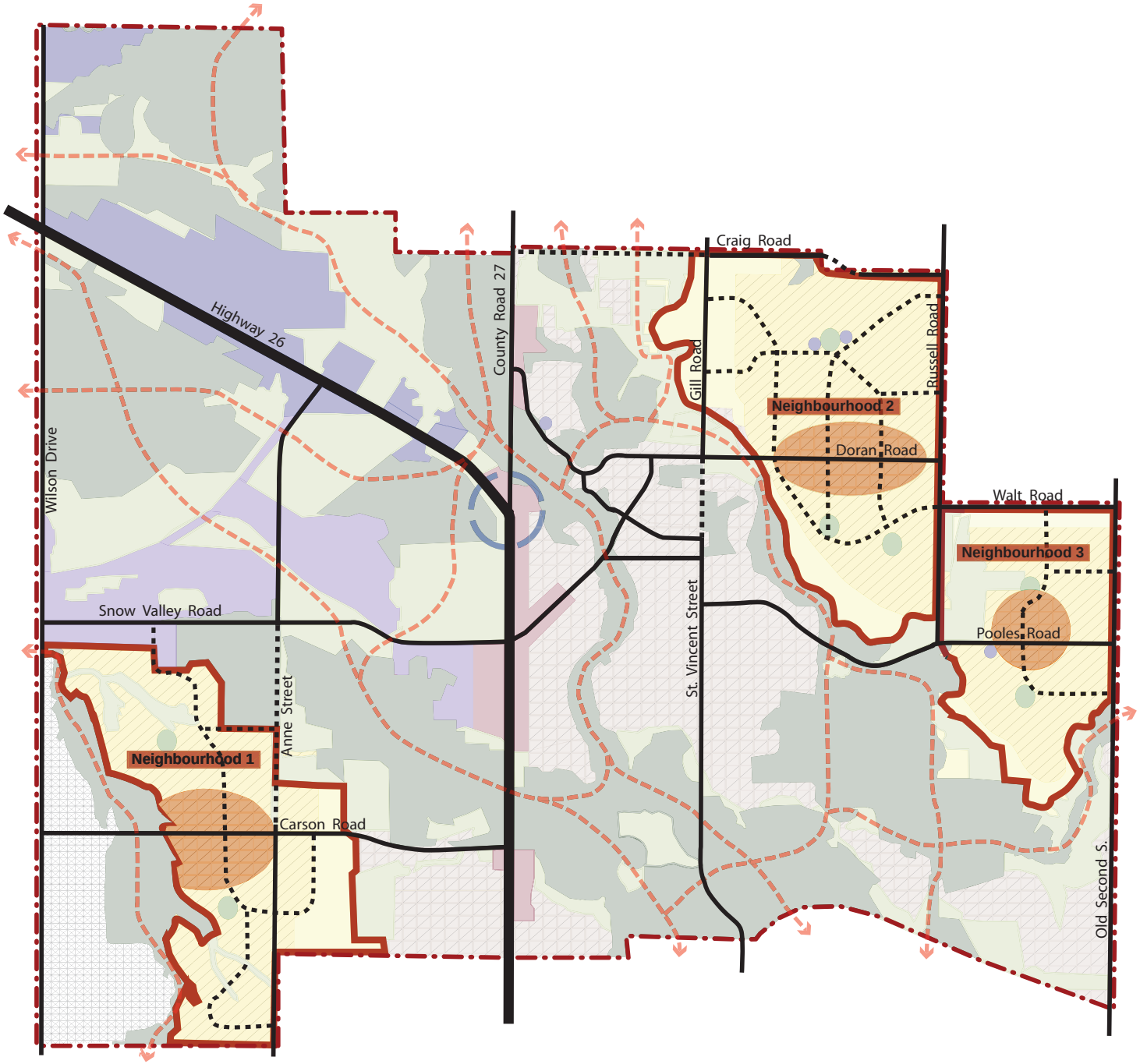
**Development yields for each Growth Option are as follows:**

| | 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

0 50 250 500 750 1000 m

Ministry of the Environment,
Conservation and Parks

Office of the Minister

777 Bay Street, 5th Floor
Toronto ON M7A 2J3
Tel.: 416-314-6790

Ministère de l'Environnement,
de la Protection de la nature et des
Parcs

Bureau du ministre

777, rue Bay, 5e étage
Toronto (Ontario) M7A 2J3
Tél. : 416.314.6790

Ontario

357-2019-859

NOV 2 0 2019

James Feehely
[redacted]

Dear Mr. Feehely:

Thank you for your interest in the Midhurst Water, Wastewater, and Transportation Master Plan Class Environmental Assessment (Master Plan) as proposed by the Township of Springwater (Township). I welcome your comments on this Master Plan.

On September 18, 2018, you requested on behalf of the Estate of Marie Louise Frankcom, that the Township be required to prepare an individual environmental assessment for the projects contained within the Midhurst Water, Wastewater, and Transportation Master Plan. I am taking this opportunity to inform you that I have decided that elevating the project to an individual environmental assessment is not required.

In making this decision, I have given careful consideration to the Master Plan documentation, the provisions of the Municipal Class Environmental Assessment, the issues raised in your request, and relevant matters to be considered in subsection 16(4) of the Environmental Assessment Act.

Despite my not requiring an individual environmental assessment be prepared, in reviewing the requests and the Master Plan documentation, I have decided to impose conditions with respect to the projects in the Master Plan regarding species at risk, source water protection, and air quality impacts. These conditions are outlined in the attached letter to the Township.

I am satisfied that the issues raised in the Part II Order requests can be addressed by the work that is required to be carried out as a result of the conditions I have imposed and through additional permitting and approvals.

With this decision having been made, the Township can now proceed with the projects in the Master Plan subject to the conditions I have imposed, and any permits or approvals that are required. The Township must ensure it implements the projects in the manner they were developed and designed, as set out in the Master Plan documentation, and inclusive of all mitigating measures, and environmental and other provisions therein.

Again, I would like to thank you for participating in the Municipal Class Environmental Assessment process and for bringing your concerns to my attention.

Sincerely,

Jeff Yurek
Minister of the Environment, Conservation and Parks

Attachment

c: Heather Coleman, Director of Public Works, Township of Springwater

Lydia Bojeczko, MPP Liaison & Strategic Communications Advisor, Ministry of the Environment Conservation and Parks

The Estate of Marie Louise Frankcom
c/o S. Kirsch, authorized agent
skirsch@bellnet.ca

EA File No. 18077 – Midhurst Water, Wastewater, and Transportation Master Plan Class Environmental Assessment

**FEEHELY, GASTALDI**
Barristers and Solicitors

**JAMES J. FEEHELY**
**PAUL F. GASTALDI**
**JERRY W. SWITZER**
**COLLEEN E. BUTLER**
**AMANDA M. SWARBRECK**
**PETER R. McKENNA**

[redacted]

September18, 2018

**Via E-Mail:** Minister.MECP@ontario.ca

The Honourable Rod Phillips
Minister, of the Environment, Conservation and Parks
Ferguson Block, 77 Wellesley Street West, 11th Floor
Toronto, Ontario, M7A 2T5

Dear Minister Phillips:

**Re: Request for a Part II Order, Environmental Assessment Act**
**Midhurst – Water, Wastewater and Transportation Class Environmental Assessment Phases 3 and 4 (the "Midhurst EA")**
**Township of Springwater (the "Township")**

I am writing to you on behalf of my client, the Estate of Marie Louise Frankcom (the "**Estate**"). The purpose of this letter is to request that the Ministry of the Environment, Conservation and Parks (the "**Ministry**") approve a Part II Order for the Midhurst EA.

**Background**

The Estate owns lands at 124 Doran Roan in Midhurst, Ontario (the "**Estate's Lands**"). The Estate's Lands are 20.318 hectares in size and are directly across the road from Midhurst's built boundary, out from which development is to occur in accordance with the County of Simcoe's Official Plan policy on this matter as approved by the Ontario Municipal Board (the "**OMB**") on May 15, 2014 (the "**County Policy**").

In a subsequent January 4, 2017 decision regarding the Midhurst Secondary Plan, the OMB approved the Midhurst Secondary Plan and urban land use designations for certain lands in the Midhurst Secondary Plan Area, including the Estate's Lands. This approval, along with the population allocated to the Estate by the County of Simcoe in October of 2016, allows for the development of the Estate's Lands as a residential subdivision (the "**Subdivision**"). The full build out of the Subdivision would result in the construction of 276 residential homes along with a commercial and mixed use area.

Given the above noted decisions and approvals, the Estate's Lands should be developed as part of Phase 1 Stage 1 of development in the new urban settlement area of Midhurst. Accordingly, the provision of water, wastewater and transportation infrastructure servicing to/for/and through the Estate's Lands should have been properly

studied and provided for early on as part of the Midhurst EA, the purpose of which is to "*determine specific water, wastewater and transportation infrastructure requirements to accommodate future growth within the Midhurst Secondary Plan Area*".

**Issues and Omissions Regarding the Midhurst EA**

It is the position of the Estate that the Midhurst EA did not adequately, despite the claims otherwise by the Township and their EA consultant, Ainley Group ("**Ainley**"), consider the Estate's Lands as part of the urban area to be serviced at this time. This is contrary to the County Policy.

Examples of these omissions include, but are not limited to:

1) The Midhurst EA proposes that the first servicing of housing units in the lands north of Doran Road where the Estate's Lands are located will go to the lands surrounding the Estate's Lands to the north and east, even though the Estate's Lands are closer to the built boundary of Midhurst. These other lands cannot and should not be examined in isolation given (a) the County Policy, and (b) that it is more efficient and cost effective for the Township to address all infrastructure in the area north of Doran Road together. There will be a common road network, a common water and wastewater handling network, and a common storm water management pond. Reviewing the lands on a piecemeal basis does not make environmental sense.

2) The traffic study does not address how the Estate's Street 'A' in the Subdivision is an important and integral part of the road and active transportation network for the area in which the Estate's Lands are located. This is a matter that should have been considered and addressed. In fact, the lot fabric and the road network for the Estate's lands was not even shown in the Midhurst EA until the late May 2018 draft of that EA.

3) The provision of water and wastewater infrastructure handling services for the proposed homes to be located on the Estate's Lands has not been addressed by Ainley, as a priority. This would deny essential servicing to the Subdivision. Again, this approach will not allow for the efficient and orderly development of the Estate Lands and the larger community.

4) Water distribution can be more effectively and efficiently handled by including the Estate's lands in the water distribution pattern for the area early on. This is not being proposed at the present time.

5) Leaving the Estate's Lands as a "hole in the donut" runs counter to the objectives of the Province to develop complete, compact, efficient communities (*Growth Plan, Provincial Policy Statement 2014*).

**Lack of Meaningful Consultation**

It is further the submission of the Estate that these omissions could have been avoided had the Township and Ainley engaged in a proper dialogue with the Estate during the preparation of the Midhurst EA. It is not enough to host open houses or Council presentations. Consultation is to be meaningful. Unfortunately neither the Township nor Ainley ever meet with representatives of the Estate in regard to the Midhurst EA (which is a legal requirement under the Environmental Assessment Act) nor did they take into serious consideration the concerns and the submissions of the Estate. Ainley relied instead primarily on other sources of information as the basis for its review.

**Results of the Omissions**

The consequences of this approach by the Township and Ainley is that water, wastewater, and transportation infrastructure servicing will not be provided to the Estate's lands in an appropriate manner or on a timely basis and makes little logical or environmental sense given that there is to be a logical progression of contiguous development out from Midhurst's built boundary.

**Request for a Part II Order**

A higher level review of the Midhurst EA by the Ministry through a Part II Order would, in our respectful submission, result in a more comprehensive assessment. This in turn would avoid traffic, wastewater, and transportation infrastructure servicing issues such as those identified above and would also bring the Midhurst EA into greater conformity with the objectives of the Province and the County in promoting efficient, cost-effective development.

Accordingly, the Estate requests that you grant this request for a Part II Order. As part of this review process the Estate would be pleased to participate in mediation to help resolve the above concerns.

In connection with my client's request please find attached the executed Part II Order Request Form in support of my client's request for a Part II Order.

Thank you in advance for your consideration of our request. The Estate looks forward to hearing from you.

Yours truly,
**FEEHELY, GASTALDI**

James J. Feehely

cc: Director, Environmental Assessment and Permissions Branch
Ministry of the Environment, Conservation and Parks
E-Mail: enviropermissions@ontario.ca

cc: Ms. Heather Coleman
Director of Public Works
Township of Springwater
E-Mail: midhurst.classea@springwater.ca

cc: The Estate of Marie Louise Frankcom
[redacted]

Ontario Ministry of the Environment and Climate Change

# Part II Order Request

## General Information and Instructions

### General

Anyone who has outstanding environmental issues that have not been addressed through the Class Environmental Assessment process can request the Minister of the Environment and Climate Change to make an order under Part II of the Environmental Assessment Act. This is known as requesting a Part II Order.

A Part II Order request should be submitted after the proponent has issued the Notice of Completion for a Class Environmental Assessment for a project. The request should be submitted within the review period/comment period outlined in the Notice of Completion.

The Ministry recommends that you follow the process set out below before submitting a Part II Order request:

- Participate in the consultation opportunities provided to the public within the Class Environmental Assessment process
- Engage in discussions with the proponent to try to address and resolve your concerns

A Part II Order request should not be submitted for the sole purpose of delaying, stopping, or frustrating the planning and implementation of an undertaking proceeding under a Class Environmental Assessment process. The Minister may consider the efforts of the requester to resolve the concerns directly with the proponent when deciding whether to make an order.

Questions regarding the completion and submission of this form should be directed to a Customer Service representative at the Client Services and Permissions Branch at 416-314-8001 or 1-800-461-6290.

## Step 1 - Get the Facts

- Class Environmental Assessments are used for projects that the Ministry of the Environment and Climate Change considers routine, with predictable and manageable effects on the environment.
- A Part II Order request will not stop a project from proceeding. The Minister has four options when deciding a Part II Order request:
  - To request mediation between you and the proponent to help address your concerns before making a decision
  - To deny the request
  - To deny the request but require the proponent to fulfill additional conditions before the project can proceed, such as further studies or more public consultation
  - To require the proponent to conduct a higher review of the project through an Individual Environmental Assessment; this happens only in rare and exceptional cases.
- Key factors that the Minister may consider when looking at a Part II Order request are:
  - whether the project has the potential to pose significant adverse effects on the environment
  - how the project is significantly different from other projects in its class
  - whether the process for the Class Environment Assessment was adequate.

To learn more about Class Environmental Assessments visit https://www.ontario.ca/page/class-environmental-assessments-approved-class-ea-information.

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## Step 2 – Statement of Participation

☑ I have raised my concerns with the project proponent

Describe how and when you raised your concerns with the proponent and the proponent's response
The Estate has tried to raise concerns with the Proponent (i.e. the Township of Springwater) and its consulting engineering firm Ainley over many years 1) in person at Council meetings and/or PIC's 2) by email and 3) over the phone in regard to the Estate's project and its EA matters but what was said on the Estate's behalf fell on deaf ears.

At the beginning of the process the Proponent and Ainley took the position that it was too soon to address EA matters related to the Estate's Lands. More recently they essentially suggested that what they are doing and how they are doing it is fine.

In our view it was not too soon to deal with the Estate's EA matters years ago and what they are doing now is not fine. It is inadequate.

For one thing, there is a legal requirement under the Environmental Assessment Act for the Proponent and/or its consulting engineering firm Ainley to meet with representatives of the Estate to address the Estate's EA concerns and so far they haven't done so.

For additional comments on the lack of meaningful consultation see the covering letter to the Minister to which this form is attached.

☑ I was unable to have my concerns resolved by the project proponent

Describe what concerns remain outstanding and why these concerns could not be resolved through discussions with the proponent.
Water, wastewater, and transportation matters have not been adequately addressed for the Estate's site in spite of the fact that the Estate's land development project is directly across the road from Midhurst's built boundary and there is to be a logical progression of contiguous development out from the built boundary in accordance with the County's Official Plan policy on this matter.

Some examples of infrastructure matters not addressed in respect to the Estate's land development project in Midhurst include but are not limited to the following:

1) The Midhurst EA proposes that the first servicing of housing units in the lands north of Doran Road where the Estate's Lands are located will go to the lands surrounding the Estate's Lands to the north and east, even though the Estate's Lands are closer to the built boundary of Midhurst. These other lands cannot and should not be examined in isolation given (a) the County Policy, and (b) that it is more efficient and cost effective for the Township to address all infrastructure in the area north of Doran Road together. There will be a common road network, a common water and wastewater handling network, and a common storm water management pond. Reviewing the lands on a piecemeal basis does not make environmental sense.

2) The traffic study does not address how the Estate's Street 'A' in the Subdivision is an important and integral part of the road and active transportation network for the area in which the Estate's Lands are located. This is a matter that should have been considered and addressed. In fact, the lot fabric and the road network for the Estate's lands was not even shown in the Midhurst EA until the late May 2018 draft of that EA.

3) The provision of water and wastewater infrastructure handling services for the proposed homes to be located on the Estate's Lands has not been addressed by Ainley, as a priority. This would deny essential servicing to the Subdivision. Again, this approach will not allow for the efficient and orderly development of the Estate Lands and the larger community.

4) Water distribution can be more effectively and efficiently handled by including the Estate's lands in the water distribution pattern for the area early on. This is not being proposed at the present time.

5) Leaving the Estate's Lands as a "hole in the donut" runs counter to the objectives of the Province to develop complete, compact, efficient communities (Growth Plan, Provincial Policy Statement 2014).

The Estate's concerns could not be resolved because the Township is taking the position that they do not have to address these matters at the present time and perhaps not at all, in spite of the benefits in doing so and in spite of the fact that by not doing so they are failing to follow County policy, the Growth Plan's policies, and Ainley's professional requirements to follow any and all such policies in the doing of their work for the Township.

☑ My unresolved concerns relate to:

- ☑ potential environment impacts
- ☐ how the project is significantly different from other projects in its class
- ☑ the adequacy of the process for the Class Environment Assessment
- ☑ other (specify)

Describe
The infrastructure planning and implementation process is flawed as it a) didn't comply with the County's requirement for there to be a logical progression of contiguous development out from Midhurst's built boundary b) isn't complying with the notion of complete communities c) doesn't address the Estate's EA matters adequately or as a priority even though the OMB has approved the Midhurst Secondary Plan on the Estate's lands and provided urban land use designations for the Estate's lands to go along with the population allocated to its lands by the County and d) changed the land area of focus going from Phase 1 & 2 to Phase 3 & 4 of the project.

Other concerns are as follows;
1) Failure of the Township and its consulting engineering firm to deal with the Estate in an open and transparent manner
2) Failure of the Township to provide public studies on a timely basis or in some cases not at all
3) Failure of the Township to deal with the Estate in a fair and equitable manner
4) Special treatment of our developer neighbours

☑ The proponent has issued the Notice of Completion for the project

☑ This request is being made within the review/comment period outlined in that notice

2018/06/18 (Start Date (yyyy/mm/dd)) to 2018/09/18 (End Date (yyyy/mm/dd))

☑ I hereby declare that, to the best of my knowledge, the information contained in this form and the information submitted in support of this form is complete and accurate.

| Last Name | First Name | Date (yyyy/mm/dd) |
|---|---|---|
| Kirsch | Stanley | 2018/09/18 |

With all Part II Order requests, the Ministry maintains a public file that is available for viewing by any member of the public upon request. Personal and other information from your request, such as name, address, and telephone number and your concerns with the project will form part of the public record. If you wish for your information to be excluded from the public file, you can advise the Ministry by checking the box in the declaration below. Even if you request that your information be excluded, your contact information may still be obtained by members of the public if the Ministry is required to disclose the information under the *Freedom of Information and Protection of Privacy Act.*

☑ Please exclude my personal information from the public file (select if you wish to be excluded).

## Step 3 – Provide Identifying Information

If you are certain making a Part II Order Request is the right approach for you, complete the following information:

Requester Name

| Last Name | First Name |
|---|---|
| Kirsch | Stanley |

Requester Type

☐ Individual

☑ On behalf of Person/Group (specify) S. Kirsch on behalf of the Estate of Marie Louise Frankcom

☐ Other (specify)

**Current Address**

| Unit Number | Street Number | Street Name | PO Box |
|---|---|---|---|
| | [redacted] | [redacted] | |

| City/Town | Province | Country | Postal Code |
|---|---|---|---|
| [redacted] | [redacted] | [redacted] | [redacted] |

| Concession | Rural Route |
|---|---|
| | |

| Telephone Number | Fax Number | Email Address (if available) |
|---|---|---|
| [redacted] | | [redacted] |

Name of proposed Project (as it appears on the Notice of Completion if available)
The Township of Springwater, Midhurst Water, Wasterwater & Transportation (Phase 3 & 4), Environmental Study Report

Name of Proponent (as it appears on the Notice of Completion if available)
The Township of Springwater

## Step 4 – Making Your Request

By submitting this form, you are requesting a Part II Order by the Minister.

Confirm what outcome you are seeking from the Minister by making this request.

I want the Minister to:

☑ Refer the matter to mediation to help me and the proponent address my concerns

☑ Impose additional conditions before the project can proceed

Describe what conditions you think would be appropriate and how they would address your concerns.
Ainley and the Township should be required to complete whatever additional work is necessary for the Estate's EA issues to be properly and adequately addressed and for its land development project to be integrated into the infrastructure build for Midhurst in Phase 1 Stage 1of development in Midhurst as is required by County Official Plan policy, Growth Plan policy, good engineering practice, and good planning policy and practice.

☐ To require the proponent to conduct a higher review of the project through an Individual Environmental Assessment

Describe how an Individual Environmental Assessment would address your concerns in a way that the Class Environmental Assessment does not:

If applicable, provide any other relevant information related to this request you would like to share.
Leapfrogging over the Estate's land development project (that has no natural barriers or other such issues and is surrounded by lands for which infrastructure is being provided early on) leaving it as the hole in the donut so to speak is neither good planning nor good engineering and needs not be done nor should it.

## Step 5 – Submitting Your Request

Please send the completed form and any supporting information you would like to provide to all three of the following:

Minister
Ministry of the Environment and Climate Change
Ferguson Block, 77 Wellesley St. W, 11th Floor
Toronto ON M7A 2T5
Fax: 416-314-8452
Minister.MOECC@ontario.ca

Director, Environmental Assessment and Permissions Branch
Ministry of the Environment and Climate Change
135 St. Clair Ave W, 1st Floor
Toronto ON M4V 1P5
MOECCpermissions@ontario.ca

Project Proponent
The email or mailing address for the project proponent can be found on the Notice of Completion for the project.

## Step 6 – Attachments

| Description | File name |
|---|---|
| 1. See the covering letter to the Minister to which this form is attached. | |

**Ministry of the Environment and Climate Change**

Environmental Assessment and Permissions Branch

135 St. Clair Avenue West
1st Floor
Toronto ON M4V 1P5
Tel.: 416 314-8001
Fax: 416 314-8452

**Ministère de l'Environnement et de l'Action en matière de changement climatique**

Direction des évaluations et des permissions environnementales

135, avenue St. Clair Ouest
Rez-de-chaussée
Toronto ON M4V 1P5
Tél : 416 314-8001
Téléc. : 416 314-8452

Ontario

October 3, 2018

James Feehely
[redacted]

Dear Mr. Feehely,

Thank you for your correspondence sent on September 18, 2018 to the Minister of the Environment, Conservation and Parks regarding the Midhurst Water, Wastewater and Transportation Servicing Phase 3 and 4 Environmental Study Report proposed by the Township of Springwater.

It is the understanding of the Ministry of the Environment, Conservation and Parks that the project was developed under the Master Plan procedures of the Municipal Class Environmental Assessment. The project contains multiple individual undertakings that are classified as Schedule C projects in the environmental study report.

The various undertakings within the Master Plan include:

- New water system(s) to service the proposed growth within the Midhurst Secondary Plan including new wells, water treatment facility, high lift pumps or booster stations, water storage, reservoirs and distribution systems including transmission mains;
- A new wastewater treatment and collection system (including sanitary collection systems, pump stations, treatment plant and effluent outfall) to service the proposed growth within the Midhurst Secondary Plan with the capability of servicing the existing Midhurst area, if required;
- Upgrading/Reconstruction of existing roads and intersections throughout the existing community;
- Construction of a new Craig Road (2 lanes) from County Road 27 to Russell Road including a direct connection to Forbes Road; and
- Upgrading of the Forbes Road and Highway 400 Interchange.

These undertakings are detailed in the Project's environmental study report that can be accessed here:
http://www.springwater.ca/UserFiles/Servers/Server_229/File/Municipal%20Services/Planning%20and%20Development/Midhurst%20Secondary%20Plan/Environmental%20Assessment/Midhurst%20Class%20EA%20-%20ESR%20-%20V1.pdf

The Municipal Class Environmental Assessment requires that requests for a Part II Order must be in the context of specific projects, and not for the Master Plan itself, or a secondary plan. Please note that the Midhurst Secondary Plan is a separate and distinct process under the Planning Act, and is beyond the scope of this Master Plan. Therefore, the issues you raised related to the secondary plan or official plan policies will not be considered through this process.

In your letter, you identified concerns of inadequate servicing, provision of water and wastewater infrastructure handling services and lack of consultation. We require your clarification as to which class environmental assessment project(s) you are referencing in your correspondence. We would ask that you clarify which project(s) you are concerned with by **October 15, 2018**. You can contact Callee Robinson, Project Evaluator, directly at 416-314-0286 or at Callee.Robinson@ontario.ca.

Thank you for taking the time to share your concerns with the project.

Yours sincerely,

Kristina Rudzki
Supervisor, Project Review Unit
Environmental Assessment and Permissions Branch

c: Heather Coleman, Township of Springwater
Joe Mullan, the Ainley Group

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## FRANKCOM - PART II ORDER RESPONSE

| | |
|---|---|
| **PROPONENT:** | **Township of Springwater** |
| **PROJECT TITLE:** | **Midhurst Phase 3 & 4 Class EA (Water, Wastewater & Transportation)** |
| **PROJECT LOCATION:** | **Midhurst Secondary Plan Area – Township of Springwater, ON** |
| **PREPARED BY:** | **Joe Mullan, P.Eng. - Ainley Group** |
| **DATE SUBMITTED TO MECP** | **Friday, October 26, 2018** |
| **PHONE # and E-MAIL:** | **(705) 445-3451, mullan@ainleygroup.com** |

| Issues and Concerns | Proponent Response | Status |
|---|---|---|
| **Estate's lands should be developed as part of Phase 1, Stage 1 of the new urban settlement area.** | The issue related to the "timing" of when the Frankcom Estates development proceeds has been discussed and communicated with Mr. Kirsch (on behalf of Frankcom Estates) numerous times throughout the Class EA process. These communications are briefly summarized below:<br>a) Within our Mar. 3, 2017 letter to Mr. Kirsch (Appendix Y of the ESR). This letter advised Mr. Kirsch that the service area associated with the Class EA is in accordance with the Official Plan Amendment 38 of the Midhurst Secondary Plan. Further the Phase 3 & 4 Class EA is a continuation of the Phase 1 and 2 Master Plan (approved in Jul 2009) which identified a projected growth of 8,208 new equivalent units (7,858 new residential units and 350 equivalent employment units) for the Midhurst Secondary Plan Area. Specifically, we noted that:<br>*"All lands intended for development as identified within the Midhurst Secondary Plan are included within this Class Environmental Assessment. Accordingly, the Frankcom lands are not excluded from the Class EA.*<br>*However, allocation of population does not dictate phasing of development. Phasing is determined in accordance with the approved Secondary Plan policies. In particular, Section 9.2(b) of OPA 38 directs that the first phase of development is intended to accommodate "a total of 3,850 new dwelling units plus employment generating uses". In this regard, it is noted that the Draft Plan approvals to date for other development lands under OPA 38 already exceed the 3,850 new dwelling units intended for the first phase of development, by a substantial margin."*<br>b) A Jun. 29, 2017 email from Mr. Kirsch to the MOECC (Ainley were not provided a copy of this email). In response to this email Paul Martin of the MOECC sent an email to Mr. Kirsch dated Aug. 3, 2017 and copied to Ainley (Appendix CC of ESR). Within this email Mr. Martin noted<br>*"…please be aware that the Municipal Class EA study is the process to evaluate options for municipal servicing, but does not determine details about how or which parcels of land will be developed.* | We have communicated with Mr. Kirsch (on behalf of Frankcom Estates) numerous times throughout the Class EA process regarding his issues and unfortunately, we do not feel any further communication with him will change his mind on any of his issues. |

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## FRANKCOM - PART II ORDER RESPONSE

| Issues and Concerns | Proponent Response | Status |
|---|---|---|
| | *Phasing and staging of land development are decisions made by the municipality under the planning process, although the Class EA may use information and data to evaluate alternative solutions and design concepts."*<br><br>c) Within our May 30, 2018 letter to Mr. Kirsch (Appendix CC of the ESR). This letter was in response to a number of issues raised by Mr. Kirsch. Within this letter we noted<br><br>*"Items 3 through 13 are related to Phasing and Staging of land development, which are decisions made by the Municipality under the Planning Approval process and should be directly to the Township of Springwater Planning department directly, as they will not be addressed by the Class EA process. We also note that Mr. Paul Martin of MOECC in his Aug. 3, 2017 email to you also noted this."*<br><br>In summary it is our position that the "timing" of when the Frankcom Estates development proceeds is a Planning related matter in accordance with the Planning Act. As such this item is outside the scope of the Class Environmental Assessment process. | |
| **Provision of water wastewater & transportation infrastructure servicing should have been properly studied and provided for early on as part of the EA. Servicing of Estate's lands has not been addressed as a priority even though the OMB has approved the MSP on the Estate's lands.** | The service area associated with the Class EA is in accordance with the Township's Official Plan Amendment No 38 for the Midhurst Secondary Plan. Further, the Phase 3 & 4 Class EA is a continuation of the Phase 1 and 2 Master Plan (approved Jul 2009) which identified a projected growth of 8,208 new equivalent units (7,858 new residential units and 350 equivalent employment units) for the Midhurst Secondary Plan Area. Therefore; as we previously advised Mr. Kirsch in our Mar. 3, 2017 letter (Appendix Y of the ESR) "*All lands intended for development as identified within the Midhurst Secondary Plan are included within this Class Environmental Assessment. Accordingly, the Frankcom Estates lands are not excluded from the Class EA."*<br><br>The concern related to "priority" of the development is a Planning related matter in accordance with the Planning Act. As such this item is outside the scope of the Class Environmental Assessment process. | |
| **The EA did not adequately, despite the claims otherwise by the Township and Ainley, consider the Estate's Lands as part of the urban area to be serviced at this time.** | As noted above, we have previously advised Mr. Kirsch that the Frankcom Estates lands are included in the Water, Wastewater & Transportation servicing calculations identified in the Class EA. | |
| **The EA proposes the first servicing of housing units in the lands north of Doran Road will go to the lands surrounding the Estate's Lands, even though the Estate's Lands are closer to the** | See the earlier responses related to the "timing" of when the Frankcom Estates development proceeds. | |

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## FRANKCOM - PART II ORDER RESPONSE

| Issues and Concerns | Proponent Response | Status |
|---|---|---|
| **built boundary of Midhurst. Wants contiguous development out from Midhurst's built boundary.** | | |
| **Traffic Study does not address Estate's Street A as an important and integral part of transportation network.** | The transportation analysis and modelling completed in the Class EA analyzed the impacts of the proposed traffic on the arterial and collector roads throughout the overall Secondary Plan Area. In the case of the developments in the eastern side of the Secondary Plan (between Hwy 26 and Hwy 400) the analysis and modelling looked at Doran Road, Craig Road, Russel Road, Gill Road, Forbes Road, Hwy 27 & Hwy 400. Four of these collector/arterial roads form a perfect grid around the Frankcom Estates development, with Doran Road & the future Craig Road Extension (both east-west collectors) approx. 1.0km apart, with Russel Road & Gill Road (both north-south collectors) approx. 1.4km apart.<br><br>In addition, Street A will have a large number of residential driveways and internal subdivision side-streets that will intersect with it, which would hinder efficient vehicular movement.<br><br>Therefore, the inclusion or exclusion of Street A within the Frankcom Estates lands has no impact on overall traffic network, given the close proximity to the aforementioned collector/arterial roads. It is acknowledged that Street A within the Frankcom Estates development will form part of the overall road network; however, it is not an integral component of the road network that is needed to accommodate the other developments. | |
| **Provision of water and wastewater infrastructure for the proposed homes to be located on the Estate's Lands has not been addressed by Ainley, as a priority. This would deny essential servicing to the Subdivision. Again, this approach will not allow for the efficient and orderly development of the Estate Lands and the larger community.** | As noted above, we have previously advised Mr. Kirsch that the Frankcom Estates lands are included in the Water, Wastewater servicing calculations identified in the Class EA.<br><br>The concerns related to "priority" and "timing" of the development are Planning related matter in accordance with the Planning Act. As such these items are outside the scope of the Class Environmental Assessment process. | |
| **Water distribution can be more effectively and efficiently handled by including Estate's lands.** | We disagree with this observation, as the water component of the Class EA looked at the Supply, Treatment, Fire & Emergency Storage and Trunk Distribution systems necessary to permit the development of the entire Midhurst Secondary Plan. The inclusion or exclusion of the watermains within the Frankcom Estates lands has no impact on any of these components. It is acknowledged that the water distribution within the Frankcom Estates development will form part of the ultimate water distribution network; however, it is not an integral component of the water distribution network that is needed to accommodate the other developments. | |

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## FRANKCOM - PART II ORDER RESPONSE

| Issues and Concerns | Proponent Response | Status |
|---|---|---|
| **Leaving Estate's lands as a "hole in the donut" runs counter to the objectives of the Province – Growth Plan, Provincial Policy Statement 2014. Is not complying with the notion of complete communities.** | See the earlier responses related to the "timing" of when the Frankcom Estates development proceeds. | |
| **Lack of Meaningful Consultation** | We disagree with this observation, as noted above, Mr. Kirsch was fully aware and engaged in each step in the Class EA process including having meaningful consultation with the Township and Ainley. However, his objective of having the Frankcom Estate Lands developed and serviced as part of Phase 1, Stage 1 of the Midhurst Secondary Plan was always the focus of his communications and unfortunately Mr. Kirsch did not like our responses that the timing of when development proceeds is a Planning related matter and beyond the scope of this Class EA process. | |
| **Results of the Omissions: The consequences of this approach is that water, wastewater, and transportation infrastructure servicing will not be provided to the Estate's lands in an appropriate manner or on a timely basis and makes little logical or environmental sense given that there is to be a logical progression of contiguous development out from Midhurst's built boundary.** | See the earlier responses related to the "timing" of when the Frankcom Estates development proceeds. | |
| **a) didn't comply with the County's requirement for there to be a logical progression of contiguous development out from Midhurst's built boundary**<br><br>**b) isn't complying with the notion of complete communities** | See the earlier responses related to the "timing" of when the Frankcom Estates development proceeds. | |

# TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

## FRANKCOM - PART II ORDER RESPONSE

| Issues and Concerns | Proponent Response | Status |
|---|---|---|
| **c) doesn't address the Estate's EA matters adequately or as a priority even though the OMB has approved the Midhurst Secondary Plan on the Estate's lands and provided urban land use designations for the Estate's lands to go along with the population allocated to its lands by the County and** | | |
| **d) changed the land area of focus going from Phase 1 & 2 to Phase 3 & 4 of the project** | We disagree with this comment, as the service area associated with the Class EA has not changed between the start of the Master Plan in 2008 through the completion of Phase 3 & 4 ESR in 2018. In particular, the Phase 1 & 2 Master Plan (approved Jul 2009) identified a projected growth of 8,208 new equivalent units (7,858 new residential units and 350 equivalent employment units) for the Midhurst Secondary Plan Area, which is the exact growth projections used in the Phase 3 & 4 Class EA (Section 3 of the ESR).<br><br>For reference, we also attach the applicable pages from the Phase 1 & 2 Master Plan dealing with the identification of the service area and includes a Schedule from the Township's Official Plan. | |
| **1) Failure of the Township and its consulting engineering firm to deal with the Estate in an open and transparent Manner** | We disagree with this comment, as noted earlier in this table. | |
| **2) Failure of the Township to provide public studies on a timely basis or in some cases not at all** | We disagree with this comment as all the Phase 3 Reports for Water, Wastewater & Transportation were posted to the Township's website at the end of Aug 2016 to allow the public and interested party's ample opportunity to review them in advance of the Oct. 18, 2016 Phase 3 PIC. In addition, the ESR was made available for 90 days, instead of the standard 30 days again to allow the public and interested party's ample time to review the information. | |
| **3) Failure of the Township to deal with the Estate in a fair and equitable manner** | We disagree with this comment, as noted earlier in this table. | |
| **4) Special treatment of our developer neighbours** | We disagree with this comment, as no special treatment was given to any developer. | |

## Reid Mitchell

**From:** Joe Mullan <mullan@ainleygroup.com>
**Sent:** August-04-17 7:02 AM
**To:** Paul Martin (MOECC)
**Cc:** Chunmei Liu; Brent Spagnol; Heather Coleman; Barnet Kussner; Reid Mitchell
**Subject:** Frankcom Estate - Outstanding Concerns - Midhurst

**Hi Paul:**

Thank you for providing us a copy of the Ministry's response back to Mr. Stan Kirsch regarding the Midhurst Class EA. To assist us fully understand Mr. Kirsch's concerns would it be possible for you to send us a copy of the correspondence (email/letter) that Mr. Kirsch sent to the Ministry originally?

Regards,

J. A. Mullan, P.Eng.
President & CEO

Ainley

www.ainleygroup.com
Tel: (705) 445-3451 Ext. 126
Cell: (705) 718-7230

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**From:** Martin, Paul (MOECC) [mailto:Paul.D.Martin@ontario.ca]
**Sent:** Thursday, August 3, 2017 2:10 PM
**To:** Joe Mullan <mullan@ainleygroup.com>; midhurst.classea@springwater.ca
**Subject:** Frankcom Estate - Outstanding Concerns - Midhurst

Good afternoon Joe / Mark
Please see below our response to Stan Kirsch as an FYI
If you have any questions, please feel free to let me know
Thanks

Thank you for your email dated June 29, 2017 regarding our response to your concerns with the ongoing Midhurst Water, Wastewater & Transportation Class Environmental Assessment (Class EA) undertaking.

Please be assured that during planning, all development must consider environmental impacts either through the *Planning Act* or *EA Act* processes. Under the *EA Act,* municipal infrastructure works are subject to the *Municipal Class Environmental Assessment* (October 2000, as amended in 2007&2011), including private sector proposed Schedule C municipal roads, water & wastewater projects for residential developments. The Township of Springwater is currently proceeding with a Class EA study to evaluate water, wastewater and transportation for servicing the Midhurst Secondary Plan area.

In your letter, you asked if the ministry also deals with wastewater and transportation matters. For projects that follow the Class EA process, including wastewater and transportation projects, the ministry's review focuses on the potential

impacts from the proposed undertaking related to the ministry's mandate, including air, water and land. We also note that other bodies including federal, provincial and municipal agencies may also be asked to provide input on a project such as this, and provide comments based on their respective mandates.

In your letter, you listed six items for which I am responding to you as follows:

Items 1, 3 and 4: As per your request for a copy of Figure 5 to the Draft Traffic Study of August 2016, and the EA Phasing and Staging Table in Items 3 and 4, we have spoken with Ainley Group and the Township of Springwater and they will follow up with you regarding your inquiry. For your request of a copy of the draft ESR for review in Item 1, please be aware that under the Municipal Class EA, there is no obligation that the draft ESR be provided for public review. We encourage you to work with Ainley Group and the Township directly to address your specific concerns prior to the 30-day public review when a Notice of Completion is issued. If you still want to review the draft ESR, you may request the draft ESR under the Freedom of Information (FOI) process.

Items 2, 4 and 6: For your questions related to the scope of this Class EA, please be aware that the Municipal Class EA study is the process to evaluate options for municipal servicing, but does not determine details about how or which parcels of land will be developed. Phasing and staging of land development are decisions made by the municipality under the planning process, although the Class EA may use information and data to evaluate alternative solutions and design concepts. We encourage you to discuss your concerns with the phasing and staging of the land development in Midhurst with the Township of Springwater planning department directly, as they will not be addressed by the Class EA process.

Item 5: The draft ESR includes the Ainley Group's March 3, 2017 letter to you, however, your response letter to Ainley Group of March 27, 2017 is not included. We assume that Ainley Group was wrapping up the draft ESR during that time. Ainley is expected to include all correspondence in the final ESR for the 30-day public review when a Notice of Completion is issued, as required by the Municipal Class EA.

The Class EA is a proponent driven process and we would encourage you to follow up with the Township (and it's consultants) if you have further questions. For our part, we have reached out to Ainley to remind them of the importance of engaging with all interested stakeholders and making meaningful efforts to address comments received. If your concerns are not resolved through discussions with the Township during the Class EA study, under the provisions of subsection 16 of the amended *EA Act*, you may write to the Minister or delegate and request a Part II Order during the 30-day review period after the Notice of Completion has been issued. Upon receipt of your concerns, the Minister or delegate will make a decision on the Part II Order in accordance with section A. 2.8 of the Municipal Class EA. Please note that only matters within the scope of the Class EA process will be considered.

Thank you for bringing the issues to our attention.

**Paul Martin, GISP** | Supervisor – Air, Pesticides & Environmental Planning | Technical Support Section, Central Region
Ontario Ministry of the Environment and Climate Change | 5775 Yonge St. 9th Floor | Toronto, ON | M2M 4J1 | T: 416-326-3477 F: 416-325-6347

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May 30, 2018

113027

"By Email"

**Attn: Stan Kirsch**
[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. Kirsch:

On behalf of the Township of Springwater, we wish to thank you for your interest in the above-mentioned Class EA. When we received your March 27, 2017 email and comment letter we were in the process of finalizing and submitting a draft Environmental Study Report (ESR) to the Ministry of Environment and Climate Change (MOECC) for their review and comments. In conjunction with the submission of the draft ESR to the MOECC, the Class EA was put unofficially on hold until MOECC comments were received. Now that we recently received formal MOECC comments on the draft ESR we are re-initiating the Class EA and as such are now responding to Mar 27, 2017 letter.

For your convenience, we have provided your specific comments in blue, followed by our responses.

1. *There is a legal requirement under the Environmental Assessment Act to consult with interested parties early on (i.e. to talk to, and hold meetings with, interested parties early on). Also, municipal class environmental assessment work is to be done in an open, transparent, and objective manner. When it comes to the Frankcom Estate's lands in Midhurst there was no consultation with the Estate early on (or at all so far) and the Estate has not been dealt with in an open and transparent manner putting it and its land development project at risk of harm.*

We respectfully disagree and believe that the Midhurst Class EA has been undertaken in an extremely open and transparent manner. In particular, we have held multiple Open Houses, provided regular updates to Council (during open Council meetings), held at least 15 Resident Liaison Group Meetings, plus posted all Reports and documentation on the Township website, as soon as they became throughout the past three years.

With regard to your specific involvement, we added your name and contact information to the Class EA distribution list as soon as we became aware of your interest in the Class EA in the fall 2016. Since then you have submitted a number of comments (letters and emails) related to the Class EA and we have taken them into consideration and provided response comments back to you.

Finally, as noted previously the Frankcom Estates development lands are included in the Class EA process and can be accommodated within the 7,858 residential units that are planned within the Midhurst Secondary Plan.

2. *The Class EA process currently under way in Midhurst can be updated to accommodate additional information received during the course of the study but this has not been done in respect to the Estate's lands or infrastructure matters related to the Estate's lands.*

Again, we respectfully disagree as responses have been provided to all of the documentation received to date and as noted later in this letter, the Class EA maps and associated tables have been updated to include the proposed lot fabric for the Frankcom Estates.

3. *The County's built boundary phasing policy is not being followed in the EA phasing and staging of infrastructure work for Midhurst. If the currently proposed phasing and staging goes forward this would keep the Estate's lands from being developed as early on as they should be. This is not right.*
4. *Estate's lands have sufficient development rights to be phased and staged for EA purposes particularly given that the Ontario Municipal Board (the "OMB") has approved the Midhurst Secondary Plan in respect to the Estate's lands and has provided urban land use designations for the Estate's lands to go along with the population allocated to its lands by the County.*
5. *There is nothing in the Midhurst Secondary Plan that says that only draft plan approved lands (like the Alliance and Geranium 300 hectare rule lands) can be phased and staged for infrastructure purposes early on.*
6. *Midhurst Secondary Plan policy 9.2(b) and 9.2(f) do not constitute a bar to the Estate's lands going forward in Midhurst' s Phase 1 Stage 1 of infrastructure servicing for the Midhurst settlement area contrary to what you suggest in your letter.*
7. *The County's built boundary phasing policy calls for lands adjacent to Midhurst's built boundary (like the Frankcom lands) to be serviced and developed first, except in some limited cases that don't apply to the Estate's lands in Midhurst. As a result, any proposal to service the Estate's lands later on (or perhaps, not at all) is not good land development planning or good engineering.*
8. *Good infrastructure planning is not limited to draft plan approved lands regardless of where they are located in the settlement area or for that matter draft plan approved lands only. Also, good infrastructure planning does not give such lands priority status simply because they were approved first. So, in our view the reasons given in your response letter, to propose that only the Alliance and Geranium 300 hectare lands go forward first, are flawed.*
9. *The OMB did approve some of the Alliance and Geranium lands for development in July of 2014 and in doing so the Board did require them to phase their own projects BUT the Board did not address the matter of whose lands would get to go forward in Midhurst' s first phase of development (i.e. they did not address whose land holdings in Midhurst [whether the Alliance companies lands, the Geranium companies lands, the Estate's lands, or anyone else's lands] would get to fill Midhurst's first phase of development). In passing, development of the Estate's lands and the related servicing of same has been held up for some 28 years now and there is no good reason to hold development of the Estate's lands up any longer now that the OMB has approved the Midhurst Secondary Plan on the Estate's lands and provided land use designations for the Estate's lands to go along with the population allocated to the Estate's lands by the County.*
10. *There is nothing in the Midhurst Secondary Plan that says that Midhurst's Phase 1 Stage 1 (or any other phase or stage) of infrastructure work in Midhurst (none of which has started yet or will start for say 1 to 2 years) is to be filled on a first come-first served basis. In fact, to do so would neither be good land development planning nor would it be good infrastructure planning. So, in point of fact, there is nothing to say that solely the Alliance and Geranium 300 hectare rule lands should fill up the whole first phase of development in Midhurst and the infrastructure servicing related thereto.*
11. *The Township is obligated to phase and stage development and the related required infrastructure in accordance with both good planning principles and good engineering principles. Ignoring the County's built boundary phasing policy and leapfrogging over the*

*Estate's lands is neither good planning nor good engineering and is not consistent with the notion of building complete communities efficiently, and cost effectively.*

12. *Any unknowns related to the Estate's lands that cannot be resolved through discussion can be addressed by the OMB before shovels go in the ground for the provision of services to the Midhurst area whether such matters relate to lot fabric, the number of housing units to be allowed on the Estate's lands or anything else. Accordingly the Estate's lands do not need to be held back or held up.*
13. *The Midhurst Secondary Plan is not the only source of policy direction that is to be followed contrary to the suggestion in your response letter that it is. The Planning Act, The Growth Plan, the Provincial Policy Statement 2014, and the County OP all need to be complied with in doing planning or EA work as do all applicable codes, the Municipal Engineer's manual, municipal laws, and so forth. In the case of the Estate's lands the required policy directives are not being followed.*

Items 3 through 13 are related to Phasing and Staging of land development, which are decisions made by the Municipality under the Planning Approval process, and should be directly to the Township of Springwater Planning department directly, as they will not be addressed by the Class EA process. We also note that Mr. Paul Martin of MOECC in his Aug. 3, 2017 email to you also noted this.

14. *The proposed phasing and staging table shown on page 10 and 11 of your draft traffic study of August 2016 needs to be revised and updated.*

    *REASON - it doesn't match up against what you have told me verbally, nor does it line up with what you have had to say in your response letter to me. It also doesn't agree to what was approved under the Municipal Class EA 1 & 2 work.*

    *Note - The portion of neighbourhood 2 that the Estate's lands are in, should show 2379 residential dwelling units not 1440 such units and the Doran Road South figure should show 2920 residential dwelling units and not the 3859 residential dwelling units that you are showing.*

See the Response to Items 25 through 27.

15. *The Estate's lands do not need to be draft plan approved to be shown as Phase 1 Stage 1 lands for EA purposes. Other jurisdictions have shown lands like the Estate's lands in phase 1 of development for phasing and staging infrastructure purposes without such lands being draft plan approved yet and you can too. This is particularly true due to the OMB's approval of the Estate's lands for development and the fact that the Estate's lands received a population allocation from the County after going through a rigorous application process that included draft plan concept work, preparation and submission of engineering drawings, NVCA review of the Estate's plans and so on.*
16. *Neither the Alliance nor Geranium companies (and in particular the Alliance companies) can object to the Estate's lands going forward in Phase 1 Stage 1 of development in Midhurst and for planning and infrastructure reasons whatever is necessary for the Estate's land to go forward in Phase 1 Stage 1 should be done.*

Items 15 & 16 are related to Phasing and Staging of land development, which are decisions made by the Municipality under the Planning Approval process, and should be directly to the Township of Springwater Planning department directly, as they will not be addressed by the Class EA process.

17. *In your response letter you state that "Ainley has not been provided any documentation related to the Frankcom lands" - this is not correct. Brian Goodreid of the Goodreid Planning Group personally emailed you the Estate's Draft Plan Subdivision Concept (done to the same performance standards as those used by Alliance and Geranium with respect to their 300 hectare lands) and related engineering diagrams on March 23, 2015 thereby providing you with more than enough information to show lot fabric on the Estate's lands as was done for the Geranium lands (to the south and east of the Estate's lands) which received Midhurst Secondary Plan approval at the same time as the Estate's lands did. To show lot fabric on the Geranium lands in this circumstance and not show lot fabric on the Estate's lands in the same circumstance is simply wrong.*

We have updated the maps within the Class EA, to show the proposed lot fabric for the Frankcom Estates property (based on the Concept Plan, dated Aug 2014 provided by Brian Goodreid).

However, it must be noted that the inclusion of this Concept Plan does not constitute acceptance of the Plan by the Township and from our review of the Concept Plan, it can be expected that changes will be be required before it is acceptable.

18. *The Estate's settlement agreement with the County is not a bar to the Estate's lands going forward in Phase 1 Stage 1 for infrastructure purposes although you suggest that it is. It only says that the Estate will adhere to all relevant policies and the Estate is ready, willing, and able to do so, and in fact the Estate has been doing so. You and your client on the other hand have not been adhering to all relevant policies in dealing with the Estate's lands because as you know or should know you need, among other things, to follow the County's built boundary phasing policy in dealing with the Estate's lands and you and your client are not doing so to the detriment of the Estate's land development project in Midhurst. Of course, as already mentioned previously, there has also not been any consultation with the Estate to date even though there ought to have been, nor has the Estate been dealt with in an open and transparent manner as is also a requirement of the current environmental assessment process.*
19. *The County's letter agreement with your client is between your client and the County. We are not a party to it and are not bound by it. Furthermore, the position taken by the County staff in the County's letter agreement with the Township is contrary to the County's own built boundary phasing policy.*
20. *If you are missing any information in dealing with the Estate's lands it is because you and your client have been refusing to deal with Estate matters since at least August of 2014. A situation that is particularly galling given that you are spending so much time with our developer neighbours; meeting with them, discussing your responses to us with them and so on.*

Items 18 through 20 are related to Phasing and Staging of land development, which are decisions made by the Municipality under the Planning Approval process, and should be directly to the Township of Springwater Planning department directly, as they will not be addressed by the Class EA process.

21. *Figure 5 to the draft traffic study will not be the same as figure 14 to the draft traffic study because two separate figure numbers would not be assigned to the same diagram if they were the same. Also, the wording on page 10 of the draft traffic study makes it clear that the two diagrams are not the same in spite of what you have had to say on the matter. Accordingly, please provide me with figure 5 to the draft traffic study. It was requested 5 months ago and there is no excuse to fail to provide it.*

All of the Figures within the Transportation section of the ESR have been revised and updated.

22. *Item number 4 from my email to you of January 9, 2017;*

    a. *My question regarding the 27 Phase 1 Stage v residential housing units shown (on the excerpt of the lower right hand corner of figure 14 to your draft traffic study) in the Carson Road area has not been answered. Query: Who owns these lands and where exactly are they located?*
    b. *My question regarding the 259 Phase 2 Stage i residential housing units shown (on the excerpt of the lower right hand corner of figure 14 to your draft traffic study) in the Carson Road area has not been answered. Query: Who owns these lands and where exactly are they located?*
    c. *My question regarding the Phase 2 stage i, ii, iii, and iv residential housing units shown (on the excerpt of the lower right hand corner of figure 14 to your draft traffic study) in the so called Doran Road Developments area of that excerpt (750, 750,725, and 724 residential housing units respectively) has not been answered. Query: Who owns these lands and where exactly are they located?*

23. *You indicated in your letter that all residential housing unit lands currently proposed for infrastructure phasing and staging in Phase 1 of your EA work all come from the 300 hectare lands approved by the Board on July 4, 2014. We don't agree that this should be the case for reasons already stated but in any case this is not correct anyway as 49 residential housing units shown by you were not Board approved on July 4, 2014 (i.e. 5000 - 350 - 4601 = 49 residential housing units not approved by the Board on July 4, 2014). Additionally I don't recall the Board dealing with the 350 employment lands figure either.*

In response to 22 & 23 we note that during Phase 1 & 2 of the Class EA in 2008 it was determined, using an estimated number of units per hectare, that the Class EA would allow for 7,858 residential units plus 350 equivalent employment units for a total of 8,208 equivalent units. Then at the initiation of Phase 3 & 4 Class EA process in 2013, it was agreed by the Steering Committee that for the purpose of the Class EA process, we would continue with a total of 8,208 equivalent units and that the first Phase would include 5,000 equivalent units with the remaining 3,208 in Phase 2. In addition, the Steering Committee noted that they wanted the employment units to be included in the first Phase. Therefore, within our table, we have identified the OMB Draft Plan approved units (4,601) plus the 350 employment units and then the number was rounded up from 4,951 to 5,000; therefore 49 units were taken out of Phase 2 and brought into Phase 1.

However, we want to emphasize that the phasing table developed as part of the Class EA, was solely for identifying infrastructure needs and should not be taken in a Planning Approval context, as the timing associated when and which developments can proceed, is dealt with by the Township Planning department and not this Class EA.

24. *Lot fabric has been shown for others in the same position as the Estate (i.e. lands not yet draft plan approved show lot fabric) so lot fabric can and should be shown for the Estate's lands as well.*

See the response to item 17

25. *The Frankcom lands can proceed to development now in accordance with the phasing policies of both OPA 38 and the County OP contrary to what is suggested in your response letter.*
26. *The Future Development Potential land category is still under appeal by the Ministry and doesn't, nor cannot, apply to the Estate's lands as the Estate's lands are no longer under appeal by the Ministry given that the OMB has approved the Midhurst Secondary Plan on the Estate's lands and has provided the Estate's lands with urban land use designations that do not include the Future Development Potential land category contrary to what your letter suggests.*
27. *Item 5 from my email to you of January 9, 2017;*
    a. *You say that the Estate's lands are phased and staged. What phase and what stage are the Estate's lands in? Note: On February 21, 2017 you told me verbally after the Township Council meeting that the Estate's lands are in Phase 2 Stage 1 but this is not reflected in your current phasing and staging table nor is it reflected in your response letter.*
    *Of course we believe that the Estate's lands should be phased and staged much earlier on than what you said verbally in any case, for all the reasons we have stated here and elsewhere.*

Based upon the updated maps and associated tables within the ESR, 375 residential units have been redistributed within Phase 2 - Stage 1, from Doran Road South to Doran Road North. Therefore, with this revision, the infrastructure within the Class EA now includes 375 units north of Doran Road, in addition to the 1,440 units that are Draft Plan approved north of Doran Road. These 375 units "could" represent the Frankcom Estates if the appropriate Planning Approvals were received from the Township in the future. We also note that the Concept Plan for the Frankcom Estates, dated Aug 2014 and provided by Brian Goodreid on your behalf, identifies 304 units within the Frankcom Estates development.

28. *If the purple cross hatch colour shown on the Estate's lands in figure 14 of the draft traffic study is intended to mean that lot fabric can't be shown for these lands then you ought to have said so in the legend for the diagram and have told me and my wife this when we first asked you about the matter. Furthermore, if this is the position that is now being taken it is not consistent with what you personally told me just 10 days prior to the date of your response letter.*

See responses to Item 17 & 27.

29. *Item 7 from my email to you of January 9, 2017;*

    a. *"The lot fabric ... for the MDDRI future lands within Phase 2 was provided to Ainley and therefore inserted."*

*Comment: The lot fabric for the Frankcom lands was also provided to your firm contrary to your assertion that no documentation was provided. Accordingly, it should also be inserted as was done for the MDDRI lands.*

See responses to Item 17 & 27.

30. *Your response to item 8 of my email to you of January 9, 2017 is not correct. The phasing and staging of the Class EA is not limited to the 300 hectare lands as you suggested in the first sentence of your response to this item nor does it need to be. Other comments on your response to this item of my email are as follows;*

    a. *The OMB did not approve 4623 residential housing units for development as you say in your second sentence of your response to this item. Only 4601 residential housing units were approved by the OMB and the OMB never said that any or all of these units must go forward in Midhurst's first phase of development (see my earlier comments on this for details).*
    b. *Midhurst's first phase of development is limited to 3850 residential housing units not 4623 such units or the 4650 such units you show currently in Phase 1 of your EA work. In fact by proposing 4650 such Phase 1 residential housing units you actually exceed the allowable limit for Midhurst's first phase of development by 800 residential housing units.*
    c. *The remaining residential housing units you talk about (8208 - 4973) are not equally subdivided into 4 stages in Phase 2 of your phasing and staging table contrary to what you have had to say in this regard.*

See responses to Item 17, 23 & 27.

*THE BOTTOM LINE*

*Any issues related to the Estate's lands that cannot otherwise be resolved through consultation and discussion at the present time via a sit down meeting or meetings can be addressed by the OMB before shovels go in the ground with respect to infrastructure servicing for Midhurst. Accordingly, there are no good reasons not to phase and stage the Estate's lands early on for infrastructure purposes and there are a lot of reasons why you should.*

*The benefits of phasing and staging the Frankcom lands in Phase 1 Stage 1 of the Municipal Class EA 3 & 4 work for the Midhurst area include the following;*

1. *With servicing starting right next door to the Estate's lands in any case, servicing of the Estate's lands at the same time will be less disruptive to the local community than doing only some of the work now and having to come back to do more work later on.*
2. *Servicing the Estate's lands early on will allow for the early completion of significant infrastructure in the portion of Neighbourhood 2 getting infrastructure early on (i.e. dealing with the Estate's lands early on will help complete the local area community which is a requirement under the Growth Plan.*
3. *There will be a more orderly progression of development than there would be otherwise. Plus, an orderly progression of development is required in any case in accordance with the Provincial Policy Statement 2014, the County Official Plan and the Midhurst Secondary Plan as well, and won't be achieved without dealing with infrastructure for the*

*Estate's lands early on.*

4. *It is more efficient and cost effective to deal with the Estate's lands at the same time as the lands of its developer neighbour (i.e. the Alliance companies) which have been phased and staged for development early on. This is particularly the case since the Alliance companies' lands surround the Estate's lands and the Estate's lands will be sharing a common road network, a common water and wastewater handling network, and a common storm water management pond with them as well.*
5. *Compliance with Provincial, County and local policy directives will be achieved by phasing and staging the Estate's lands for EA purposes early on but cannot and will not be achieved otherwise.*
6. *There are economies of scale and efficiencies to be achieved by providing infrastructure for the Estate's lands early on.*
7. *Servicing the Estate's lands early on will enhance traffic flow into and out of the Doran Road area where the Estate's lands are located. This is particularly consequential due to the importance of the Estate's Street "A" in providing early access to Doran Road. Note: The Alliance companies will have no access to Doran Road early on without going through the Estate's lands and without this access there will be much more traffic congestion in the area than there would or should be otherwise. Additionally, the Estate's road "A" provides a vital connective link between the Geranium lands to the south of the Estate's lands and the Alliance companies' lands to the north. In fact, when getting their 300 hectare rule Board approvals the Alliance and the Geranium companies were required to align their roads with the Estate's street "A" a clear indicator of the importance of the Estate's street "A" as a vital connector road for the area.*
8. *By servicing the Estate's lands early on water main looping can be provided for.*
9. *Sanitary trunk line savings can likely be achieved as well.*

These closing comments are all related to Phasing and Staging of land development, which are decisions made by the Municipality under the Planning process, and should be directly to the Township of Springwater Planning department directly, as they will not be addressed by the Class EA process.

Thank you again for your interest in this Class EA.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P.Eng.
President & CEO

cc: Heather Coleman - Township of Springwater (By Email)

FRANKCOM ESTATE
[redacted]

Email: Stan Kirsch
[redacted]

March 27, 2017

Ref: Township of Springwater
Municipal Class Environmental Assessment (Phases 3 & 4)
Midhurst Servicing

Dear Mr. Mullan:

This will respond to your letter of March 3, 2017 sent to me by email on Sunday, March 5th at 4:50 pm (see attached for details) which in and of itself responded to my emails to you of November 30, 2016, and my follow-up emails of January 9, 2017 and January 11, 2017.

I understand that while your signature is on the attached letter a number of individuals have provided input to it. So while I am responding to you (given that you signed the letter) I understand that your response is very much a coordinated effort falling under the direction and control of the Township acting in its capacity as the Proponent of this Municipal Class EA process and who in essence you reported to and took instruction from in the preparation of what are nominally your responses to me.

Be this as it may, on reviewing your letter (regardless of whose points you are actually making) I have found it to contain unanswered questions, a number of incorrect assertions, many positions contrary to what we understand to be applicable, what we see as faulty analysis, and so on.

Having said all of this, I will respond to the points made in your letter although not necessarily in the order in which you made them. In this regard, and in order to facilitate ongoing dialogue and meetings going forward, I will number my responses.

Accordingly, I respond to your letter as follows;

1. There is a legal requirement under the Environmental Assessment Act to consult with interested parties early on (i.e. to talk to, and hold meetings with, interested parties early on). Also, municipal class environmental assessment work is to be done in an open, transparent, and objective manner. When it comes to the Frankcom Estate's lands in Midhurst there was no consultation with the Estate early on (or at all so far) and the Estate has not been dealt with in an open and transparent manner putting it and its land development project at risk of harm.
2. The Class EA process currently under way in Midhurst can be updated to accommodate additional information received during the course of the study but this has not been done in respect to the Estate's lands or infrastructure matters related to the Estate's lands.

3. The County's built boundary phasing policy is not being followed in the EA phasing and staging of infrastructure work for Midhurst. If the currently proposed phasing and staging goes forward this would keep the Estate's lands from being developed as early on as they should be. This is not right.
4. The Estate's lands have sufficient development rights to be phased and staged for EA purposes particularly given that the Ontario Municipal Board (the "OMB") has approved the Midhurst Secondary Plan in respect to the Estate's lands and has provided urban land use designations for the Estate's lands to go along with the population allocated to its lands by the County.
5. There is nothing in the Midhurst Secondary Plan that says that only draft plan approved lands (like the Alliance and Geranium 300 hectare rule lands) can be phased and staged for infrastructure purposes early on.
6. Midhurst Secondary Plan policy 9.2(b) and 9.2(f) do not constitute a bar to the Estate's lands going forward in Midhurst's Phase 1 Stage 1 of infrastructure servicing for the Midhurst settlement area contrary to what you suggest in your letter.
7. The County's built boundary phasing policy calls for lands adjacent to Midhurst's built boundary (like the Frankcom lands) to be serviced and developed first, except in some limited cases that don't apply to the Estate's lands in Midhurst. As a result, any proposal to service the Estate's lands later on (or perhaps, not at all) is not good land development planning or good engineering.
8. Good infrastructure planning is not limited to draft plan approved lands regardless of where they are located in the settlement area or for that matter draft plan approved lands only. Also, good infrastructure planning does not give such lands priority status simply because they were approved first. So, in our view the reasons given in your response letter, to propose that only the Alliance and Geranium 300 hectare lands go forward first, are flawed.
9. The OMB did approve some of the Alliance and Geranium lands for development in July of 2014 and in doing so the Board did require them to phase their own projects BUT the Board did not address the matter of whose lands would get to go forward in Midhurst's first phase of development (i.e. they did not address whose land holdings in Midhurst [whether the Alliance companies lands, the Geranium companies lands, the Estate's lands, or anyone else's lands] would get to fill Midhurst's first phase of development). In passing, development of the Estate's lands and the related servicing of same has been held up for some 28 years now and there is no good reason to hold development of the Estate's lands up any longer now that the OMB has approved the Midhurst Secondary Plan on the Estate's lands and provided land use designations for the Estate's lands to go along with the population allocated to the Estate's lands by the County.
10. There is nothing in the Midhurst Secondary Plan that says that Midhurst's Phase 1 Stage 1 (or any other phase or stage) of infrastructure work in Midhurst (none of which has started yet or will start for say 1½ to 2 years) is to be filled on a first come-first served basis. In fact, to do so would neither be good land development planning nor would it be good infrastructure planning. So, in point of fact, there is nothing to say that solely the Alliance and Geranium 300 hectare rule lands should fill up the whole first phase of development in Midhurst and the infrastructure servicing related thereto.
11. The Township is obligated to phase and stage development and the related required infrastructure in accordance with both good planning principles and good engineering

principles. Ignoring the County's built boundary phasing policy and leapfrogging over the Estate's lands is neither good planning nor good engineering and is not consistent with the notion of building complete communities efficiently, and cost effectively.

12. Any unknowns related to the Estate's lands that cannot be resolved through discussion can be addressed by the OMB before shovels go in the ground for the provision of services to the Midhurst area whether such matters relate to lot fabric, the number of housing units to be allowed on the Estate's lands or anything else. Accordingly the Estate's lands do not need to be held back or held up.
13. The Midhurst Secondary Plan is not the only source of policy direction that is to be followed contrary to the suggestion in your response letter that it is. The Planning Act, The Growth Plan, the Provincial Policy Statement 2014, and the County OP all need to be complied with in doing planning or EA work as do all applicable codes, the Municipal Engineer's manual, municipal laws, and so forth. In the case of the Estate's lands the required policy directives are not being followed.
14. The proposed phasing and staging table shown on page 10 and 11 of your draft traffic study of August 2016 needs to be revised and updated.

    REASON - it doesn't match up against what you have told me verbally, nor does it line up with what you have had to say in your response letter to me. It also doesn't agree to what was approved under the Municipal Class EA 1 & 2 work.

    Note - The portion of neighbourhood 2 that the Estate's lands are in, should show 2379 residential dwelling units not 1440 such units and the Doran Road South figure should show 2920 residential dwelling units and not the 3859 residential dwelling units that you are showing.
15. The Estate's lands do not need to be draft plan approved to be shown as Phase 1 Stage 1 lands for EA purposes. Other jurisdictions have shown lands like the Estate's lands in phase 1 of development for phasing and staging infrastructure purposes without such lands being draft plan approved yet and you can too. This is particularly true due to the OMB's approval of the Estate's lands for development and the fact that the Estate's lands received a population allocation from the County after going through a rigorous application process that included draft plan concept work, preparation and submission of engineering drawings, NVCA review of the Estate's plans and so on.
16. Neither the Alliance nor Geranium companies (and in particular the Alliance companies) can object to the Estate's lands going forward in Phase 1 Stage 1 of development in Midhurst and for planning and infrastructure reasons whatever is necessary for the Estate's land to go forward in Phase 1 Stage 1 should be done.
17. In your response letter you state that "Ainley has not been provided any documentation related to the Frankcom lands" - this is not correct. Brian Goodreid of the Goodreid Planning Group personally emailed you the Estate's Draft Plan Subdivision Concept (done to the same performance standards as those used by Alliance and Geranium with respect to their 300 hectare lands) and related engineering diagrams on March 23, 2015 thereby providing you with more than enough information to show lot fabric on the Estate's lands as was done for the Geranium lands (to the south and east of the Estate's lands) which received Midhurst Secondary Plan approval at the same time as the Estate's

lands did. To show lot fabric on the Geranium lands in this circumstance and not show lot fabric on the Estate's lands in the same circumstance is simply wrong.

18. The Estate's settlement agreement with the County is not a bar to the Estate's lands going forward in Phase 1 Stage 1 for infrastructure purposes although you suggest that it is. It only says that the Estate will adhere to all relevant policies and the Estate is ready, willing, and able to do so, and in fact the Estate has been doing so. You and your client on the other hand have not been adhering to all relevant policies in dealing with the Estate's lands because as you know or should know you need, among other things, to follow the County's built boundary phasing policy in dealing with the Estate's lands and you and your client are not doing so to the detriment of the Estate's land development project in Midhurst. Of course, as already mentioned previously, there has also not been any consultation with the Estate to date even though there ought to have been, nor has the Estate been dealt with in an open and transparent manner as is also a requirement of the current environmental assessment process.
19. The County's letter agreement with your client is between your client and the County. We are not a party to it and are not bound by it. Furthermore, the position taken by the County staff in the County's letter agreement with the Township is contrary to the County's own built boundary phasing policy.
20. If you are missing any information in dealing with the Estate's lands it is because you and your client have been refusing to deal with Estate matters since at least August of 2014. A situation that is particularly galling given that you are spending so much time with our developer neighbours; meeting with them, discussing your responses to us with them and so on.
21. Figure 5 to the draft traffic study will not be the same as figure 14 to the draft traffic study because two separate figure numbers would not be assigned to the same diagram if they were the same. Also, the wording on page 10 of the draft traffic study makes it clear that the two diagrams are not the same in spite of what you have had to say on the matter. Accordingly, please provide me with figure 5 to the draft traffic study. It was requested 5 months ago and there is no excuse to fail to provide it.
22. Item number 4 from my email to you of January 9, 2017;
    a. My question regarding the 27 Phase 1 Stage v residential housing units shown (on the excerpt of the lower right hand corner of figure 14 to your draft traffic study) in the Carson Road area has not been answered. Query: Who owns these lands and where exactly are they located?
    b. My question regarding the 259 Phase 2 Stage i residential housing units shown (on the excerpt of the lower right hand corner of figure 14 to your draft traffic study) in the Carson Road area has not been answered. Query: Who owns these lands and where exactly are they located?
    c. My question regarding the Phase 2 stage i, ii, iii, and iv residential housing units shown (on the excerpt of the lower right hand corner of figure 14 to your draft traffic study) in the so called Doran Road Developments area of that excerpt (750, 750,725, and 724 residential housing units respectively) has not been answered. Query: Who owns these lands and where exactly are they located?
23. You indicated in your letter that all residential housing unit lands currently proposed for infrastructure phasing and staging in Phase 1 of your EA work all come from the 300 hectare lands approved by the Board on July 4, 2014. We don't agree that this should be

the case for reasons already stated but in any case this is not correct anyway as 49 residential housing units shown by you were not Board approved on July 4, 2014 (i.e.5000 -350-4601= 49 residential housing units not approved by the Board on July 4, 2014). Additionally I don't recall the Board dealing with the 350 employment lands figure either.

24. Lot fabric has been shown for others in the same position as the Estate (i.e. lands not yet draft plan approved show lot fabric) so lot fabric can and should be shown for the Estate's lands as well.
25. The Frankcom lands can proceed to development now in accordance with the phasing policies of both OPA 38 and the County OP contrary to what is suggested in your response letter.
26. The Future Development Potential land category is still under appeal by the Ministry and doesn't, nor cannot, apply to the Estate's lands as the Estate's lands are no longer under appeal by the Ministry given that the OMB has approved the Midhurst Secondary Plan on the Estate's lands and has provided the Estate's lands with urban land use designations that do not include the Future Development Potential land category contrary to what your letter suggests.
27. Item 5 from my email to you of January 9, 2017;
    a. You say that the Estate's lands are phased and staged. What phase and what stage are the Estate's lands in? Note: On February 21, 2017 you told me verbally after the Township Council meeting that the Estate's lands are in Phase 2 Stage 1 but this is not reflected in your current phasing and staging table nor is it reflected in your response letter.

       Of course we believe that the Estate's lands should be phased and staged much earlier on than what you said verbally in any case, for all the reasons we have stated here and elsewhere.
28. If the purple cross hatch colour shown on the Estate's lands in figure 14 of the draft traffic study is intended to mean that lot fabric can't be shown for these lands then you ought to have said so in the legend for the diagram and have told me and my wife this when we first asked you about the matter. Furthermore, if this is the position that is now being taken it is not consistent with what you personally told me just 10 days prior to the date of your response letter.
29. Item 7 from my email to you of January 9, 2017;
    a. "The lot fabric ... for the MDDRI future lands within Phase 2 was provided to Ainley and therefore inserted".

       Comment: The lot fabric for the Frankcom lands was also provided to your firm contrary to your assertion that no documentation was provided. Accordingly, it should also be inserted as was done for the MDDRI lands.
30. Your response to item 8 of my email to you of January 9, 2017 is not correct. The phasing and staging of the Class EA is not limited to the 300 hectare lands as you suggested in the first sentence of your response to this item nor does it need to be. Other comments on your response to this item of my email are as follows;
    a. The OMB did not approve 4623 residential housing units for development as you say in your second sentence of your response to this item. Only 4601 residential

housing units were approved by the OMB and the OMB never said that any or all of these units must go forward in Midhurst's first phase of development (see my earlier comments on this for details).

b. Midhurst's first phase of development is limited to 3850 residential housing units not 4623 such units or the 4650 such units you show currently in Phase 1 of your EA work. In fact by proposing 4650 such Phase 1 residential housing units you actually exceed the allowable limit for Midhurst's first phase of development by 800 residential housing units.
c. The remaining residential housing units you talk about (8208 - 4973) are not equally subdivided into 4 stages in Phase 2 of your phasing and staging table contrary to what you have had to say in this regard.

THE BOTTOM LINE

Any issues related to the Estate's lands that cannot otherwise be resolved through consultation and discussion at the present time via a sit down meeting or meetings can be addressed by the OMB before shovels go in the ground with respect to infrastructure servicing for Midhurst. Accordingly, there are no good reasons not to phase and stage the Estate's lands early on for infrastructure purposes and there are a lot of reasons why you should.

The benefits of phasing and staging the Frankcom lands in Phase 1 Stage 1 of the Municipal Class EA 3 & 4 work for the Midhurst area include the following;

1. With servicing starting right next door to the Estate's lands in any case, servicing of the Estate's lands at the same time will be less disruptive to the local community than doing only some of the work now and having to come back to do more work later on.
2. Servicing the Estate's lands early on will allow for the early completion of significant infrastructure in the portion of Neighbourhood 2 getting infrastructure early on (i.e. dealing with the Estate's lands early on will help complete the local area community which is a requirement under the Growth Plan.
3. There will be a more orderly progression of development than there would be otherwise. Plus, an orderly progression of development is required in any case in accordance with the Provincial Policy Statement 2014, the County Official Plan and the Midhurst Secondary Plan as well, and won't be achieved without dealing with infrastructure for the Estate's lands early on.
4. It is more efficient and cost effective to deal with the Estate's lands at the same time as the lands of its developer neighbour (i.e. the Alliance companies) which have been phased and staged for development early on. This is particularly the case since the Alliance companies' lands surround the Estate's lands and the Estate's lands will be sharing a common road network, a common water and wastewater handling network, and a common storm water management pond with them as well.
5. Compliance with Provincial, County and local policy directives will be achieved by phasing and staging the Estate's lands for EA purposes early on but cannot and will not be achieved otherwise.
6. There are economies of scale and efficiencies to be achieved by providing infrastructure for the Estate's lands early on.

7. Servicing the Estate's lands early on will enhance traffic flow into and out of the Doran Road area where the Estate's lands are located. This is particularly consequential due to the importance of the Estate's Street "A" in providing early access to Doran Road. Note: The Alliance companies will have no access to Doran Road early on without going through the Estate's lands and without this access there will be much more traffic congestion in the area than there would or should be otherwise. Additionally, the Estate's road "A" provides a vital connective link between the Geranium lands to the south of the Estate's lands and the Alliance companies' lands to the north. In fact, when getting their 300 hectare rule Board approvals the Alliance and the Geranium companies were required to align their roads with the Estate's street "A" a clear indicator of the importance of the Estate's street "A" as a vital connector road for the area.
8. By servicing the Estate's lands early on water main looping can be provided for.
9. Sanitary trunk line savings can likely be achieved as well.

I look forward to meeting with you and/or members of the Township staff to deal with and resolve all such matters.

Regards,

Stan Kirsch
Authorized Agent for the Frankcom Estate

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March 3, 2017

Mr. Stan Kirsch
[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. Kirsch:

On behalf of the Township of Springwater, we wish to thank you for your interest in the above-mentioned Class EA. We have reviewed your comments which were received following the October 18, 2016 Public Information Centre (PIC). Your comments/requests have been summarized and our responses are provided following each comment.

- *It appears from your PIC paperwork, and other information available to me, that the Estate's lands are not being properly addressed in your EA work for Midhurst.*

All proposed development lands identified within Official Plan Amendment 38 (OPA 38 or the Midhurst Secondary Plan) are included within this Class Environmental Assessment. Further this Class EA is an extension/continuation of the Phase 1 and 2 Master Plan that was approved in 2009 which identified a total projected growth four the Midhurst Secondary Plan of 8,208 units comprised of 7,858 new residential units and 350 employment equivalent residential units.

It is the Midhurst Secondary Plan that provides specific policy direction with respect to phasing of development, not the Class EA. It is for this reason that lands with draft plan approval are categorized as Phase 1 lands and are specifically accounted for within the EA process, since lands that are already draft approved are less likely to have significant changes.

Lands that are current working their way through the development approval process (Pending Applications as per the Planning Act) and have not received draft approval are being considered, but not fully accounted for because those applications/draft plans remain subject to change.

Therefore, this Class Environmental Assessment will accommodate new growth of 8,208 units (7,858 + 350) within the Midhurst Secondary Plan Area. This is sufficient to accommodate both the development lands within the 300 ha that were released for development back in 2012 and received Draft Plan approval by the OMB in 2014, as well as the development lands that were recently given population allocations by the County and whose OPA 38 designations were approved by the OMB in 2016 on that basis (including Frankcom).

- *This is especially the case as the Ministry of Municipal Affairs' appeal of the Midhurst Secondary Plan no longer applies to the Estate's lands due to the Ontario Municipal Board's recent decision to approve the Midhurst Secondary Plan in respect to the Estate's lands as well as its decision to \provide urban land use designations for the Estate's lands.*

The statement that urban land use designations are now in place for the Frankcom property is accurate. However, planning applications (draft plan of subdivision, zoning) for actual development of the Frankcom property under the Planning Act have not been submitted. At this stage, it remains unclear how the 50% population allocations which were approved by the County as the basis for OMB approval of the designations are to be implemented, due to the following considerations:

- Is the approved 50% population allocation to be applied to the entire land holding (i.e., at one-half the density originally proposed) and if so, how is that proposed to be implemented? or
- Is only 50% of the land holding to be utilized for development? If so, which 50% and how is it to be determined?

  - *As the Frankcom Estate's lands are clearly in the development stream in an area of Midhurst where infrastructure is to be provided early on, and given that the Estate's lands ought to go forward early on in the development of Midhurst due to their location adjacent to Midhurst's built boundary (and in accordance with the County's built boundary phasing policy in force and effect since May 15, 2014) your EA work needs to properly address the Estate's land development status and location. Otherwise, it will be necessary to request a bump-up (i.e. a Part II Order) to deal with the matter.*

As previously noted, all lands intended for development as identified within the Midhurst Secondary Plan are included within this Class Environmental Assessment. Accordingly, the Frankcom lands are not excluded from the Class EA.

However, allocation of population does not dictate phasing of development. Phasing is determined in accordance with the approved Secondary Plan policies. In particular, Section 9.2(b) of OPA 38 directs that the first phase of development is intended to accommodate "a total of 3,850 new dwelling units plus employment generating uses". In this regard, it is noted that the Draft Plan approvals to date for other development lands under OPA 38 already exceed the 3,850 new dwelling units intended for the first phase of development, by a substantial margin.
Section 9.2 f) of OPA 38 in turn provides as follows:

f) The timing of release of subsequent phases of new growth within the Secondary Plan Area beyond the first phase will be reviewed with each five-year review of the Township of Springwater Official Plan. The justification of subsequent phases will take into account the overall population and employment forecasts of the Township, satisfactory absorption of residential and employments lands in previous phases, and requiring confirmation of Council of the Township as to the need for additional land for urban residential growth across the Township in keeping with an up-to-date land budget for the municipality and consistent with Provincial, County and Township policies. No amendment is required to this Plan to release subsequent phases of growth provided all other policies of this Plan are met.

The Minutes of Settlement dated October 6, 2016 between the County and various Landowners within OPA 38 (including Frankcom) expressly provide that the Landowners "will ensure that all future development applications to implement OPA 38 will conform with the Secondary Plan policies including Policy 9.2(f) and will also conform with applicable Provincial and County policies, plans and requirements".

The Frankcom lands are located within the development area of Midhurst and currently do not have approval status. As such, development of the Frankcom lands can only be considered as part of a subsequent phase of development beyond Phase I, in accordance with the above noted policy and

the criteria specified therein, and in consultation with the County and other approval authorities. The County's position in that regard is quite clear from the letter dated October 24, 2016 which was provided by the County to the Township and filed as Exhibit 40 in the OMB proceedings respecting the OPA 38 appeals. Item #1 in the Attachment to that letter provides in part as follows:

> Section 9.2(f) of OPA 38 is in force following the Province's withdrawal of that part of its appeal. Given that the population allocation for the lands which are subject to the Minutes of Settlement is well in excess of the 3,850 units intended for the first phase of development under Section 9.2(b), it is staff's opinion that the lands could only proceed as part of subsequent phases of new growth within the Secondary Plan under Section 9.2(f).

This applies to the Frankcom lands and is further underscored by the fact that development applications under the Planning Act (Draft Plan of Subdivision/Zoning By-law Amendment) have not been submitted yet for the Frankcom lands - in contrast with the pending development applications already submitted (and in some cases, already approved) for various other OPA 38 landowners. The following questions arise from this key distinction:

- What are the infrastructure needs required to service the Frankcom lands?
- What basis is there for establishing these infrastructure needs?
- What is the approved unit yield for the property (as distinct from population allocation)?
- What is the basis for establishing the unit yield?
- How can the E.A. specifically consider the Frankcom lands when key information that is normally tied to development applications/approvals is not yet available?

2. *During October's PIC I mentioned to several members of your company that Figure 5 was missing from your Draft Traffic Operational Analysis Report (copy attached) and I asked that the missing figure be provided to me. I still haven't received it. Accordingly, I would appreciate it if you would email it to me.*

Figure 5 is the same as Figure 14 referenced and attached to your email.

3. *The lower right hand corner of Figure 14 of the draft traffic study (see enlarged and marked up excerpt of it attached) shows your proposed phasing related to lands approved for development in accordance with the 300 hectare rule as well as the "development phasing and staging" you say is "to be used to determine infrastructure phasing". Am I correct that all current EA 3 & 4 studies are based on this phasing?*

The Table at the bottom right hand corner of Figure 14 (which is also identified on Slide 5 at the recent Public Information Centre (PIC) represents the proposed growth within the Midhurst Secondary Plan that is being utilized within this Class Environmental Assessment. The total number of 9,546 cumulative total units, shown within Figure 14 and Slide 5 table, was carried over from the Midhurst Phase 1 & 2 Master Plan that was completed and approved in 2009 and is broken down as follows:

- 7,858 new residential units
- 350 employment equivalent residential units
- 1,338 existing units (service and on serviced)

4. *The residential housing units (and employment units) phased and circled in red on the enlarged and marked up excerpt of the lower right hand corner of Figure 14 are all residential housing units (or employment units) shown and phased on lands that are not part of those lands that were approved for development under the 300 hectare rule. Given that this is the case, please provide me with a diagram showing where these lands are located and who owns them.*

The referenced employment units within Phase 1 are not specifically identified on our plans, however these would be located within the employment lands designated under the Midhurst Secondary Plan. The referenced units within Phase 2 are not specifically identified within the phasing or staging plans.

All lands (residential, employment, commercial, institutional, open space) that were designated for urban uses prior to the approval of the MSP continue to possess urban land use designations that remain in-force and are not covered under the umbrella of the Ministry's appeal (per the Ministry's letter dated November 28, 2012). A site-specific appeal remains for one property with an employment designation, but this site is not subject to the Ministry's appeal. Reference materials which substantiate this point can be found on Attachment 1 to the Ministry's OMB Withdrawal letter as referenced, which clearly shows that existing residential and employment lands are not subject to the Ministry's appeal.

That said, all lands identified within Phase 1 for residential uses are within the 300 hectares for which OPA 38 came into force as a result of the partial withdrawal of the Ministry's appeal in 2012.

5. *Where are the Estate's lands shown in the phasing and staging numbers (or are they) and if they aren't why aren't they, given that among other points a) the Estate's lands are in a prime development location adjacent to Midhurst's built boundary b) the Estate's concept diagram, engineering report and other such documentation showing and addressing the Estate's residential housing units, roads, storm water management pond and so forth have all been on file with the Township since August 29, 2014, and c) the Township has been aware of the Estate's land development project for many years now.*

Ainley has not been provided any documentation relating to the Frankcom lands. Applications for the Frankcom lands under the Planning Act (draft plan of subdivision and zoning by-law) have not been approved or even submitted to date. The concept plan submitted for the Frankcom lands as a part of the County's approval of population allocation under the 20,000 Population Program does not provide status from an application standpoint. The merits of a draft plan of subdivision can only be tested through an application under the Planning Act, which includes the consideration of required infrastructure. Moreover, as noted above, significant questions remain to be answered in terms of the 50% population allocations approved by the County and how those allocations are to be implemented on the lands to which they apply, including Frankcom. As such, no specific lot fabric can be shown for the Frankcom lands.

Until such time as the Frankcom lands can proceed to development in accordance with the approved OPA 38 phasing policies noted above and complete applications are submitted under the Planning Act, the status of the Frankcom lands will remain as potential lands for future development which will be continue to be considered through the EA process. However, all lands designated for development within OPA 38 approved, including the Frankcom lands, are included in our Phasing and Staging Plan.

6. *As well, Figure 14 of the draft traffic study (attached) shows purple cross-hatch markings on the Estate's lands in neighbourhood 2 (along with some of the Midhurst Development Doran Road Inc.("MDDRI") lands in neighbourhood 3 to the south and east of the Estate's lands) however the legend for the diagram does not include what this means. Accordingly, please advise as to what the purple cross-hatch markings on the Estate's lands are intended to mean. By the way, my wife asked you personally about this matter during the PIC in October but you dismissed her query at that time in regard to this matter by advising her that "purple was used because we just ran out of other colours". Your response to her at the PIC was clearly evasive, and I would ask that you provide a clear and meaningful response to the query at the present time.*

Please see our response to item #5 above.

7. *Additionally, I note that roads are shown and phased (and perhaps residential housing units are phased as well) in your August 2016 study on some of the lands owned by MDDRI that are not part of what was approved for development under the 300 hectare rule. At the same time, no phased roads or housing units are being shown for the Estate's lands in spite of the fact that the Township has had the Estate's Concept Diagram for its land development project since at least August of 2014 and has known about the Estate's land development project for many years now. This is improper, and needs to be corrected at the present time (and certainly before your EA phase 3 & 4 work is completed).*

The lot fabric associated with applications for Draft Plan of Subdivision under the Planning Act for the MDDRI future lands within Phase 2 (beyond 300 ha) was provided to Ainley and therefore inserted. As noted above, applications for Draft Plan of Subdivision have not been submitted to date for the Frankcom lands. Please also see our response to item #5 above.

8. *To the extent not already done, your EA work needs to be modified to provide infrastructure early on to the Estate's lands for reasons as detailed in my email to you of November 30, 2016 and for other good and sufficient reasons including economy of scale savings, integration, less disruption to the area in which the Estate's lands are located, County phasing policy related to development outward from a local municipality's built boundary (in this case Midhurst's built boundary) and so on.*

The Phasing and Staging Plan being used for the Class EA and identified at the recent PIC is based upon the Draft Plans for lands within the 300 ha that were released for development as part of the Ministry's partial withdrawal of its OPA 38 appeal back in 2012 and that were subsequently approved by the OMB, with Draft Plan conditions, back in 2014. After allowing for the 350 employment equivalent units, this equates to a total of approximately 4,973 units (4,623 + 350). The remaining development units available for Phase 2 (beyond the 300 ha) represent the difference between the total within the Class EA and the Phase 1 numbers (8,208 - 4,973). This amount was then equally subdivided over four stages in Phase 2.

9. *The Estate's lands should never have been excluded from infrastructure development phasing and staging and it certainly shouldn't be now. When do you plan to address this matter? As you know the 30 day review period is coming up soon and the Estate's issues related to your EA work need to be addressed asap and should have been addressed a long time ago.*

As previously noted, all lands intended for development within the Midhurst Secondary Plan area under OPA 38 are included within this Class Environmental Assessment. Therefore, the Frankcom Estates lands are not excluded from this Class EA.

Thank you again for your interest in this Class EA.

Should you have any questions please do not hesitate to contact the undersigned.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P.Eng.
President & CEO

## Reid Mitchell

**From:** Reid Mitchell <mitchell@ainleygroup.com>
**Sent:** January-22-19 2:50 PM
**To:** 'Robinson, Callee (MECP)'
**Cc:** Joe Mullan (mullan@ainleygroup.com)
**Subject:** RE: Midhurst Class EA

Hello Callee.

Further to our telephone discussion of this afternoon, we want to reiterate that it is our understanding that the natural, socio and economic environments of the various project locations for the proposed servicing (water, wastewater and transportation) of Midhurst were identified as part of the Secondary Plan work. Those Background Reports were identified in the Master Servicing Plan (Class EA Phase 1 and 2 Report) dated July 2009. The list of Reports is provided in Section 2 along with a summary of each Report. We would be pleased to provide copies of the actual Reports should you deem that to be necessary. However, as noted in our discussion, all of the proposed works are located either within lands owned by the Developers or within existing Road Allowances. I pointed out that there may be a need for some minor road allowance widening at certain locations to be determined during final design. As such, we believe that these issues were addressed during the completion of the Secondary Plan. You agreed to review Section 2 of the Master Servicing Plan and to get back to us for further discussion.

In addition, we discussed the recent submission by the Midhurst Rate Payers Association (MRA) dated December 31, 2018. I advised you that, based on our review of the document, the concerns outlined by the MRA are simply a reiteration of previous comments provided by that group. As such, we are not planning to respond. It was agreed that if you deem that any of the most recent comments warrant additional response from us, you would advise us.

Please do not hesitate to contact us if you require any other information in preparing your decision on the need for a Part II Order.

Reid Mitchell
Engineering Techonologist

Ainley
www.ainleygroup.com
Tel: (705) 445-3451 Ext. 135
Cell: (705) 444-4837

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**From:** Robinson, Callee (MECP) [mailto:Callee.Robinson@ontario.ca]
**Sent:** Tuesday, January 15, 2019 12:57 PM
**To:** Joe Mullan; 'Heather Coleman'
**Cc:** Reid Mitchell
**Subject:** Midhurst Class EA

Hi Joe and Heather,

As you'll recall from our meeting back in November, I'm looking for a copy of the report that details the environmental features within the study area, and the potential impacts that may be caused by the proposed Midhurst development class EA.

As required in Phase 2 of the MCEA, I'm looking for a physical description of the area where the project is to occur and a general inventory of the natural social, and economic environments. I can't seem to find this information in your Phase 1/ 2 report. Please advise.

Feel free to give me a call if you have any questions.

Thanks,

**Callee Robinson** | Project Evaluator
Project Review Unit | Environmental Assessment and Permissions Branch
Ministry of the Environment, Conservation and Parks
416-314-0286

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If you have any accommodation needs or require communication supports or alternate formats, please let me know.
Si vous avez des besoins en matière d'adaptation, ou si vous nécessitez des aides à la communication ou des médias substituts, veuillez me le faire savoir.

**Reid Mitchell**

---

**From:** Robinson, Callee (MECP) <Callee.Robinson@ontario.ca>
**Sent:** March-12-19 12:24 PM
**To:** Joe Mullan
**Cc:** 'Heather Coleman'; Reid Mitchell; Jordan, Abraham (MECP); Gauthier, Shannon (MECP)
**Subject:** Midhurst Class EA
**Attachments:** A9Rewbw3v_t17rfl_2d4.pdf

Good afternoon Joe,

I hope all is well.

Regarding the Midhurst Servicing Class EA:

1. Has the Township provided a response to the NVCA's comments, dated September 17, 2018? I have attached them for your quick reference. If not, when will a response be provided?
2. Are any additional studies being completed to address the concerns raised by NVCA, especially as they pertain to the potential impacts to trout habitat in Willow Creek and Black Creek (on both sides of Doran Road)?
3. Has the Township consulted with the Department of Fisheries and Oceans Canada regarding the potential impacts to fish habitat?
4. Has the Township consulted with Environment and Climate Change Canada regarding the Hine's emerald dragonfly?

WESL TECH MEMO,

Thanks,

**Callee Robinson** | Project Evaluator
Project Review Unit | Environmental Assessment and Permissions Branch
Ministry of the Environment, Conservation and Parks
416-314-0286

Please consider the environment before printing this email.

If you have any accommodation needs or require communication supports or alternate formats, please let me know.
Si vous avez des besoins en matière d'adaptation, ou si vous nécessitez des aides à la communication ou des médias substituts, veuillez me le faire savoir.

## Reid Mitchell

**From:** Joe Mullan <mullan@ainleygroup.com>
**Sent:** August-06-19 8:36 AM
**To:** Reid Mitchell
**Subject:** FW: Midhurst ESR - SAR Clarification
**Attachments:** 2019-Jul-25 Memo Re SAR & secondary plan 219342Rev.pdf; HESL HED Summary.pdf; HESL 7Q20 and Eco Low Flow.pdf

FYI

Regards,

J. A. Mullan, P.Eng.
President & CEO

Ainley

www.ainleygroup.com
Tel: (705) 445-3451 Ext. 126
Cell: (705) 718-7230

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**From:** Vimal Patel <vimalp@geranium.com>
**Sent:** Friday, July 26, 2019 12:00 AM
**To:** Joe Mullan <mullan@ainleygroup.com>
**Subject:** FW: Midhurst ESR - SAR Clarification

**From:** Vimal Patel <vimalp@geranium.com>
**Sent:** July 25, 2019 11:19 AM
**To:** Paul.Heeney@ontario.ca; brent.shirley@ontario.ca
**Cc:** kristina.rudzki@ontario.ca; Robinson, Callee (MECP) <Callee.Robinson@ontario.ca>; Shauna Dudding <shaunad@geranium.com>; Mario Giampietri <mariog@geranium.com>; Cheryl Shindruk <cherylS@geranium.com>
**Subject:** Midhurst ESR - SAR Clarification

Paul et al.,

Further to Neil's responses and discussion in our meeting earlier this week, please see summary below referencing the location of the reports in the ESR that pertain to the Hines Emerald Dragon fly assessment (the reports are also attached to the email for ease of reference). Note that the DFO guidelines, which was discussed in the meeting, are discussed in sections 5.1 and 5.2 of the 7Q20/Ecological Low Flow Assessment.

- **Appendix L (pages 541-572 of the ESR)** – 7Q20 Flow Assessment of Willow Creek at Highway 26 (Near Minesing) and Ecological Low Flow Assessment, dated May 28, 2018.
- **Appendix M (pages 724-730 of the ESR)** - Hine's Emerald Dragonfly Habitat in the Minesing Wetlands & the Midhurst Development prepared by Hutchinson Environmental Sciences, dated February 7, 2017.

In addition to the above information, please find attached a supplementary memorandum from Beacon Environmental speaking to the additional species (Eastern Prairie Fringed-orchid and Spotted Turtle) noted in the meeting.

If you have any further questions, or would like to discuss the above, please do not hesitate to contact me.

Thanks,

Vimal

# Memorandum

To: Vimal Patel, Geranium

From: Jo-Anne Lane, Geri Poisson

Date: July 25, 2019

Ref.: BEL 219342

Re: Eastern Prairie Fringed-orchid (*Platanthera leucophaea*) and Spotted Turtle (*Clemmys guttata*) habitat and the Midhurst Development

---

The Eastern Prairie Fringed Orchid (*Platanthera leucophaea*, EPFO) and the Spotted Turtle (*Clemmys guttata*) are both listed as Endangered both federal and provincially and regulated in Ontario under the *Endangered Species Act (2007)*.

The EPFO historically ranged across the northeastern United States and into southern Ontario (COSEWIC 2003). In Ontario, there are about 20 small populations in prairie habitat or fens in Simcoe, Essex and Lambton counties, and the municipality of Chatham-Kent (NHIC 2012).

A habitat regulation is in effect for the EPFO, as per Ontario Regulation 242/08:

25. (1) For the purpose of clause (a) of the definition of "habitat" in subsection 2 (1) of the Act, the following areas are prescribed as the habitat of the eastern prairie fringed-orchid:

1. Areas described in subsection (2) where eastern prairie fringed-orchids exist or existed at any time in the past in,

i. the City of Ottawa,

ii. the counties of Bruce, Essex, Grey, Lambton, Lanark, Lennox and Addington and Simcoe,

iii. the Municipality of Chatham-Kent,

iv. The Regional Municipality of York, and

v. the United Counties of Leeds and Grenville and the United Counties of Stormont, Dundas and Glengarry. O. Reg. 436/09, s. 1.

(2) Paragraph 1 of subsection (1) applies to the following areas:

1. Fens.

2. Tallgrass prairies.

3. Moist old fields. O. Reg. 436/09, s. 1

Consultation of the NHIC occurrence records for this species indicates that this species has been recorded within the Minesing Wetland complex, located several kilometres from the Midhurst development. An Environmental Impact Study found that none of the habitat types for the EPFO are present within the proposed areas of disturbance for the Midhurst development (Beacon Environmental 2009a, Beacon Environmental 2009b).

The following is a description of the habitat of the Spotted Turtle from the Ministry of Environment, Conservation and Parks:

> "The Spotted turtle is semi-aquatic and prefers ponds, marshes, bogs and even ditches with slow-moving, unpolluted water and an abundant supply of aquatic vegetation.
>
> They are found in different types of wetlands throughout the province, depending on the types of habitats that are available. Females dig their nests in sunny locations where there is not a lot of woody vegetation.
>
> This species usually hibernates in wetlands or seasonally wet areas associated with structures including overhanging banks, hummocks, tree roots, or aquatic animal burrows." (MECP, https://www.ontario.ca/page/spotted-turtle)

No occurrences of the Spotted Turtle within the Midhurst development were found on the NHIC web site. An Environmental Impact Study found that none of the types of habitats for the Spotted Turtle are located within the proposed areas of disturbance for the Midhurst development (Beacon Environmental 2009a, Beacon Environmental 2009b).

Potential impacts to this species or its habitat relate mainly to any impacts the development may have on the Minesing Wetland and surrounding aquatic or wetland habitats. The effects of groundwater takings to supply the Midhurst development, combined with the inputs of treated municipal wastewater effluent into Willow Creek, upstream of the Minesing Wetlands, have been modelled and analyzed by Golder Associates (2017) and Hutchinson Environmental Sciences Ltd. (2016), respectively. These studies have found that the water quality will meet provincial standards and water levels may be reduced by a maximum of 1mm.

No habitat loss for either the EPFO or the Spotted Turtle will occur due to the Midhurst development.

The predicted effects on the Minesing Wetland will not alter the wetland habitats for either the Eastern Prairie Fringed-orchid or the Spotted Turtle.

**References**

Beacon Environmental Limited. 2009a.
Doran Road - Neighbourhoods 2 and 3 Environmental Impact Study. June 2009.

Beacon Environmental Limited. 2009b.
Carson Road – Neighbourhood 1 Environmental Impact Study. September 2009.

COSEWIC 2003.
COSEWIC assessment and update status report on the eastern prairie fringed-orchid Platanthera leucophaea in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 27 pp.

Golder Associates. 2017.
Midhurst Ontario: Report on Carson and Doran Neighbourhoods Proposed Water Supply Groundwater Modelling. January 2017.

Hutchinson Environmental Sciences Ltd. 2016.
Willow Creek Assimilative Capacity Study, Final Report. April 2016.

Ontario Natural Heritage Information Centre, 2019. www.nhic.mnr.gov.on.ca

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Environmental Sciences Ltd.

1-5 Chancery Lane, Bracebridge, ON P1L 2E3 | 705-645-0021

# Technical Memorandum

**Date:** **February 7, 2017**

**To:** **Joe Mullan (Ainley and Associates)**

**From:** **Neil Hutchinson, Brent Parsons**

**Re:** **Hine's Emerald Dragonfly Habitat in the Minesing Wetlands and the Midhurst Development**

The Hine's Emerald Dragonfly (HED; *Somatochlora hineana*) is listed as endangered federally and provincially and its habitat is protected and regulated under Ontario's *Endangered Species Act* (2007). It is found in Wisconsin, Michigan, Illinois, Missouri and in one section of the Minesing wetland in Ontario and is considered rare throughout its range (COSEWIC 2011). This memo reviews the characteristics of the HED habitat and the proposed Midhurst Development to determine the potential for interaction of the development with regulated HED habitat.

The development of the Midhurst Secondary Plan (the "Midhurst Development") is >5 km from the regulated HED habitat in the Minesing wetland (Figure 1) and so there is no potential for direct effects on habitat. HED habitat is associated with areas of groundwater upwelling however, and so this memo examines how groundwater pumping for water supply to the development may interact with HED habitat and reviews the management activities that will assure there is no impact to HED or its habitat.

Areas of potential interference to HED habitat were determined by delineation of regulated HED habitat based on a literature review of publicly available HED habitat documentation. This information was combined with post-development surface water levels for the Minesing Wetlands, as modelled by Golder Associates Ltd. (Golder's) hydrological/hydrogeological model for the Midhurst development (Golder 2017).

***Species and Habitat Description***

Females lay eggs in moist sediment or shallow water and eggs hatch into larvae that live in the wetland for 3-5 years before crawling up emergent vegetation, shedding their exoskeleton and emerging as adults. This likely occurs between early and mid-June in Ontario (COSEWIC 2011). The larvae are associated with Digger Crayfish (*Fallicambarus fodiens*) because crayfish burrows provide refuge against drought conditions in summer and freezing conditions in winter. Adults live up to 4 to 5 weeks, with males generally occurring in seepage areas and fens and females in dry meadow habitat (Pulfer et al. 2013; USFWS 2013).

Habitat in the Minesing Wetlands in the vicinity of the HED observations is characterized as calcareous wetlands with groundwater high in bicarbonate, carbonate and alkalinity, and vegetation in a wet/saturated state dominated by grasses and fed primarily from intermittent seeps of groundwater (COSEWIC 2011; Post et al. 2015).

### *Species Occurrences*

The first HED discovery in Canada occurred on June 20, 2007 in the Minesing Wetlands when Chris Evans captured an adult male HED (COSEWIC 2011). Additional HED were observed during focused surveys (238 person hours) of 28 sites during 2007, 2008 and 2009, including the observation of larvae on July 7, 2008 while pumping water into crayfish burrows.

We searched the Natural Heritage Information Centre (NHIC) for records of species occurrences of HED in the area noted in COSEWIC (2011). A number of 1 km x 1 km grids contained an occurrence of HED, with the latest observation dated June 22, 2009. A study by Post et al. (2015) focuss only on a description of monitoring efforts and groundwater well locations within "areas of known co-occurrence of HED and digger crayfish" and did not include document any additional observations of HED. These wells were the most precise locations of known Ontario HED habitat identified in our literature review and were used in our delineation of regulated habitat (Figure 1).

### *Habitat Regulation*

HED habitat is protected under Ontario's *Endangered Species Act*. Ontario Regulation 242/08 describes HED habitat as the following:

- Category 1

  Any part of a fen, marsh, seepage area, pond or other body of water, including a vernal or other temporary pool, that is being used, or has been used at any time in the past, by HED for egg laying or larval development.

  Areas classified as Category 1 have the lowest tolerance to alteration.

- Category 2

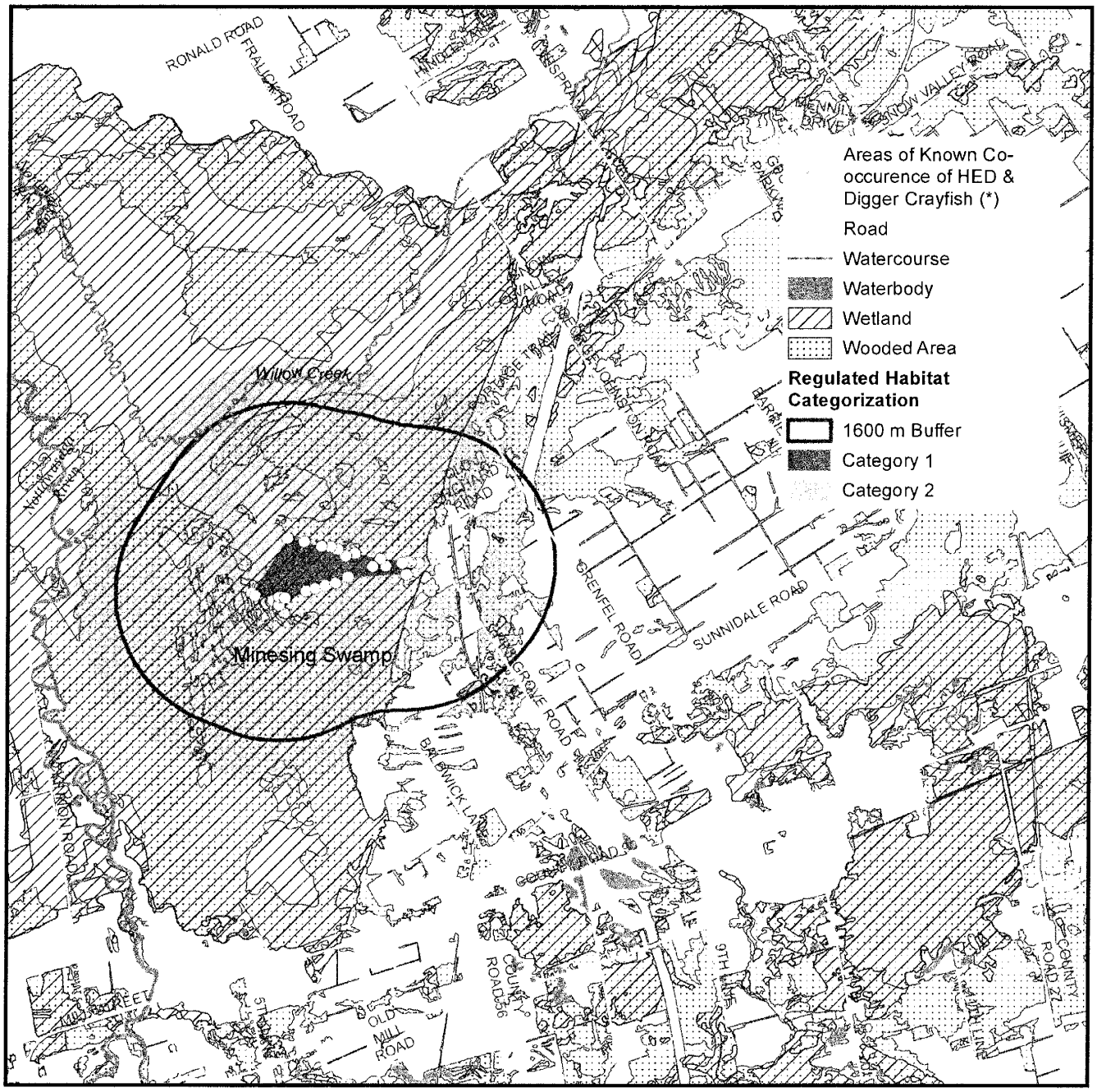
  Any part of a wetland, watercourse, pond or other body of water, including a vernal or other temporary pool, up to the high water mark, that is within 1600 metres of an area used for egg laying or larval development.

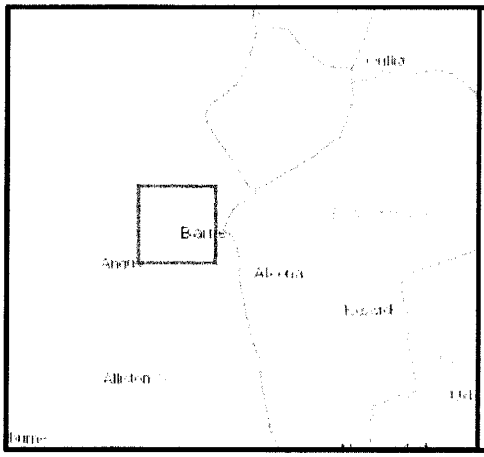
  AND

  Any area that does not have an impervious surface and that is within 500 metres of the wetland or aquatic features described in #2. Areas that do not allow water infiltration into the soil (e.g., roads and buildings) are not included in the 500 m area.

  Areas classified as Category 2 have a moderate tolerance to alteration.

Category 1 and 2 regulated HED habitat is presented in Figure 1 based on areas of known co-occurrence of HED and digger crayfish (Post et al. 2015). All regulated Category 1 and 2 habitat areas are >4 km from the boundaries of the Midhurst Secondary Plan Area (MSPA, Figure 2).



(*)Post, R., McPhie, St., and J. Spoelstra. 2015. Hydrogeological and Geochemical Evaluation of the Eastern Minesing Wetland in Support of the Hine's Emerald Dragonfly (Sometochlora hineana). Nottawasaga Valley Conservation Authority.

**Figure 1:**
Regulated Hine's Emerald Dragonfly Habitat in the Minesing Wetlands

**Project:** Midhurst Secondary Plan
**Project #:** 130030

Project Lead: Brent Parsons
Prepared by: Eric Dilligeard
Data Source: HESL,Ontario Land
Coordinate System: NAD 1983 UTM Zone 17N

May 2, 2016

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Activities generally deemed incompatible with regulated habitat include alteration of aquatic or wetland habitat including changes to water quality, flows, levels, or vegetation characteristics (COSEWIC 2011). Specific threats and how these threats relate to the Minesing Wetlands include:

- Groundwater and Surface Water Levels - The impacts of the MSPA supply wells on surface water levels in and around the Minesing wetlands were predicted to be minimal by Golder's hydrological/hydrogeological model. These predictions are detailed below.
- Groundwater/Surface Water Quality - There will be no interaction of the MSPA activities with water quality in the HED habitat area as the development areas are >5km distant. Treated municipal wastewater effluent will be discharged to Willow Creek, which does not interact with the HED habitat area. The proposed effluent limits will maintain total phosphorus, dissolved oxygen and un-ionized ammonia concentrations within their respective PWQOs in Minesing Creek (HESL 2016) and will not, therefore, impact aquatic life.
- Invasion of Non-native Species - The spread of invasive non-native plant species, particularly European Common Reed (*Phragmites australis ssp. australis*) and Glossy Buckthorn (*Frangula alnus*) into the Minesing Wetlands, could threaten HED habitat but the spread will not be influenced by or altered by interactions with the Midhurst Development.
- Climate Change - Climate change and its effects on weather patterns will not be influenced by or altered by interactions with the Midhurst Development. The stormwater management plan for the development will infiltrate the first 20mm of runoff from storm events to promote groundwater recharge.

***Predicted Changes in Streamflow and Surface Water Levels in and around the Minesing Wetlands due to Future Groundwater Pumping Activities***

A hydrologic/hydrogeologic model was built by Golder Associates Ltd. (Golder 2017) to assess changes, if any, in surface water levels and flows at the Minesing Wetland as a result of proposed water supply pumping from development of the Midhurst Secondary Plan. The model encompassed a total area of 746 $km^2$ including approximately 90% of the Willow Creek Watershed, the proposed development area and all proposed water supply wells for these neighbourhoods, existing municipal supply wells in Midhurst and the City of Barrie, and other regional takings within the model area. Particular focus was given to Willow Creek and the Minesing Wetlands. The calibrated model was run for 10-year simulations and steady-state (annual average) simulations at Post-Development conditions. The model report, which includes details of the model development and results, is provided as a companion document to this memorandum (Appendix A *Report on Carson and Doran Neighbourhoods Proposed Water Supply: Supplementary Hydrologic Modelling* (Golder, January 2017).

An annual average streamflow reduction of 3% was simulated with a maximum decline of 5% occurring during summer at the Minesing Wetland. However, when inflow from the Nottawasaga River upstream of the model domain and discharge from the proposed upstream wastewater treatment plant at Willow Creek and Highway 26 were considered, these losses comprised less than 1% of the wetland's total flow and are thus considered negligible. Modelled surface water level changes in the Minesing Wetland and Snow Valley area showed a reduction of approximately 1 millimetre (mm) or less and are considered inconsequential (Golder, 2017).

***Recommendations***

Table 1 describes Best Management Practices that have been used to protect the largest known HED population in Wisconsin (i.e., The Ridges Sanctuary 2013). These have been or will be implemented in the design for the Midhurst Secondary Plan Area (SPA), as additional protective measures.

**Table 1. Best Management Practices to Protect HED Population in Wisconsin and Recommended Action Items for the Midhurst Secondary Plan Area**

| Item | Best Management Practice | Comments/Recommended Action Items for Midhurst SPA |
|---|---|---|
| 1 | Eliminate pesticide and synthetic fertilizer usage on residential lawns, recreational fields and public spaces immediately adjacent to known habitat. | Not Applicable - The Midhurst Secondary Plan (MSP) areas are over 5 km from any regulated HED habitat and there is no pathway for transport. |
| 2 | Maintain private onsite wastewater treatment systems in rural lands through inspections, maintenance and awareness | Not Applicable - Collection of municipal effluent and treatment at the proposed WWTP will achieve a superior degree of treatment and greater assurance and regulation than what is achieved through private on-site systems |
| 3 | Properly dispose of pharmaceuticals and hazardous waste | Already implemented through municipal sewer use bylaws, provincial regulations and educational programs |
| 4 | Follow manure application standards | Not Applicable on developed lands |
| 5 | Develop and implement a Storm Water Management Plan to control erosion on construction sites | No construction is proposed within 5 km of the regulated area. Stormwater and Sediment and Erosion Control Plans have been or will be developed for the MSP areas. |
| 6 | Install storm water infiltration systems to mitigate impervious surface runoff | Already Implemented - The Low Impact Development techniques proposed for the Midhurst Development will infiltrate the first 20 mm of precipitation from all storms, or ~90% of the annual precipitation to maintain groundwater recharge; |
| 7 | Protect groundwater from the impacts of development with conservation easements | Not Necessary - The development areas are >5 km from the regulated habitat areas. Low Impact Development techniques will maintain groundwater recharge. |
| 8 | Groundwater protection through accurate delineation of locations supplying groundwater to HED larval wetlands | Already Implemented - See Figure 2 and Golder (2017). |

### *Conclusions and Recommendations*

HED habitat is protected under the *Endangered Species Act* which includes the provision that no person shall damage or destroy the habitat of an endangered or threatened species. Our review concludes that development of the MSPA does not threaten the HED or its habitat:

- No physical disturbances associated with development of the MSPA will occur within 5 km of the regulated HED habitat and so there are no direct impacts,
- A hydrologic/hydrogeologic model (Golder 2017) indicated maximum surface water level decreases of less than 1 mm in the Minesing Wetland over a ten-year period at full development build out. Therefore, with respect to regulated HED habitat, the HED's use of the wetlands for egg-laying and larval development would not be affected as a result of water level changes.
- A series of Best Management Practices have been or will be implemented in the design for the Midhurst Secondary Plan Area (SPA), as appropriate, as additional protective measures.

We will continue to monitor the ecological literature and local information on the HED to maintain our knowledge of current conditions.

### *References*


COSEWIC. 2011. COSEWIC assessment and status report on the Hine's Emerald Dragonfly *Somatochlora hineana* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 41 pp

Golder Associates. 2017. Midhurst Ontario: Report on Carson and Doran Neighbourhoods Proposed Water Supply Groundwater Modelling. January 2017.

Hutchinson Environmental Sciences Ltd. 2016. Willow Creek Assimilative Capacity Study, Final Report. April 2016.

Post, R., McPhie, St., and J. Spoelstra. 2015. Hydrogeological and Geochemical Evaluation of the Eastern Minesing Wetland in Support of the Hine's Emerald Dragonfly (*Sometochlora hineana*). Nottawasaga Valley Conservation Authority.

Pulfer, T.L., C.G. Evans, D. Featherstone, R. Post, J.I. McCarter, and J.F. Laverty. 2013. Recovery Strategy for the Hine's Emerald (*Somatochlora hineana*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. vi + 27 pp.

The Ridges Sanctuary, 2013. Best Management Practives to Protect Groundwater at Hine's Emerald Dragonfly Larval Sites in Door County, Wisconsin. Cooperative Agreement between the USFWS and the Ridges Sanctuary.

USFWS. 2013. Hine's Emerald Dragonfly, Somatochlora hineana (Odonata: Corduliidae) 5-Year Review: Summary and Evaluation. Chicago Ecological Services Field Office. Barrington, Illinois – May 2013

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# 7Q20 Flow Assessment Update for Willow Creek at Highway 26 (Near Minesing) and Ecological Low Flow Assessment

## Final Report

Prepared for: Township of Springwater c/o
Job #: J130030

May 28, 2018

1-5 Chancery Lane, Bracebridge ON, P1L 2E3 | 705-645-0021

## Reid Mitchell

**From:** Joe Mullan <mullan@ainleygroup.com>
**Sent:** August-07-19 9:13 AM
**To:** Reid Mitchell
**Subject:** FW: Midhurst Water, WW and Transportation Class EA - Source Protection follow up
**Attachments:** Midhurst_Response to TechMemo_SPPB_08012019.docx

FYI

Regards,

J. A. Mullan, P.Eng.
President & CEO

Ainley

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**From:** Vimal Patel <vimalp@geranium.com>
**Sent:** Tuesday, August 06, 2019 11:24 PM
**To:** Joe Mullan <mullan@ainleygroup.com>
**Subject:** FW: Midhurst Water, WW and Transportation Class EA - Source Protection follow up

fyi – Golder is currently drafting a response to summarize the vulnerability assessment

Thanks,
Vimal

**From:** Moulton, Jennifer L. (MECP) <Jennifer.L.Moulton@ontario.ca>
**Sent:** August 1, 2019 2:48 PM
**To:** Vimal Patel <vimalp@geranium.com>; Shauna Dudding <shaunad@geranium.com>; Easton, John <John_Easton@golder.com>; Hannan, Devin <Devin_Hannan@golder.com>
**Cc:** Rudzki, Kristina (MECP) <Kristina.Rudzki@ontario.ca>; Robinson, Callee (MECP) <Callee.Robinson@ontario.ca>; Forrest, Elizabeth (MECP) <Elizabeth.Forrest@ontario.ca>; Mario Giampietri <mariog@geranium.com>; Cheryl Shindruk <cherylS@geranium.com>; Scanlon, Debbie (MECP) <Debbie.Scanlon@ontario.ca>; Ecclestone, Susan (MECP) <Susan.Ecclestone@ontario.ca>; DesLauriers, Angelune (MECP) <Angelune.DesLauriers@ontario.ca>
**Subject:** RE: Midhurst Water, WW and Transportation Class EA - Source Protection follow up

Thank you again for the short-notice meeting this afternoon. I have attached the memorandum that I referred to which will hopefully help identify the remaining information needs more clearly. If you have any outstanding questions / concerns you can reach me today or reach out to Angelune DesLauriers copied here (289) 237-3062.

Thanks again,
***Jennifer Moulton***
Jennifer.l.moulton@ontario.ca
(519) 860-7851

**From:** Ecclestone, Susan (MECP)
**Sent:** July 30, 2019 10:23 AM
**To:** Vimal Patel <vimalp@geranium.com>
**Cc:** Rudzki, Kristina (MECP) <Kristina.Rudzki@ontario.ca>; Robinson, Callee (MECP) <Callee.Robinson@ontario.ca>; Forrest, Elizabeth (MECP) <Elizabeth.Forrest@ontario.ca>; Easton, John <John_Easton@golder.com>; Hannan, Devin <Devin_Hannan@golder.com>; Shauna Dudding <shaunad@geranium.com>; Mario Giampietri <mariog@geranium.com>; Cheryl Shindruk <cherylS@geranium.com>; Moulton, Jennifer L. (MECP) <Jennifer.L.Moulton@ontario.ca>; Scanlon, Debbie (MECP) <Debbie.Scanlon@ontario.ca>
**Subject:** RE: Midhurst Water, WW and Transportation Class EA - Source Protection follow up

Thanks very much for your emails. We are reviewing the information you have provided and will reply to you shortly.

I note that I have included Debbie Scanlon on this email. Debbie is the Manager, Source Protection Approvals, the section in which Jen Moulton works.

Thanks, Susan.

Susan Ecclestone I Director I Source Protection Programs Branch I Day of Action on Litter I Land and Water Division I Ministry of the Environment, Conservation and Parks I susan.ecclestone@ontario.ca I 416-274-8864 Please let me know if you have any accommodation needs or require communication supports or alternate formats.

**From:** Vimal Patel <vimalp@geranium.com>
**Sent:** July 29, 2019 10:59 PM
**To:** Ecclestone, Susan (MECP) <Susan.Ecclestone@ontario.ca>; Moulton, Jennifer L. (MECP) <Jennifer.L.Moulton@ontario.ca>
**Cc:** Rudzki, Kristina (MECP) <Kristina.Rudzki@ontario.ca>; Robinson, Callee (MECP) <Callee.Robinson@ontario.ca>; Forrest, Elizabeth (MECP) <Elizabeth.Forrest@ontario.ca>; Easton, John <John_Easton@golder.com>; Hannan, Devin <Devin_Hannan@golder.com>; Shauna Dudding <shaunad@geranium.com>; Mario Giampietri <mariog@geranium.com>; Cheryl Shindruk <cherylS@geranium.com>
**Subject:** RE: Midhurst Water, WW and Transportation Class EA - Source Protection follow up

Hi Susan and Jennifer,

I am following up on the email below. I trust the supplemental information provided last week was satisfactory.

If you require anything further, please let me know.

Thanks,
Vimal

**From:** Vimal Patel <vimalp@geranium.com>
**Sent:** July 26, 2019 12:00 AM

**To:** 'Susan.Ecclestone@ontario.ca' <Susan.Ecclestone@ontario.ca>; 'Jennifer.L.Moulton@ontario.ca' <Jennifer.L.Moulton@ontario.ca>
**Cc:** 'Kristina.Rudzki@ontario.ca' <Kristina.Rudzki@ontario.ca>; 'Callee.Robinson@ontario.ca' <Callee.Robinson@ontario.ca>; 'Elizabeth.Forrest@ontario.ca' <Elizabeth.Forrest@ontario.ca>; 'Easton, John' <John_Easton@golder.com>; 'Hannan, Devin' <Devin_Hannan@golder.com>; Shauna Dudding <shaunad@geranium.com>; Mario Giampietri <mariog@geranium.com>; Cheryl Shindruk <cherylS@geranium.com>
**Subject:** RE: Midhurst Water, WW and Transportation Class EA - Source Protection follow up

Susan and Jennifer,

Thanks again for making the time and for arranging the follow-up call earlier this week. Please find enclosed a memorandum prepared by Golder responding to the items discussed during our call.

If you have any further questions, or would like to discuss the above, please do not hesitate to contact me.

Thanks,
Vimal

**Vimal Patel, P.Eng**
Sr. Project Manager, Land Development

GERANIUM
C: 416-697-6295
T: 905-477-1177 Ext. 242 I F: 905-477-7733
3190 Steeles Avenue East, Suite 300
Markham, ON L3R 1G9

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**From:** Ecclestone, Susan (MECP) <Susan.Ecclestone@ontario.ca>
**Sent:** July 23, 2019 8:47 AM
**To:** Shauna Dudding <shaunad@geranium.com>
**Cc:** Moulton, Jennifer L. (MECP) <Jennifer.L.Moulton@ontario.ca>; Rudzki, Kristina (MECP) <Kristina.Rudzki@ontario.ca>; John Easton <John_Easton@golder.com>; Devin Hannan <Devin_Hannan@golder.com>; Vimal Patel <vimalp@geranium.com>; Kathryn Hill <kathrynh@geranium.com>; Forrest, Elizabeth (MECP) <Elizabeth.Forrest@ontario.ca>
**Subject:** RE: Midhurst Water, WW and Transportation Class EA - Source Protection follow up

Thanks Shauna. I will send the invitation. Here is the call in number just in case folks do not properly receive the invite.

Telephone Conference: 416-212-8013/Toll Free: 1-866-633-1033. Conference ID: 3024467

I may be a few minutes late due to an earlier commitment but Jen Moulton will start the call. We'll also be including Beth Forrest who is a Liaison Officer with the Source Protection Programs Branch and Lubna Hussain who is manager of the Technical Support Section in MECP's Central Region.

Susan.

Susan Ecclestone I Director I Source Protection Programs Branch I Day of Action on Litter I Land and Water Division I Ministry of the Environment, Conservation and Parks I susan.ecclestone@ontario.ca I 416-274-8864 Please let me know if you have any accommodation needs or require communication supports or alternate formats.

**From:** Shauna Dudding <shaunad@geranium.com>
**Sent:** July 23, 2019 8:43 AM
**To:** Ecclestone, Susan (MECP) <Susan.Ecclestone@ontario.ca>
**Cc:** Moulton, Jennifer L. (MECP) <Jennifer.L.Moulton@ontario.ca>; Rudzki, Kristina (MECP) <Kristina.Rudzki@ontario.ca>; John Easton <John_Easton@golder.com>; Devin Hannan <Devin_Hannan@golder.com>; Vimal Patel <vimalp@geranium.com>; Kathryn Hill <kathrynh@geranium.com>
**Subject:** Re: Midhurst Water, WW and Transportation Class EA - Source Protection follow up

Hi Susan,

Confirming 10:30am. Devin, John, myself and Vimal will make ourselves available.

If you can please share a call in number, or I can circulate one if preferred.

Best regards,
Shauna

On Tue, Jul 23, 2019 at 6:50 AM Ecclestone, Susan (MECP) <Susan.Ecclestone@ontario.ca> wrote:

> Shauna I should have mentioned that, while it's your choice to join me in person for this meeting at 40 St Clair West, I recommend doing this meeting by teleconference to save your team travel time. Jen is based in London and some of other folks will also be on the phone due our distributed geographic location
>
> Looking forward to hearing about what time works best.
>
> Susan
>
> 416-274-8864

---

**From:** Shauna Dudding <shaunad@geranium.com>
**Sent:** Monday, July 22, 2019 4:59:49 PM
**To:** Ecclestone, Susan (MECP) <Susan.Ecclestone@ontario.ca>
**Cc:** Moulton, Jennifer L. (MECP) <Jennifer.L.Moulton@ontario.ca>; Rudzki, Kristina (MECP) <Kristina.Rudzki@ontario.ca>
**Subject:** Re: Midhurst Water, WW and Transportation Class EA - Source Protection follow up

Thank you so much Susan. I will be back to you shortly on best windows for a call.

Best,
Shauna

Sent from my iPhone

On Jul 22, 2019, at 4:44 PM, Ecclestone, Susan (MECP) <Susan.Ecclestone@ontario.ca> wrote:

Shauna,

It was a pleasure to meet you today. I am emailing as promised to set up a meeting to discuss the source protection aspects.

Would you please let me know what time works best for you tomorrow? Would you also please let me know who you'd like me to include in the invite?

We are available 9-10, 10:30-11:15, 2:00-4:00.

In the meantime, here is the contact information for the individual we mentioned today and attached is the excerpt of the guidance pertaining to this class EA.

Bill Thompson

Manager, Watershed Plans and Strategies

Lake Simcoe Region Conservation Authority

905-895-1281 X271

b.thompson@lsrca.on.ca

Looking forward to your response,

Susan.

Susan Ecclestone I Director I Source Protection Programs Branch I Day of Action on Litter I Land and Water Division I Ministry of the Environment, Conservation and Parks I susan.ecclestone@ontario.ca I 416-274-8864 Please let me know if you have any accommodation needs or require communication supports or alternate formats.

<image002.png>

<2015-10-20 Final MEA Amendments-pagesforCWAonly.pdf>

--

**Shauna Dudding, P.Eng**

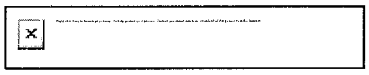
Senior Vice President, Land Development

Important: My email address has changed. Please ensure you update your contact information to shaunad@geranium.com

GERANIUM

**C:** 647-202-4111 I **D:** 905-413-7162

**T:** 905-477-1177 Ext. 202 I **F:** 905-477-7733
3190 Steeles Avenue East, Suite 300
Markham, ON L3R 1G9



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**Ministry of the Environment, Conservation and Parks**

Source Protection Programs Branch

14th Floor
40 St. Clair Ave. West
Toronto ON M4V 1M2

**Ministère de l'Environnement, de la Protection de la nature et des Parcs**

Direction des programmes de protection des sources

14e étage
40, avenue St. Clair Ouest
Toronto (Ontario) M4V 1M2

Ontario

August 1, 2019

**MEMORANDUM**

**To:** Shauna Dudding and Vimal Patel, Geranium
Devin Hannan and John Easton, Golder Associates Ltd.

**From:** Jennifer Moulton, Senior Drinking Water Program Advisor
Source Protection Programs Branch

**Re:** Midhurst Water, Wastewater & Transportation (Phase 3 and 4)
Environmental Study Report

Thank you for submitting the technical memorandum dated July 25, 2019 in follow up to our conversations with you on July 22nd and 23rd.

At the source protection meeting on July 23rd it was agreed that following that discussion, wherein Source Protection Programs Branch outlined our concerns and information needs, you would provide the additional information and, once it was found to be satisfactory, it would form part of an addendum to the Environmental Study Report. For clarity as an addendum, consideration should be given to removing the copied sections of the MEA Class EA and clearly providing the relevant maps of vulnerable areas and other necessary information and discussion under appropriate headings.

The technical memorandum is helpful in understanding both the existing and proposed land uses that are in the proposed development areas. However, for an interested or affected stakeholder to comprehend the interrelationship of the proposed development to the source protection plan, additional information regarding the vulnerability assessment (zones, scoring, issues contributing areas when applicable) and any plan policies that could apply based on land uses should be included and discussed. Referring the reader to Appendix M of Appendix J is not helpful as this technical report does not clearly identify vulnerability scores or source protection plan policies.

When a reader refers to the South Georgian Bay Lake Simcoe source protection plan they will find tables indicating where threats are significant and policies apply, generally WHPAs with a score of 10, some 8, and issues contributing areas, or if policies apply to moderate / low threats. Without corresponding vulnerability assessment information available in the ESR/addendum as it pertains to the Midhurst project area, it would be especially difficult for anyone to determine if a particular plan policy applies to any given area. It is noted that there are some instances where the technical memorandum does refer to the vulnerability scoring of a given area but this is inconsistent.

To address this issue and improve the clarity of the technical memorandum/addendum, Source Protection Programs Branch suggests the following types of additional information be included (examples below are illustrative and not an inclusive list of changes suggested. Guiding instructions are shown in *blue italic*, and additional text examples in red font).

Page 1 – Definitions - *including a map as well as additional information about the vulnerability assessments within the definitions would be helpful for readers to refer to when interpreting later sections of the memorandum. Eg:*

> Area WHPA-A, being the surface and subsurface area centred on the well with an outer boundary identified by a radius of 100 metres. This area always has a vulnerability score of 10.

Page 3 – Vulnerable Areas WHPA-A, B, C, D

> The only portion of the Midhurst project within these WHPAs is the southeast portion of the Doran / Pooles Rd property which is located within part of the WHPA-D (with a vulnerability score of 2) capture zone of the Midhurst Idlewood Drive and Greenpine municipal wells and therefore **there are [**or **there are no]** policies that apply in the source protection plan. *(If there are low/moderate policies that apply please include these and discuss the outcome in relation to the project by tying this into the following information).* The planned land use in the area overlapping the WHPA-D is either Environmental Protection Area / Greenspace, Open Space, Residential, or Storm Water Management Pond. Therefore, none of these planned land uses are considered drinking water threats within a WHPA-D under the *Clean Water Act* 2017 Technical Rules list of drinking water threats (if necessary, state that the policies identified above if any do not apply).

Page 5 - Land Uses in WHPAs – *this section should also include an introductory paragraph that explains the concept of requiring amendments to the source protection plan to incorporate new WHPAs and that for the purpose of evaluating the potential for impacts it is being assumed that the same policies will apply to those areas.*

> **Alliance Wells PW1 and PW2.** There are no homes in WHPA A (score 10) currently, however the wells will be in parkland and there will be homes within WHPA A. The policies that may apply to future residential development within WHPA A based on the current source protection plan include: [a,b,c, etc] *Then list and describe how these policies will be addressed where necessary.* There are 8 homes within WHPA B (score(s) ?, ICAs?) and a farm that is currently used as a horse ranch and the fields are cropped. The policies that may apply to existing or future development within this area based on the source protection plan include: *list if any, if none explain no policies apply to existing / future uses and how any mitigation strategies will be employed where necessary.* There are three homes, one of which is a farmstead with a feed lot, and farmed fields in WHPA C (score(s)?, ICAs?). The policies that may apply to existing or future development within this area based on the source protection plan include: *list if any, if none explain no policies apply to existing / future uses and how any mitigation strategies will be employed where necessary.* In WHPA D (score?) there are 39 homes, 2 field lots, and the lands are primarily farm fields. Highway 400 crosses WHPA D. The policies that may apply to existing or future development within this area based on the source protection plan include: *list if any, if none explain no policies apply to existing / future uses.*

In relation to the addition of the new information identified above, should it be determined that there are potential policy impacts to existing landowners, it will be appropriate to provide those landowners with this information and an opportunity to review and comment.

We look forward to receiving an updated version of the proposed addendum at your earliest opportunity.

Should you have further questions please don't hesitate to contact myself or Debbie Scanlon, Manager, Source Protection Approvals Section, Debbie.Scanlon@ontario.ca or (647) 627-5917.

*Jennifer Moulton*
Senior Drinking Water Program Advisor
Source Protection Programs Branch
Jennifer.l.moulton@ontario.ca
519-860-7851

C: Debbie Scanlon, Manager, Approvals Unit, SPPB
Susan Ecclestone, Director, SPPB
Kristina Rudzki, Supervisor, EAPB
Callee Robinson, Project Officer, EAPB

## Reid Mitchell

**From:** Joe Mullan <mullan@ainleygroup.com>
**Sent:** August-07-19 9:13 AM
**To:** Reid Mitchell
**Subject:** FW: Midhurst ESR - SAR Clarification

FYI

Regards,

J. A. Mullan, P.Eng.
President & CEO
Ainley
www.ainleygroup.com
Tel: (705) 445-3451 Ext. 126
Cell: (705) 718-7230

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**From:** Vimal Patel <vimalp@geranium.com>
**Sent:** Tuesday, August 06, 2019 11:25 PM
**To:** Joe Mullan <mullan@ainleygroup.com>
**Subject:** FW: Midhurst ESR - SAR Clarification

fyi – I will take this as MNR signing off.

Awaiting a response from Paul at MECP.

V

**From:** Shirley, Brent (MNRF) <brent.shirley@ontario.ca>
**Sent:** August 6, 2019 2:01 PM
**To:** Vimal Patel <vimalp@geranium.com>
**Subject:** RE: Midhurst ESR - SAR Clarification

Hi Vimal,

Sorry for not responding earlier. Thanks for pointing out the reports that speak to the DFO guidelines and how your hydrological impact assessment meets their guidelines.

Best Regards,
Brent

**From:** Vimal Patel <vimalp@geranium.com>
**Sent:** August-06-19 1:54 PM
**To:** Heeney, Paul (MECP) <Paul.Heeney@ontario.ca>; Shirley, Brent (MNRF) <brent.shirley@ontario.ca>
**Cc:** Rudzki, Kristina (MECP) <Kristina.Rudzki@ontario.ca>; Robinson, Callee (MECP) <Callee.Robinson@ontario.ca>; Shauna Dudding <shaunad@geranium.com>; Mario Giampietri <mariog@geranium.com>; Cheryl Shindruk <cheryls@geranium.com>
**Subject:** RE: Midhurst ESR - SAR Clarification

Hi Paul,

I just wanted to follow-up on this item again. Please let me know if you've had a chance to review the material we discussed during our meeting/call on July 22nd.

Thanks,
Vimal

---

**From:** Vimal Patel <vimalp@geranium.com>
**Sent:** July 29, 2019 11:05 PM
**To:** 'Paul.Heeney@ontario.ca' <Paul.Heeney@ontario.ca>; 'brent.shirley@ontario.ca' <brent.shirley@ontario.ca>
**Cc:** 'kristina.rudzki@ontario.ca' <kristina.rudzki@ontario.ca>; 'Robinson, Callee (MECP)' <Callee.Robinson@ontario.ca>; Shauna Dudding <shaunad@geranium.com>; Mario Giampietri <mariog@geranium.com>; Cheryl Shindruk <cheryls@geranium.com>
**Subject:** RE: Midhurst ESR - SAR Clarification

Hi Paul/Brent,

I am following up on the email below regarding our discussions on the Hines Emerald Dragon fly. I trust the information provided last week is satisfactory.

If you have any further questions, or would like to discuss, please do not hesitate to contact me.

Thanks,
Vimal

**From:** Vimal Patel <vimalp@geranium.com>
**Sent:** July 25, 2019 11:19 AM
**To:** Paul.Heeney@ontario.ca; brent.shirley@ontario.ca
**Cc:** kristina.rudzki@ontario.ca; Robinson, Callee (MECP) <Callee.Robinson@ontario.ca>; Shauna Dudding <shaunad@geranium.com>; Mario Giampietri <mariog@geranium.com>; Cheryl Shindruk <cheryls@geranium.com>
**Subject:** Midhurst ESR - SAR Clarification

Paul et al.,

Further to Neil's responses and discussion in our meeting earlier this week, please see summary below referencing the location of the reports in the ESR that pertain to the Hines Emerald Dragon fly assessment (the reports are also attached to the email for ease of reference). Note that the DFO guidelines, which was discussed in the meeting, are discussed in sections 5.1 and 5.2 of the 7Q20/Ecological Low Flow Assessment.

- **Appendix L (pages 541-572 of the ESR)** – 7Q20 Flow Assessment of Willow Creek at Highway 26 (Near Minesing) and Ecological Low Flow Assessment, dated May 28, 2018.
- **Appendix M (pages 724-730 of the ESR)** - Hine's Emerald Dragonfly Habitat in the Minesing Wetlands & the Midhurst Development prepared by Hutchinson Environmental Sciences, dated February 7, 2017.

In addition to the above information, please find attached a supplementary memorandum from Beacon Environmental speaking to the additional species (Eastern Prairie Fringed-orchid and Spotted Turtle) noted in the meeting.

If you have any further questions, or would like to discuss the above, please do not hesitate to contact me.

Thanks,

Vimal

## Reid Mitchell

**From:** Joe Mullan <mullan@ainleygroup.com>
**Sent:** August-12-19 10:02 AM
**To:** 'Reid Mitchell'
**Subject:** FW: Midhurst Water, WW and Transportation Class EA - Source Protection follow up
**Attachments:** Midhurst Golder Response to MECP August 8 2019 (13-1170-0040).pdf

FYI

Regards,

J. A. Mullan, P.Eng.
President & CEO
[image003]
www.ainleygroup.com
Tel: (705) 445-3451 Ext. 126
Cell: (705) 718-7230

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From: Vimal Patel <vimalp@geranium.com>
Sent: Friday, August 9, 2019 2:34 PM
To: Joe Mullan <mullan@ainleygroup.com>
Subject: FW: Midhurst Water, WW and Transportation Class EA - Source Protection follow up

fyi – give me a call when you have a moment.

Thanks,
Vimal

From: Vimal Patel <vimalp@geranium.com<mailto:vimalp@geranium.com>>
Sent: August 8, 2019 1:15 PM
To: 'Jennifer.L.Moulton@ontario.ca<mailto:Jennifer.L.Moulton@ontario.ca>'
<Jennifer.L.Moulton@ontario.ca<mailto:Jennifer.L.Moulton@ontario.ca>>;
'Angelune.DesLauriers@ontario.ca<mailto:Angelune.DesLauriers@ontario.ca>'
<Angelune.DesLauriers@ontario.ca<mailto:Angelune.DesLauriers@ontario.ca>>
Cc: 'kristina.rudzki@ontario.ca<mailto:kristina.rudzki@ontario.ca>'
<kristina.rudzki@ontario.ca<mailto:kristina.rudzki@ontario.ca>>; 'Robinson, Callee (MECP)'
<Callee.Robinson@ontario.ca<mailto:Callee.Robinson@ontario.ca>>;
'Elizabeth.Forrest@ontario.ca<mailto:Elizabeth.Forrest@ontario.ca>'
<Elizabeth.Forrest@ontario.ca<mailto:Elizabeth.Forrest@ontario.ca>>;
'Susan.Ecclestone@ontario.ca<mailto:Susan.Ecclestone@ontario.ca>'
<Susan.Ecclestone@ontario.ca<mailto:Susan.Ecclestone@ontario.ca>>; 'Mario Giampietri'
<mariog@geranium.com<mailto:mariog@geranium.com>>; 'Cheryl Shindruk'
<cherylS@geranium.com<mailto:cherylS@geranium.com>>; Shauna Dudding

<shaunad@geranium.com<mailto:shaunad@geranium.com>>; Stephanie Morizio
<stephaniem@geranium.com<mailto:stephaniem@geranium.com>>; 'Easton, John'
<John_Easton@golder.com<mailto:John_Easton@golder.com>>; 'Hannan, Devin'
<Devin_Hannan@golder.com<mailto:Devin_Hannan@golder.com>>;
'Debbie.Scanlon@ontario.ca<mailto:Debbie.Scanlon@ontario.ca>'
<Debbie.Scanlon@ontario.ca<mailto:Debbie.Scanlon@ontario.ca>>
Subject: RE: Midhurst Water, WW and Transportation Class EA - Source Protection follow up

All,

Further to our discussion last Thursday, please find attached the updated memorandum, prepared by Golder, to provide more clarity on the vulnerability scores and applicable source protection plan policies.

If you have any further questions, or would like to discuss, please do not hesitate to contact me.

Regards,
Vimal

From: Moulton, Jennifer L. (MECP) <Jennifer.L.Moulton@ontario.ca<mailto:Jennifer.L.Moulton@ontario.ca>>
Sent: August 1, 2019 2:48 PM
To: Vimal Patel <vimalp@geranium.com<mailto:vimalp@geranium.com>>; Shauna Dudding
<shaunad@geranium.com<mailto:shaunad@geranium.com>>; Easton, John
<John_Easton@golder.com<mailto:John_Easton@golder.com>>; Hannan, Devin
<Devin_Hannan@golder.com<mailto:Devin_Hannan@golder.com>>
Cc: Rudzki, Kristina (MECP) <Kristina.Rudzki@ontario.ca<mailto:Kristina.Rudzki@ontario.ca>>; Robinson, Callee (MECP)
<Callee.Robinson@ontario.ca<mailto:Callee.Robinson@ontario.ca>>; Forrest, Elizabeth (MECP)
<Elizabeth.Forrest@ontario.ca<mailto:Elizabeth.Forrest@ontario.ca>>; Mario Giampietri
<mariog@geranium.com<mailto:mariog@geranium.com>>; Cheryl Shindruk
<cheryls@geranium.com<mailto:cheryls@geranium.com>>; Scanlon, Debbie (MECP)
<Debbie.Scanlon@ontario.ca<mailto:Debbie.Scanlon@ontario.ca>>; Ecclestone, Susan (MECP)
<Susan.Ecclestone@ontario.ca<mailto:Susan.Ecclestone@ontario.ca>>; DesLauriers, Angelune (MECP)
<Angelune.DesLauriers@ontario.ca<mailto:Angelune.DesLauriers@ontario.ca>>
Subject: RE: Midhurst Water, WW and Transportation Class EA - Source Protection follow up

Thank you again for the short-notice meeting this afternoon. I have attached the memorandum that I referred to which will hopefully help identify the remaining information needs more clearly. If you have any outstanding questions / concerns you can reach me today or reach out to Angelune DesLauriers copied here (289) 237-3062.

Thanks again,
Jennifer Moulton
Jennifer.l.moulton@ontario.ca<mailto:Jennifer.l.moulton@ontario.ca>
(519) 860-7851

From: Ecclestone, Susan (MECP)
Sent: July 30, 2019 10:23 AM
To: Vimal Patel <vimalp@geranium.com<mailto:vimalp@geranium.com>>
Cc: Rudzki, Kristina (MECP) <Kristina.Rudzki@ontario.ca<mailto:Kristina.Rudzki@ontario.ca>>; Robinson, Callee (MECP)
<Callee.Robinson@ontario.ca<mailto:Callee.Robinson@ontario.ca>>; Forrest, Elizabeth (MECP)
<Elizabeth.Forrest@ontario.ca<mailto:Elizabeth.Forrest@ontario.ca>>; Easton, John
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<shaunad@geranium.com<mailto:shaunad@geranium.com>>; Mario Giampietri

<mariog@geranium.com<mailto:mariog@geranium.com>>; Cheryl Shindruk
<cheryls@geranium.com<mailto:cheryls@geranium.com>>; Moulton, Jennifer L. (MECP)
<Jennifer.L.Moulton@ontario.ca<mailto:Jennifer.L.Moulton@ontario.ca>>; Scanlon, Debbie (MECP)
<Debbie.Scanlon@ontario.ca<mailto:Debbie.Scanlon@ontario.ca>>
Subject: RE: Midhurst Water, WW and Transportation Class EA - Source Protection follow up

Thanks very much for your emails. We are reviewing the information you have provided and will reply to you shortly.

I note that I have included Debbie Scanlon on this email. Debbie is the Manager, Source Protection Approvals, the section in which Jen Moulton works.

Thanks, Susan.

Susan Ecclestone I Director I Source Protection Programs Branch I Day of Action on Litter I Land and Water Division I Ministry of the Environment, Conservation and Parks I susan.ecclestone@ontario.ca<mailto:susan.ecclestone@ontario.ca> I 416-274-8864 Please let me know if you have any accommodation needs or require communication supports or alternate formats.
[English version of the "I support self care and wellness" ebutton]

From: Vimal Patel <vimalp@geranium.com<mailto:vimalp@geranium.com>>
Sent: July 29, 2019 10:59 PM
To: Ecclestone, Susan (MECP) <Susan.Ecclestone@ontario.ca<mailto:Susan.Ecclestone@ontario.ca>>; Moulton, Jennifer L. (MECP) <Jennifer.L.Moulton@ontario.ca<mailto:Jennifer.L.Moulton@ontario.ca>>
Cc: Rudzki, Kristina (MECP) <Kristina.Rudzki@ontario.ca<mailto:Kristina.Rudzki@ontario.ca>>; Robinson, Callee (MECP) <Callee.Robinson@ontario.ca<mailto:Callee.Robinson@ontario.ca>>; Forrest, Elizabeth (MECP) <Elizabeth.Forrest@ontario.ca<mailto:Elizabeth.Forrest@ontario.ca>>; Easton, John <John_Easton@golder.com<mailto:John_Easton@golder.com>>; Hannan, Devin <Devin_Hannan@golder.com<mailto:Devin_Hannan@golder.com>>; Shauna Dudding <shaunad@geranium.com<mailto:shaunad@geranium.com>>; Mario Giampietri <mariog@geranium.com<mailto:mariog@geranium.com>>; Cheryl Shindruk <cheryls@geranium.com<mailto:cheryls@geranium.com>>
Subject: RE: Midhurst Water, WW and Transportation Class EA - Source Protection follow up

Hi Susan and Jennifer,

I am following up on the email below. I trust the supplemental information provided last week was satisfactory.

If you require anything further, please let me know.

Thanks,
Vimal

From: Vimal Patel <vimalp@geranium.com<mailto:vimalp@geranium.com>>
Sent: July 26, 2019 12:00 AM
To: 'Susan.Ecclestone@ontario.ca<mailto:Susan.Ecclestone@ontario.ca>' <Susan.Ecclestone@ontario.ca<mailto:Susan.Ecclestone@ontario.ca>>; 'Jennifer.L.Moulton@ontario.ca<mailto:Jennifer.L.Moulton@ontario.ca>' <Jennifer.L.Moulton@ontario.ca<mailto:Jennifer.L.Moulton@ontario.ca>>
Cc: 'Kristina.Rudzki@ontario.ca<mailto:Kristina.Rudzki@ontario.ca>' <Kristina.Rudzki@ontario.ca<mailto:Kristina.Rudzki@ontario.ca>>; 'Callee.Robinson@ontario.ca<mailto:Callee.Robinson@ontario.ca>' <Callee.Robinson@ontario.ca<mailto:Callee.Robinson@ontario.ca>>;

'Elizabeth.Forrest@ontario.ca<mailto:Elizabeth.Forrest@ontario.ca>'
<Elizabeth.Forrest@ontario.ca<mailto:Elizabeth.Forrest@ontario.ca>>; 'Easton, John'
<John_Easton@golder.com<mailto:John_Easton@golder.com>>; 'Hannan, Devin'
<Devin_Hannan@golder.com<mailto:Devin_Hannan@golder.com>>; Shauna Dudding
<shaunad@geranium.com<mailto:shaunad@geranium.com>>; Mario Giampietri
<mariog@geranium.com<mailto:mariog@geranium.com>>; Cheryl Shindruk
<cheryls@geranium.com<mailto:cheryls@geranium.com>>
Subject: RE: Midhurst Water, WW and Transportation Class EA - Source Protection follow up

Susan and Jennifer,

Thanks again for making the time and for arranging the follow-up call earlier this week. Please find enclosed a memorandum prepared by Golder responding to the items discussed during our call.
If you have any further questions, or would like to discuss the above, please do not hesitate to contact me.
Thanks,
Vimal

Vimal Patel, P.Eng
Sr. Project Manager, Land Development

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C: 416-697-6295
T: 905-477-1177<tel:(905)%20477-1177> Ext. 242 I F: 905-477-7733<tel:(905)%20477-7733>
3190 Steeles Avenue East, Suite 300
Markham, ON L3R 1G9

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From: Ecclestone, Susan (MECP) <Susan.Ecclestone@ontario.ca<mailto:Susan.Ecclestone@ontario.ca>>
Sent: July 23, 2019 8:47 AM
To: Shauna Dudding <shaunad@geranium.com<mailto:shaunad@geranium.com>>
Cc: Moulton, Jennifer L. (MECP) <Jennifer.L.Moulton@ontario.ca<mailto:Jennifer.L.Moulton@ontario.ca>>; Rudzki, Kristina (MECP) <Kristina.Rudzki@ontario.ca<mailto:Kristina.Rudzki@ontario.ca>>; John Easton <John_Easton@golder.com<mailto:John_Easton@golder.com>>; Devin Hannan <Devin_Hannan@golder.com<mailto:Devin_Hannan@golder.com>>; Vimal Patel <vimalp@geranium.com<mailto:vimalp@geranium.com>>; Kathryn Hill <kathrynh@geranium.com<mailto:kathrynh@geranium.com>>; Forrest, Elizabeth (MECP) <Elizabeth.Forrest@ontario.ca<mailto:Elizabeth.Forrest@ontario.ca>>
Subject: RE: Midhurst Water, WW and Transportation Class EA - Source Protection follow up

Thanks Shauna. I will send the invitation. Here is the call in number just in case folks do not properly receive the invite.

Telephone Conference: 416-212-8013/Toll Free: 1-866-633-1033. Conference ID: 3024467

I may be a few minutes late due to an earlier commitment but Jen Moulton will start the call. We'll also be including Beth Forrest who is a Liaison Officer with the Source Protection Programs Branch and Lubna Hussain who is manager of the Technical Support Section in MECP's Central Region.

Susan.

Susan Ecclestone I Director I Source Protection Programs Branch I Day of Action on Litter I Land and Water Division I Ministry of the Environment, Conservation and Parks I

susan.ecclestone@ontario.ca<mailto:susan.ecclestone@ontario.ca> I 416-274-8864 Please let me know if you have any accommodation needs or require communication supports or alternate formats.
[English version of the "I support self care and wellness" ebutton]

From: Shauna Dudding <shaunad@geranium.com<mailto:shaunad@geranium.com>>
Sent: July 23, 2019 8:43 AM
To: Ecclestone, Susan (MECP) <Susan.Ecclestone@ontario.ca<mailto:Susan.Ecclestone@ontario.ca>>
Cc: Moulton, Jennifer L. (MECP) <Jennifer.L.Moulton@ontario.ca<mailto:Jennifer.L.Moulton@ontario.ca>>; Rudzki, Kristina (MECP) <Kristina.Rudzki@ontario.ca<mailto:Kristina.Rudzki@ontario.ca>>; John Easton <John_Easton@golder.com<mailto:John_Easton@golder.com>>; Devin Hannan <Devin_Hannan@golder.com<mailto:Devin_Hannan@golder.com>>; Vimal Patel <vimalp@geranium.com<mailto:vimalp@geranium.com>>; Kathryn Hill <kathrynh@geranium.com<mailto:kathrynh@geranium.com>>
Subject: Re: Midhurst Water, WW and Transportation Class EA - Source Protection follow up

Hi Susan,

Confirming 10:30am. Devin, John, myself and Vimal will make ourselves available.

If you can please share a call in number, or I can circulate one if preferred.

Best regards,
Shauna

On Tue, Jul 23, 2019 at 6:50 AM Ecclestone, Susan (MECP) <Susan.Ecclestone@ontario.ca<mailto:Susan.Ecclestone@ontario.ca>> wrote:
Shauna I should have mentioned that, while it's your choice to join me in person for this meeting at 40 St Clair West, I recommend doing this meeting by teleconference to save your team travel time. Jen is based in London and some of other folks will also be on the phone due our distributed geographic location Looking forward to hearing about what time works best.
Susan
416-274-8864

---

From: Shauna Dudding <shaunad@geranium.com<mailto:shaunad@geranium.com>>
Sent: Monday, July 22, 2019 4:59:49 PM
To: Ecclestone, Susan (MECP) <Susan.Ecclestone@ontario.ca<mailto:Susan.Ecclestone@ontario.ca>>
Cc: Moulton, Jennifer L. (MECP) <Jennifer.L.Moulton@ontario.ca<mailto:Jennifer.L.Moulton@ontario.ca>>; Rudzki, Kristina (MECP) <Kristina.Rudzki@ontario.ca<mailto:Kristina.Rudzki@ontario.ca>>
Subject: Re: Midhurst Water, WW and Transportation Class EA - Source Protection follow up

Thank you so much Susan. I will be back to you shortly on best windows for a call.

Best,
Shauna
Sent from my iPhone

On Jul 22, 2019, at 4:44 PM, Ecclestone, Susan (MECP) <Susan.Ecclestone@ontario.ca<mailto:Susan.Ecclestone@ontario.ca>> wrote:
Shauna,

It was a pleasure to meet you today. I am emailing as promised to set up a meeting to discuss the source protection aspects.

Would you please let me know what time works best for you tomorrow? Would you also please let me know who you'd like me to include in the invite?

We are available 9-10, 10:30-11:15, 2:00-4:00.

In the meantime, here is the contact information for the individual we mentioned today and attached is the excerpt of the guidance pertaining to this class EA.

Bill Thompson
Manager, Watershed Plans and Strategies
Lake Simcoe Region Conservation Authority
905-895-1281 X271
b.thompson@lsrca.on.ca<mailto:b.thompson@lsrca.on.ca>

Looking forward to your response,
Susan.

Susan Ecclestone I Director I Source Protection Programs Branch I Day of Action on Litter I Land and Water Division I Ministry of the Environment, Conservation and Parks I
susan.ecclestone@ontario.ca<mailto:susan.ecclestone@ontario.ca> I 416-274-8864 Please let me know if you have any accommodation needs or require communication supports or alternate formats.
<image002.png>

<2015-10-20 Final MEA Amendments-pagesforCWAonly.pdf>

--

Shauna Dudding, P.Eng

Senior Vice President, Land Development

Important: My email address has changed. Please ensure you update your contact information to shaunad@geranium.com<mailto:kathrynh@geranium.com>

GERANIUM

C: 647-202-4111 I D: 905-413-7162

T: 905-477-1177 Ext. 202 I F: 905-477-7733
3190 Steeles Avenue East, Suite 300
Markham, ON L3R 1G9

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GOLDER

# TECHNICAL MEMORANDUM

**DATE** August 8, 2019

**Project No.** 13-1170-0040

**TO** Jennifer Moulton,
Senior Drinking Water Program Advisor, Source Protection Unit
Ministry of Environment Conservation and Parks

**FROM** Devin Hannan and John Easton
Golder Associates Ltd.

**EMAIL dhannan@golder.com**

**MIDHURST SECONDARY PLAN DRAFT ENVIRONMENTAL STUDY REPORT: RESPONSE TO MECP QUESTIONS ON SOURCE WATER PROTECTION**

Golder Associates Ltd. (Golder) is pleased to provide this memorandum in response to the Ministry of Environment, Conservation and Parks (MECP) questions regarding the Midhurst Secondary Plan Draft Environmental Study Report (ESR) to clarify source water protection items raised during a meeting with the MECP on July 22, 2019. This memorandum follows meetings between Golder and the MECP on July 22, 2019 (in-person), July 23, 2019 (follow-up call) and again on August 1, 2019 (follow-up call) wherein the MECP sought clarification on the ESR's relationship to the Municipal Class Environmental Assessment Amendment A.2.10.6 The Clean Water Act [the Amendment]. In response, we have provided the entirety of the Amendment text below *[italicized blue font]* with our commentary inserted where pertinent. It is understood that this memorandum will form a supplementary appendix to the ESR, as agreed with the MECP. Please note that, whereas this document serves as an addendum to the ESR submission, it is necessary to re-introduce some previously reported information in order to clearly address the ESRs linkages to the Amendment.

***Municipal Class Environmental Assessment Amendment A.2.10.6 The Clean Water Act***

*The purpose of the Clean Water Act (CWA) is to protect existing and future sources of municipal drinking water. Under the CWA, vulnerable areas have been delineated around surface water intakes and wellheads for every existing and planned municipal residential drinking water system that is located in a Source Protection Area (SPA). These vulnerable areas are known as a Wellhead Protection Areas (WHPAs) or surface water Intake Protection Zones (IPZs). Details regarding the location of vulnerable areas will be available in approved Source Protection Plans/Assessment Reports and from the Conservation Authority/Source Protection Authority.*

**Golder**: We note that as set out in Amendment A.2.10.6, the vulnerable areas of concern are identified as Wellhead Protection Areas (WHPAs) or Intake Protection Zones (IPZs). For the Midhurst development project, as current and future water supplies are all groundwater-sourced, only WHPA mapping is applicable.

As a pre-cursor to further commentary we provide the following WHPA definitions from the *Technical Rules Under the Clean Water Act* (MECP, 2017):

- Area WHPA-A, being the surface and subsurface area centred on the well with an outer boundary identified by a radius of 100 metres. The vulnerability score for any WHPA-A is 10 (Figure 1).

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- Area WHPA-B, being the surface and subsurface areas within which the time of travel to the well is less than or equal to two years but excluding WHPA-A. Based on the prevailing Aquifer Vulnerability Index mapping for the region and subsequent aquifer vulnerability designation of Low, the vulnerability score for WHPA-B under the Technical Rules is 6 (Figure 1).
- Area WHPA-C, being the surface and subsurface areas within which the time of travel to the well is less than or equal to five years but greater than two years. Based on the prevailing Aquifer Vulnerability Index mapping for the region and subsequent aquifer vulnerability designation of Low, the vulnerability score for WHPA-C under the Technical Rules is 4 (Figure 1).
- Area WHPA-D, being the surface and subsurface areas within which the time of travel to the well is less than or equal to twenty-five years but greater than five years. Based on the prevailing Aquifer Vulnerability Index mapping for the region and subsequent aquifer vulnerability designation of Low, the vulnerability score for WHPA-D under the Technical Rules is 2 (Figure 1).
- Area WHPA-Q1, being the combined area that is the cone of influence of the well plus the whole of the cones of influence of all other wells that intersect that area and any surface water drainage area upstream of, and including, a losing reach of a stream that contributes a significant proportion of surface water to the wells.
- Area WHPA-Q2, being the area described [above] and any area outside the WHPA-Q1 where a future reduction in recharge would have a measurable impact on the municipal wells.

*Source protection plans set out the local approach to protecting sources of drinking water. Where an activity poses a risk to drinking water, policies in the local source protection plan may impact how that activity is undertaken. Policies may prohibit certain activities, or they may use certain tools to manage these activities. Municipal Official Plans, planning decisions, Municipal Class EA projects (where a project includes a drinking water risk) and prescribed instruments must conform with policies that address significant risks to drinking water and must have regard for policies that address moderate or low risks.*

**Golder**: The Midhurst development project poses no significant risk to either drinking water quality or quantity of municipal drinking water supplies. The effects assessment is described in the Environmental Study Report (ESR) Volume 3 of 5, Appendix J Hydrogeological Study, Midhurst Water Supply Exploration Program (Golder, 2018) [in particular see within this report Appendix M Report on Carson and Doran Neighbourhood Proposed Water Supply Groundwater Modelling]. Further related information is provided in the following comments.

*Projects Located Within A Vulnerable Area:*

*Projects being proposed in a vulnerable area may pose a risk to drinking water and may be subject to policies in a source protection plan. When projects are proposed within a vulnerable area, the policies in source protection plans must be considered and the impact of the policies on those who may need to implement the policies or those who are otherwise impacted (e.g. land owners) should be given adequate consideration during the planning stage. Proponents undertaking a Municipal Class EA project must identify early in their process whether a project is or could potentially be occurring within a vulnerable area; this would fall within Phase 1 of the Class EA process and must be clearly documented in the project file or Environmental Study Report (ESR), as may be appropriate.*

**Golder:**

**Existing Vulnerable Areas WHPA-A,B,C,D** The prevailing WHPA-A,B,C,D for existing Midhurst municipal wells are illustrated in Figure 16b-1 of the Approved South Georgian Bay Lake Simcoe Source Protection Plan (SGBLSSPP, 2018). The WHPAs are located within a low vulnerability aquifer as shown in the Assessment Report aquifer vulnerability index mapping (Figure 16b-2) and vulnerability scoring mapping (Figure 16b-3) and as described in the ESR Volume 3 of 5, Appendix J Hydrogeological Study, Midhurst Water Supply Exploration Program, Appendix M Carson and Doran Neighbourhood Proposed Water Supply Groundwater Modelling Section 8 (Golder, 2018). The existing and future WHPAs for the Midhurst area are underlain by aquifer vulnerability mapping in Figure 1.

The wells are not Groundwater Under the Direct Influence of surface water (GUDI). There are no drinking water quality issues at any of the existing Midhurst or Del Trend Wells and no contaminant pathways from the surface to Aquifer A3 have been identified. Additionally, upon review of SGBLSPP, we find that there are no policies that apply to moderate or low threats in the Midhurst area.

The only portion of the Midhurst project within the prevailing WHPAs is the southeast portion of the Doran / Pooles Rd property which is located within part of the WHPA-D (vulnerability score 2) capture zone of the Midhurst Idlewood Drive and Greenpine municipal wells. There are no policies that apply within these areas according to the Source Protection Plan. Further, the planned land use in the area overlapping the WHPA-D is either Environmental Protection Area / Greenspace, Open Space, Residential, or Storm Water Management Pond. Therefore, none of these planned land uses are considered drinking water threats within a WHPA-D under the *Clean Water Act* 2017 Technical Rules list of drinking water threats.

**Future Vulnerable Areas WHPA-A,B,C,D**

The ESR illustrates new time-of-travel capture zones (potential future WHPAs) for the proposed wells and updated capture zones for the pre-existing Midhurst wells as a result of future pumping (see Figure 12 in the aforementioned groundwater modelling report and also Figure 1 provided herein). The capture zones at the existing Midhurst wells have changed as a result of a refinement to model parameters and proposed pumping (see the aforementioned groundwater modelling report). Nonetheless, the revised WHPA mapping for the existing wells does not include any land uses that are considered drinking water threats under the *Clean Water Act* 2017 Technical Rules (see below).

The three policy threats that generally apply to the Midhurst / Del Trend area are addressed as follows:

**Pathogens:** The significant threat for pathogens remains the same in the modelling of Golder (2005) and Golder (2018) because the WHPA-A does not change.

There are no new large sewage disposal systems in WHPA-B, therefore no other pathogen risk.

**Chemicals:** The land use activities in Midhurst and Del Trend have not changed between the modelling of Golder (2005) and Golder (2018).

The land use activities remain residential in Midhurst and therefore the significant threat from the use and storage of chemicals would remain as found in the 2018 Approved SWP report, which was zero.

At Del Trend the WHPA areas extend eastward across wetland areas where there is no urbanization. The land use activities, or the number of homes, in the area where the vulnerability score is 8 or greater has not changed recently and is not proposed to change as a result of the ESR. The chemical threat has not changed and would remain as found in SGBLSSPP (2018), which was zero.

**Dense non aqueous phase liquid (DNAPL):** The land uses in Midhurst WHPAs are residential, planned residential, forest, and farmland in the modelling of Golder (2005) and Golder (2018). The threat of DNAPL presence in these areas will be like that found in SGBLSSPP (2018), which was zero.

The land uses in the Del Trend WHPA are wetland, forest, residential and in WHPA D some farmland. The threat of DNAPL presence in these areas will be like that found in SGBLSSPP (2018), which was zero.

No significant threats to the Midhurst / Del Trend water systems are anticipated as a result of a change to the WHPAs. The use of land where the WHPAs has changed will not be affected by the presence of WHPAs B, C, or D.

Vulnerable Areas WHPA-Q1/Q2

The only WHPA-Q1/Q2 near the Carson and Doran Neighbourhoods is associated with the City of Barrie municipal wells and is illustrated in Figure 5.1 and Figure 5.2 of the *City of Barrie Tier Three Water Budget and Local Area Risk Assessment* (AquaResource, 2013). Notably, WHPA-Q1 and WHPA-Q2 coincide and are collectively defined in the *Assessment* as the "Local Area". The Tier Three study concluded the following: *"Based on the results of the Risk Assessment modelling scenarios, the Local Area, which includes all of the City of Barrie's municipal supply wells, was classified as having a Low Risk Level"* (AquaResource, 2013).

None of the proposed Carson and Doran Neighbourhoods proposed pumping wells are located within the WHPA-Q1/Q2, although a relatively small portion of the southern extent of the Carson Road development area falls within the northwestern perimeter of the WHPA-Q1/Q2.

Based on our review of the SGBLSSPP (2018) we do not find any source protection policies related to the existing WHPA-Q1 that would affect the proposed development given that the Barrie Local Area is classified as having a Low Risk Level and the Carson and Doran Neighbourhoods proposed pumping wells are external to the Local Area. Furthermore, the proposed development's drainage design will incorporate Low Impact Development (LID) strategies that will maintain (or enhance) pre-development infiltration rates during post-development such that no adverse impacts will occur in relation to the WHPA-Q2.

We have worked closely with the Nottawasaga Valley Conservation Authority to prepare acceptable water balance calculations and LID designs that result in maintaining and enhancing recharge. The Midhurst area is well suited to implementing LID designs to maintain recharge by virtue of the low water table and soils that are amenable to accepting recharge and meeting the predevelopment recharge is easily achieved.

We acknowledge that the proposed Carson and Doran Neighbourhoods pumping wells may result in minor drawdown interaction with the City of Barrie of wells (<1 metre) as described in the ESR (Section 6.1 of the aforementioned groundwater modelling report). This additional drawdown may result in a revised WHPA-Q1 wherein the Local Area may expand to envelop the Carson and Doran Neighbourhood wells. However, we have incorporated the Barrie Tier Three Risk Assessment Safe Additional Available Drawdown findings within the

hydrogeological impact assessment (Section 6.1.2 of the groundwater modelling report) and find that such small drawdown will not adversely affect the risk designation.

*For any proposed projects that alter or result in new vulnerable areas, the vulnerable areas will have to be incorporated into updated Source Protection Plans/Assessment Reports. Examples of such projects include but are not limited to: municipal well or surface water intake (existing or draw on a new source of drinking water), new storm sewersheds due to new development (which can expand an intake protection zone).*

**Golder:** Based on our conversations with the MECP on July 23, 2019, it is understood that the MECP confirms this statement is simply a narrative describing future activities and it is not a directive or requirement to update the Source Protection Plans/Assessment Reports under the Municipal Class EA process. As discussed, it would be premature for the proponent to engage in updating a Source Protection Plan with the project approval still pending, the wells not constructed, the well operators yet to be identified, and no permits granted. That being said, the ESR provides the necessary foundation to allow for Source Protection Plan updates including test well drilling, aquifer testing, numerical modelling and WHPA delineation as described in Appendix J of the ESR.

*When this happens, landowners within new or amended vulnerable areas (IPZs or WHPAs) will be subject to source protection plan policies. These policies may impact existing or proposed land uses and the activities carried out by landowners. To fully understand the impact of establishing a new or expanded drinking water systems, it is recommended that the technical work required by the CWA to identify the vulnerable areas and potential drinking water threats be undertaken concurrently with the Municipal Class EA process. This will facilitate the assessment of potential impacts and allow a more comprehensive consultation process with potentially affected stakeholders. Coordinating this work will also expedite Source Protection Plan/Assessment Report amendments to incorporate the new system or any changes to existing systems that may be required. It will also minimize the likelihood of Municipal Class EA proponents having to amend completed Municipal Class EA projects to reflect the technical work required by the CWA.*

**Golder:** There are four planned water supply areas for Midhurst. Each water supply well is constructed in a regionally extensive confined artesian aquifer. The wells range in depth from 90 to 131 m deep and have 34 to 70 m of confining layer materials over the aquifer. The water supply systems are discussed below:

Note that:

- The wells are not Groundwater Under the Direct Influence of surface water (GUDI).
- The water quality testing done at these wells indicates there are no drinking water quality issues.
- The aquifer vulnerability is Low.
- Private wells in the area are constructed in Aquifer A1 or A2, therefore there are no contaminant pathways from the surface to Aquifer A3.

Land uses in Proposed Well WHPAs (Figure 1)

**Alliance Wells PW1 and PW2.** There are currently no homes in WHPA-A (vulnerability score 10), however future development in WHPA-A will include parkland and homes. The policies that may apply to future residential development within WHPA-A, based on the current source protection plan, are listed in Table 1. The future owners of lands within WHPA-A will be primarily public land and residential dwellings. These landowners will be notified of the presence of the vulnerable area and will be informed of prohibited land use activities, prohibited

chemicals, and educational materials. The municipality will have a range of tools available to protect the source ranging from education to prohibition.

There are 8 homes within WHPA-B (vulnerability score 6) and a farm that is currently used as a horse ranch and the fields are cropped. There are three homes, one of which is a farmstead with a feed lot, and farmed fields in WHPA-C (vulnerability score 4). The potential significant threat is the storage and handling of dense non-aqueous phase liquids and the source protection policies are listed in Table 1. For existing land uses mitigation options for this threat include education and awareness, preparation of risk management plans, and incentives. In the case of future land DNAPLs may be prohibited from WHPA-B and WHPA-C.

In WHPA-D (vulnerability score 2) there are 39 homes, 2 field lots, and the lands are primarily farm fields. Highway 400 crosses WHPA D. There are no significant threats in WHPA D, therefore no policies that apply to these lands.

**TW21 and TW 24:** There are no homes in WHPA-A currently and the wells will be in parkland, however in the future there will be homes within WHPA A. The policies that may apply to future residential development within WHPA-A, based on the current source protection plan, are listed in Table 1. The future owners of lands within WHPA-A will be primarily public land and residential dwellings. These landowners will be notified of the presence of the source protection area and will be provided with prohibited land use activities, prohibited chemicals, and educational materials. The municipality will have a range of tools available to protect the source ranging from education to prohibition.

In WHPA-B (vulnerability score 6) there are 7 homes, forested land, small wetlands, and farm fields. In WHPA-C (vulnerability score 4) there are 2 homes, while the area is approximately half forest and half farm fields. The potential significant threat is the storage and handling of dense non-aqueous phase liquids and the source protection policies are listed in Table 1. For existing land uses mitigation options for this threat include education and awareness, preparation of risk management plans, and incentives. In the case of future land DNAPLs may be prohibited from WHPA-B and WHPA-C.

WHPA-D has nine homes, two livestock operations, and farm fields with small forested areas. Highway 400 crosses WHPA D. There are no significant threats in WHPA-D, therefore no policies that apply to these lands.

**TW 19 and TW 22:** No homes will be located within WHPA-A (vulnerability score 10). These lands will remain vacant and will be owned by the Township of Springwater. The Township is aware of the presence of the source protection area and will be provided with prohibited land use activities, prohibited chemicals, and educational materials.

There are 10 commercial properties, one private home, a potable water treatment plant, a wastewater treatment plant, a rehabilitated gravel pit, golf course lands and future residential lands, located in WHPA-B (vulnerability score 6). The Township of Springwater works yard at 1453 Snow Valley road conducts vehicle maintenance and refueling for their works fleet. Cormier Auto service and restoration service is at 1523 Snow Valley Road. There is a small amount of farmland, future residential lands, and forested lands in WHPA-C (vulnerability score 4). The potential significant threat is the storage and handling of dense non-aqueous phase liquids and the source protection policies are listed in Table 1. For existing land uses mitigation options for this threat include education and awareness, preparation of risk management plans, and incentives. In the case of future land DNAPLs may be prohibited from WHPA-B and WHPA-C.

Future residential lands, 55 existing homes, forest, and a small amount of farmland are in WHPA-D. Also, at the furthest edge of WHPA-D (vulnerability score 2) on Carson Road is the Ontario Hydro Midhurst transformer station. There are no significant threats in WHPA D, therefore no policies that apply to these lands.

**TW 34:** No homes will be located within WHPA-A (vulnerability score 10). The location of the production well on this site is to be moved further to the south and west such that the WHPA A is fully on Township of Springwater land. WHPA-A will be wholly within Township of Springwater land. The Township is aware of the presence of the source protection area and will be provided with prohibited land use activities, prohibited chemicals, and educational materials.

The land in the WHPAs is forest at this time. There is a Township of Springwater gravel pit and Snow Valley Resort tubing slopes in WHPA-B (vulnerability score 6). The Township gravel pit, Snow Valley Resort lands, and Galibier Materials lands are in WHPA-C (vulnerability score 4). The potential significant threat is the storage and handling of dense non-aqueous phase liquids and the source protection policies are listed in Table 1. For existing land uses mitigation options for this threat include education and awareness, preparation of risk management plans, and incentives. In the case of future land DNAPLs may be prohibited from WHPA-B and WHPA-C.

There are 3 homes on full municipal services, Snow Valley Resort Lands, Galibier Materials and a small amount of farmland in WHPA-D (vulnerability score 2). There are no significant threats in WHPA-D, therefore no policies that apply to these lands.

*For further clarity, the proponent can contact the Conservation Authority/Source Protection Authority.*

**Golder:** We understand that the Conservation Authority / Source Protection Authority for the project area is the NVCA as described on their website at: *https://www.nvca.on.ca/Pages/Nottawasaga-Valley-Source-Protection-Authority.aspx*. We have been in ongoing consultation with the NVCA for several years on this file, including on source protection issues as documented in Appendix CC of the ESR. For ease of reference, we have excerpted from Appendix CC and attached herein a memorandum documenting exchanges between the project team and NVCA on the hydrogeological assessment insource water protection (see Section 11 Source Water Protection of Ainley, 2018).

## CLOSURE

Golder has appreciated MECPs thoughtful consideration of the ESR and for facilitating productive discussions on the Midhurst Class EA's relation to source protection matters. As indicated above, our hydrogeological assessment as documented in Appendix J of the ESR has adequately addressed the requirements of the *Municipal Class Environmental Assessment Amendment A.2.10.6 The Clean Water Act.* We look forward to continuing our work with the MECP and other stakeholders, including the NVCA and the broader South Georgian Bay Lake Simcoe Source Protection Region, to assist in updating the Source Protection Plan upon project approval under the Class EA process.

We trust this memorandum meets your current requirements. Should you have any questions please do not hesitate to contact the undersigned.

Devin Hannan, P.Eng.
*Associate, Environmental Engineer*

John Easton, M.Sc., P.Geo.
*Associate, Senior Hydrogeologist*

DAH/JAE/ cdr

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Attachments: Figure 1: Aquifer Vulnerability Index Scoring in the Midhurst Area

Table 1: Potential Significant Treat

Ministry of the Environment, Conservation and Parks

Office of the Minister

777 Bay Street, 5th Floor
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Tel.: 416-314-6790

Ministère de l'Environnement, de la Protection de la nature et des Parcs

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Ontario

357-2019-859

Heather Coleman
Director of Public Works
Township of Springwater
2231 Nursery Road
Minesing, ON L9X 1A8

Dear Ms. Coleman:

The Ministry of the Environment, Conservation and Parks received five Part II Order requests asking that the Township of Springwater be required to prepare an individual environmental assessment under the Environmental Assessment Act for all of the projects proposed in the Midhurst Water, Wastewater & Transportation Class Environmental Assessment.

I am taking this opportunity to inform you that I have decided that an individual environmental assessment is not required. This decision was made after giving careful consideration to the issues raised in the requests, the project documentation, the provisions of the Municipal Class Environmental Assessment, and other relevant matters required to be considered under subsection 16(4) of the Environmental Assessment Act.

Despite my not requiring an individual environmental assessment be prepared, in reviewing the requests and the project documentation, I have decided to impose the following conditions with respect to the projects in the Master Plan:

1. In consultation with the Ministry's Species at Risk Branch, the Township shall prepare and submit to the Director of the Species at Risk Branch for approval, a plan that sets out the field inventory, assessment, or other activities to be carried out by the Township to identify any species listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species and their habitat that may be adversely affected by work related to one or more of the undertakings in the Master Plan.

   The plan shall contain work schedules, including but not limited to the timing and staging of:

   i. the activities required to be included in the plan; and
   ii. construction of the undertakings.

The plan may provide for (i) and (ii) to be carried out in stages.

2. The Director of the Ministry's Species at Risk Branch may require revisions to the plan required by condition 1 and the Township shall make the revisions required to ensure compliance with the *Endangered Species Act, 2007*. The Township shall implement the plan approved by the Director, including any changes to the plan. The plan shall be approved by the Director and shall be implemented by the Township prior to any work covered by the plan or any construction activities for any of the undertakings being carried out.

3. The Township shall update and provide to the Director of the Species at Risk Branch of the Ministry for review and advice Figure 1 from the Technical Memorandum dated February 7, 2017, titled "Hine's Emerald Dragonfly Habitat in the Minesing Wetlands and the Midhurst Development" including:

    i. all element occurrences of the Hine's Emerald Dragonfly within the Natural Heritage Information Centre database.
    ii. delineation of all habitat areas of the Hine's Emerald Dragonfly within or adjacent to the development areas in Figure 1 in accordance with subsection 27.3 (2) of O. Reg. 242/08 made under the *Endangered Species Act, 2007*.
    iii. any new element occurrences of Hine's Emerald Dragonfly or other species at risk are identified within or adjacent to the study area, prior to or during construction of an undertaking; the Township shall notify the Ministry and delineate the habitat area, as appropriate.
    iv. the requirement to update references and analysis, including an analysis of any adverse effects on the Hine's Emerald Dragonfly and its habitat resulting from any hydrogeological and surface water work undertaken in respect of the Minesing Wetland Complex after February 7, 2017, including any work undertaken to support an application for a permit to be issued under section 34.1 of the *Ontario Water Resources Act*.

4. Prior to completing any detailed designs for the proposed undertakings, the Township shall inform and consult with any landowners that have the potential to be impacted by source protection policies in the future, as set out below:
    i. The Township shall provide potentially impacted landowners with information on policies for dense non-aqueous phase liquids, and the potential need for Risk Management Plans if there are quantities above those that are considered incidental.
    ii. The Township shall provide information to the affected landowners to explain the purpose of the Risk Management Plan (i.e. to ensure the source of drinking water for the new system is protected once the wells come online).

5. The Township shall prepare an Odour Mitigation Plan for the design and operation of the proposed wastewater facilities.
    i. The Township shall submit the Odour Mitigation Plan to the Ministry as part of the Environmental Compliance Approval application.

6. The Township shall:
    i. make the approved plan required by condition 1 publicly available on its website prior to any work covered by the plan or any construction activities for any of the undertakings being carried out.
    ii. make the plan required by condition 5 publicly available on its website within 5 days of submitting the plan with the Environmental Compliance Approval application.

    The plans shall remain available on the website until such time as the Ministry agrees in writing that the plans may be removed.

7. The Township will submit a written report to the Director, Environmental Assessment and Permissions Branch, on how it has fulfilled conditions 1 to 6, prior to the commencement of construction.

8. For the purposes of these conditions, "construction" includes physical construction activities, including site preparation works, but does not include the tendering of contracts.

In the interest of transparency, I encourage you to make this letter available to the public on the Township's website.

With this decision having been made, the Township can now proceed with the projects in the master plan, subject to the conditions I have imposed and any permits or approvals that are required. The Township must ensure the projects in the Master Plan are implemented in the manner they were developed and designed, as set out in the Master Plan documentation, and inclusive of all mitigating measures, commitments and environmental and other provisions therein. If a significant change is required to any of the projects in the Master Plan, the Township shall consult with the Ministry to determine if an addendum to the Master Plan is required.

Lastly, I would like to ensure that the Township understands that failure to comply with the Act, the provisions of the Municipal Class Environmental Assessment, and failure to implement the projects in the Master Plan in the manner described in the Master Plan documents, are contraventions of the Act and may result in prosecution under section 38 of the Act.

I am confident that the Township recognizes the importance and value of the Act and will ensure that its requirements and those of the Municipal Class Environmental Assessment are satisfied.

Sincerely,

Jeff Yurek
Minister of the Environment, Conservation and Parks

c: Requesters

Lydia Bojeczko, MPP Liaison & Strategic Communications Advisor, Ministry of the Environment Conservation and Parks

EA File No. 18077 – Midhurst Water, Wastewater, & Transportation Class Environmental Assessment

Ministry of the Environment, Conservation and Parks

Office of the Minister

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Ontario

357-2019-859

NOV 2 0 2019

Daniel B. Artenosi
Overland LLP
[redacted]

Dear Mr. Artenosi:

Thank you for your interest in the Midhurst Water, Wastewater, and Transportation Master Plan Class Environmental Assessment (Master Plan) as proposed by the Township of Springwater (Township). I welcome your comments on this Master Plan.

On September 18, 2018, you requested on behalf of Carson Trail Estates Inc., that the Township be required to prepare an individual environmental assessment for the projects contained within the Midhurst Water, Wastewater, and Transportation Master Plan. I am taking this opportunity to inform you that I have decided that elevating the project to an individual environmental assessment is not required.

In making this decision, I have given careful consideration to the Master Plan documentation, the provisions of the Municipal Class Environmental Assessment, the issues raised in your request, and relevant matters to be considered in subsection 16(4) of the Environmental Assessment Act.

Despite my not requiring an individual environmental assessment be prepared, in reviewing the requests and the Master Plan documentation, I have decided to impose conditions with respect to the projects in the Master Plan regarding species at risk, source water protection, and air quality impacts. These conditions are outlined in the attached letter to the Township.

I am satisfied that the issues raised in the Part II Order requests can be addressed by the work that is required to be carried out as a result of the conditions I have imposed and through additional permitting and approvals.

With this decision having been made, the Township can now proceed with the projects in the Master Plan subject to the conditions I have imposed, and any permits or approvals that are required. The Township must ensure it implements the projects in the manner they were developed and designed, as set out in the Master Plan documentation, and inclusive of all mitigating measures, and environmental and other provisions therein.

Again, I would like to thank you for participating in the Municipal Class Environmental Assessment process and for bringing your concerns to my attention.

Sincerely,

Jeff Yurek
Minister of the Environment, Conservation and Parks

Attachment

c: Heather Coleman, Director of Public Works, Township of Springwater

Lydia Bojeczko, MPP Liaison & Strategic Communications Advisor, Ministry of the Environment Conservation and Parks

EA File No. 18077 – Midhurst Water, Wastewater, and Transportation Master Plan Class Environmental Assessment

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Ontario

357-2019-859

NOV 2 0 2019

Michele Bowman
[redacted]

Dear Ms. Bowman:

Thank you for your interest in the Midhurst Water, Wastewater, and Transportation Master Plan Class Environmental Assessment (Master Plan) as proposed by the Township of Springwater (Township). I welcome your comments on this Master Plan.

On September 18, 2018, you requested that the Township be required to prepare an individual environmental assessment for the projects contained within the Midhurst Water, Wastewater, and Transportation Master Plan. I am taking this opportunity to inform you that I have decided that elevating the project to an individual environmental assessment is not required.

In making this decision, I have given careful consideration to the Master Plan documentation, the provisions of the Municipal Class Environmental Assessment, the issues raised in your request, and relevant matters to be considered in subsection 16(4) of the Environmental Assessment Act.

Despite my not requiring an individual environmental assessment be prepared, in reviewing the requests and the Master Plan documentation, I have decided to impose conditions with respect to the projects in the Master Plan regarding species at risk, source water protection, and air quality impacts. These conditions are outlined in the attached letter to the Township.

I am satisfied that the issues raised in the Part II Order requests can be addressed by the work that is required to be carried out as a result of the conditions I have imposed and through additional permitting and approvals.

With this decision having been made, the Township can now proceed with the projects in the Master Plan subject to the conditions I have imposed, and any permits or approvals that are required. The Township must ensure it implements the projects in the manner they were developed and designed, as set out in the Master Plan documentation, and inclusive of all mitigating measures, and environmental and other provisions therein.

Again, I would like to thank you for participating in the Municipal Class Environmental Assessment process and for bringing your concerns to my attention.

Sincerely,

Jeff Yurek
Minister of the Environment, Conservation and Parks

Attachment

c: Heather Coleman, Director of Public Works, Township of Springwater

Lydia Bojeczko, MPP Liaison & Strategic Communications Advisor, Ministry of the Environment Conservation and Parks

EA File No. 18077 – Midhurst Water, Wastewater, and Transportation Master Plan Class Environmental Assessment

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Ontario

357-2019-859

NOV 2 0 2019

James Feehely

[redacted]

Dear Mr. Feehely:

Thank you for your interest in the Midhurst Water, Wastewater, and Transportation Master Plan Class Environmental Assessment (Master Plan) as proposed by the Township of Springwater (Township). I welcome your comments on this Master Plan.

On September 18, 2018, you requested on behalf of the Estate of Marie Louise Frankcom, that the Township be required to prepare an individual environmental assessment for the projects contained within the Midhurst Water, Wastewater, and Transportation Master Plan. I am taking this opportunity to inform you that I have decided that elevating the project to an individual environmental assessment is not required.

In making this decision, I have given careful consideration to the Master Plan documentation, the provisions of the Municipal Class Environmental Assessment, the issues raised in your request, and relevant matters to be considered in subsection 16(4) of the Environmental Assessment Act.

Despite my not requiring an individual environmental assessment be prepared, in reviewing the requests and the Master Plan documentation, I have decided to impose conditions with respect to the projects in the Master Plan regarding species at risk, source water protection, and air quality impacts. These conditions are outlined in the attached letter to the Township.

I am satisfied that the issues raised in the Part II Order requests can be addressed by the work that is required to be carried out as a result of the conditions I have imposed and through additional permitting and approvals.

With this decision having been made, the Township can now proceed with the projects in the Master Plan subject to the conditions I have imposed, and any permits or approvals that are required. The Township must ensure it implements the projects in the manner they were developed and designed, as set out in the Master Plan documentation, and inclusive of all mitigating measures, and environmental and other provisions therein.

Again, I would like to thank you for participating in the Municipal Class Environmental Assessment process and for bringing your concerns to my attention.

Sincerely,

Jeff Yurek
Minister of the Environment, Conservation and Parks

Attachment

c: Heather Coleman, Director of Public Works, Township of Springwater

Lydia Bojeczko, MPP Liaison & Strategic Communications Advisor, Ministry of the Environment Conservation and Parks

The Estate of Marie Louise Frankcom
c/o S. Kirsch, authorized agent
skirsch@bellnet.ca

EA File No. 18077 – Midhurst Water, Wastewater, and Transportation Master Plan Class Environmental Assessment

Ministry of the Environment, Conservation and Parks

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Ontario

357-2019-859

NOV 2 0 2019

Allison Graham
[redacted]

Dear Ms. Graham:

Thank you for your interest in the Midhurst Water, Wastewater, and Transportation Master Plan Class Environmental Assessment (Master Plan) as proposed by the Township of Springwater (Township). I welcome your comments on this Master Plan.

On September 10, 2018, you requested that the Township be required to prepare an individual environmental assessment for the projects contained within the Midhurst Water, Wastewater, and Transportation Master Plan. I am taking this opportunity to inform you that I have decided that elevating the project to an individual environmental assessment is not required.

In making this decision, I have given careful consideration to the Master Plan documentation, the provisions of the Municipal Class Environmental Assessment, the issues raised in your request, and relevant matters to be considered in subsection 16(4) of the Environmental Assessment Act.

Despite my not requiring an individual environmental assessment be prepared, in reviewing the requests and the Master Plan documentation, I have decided to impose conditions with respect to the projects in the Master Plan regarding species at risk, source water protection, and air quality impacts. These conditions are outlined in the attached letter to the Township.

I am satisfied that the issues raised in the Part II Order requests can be addressed by the work that is required to be carried out as a result of the conditions I have imposed and through additional permitting and approvals.

With this decision having been made, the Township can now proceed with the projects in the Master Plan subject to the conditions I have imposed, and any permits or approvals that are required. The Township must ensure it implements the projects in the manner they were developed and designed, as set out in the Master Plan documentation, and inclusive of all mitigating measures, and environmental and other provisions therein.

Again, I would like to thank you for participating in the Municipal Class Environmental Assessment process and for bringing your concerns to my attention.

Sincerely,

Jeff Yurek
Minister of the Environment, Conservation and Parks

Attachment

c: Heather Coleman, Director of Public Works, Township of Springwater

Lydia Bojeczko, MPP Liaison & Strategic Communications Advisor, Ministry of the Environment Conservation and Parks

EA File No. 18077 – Midhurst Water, Wastewater, and Transportation Master Plan Class Environmental Assessment

Ministry of the Environment, Conservation and Parks

Office of the Minister

777 Bay Street, 5th Floor
Toronto ON M7A 2J3
Tel.: 416-314-6790

Ministère de l'Environnement, de la Protection de la nature et des Parcs

Bureau du ministre

777, rue Bay, 5e étage
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Tél. : 416.314.6790

Ontario

357-2019-859

NOV 2 0 2019

Sandy Buxton and David Strachan
Midhurst Ratepayers' Association
[redacted]

Dear Sandy Buxton and David Strachan:

Thank you for your interest in the Midhurst Water, Wastewater, and Transportation Master Plan Class Environmental Assessment (Master Plan) as proposed by the Township of Springwater (Township). I welcome your comments on this Master Plan.

On September 17, 2018, you requested that the Township be required to prepare an individual environmental assessment for the projects contained within the Midhurst Water, Wastewater, and Transportation Master Plan. I am taking this opportunity to inform you that I have decided that elevating the project to an individual environmental assessment is not required.

In making this decision, I have given careful consideration to the Master Plan documentation, the provisions of the Municipal Class Environmental Assessment, the issues raised in your request, and relevant matters to be considered in subsection 16(4) of the Environmental Assessment Act.

Despite my not requiring an individual environmental assessment be prepared, in reviewing the requests and the Master Plan documentation, I have decided to impose conditions with respect to the projects in the Master Plan regarding species at risk, source water protection, and air quality impacts. These conditions are outlined in the attached letter to the Township.

I am satisfied that the issues raised in the Part II Order requests can be addressed by the work that is required to be carried out as a result of the conditions I have imposed and through additional permitting and approvals.

With this decision having been made, the Township can now proceed with the projects in the Master Plan subject to the conditions I have imposed, and any permits or approvals that are required. The Township must ensure it implements the projects in the manner they were developed and designed, as set out in the Master Plan

documentation, and inclusive of all mitigating measures, and environmental and other provisions therein.

Again, I would like to thank you both for participating in the Municipal Class Environmental Assessment process and for bringing your concerns to my attention.

Sincerely,

Jeff Yurek
Minister of the Environment, Conservation and Parks

Attachment

c: Heather Coleman, Director of Public Works, Township of Springwater

Lydia Bojeczko, MPP Liaison & Strategic Communications Advisor, Ministry of the Environment Conservation and Parks

EA File No. 18077 – Midhurst Water, Wastewater, and Transportation Master Plan Class Environmental Assessment

## Reid Mitchell

**From:** Joe Mullan <mullan@ainleygroup.com>
**Sent:** March-20-19 10:12 AM
**To:** Lee Bull
**Cc:** Doug Hevenor; Chris Hibberd; Heather Coleman; Shauna Dudding; Vimal Patel; Alex Troop; Neil Hutchinson; John Easton; Devin Hannan; Reid Mitchell
**Subject:** NVCA Comments - Midhurst Class EA - NVCA ID # 30375
**Attachments:** 113027 Midhurst Class EA - Response to NVCA (Mar 19 2019).pdf

**Hi Lee:**

In response to the comments received from the NVCA on Sept. 7, 2018 regarding the Environmental Study Report (ESR) for the Midhurst Class EA, we have compiled the attached letter containing our detailed responses.

With regard to the status of the Midhurst Class EA, as you may be aware during the public review period associated with the ESR, five Requests for Part II Orders were submitted by separate parties to the MECP. The MECP is still reviewing the Requests for Part II Orders, but we are hopeful that they will be rendering a decision in the near future. In the meantime we will be forwarding a copy of this response letter to the MECP for their files.

After resolution of the Requests for Part II Orders by the MECP, we look forward to working with the NVCA on the various studies and reports that will be necessary to facilitate the development of the Midhurst Secondary Plan.

Regards,

J. A. Mullan, P.Eng.
President & CEO

Ainley

www.ainleygroup.com
Tel: (705) 445-3451 Ext. 126
Cell: (705) 718-7230

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**From:** Lee Bull <lbull@nvca.on.ca>
**Sent:** Monday, September 17, 2018 3:00 PM
**To:** 'midhurst.classea@springwater.ca' <midhurst.classea@springwater.ca>; 'midhurst.classea@ainleygroup.com' <midhurst.classea@ainleygroup.com>
**Cc:** Doug Hevenor <dhevenor@nvca.on.ca>; Chris Hibberd <c.hibberd@nvca.on.ca>
**Subject:** NVCA Comments - Midhurst Class EA - NVCA ID # 30375

Good afternoon Heather and Joe

Please find attached the NVCA comments related to the latest materials provided in support of the above noted Environmental Assessment.

Please feel free to contact the undersigned should you have any questions related to this matter.

Sincerely,

Lee J. Bull, MCIP, RPP | **Manager, Planning Services**

**Nottawasaga Valley Conservation Authority**
8195 8th Line, Utopia, ON L0M 1T0
**T** 705-424-1479 ext. 231 | **F** 705-424-2115
**lbull@nvca.on.ca** | **nvca.on.ca**

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March 19, 2019 113027

"By Email"

Nottawasaga Valley Conservation Authority
8195 8th Line,
Utopia, Ontario
L0M 1T0

**Attn: Lee J. Bull, MCIP, RPP**
**Manager, Planning Services**

**Ref: Township of Springwater**
**Midhurst Class EA (Water Wastewater & Transportation)**
**Response to NVCA Comments dated September 17, 2018**

**Dear Ms. Bull:**

In response to the comments received from the NVCA on September 17, 2018, regarding the Environmental Study Reports (ESR) associated with the Midhurst Class EA we have reviewed the comments in conjunction with Hutchinson Environmental Sciences Ltd & Golder Associates and provide the following responses. For your convenience, we have provided the NVCA's comments (in blue italics) followed by our responses.

***ENGINEERING***

1. *It was noted in the May 2018 Phosphorus Budget Report that phosphorus loading to Willow Creek would increase under Phase 1 and Full Build Out conditions. Although it was noted that this increase would not negatively impact Willow Creek or the Minesing Wetlands, as discussed previously, at future stages we will be looking for additional phosphorus removal measures in the Willow Creek watershed to achieve no net increase in phosphorus loading. This is consistent with the OMB Minutes of Settlement criteria. Further comments on phosphorus can be found under the heading of "Aquatic Habitat".*

   **Response** – Noted. The need for offset measures is documented on p. 47 of Vol. 1 of 5 of the Draft ESR as:

   *"Following the completion of the Phosphorus Budget and subsequent Peer Review by XCG Consultants Limited, it is confirmed that the net cumulative change in Phosphorus after the development of the Midhurst Secondary Plan will be 66 kg/yr. It is also acknowledged that in accordance with prior commitments including the Draft Plan Conditions, the Midhurst Developer Group are committed to working with the Nottawasaga Valley Conservation Authority (NVCA) and the Township of Springwater to achieve a cumulative net zero increase in Phosphorus in the Willow Creek following the development of the Midhurst Secondary Plan."*

2. *The report also suggests that infiltration facilities should be designed to capture the 23 mm event, however, consistent with the OMB Minutes of Settlement, a target of 25 mm will be applied at future stages of the design.*

**Response** - p. 45 of Vol. 1 of 5 of the Draft ESR confirms that the infiltration target is 25 mm. *"Sensitivity analysis was completed using an assumption of 20 mm infiltration rate of all rain events for comparison against the NVCA target of 25 mm."* but goes on to state *"The requirement for the infiltration of the first 25 mm of rain from all storm events is considered to be unreasonable and therefore a more realistic infiltration value of 20 mm was examined for comparison purposes. It was subsequently determined that an infiltration rate of 23 mm is the maximum feasibly achievable rate."*

Therefore, although the target was 25mm it was not determined to be feasible to achieve in all rainfall scenarios. The reasons are explained in the March 7, 2017 HESL memo *"HESL J140051: Response to XCG Review of Midhurst Phosphorus Budget"* which is referenced in the NVCA comment memo. In that response, we addressed XCG's concern about the need to account for recovery of infiltration galleries between rain storms in order to achieve target infiltrations. A target of 23mm of infiltration would need to be engineered to achieve 20mm in order to account for recovery time between sequential rain events. This scenario was carried forward in the ESR as the engineering disciplines determined that the target of 25mm was not feasible for the development, because accounting for recovery of galleries would increase the target design beyond 25mm. Therefore while the target remains 25 mm and the galleries, as designed, will be able to infiltrate 25mm in any individual storm event, the report has accounted for recovery time between sequential events and assumed that infiltration facilities will capture runoff from all 20 mm rainfall events (including sequential) as this was shown to be achievable throughout the development.

3. *At future stages of the design, we will review the proposed waste water treatment plant [WWTP] outlet to Willow Creek in more detail including long-term protection against erosion surrounding the outfall. In addition, stormwater management and natural hazards will be reviewed for the study area.*

**Response** - Noted. Detailed design of the outfall will be completed by the engineering team with input on environmental protection measures from the relevant disciplines.

## *ECOLOGY*

*The comments listed below pertain to natural impacts associated with wastewater infrastructure, as outlined in Beacon's report, "Willow Creek and Wilson Drive Terrestrial Habitat Assessment" (Appendix O in the Environmental Study Report [ESR]).*

4. *Outfall Option Selection: Beacon's assessment report notes that terrestrial site investigations were undertaken out of season. Therefore, any conclusions regarding a lack of sensitive vegetation in either outfall location should be solidified by in-season follow-up investigations. Provided that these findings are verified, NVCA staff agree that the proposed Outfall Option 2 likely presents the least amount of impact from a terrestrial natural heritage perspective.*

**Response** - Noted. Beacon Environmental completed additional vegetation surveys during 2018 and will provide the requested details during the detailed design phase of the WWTP infrastructure.

5. *Outfall Restoration/Enhancement: Beacon's report further discusses the need for restoration and stream bank rehabilitation following proposed installation of Outfall Option 2. NVCA staff agrees that a detailed restoration plan should be submitted to outline a strategy for restoring and enhancing the riparian area associated with the outfall. Likewise, enhancement measures should be extended to the small meadow community associated with this proposed outfall*

*location, in an effort to demonstrate a net gain to the affected areas post-development. Given the observations of Barn Swallow nests in the vicinity of this proposed outfall location, the construction of supplemental nesting structures would represent one of many potential habitat enhancement measures that could be employed.*

**Response -** A detailed restoration plan of the selected outfall site will be submitted for NVCA approval as part of the design approval process. This plan will include the "small meadow community" associated with the outfall site. Supplemental nesting structures for Barn Swallows will be considered.

6. *Wilson Rd. Sewer Alignment:*

a. *Beacon's assessment of impacts associated with the proposed sewer alignment are reasonable given the level of detail available. However, a more detailed impact assessment should be provided at the time of detailed design to accurately describe and map vegetation communities along Wilson Rd. Assessment should be undertaken to determine if the proposed sewer alignment will require encroachment into any of the vegetation communities along Wilson Rd.*

**Response -** A more detailed impact assessment of the proposed final outfall pipe alignment along Wilson Road will be undertaken as part of the design approval process. The assessment will describe and map vegetation communities along the route of the outfall on Wilson Road. The need for encroachment into any of the vegetation communities will be determined.

b. *If encroachment into roadside vegetation will occur, further assessment should determine the impacts associated with this. Provincial mapping applications delineate areas of unevaluated wetland along parts of the west side of Wilson Rd. Has there been consideration for impacts to roadside wetlands as a result of excavation and earthworks associated with the pipeline installation? Likewise, if mature trees will be removed as a result of pipeline installation, will the applicant be conducting appropriate assessments (and obtaining clearance, as required) pertaining to potential Species at Risk habitat (e.g. bat roosting habitat)?*

**Response -** Should it be determined that encroachment into the roadside vegetation along the west side of Wilson Road is required for the outfall pipe alignment, impacts to the roadside wetlands associated with excavation and earthworks will be considered as part of the final design. Should it be determined that the removal of mature trees is required for the outfall pipe installation, appropriate assessments will be completed as part of the approval process.

c. *A restoration plan should be prepared to re-vegetate areas of roadside vegetation post-construction with site-appropriate native species.*

**Response -** A restoration plan will be prepared, in conjunction with the detailed design, to outline the proposed re-vegetation of any disturbed areas along Wilson Road as a result of the outfall pipe installation.

## *AQUATIC HABITAT*

*The comments listed below are based upon a review of: Ainley's Group, "Township of Springwater Midhurst Water, Wastewater & Transportation (Phase 3 and 4), Environmental Report, Volume 1 of 5 (Main Body)" dated June 2018.*

7. *Although the Doran Road development area may have a significant potential impact on brown trout habitat in Willow Creek, the potential impacts to brook trout habitat in the headwaters of Black Creek on either side of Carson Road may be even greater as the brook trout population*

*status is more likely to be impacted by change in groundwater [gw] contributions to gw upwelling spawning habitats, as well as the importance of maintaining cold summer water temperatures for this species.*

**Response** - Impacts of potential losses of groundwater to aquatic habitat and thermal environment of brown trout in Willow Creek and brook trout in the Black Creek tributaries were addressed in Appendix A of the ACS "7Q20 Flow Assessment Update for Willow Creek at Highway 26 (Near Minesing) and Ecological Low Flow Assessment Final Report" which was included as part of Appendix M of the Draft ESR. The assessment provided the following conclusions based, on worst case assumptions of maximum sustained water pumping for the supply and 7Q20 flows in the creeks on p.22-23:

*"Modelling completed by Golder (2016) established that monthly volumetric baseflow losses as a result of proposed MSPA pumping at full build out are estimated to range from 985 m3 /day in Willow Creek at Midhurst in August to 2595 m3 /day in April, while percent losses range from 2.5% in Matheson Creek in February to 9.6% in Willow Creek at Midhurst in August. Average monthly volumetric baseflow loss was highest in Matheson Creek (2326 m3 /day), while percent loss was highest in Black Creek (7.2%)."*

1. *Ecological Low Flow Guidelines: Modelled baseflow losses are less than the maximum loss guidelines presented in peer-reviewed and regulator-based literature, indicating no threats to aquatic life related to the water takings.*

2. *Changes in Wetted Perimeter: Changes in wetted width were calculated to range from 0.0131 m in August to 0.0149 m in October using data collected from 2015-2017. As noted previously, it is not possible to calculate a breakpoint in accordance with Wetted Perimeter Method protocols but it is clear that predicted changes to the wetted perimeter are a) minute, b) well within natural variation, and c) not anticipated to negatively affect ecosystem functions or features within Willow Creek.*

3. *Thermal Mass Balance Model: Average summer temperatures in Black Creek and Matheson Creek are estimated to increase by 0.28 and 0.15°C to 14.1 and 14.2°C respectively with maximum temperatures of 17.3 and 16.6°C. The average summer temperature in Willow Creek at Mid-2 will increase from 19.4 to 20°C and maximum temperature from 23.7 to 24.4°C.*

4. *Monitoring and Adaptive Management: Substantial baseline monitoring has been completed to characterize baseline fish communities and habitat, including water temperatures and water quality and flow measurements have been made. The baseline monitoring was refined in 2018 to collect the detailed stream cross-sectional data required for the Wetted Perimeter Method as part of the Monitoring and Adaptive Management Plan (HESL 2018a, b, c). This monitoring will continue into the future construction and post-construction periods to assess any potential impacts and determine if adaptive management associated with stormwater, wastewater management or groundwater extraction is required to mitigate any potential impacts.*

In summary, the predicted potential effects on habitat and water temperature in Matheson, Black and Willow Creeks associated with groundwater takings will not adversely affect the habitat and future monitoring will allow early identification of changes and the implementation of mitigation, if required.

Appendix A of the ACS (App. M in the Draft ESR), therefore; provides the analysis

supporting our conclusion that any changes in groundwater and creek temperature will not threaten brook trout or brown trout in Willow Creek or the tributaries of Black Creek.

8. *On page 44 the stated 430L/s 7Q20 for Willow Creek should reference a specific point along the creek (e.g. Highway 26).*

**Response** - Appendix A of the ACS (*"7Q20 Flow Assessment Update for Willow Creek at Highway 26 (Near Minesing) and Ecological Low Flow Assessment Final Report (HESL, 2018a)"),* was included as part of Appendix M of the Draft ESR. The Executive Summary states *"The Water Survey of Canada (WSC) has maintained a streamflow gauging station (02ED032) on Willow Creek at Highway 26 (located immediately downstream of the proposed discharge location) since 2006 and reached ten full years of data at the end of March 2016. We used the data from ten low-flow periods at this station to calculate a current 7Q20 for Willow Creek."*

9. *The stated existing concentration of phosphorus of 0.035mg/L should reference a specific location in the creek (e.g. Highway 26), and a specific flow scenario (e.g. 7Q20).*

**Response** - The 75$^{th}$ percentile TP concentration is based on the PWQMN data collected at George Johnson Road, and therefore specifically relates to this site.

The water quality statistics used for the ACS are not related to flow conditions in the creek (e.g. 7Q20 flows) but are based on statistics for the period of record which would include a large range of flows.

Details of water quality and flow in Willow Creek are described in detail in Section 5 of the ACS (App. M of the Draft ESR) and in "Technical Memorandum, Monthly Total Phosphorus Concentrations in Willow Creek Predicted at Phase 1 and Full Build Out of the Midhurst Secondary Plan Area, October 2016" which is included in App. M of the Draft ESR.

10. *Page 46 notes that "all increases are considered to be minor compared to overall discharge in the watershed".*

a. *Please clarify which watershed is being referred to (Nottawasaga River or Willow Creek)?*

Response - The entire discussion on p.45-46 relates to Willow Creek and the loadings it receives, not the larger Nottawasaga River watershed. e.g.:

p. 45 - In order to reduce the overall phosphorus concentration in Willow Creek…

p. 46 - HESL estimated that a loading of 46 kg of phosphorus per year is currently being added to Willow Creek…

p. 46 - an estimated 118 kg/yr of TP would be added to Willow Creek from the WWTP…

p. 46 - HESL estimated that a loading of 134 kg/yr of phosphorus would be directed to Willow Creek in the future…

p. 46 - Although there will be a reduction in phosphorus loading from the stormwater runoff component, the addition of the WWTP effluent into Willow Creek

p.46 - However, all of these increases are considered to be minor in the overall discharge to the watershed and therefore it is considered that there would be no effect on the Minesing wetlands. As a result, the Hutchinson Report recommends against the

implementation of a phosphorus offsetting program for the Willow Creek watershed.

*b. Please indicate the current loading (i.e. what would be the percentage increase in the Willow Creek Sub-watershed.)*

Response - The reviewer is referred to App. M of the Draft ESR which includes "Technical Memorandum, Estimating Phosphorus Loads to the Minesing Wetland, August 2016" Tables 4 and 5 in that document are provided below. They provide detailed breakdowns of phosphorus loads and contributions to Willow Creek and the Minesing Wetland.

**Table 4. Summary of the Source Loadings of TP to the Minesing Wetland**

| Subwatershed ID | Watershed Area (ha) | TP load (kg/yr) | Export Coefficient (kg/yr/ha) | Prorated TP Load (kg/yr) | Percent of Total |
|---|---|---|---|---|---|
| Nottawasaga River | 123,039.4 | 19,868 | 0.161 | 22,097 | 56 |
| Pine River | 19,009.6 | 3092 | 0.163 | 5629 | 14.3 |
| Mad River | 24,583.9 | 3794 | 0.154 | 5515 | 14 |
| Willow Creek | 22,922.1 | 2512 | 0.110 | 2527 | 6.4 |
| Black Creek | 854.9 | 9 | 0.010 | NA | |
| Ungauged Total | 15470 | 2046 | 0.132 | 2046 | 5.2 |
| Atmosphere | 6000 | 1560 | 0.26 | 1560 | 4 |
| MSPA | Incl. in Willow Creek total | 66 | 0.023 | 66 | 0.17 |
| Total | 205,880 | | | 39,440 | |

**Table 5. Summary of the Contribution of the MSPA Relative to Current Estimated Loads from Willow Creek and All Source Watersheds**

| | Total Phosphorus Load |
|---|---|
| Redevelopment of MSPA (Full Build out) | 66 kg/yr |
| Willow Creek (at George Johnson Road) | 2527 kg/yr |
| % MSPA of Willow Creek | 2.6% |
| All Sources to Minesing Wetland | 39,440 kg/yr |
| % MSPA of Minesing Wetland | 0.2% |

*c. What are the changes in concentrations for various scenarios (e.g. 7Q20, 7Q2, 2X baseflow etc.) during summer growing season conditions and provide an alternative perspective to the loading scenario.*

**Response -** Details of water quality and flow in Willow Creek are described in detail in Section 5 of the ACS (App. M of the Draft ESR) and in "Technical Memorandum, Monthly Total Phosphorus Concentrations in Willow Creek Predicted at Phase 1 and Full Build Out of the Midhurst Secondary Plan Area, October 2016" which is included in App. M of the Draft ESR. These provide predicted responses of Willow Creek to TP loadings from the WWTP as monthly average concentrations under minimum and median daily flows and so include the entire growing season.

We do not agree that modelling under the various scenarios proposed would provide useful additional information because:

i. p.2 of the technical memo states that *"Daily minimum and median Willow Creek flows were calculated using the 10-year period of flow measurements available from the Water Survey of Canada (WSC) Station 02ED032 located on Willow Creek at Highway 26. The daily minimum flow was the single lowest flow measured for each date of the year, …"* Use of the daily minimum flow is a highly conservative assessment.

ii. The *"summer growing season"* represents, at the minimum, a five-month period from May – September which cannot be accurately characterized by a single streamflow statistic, as requested. The predictions made using minimum daily flows are more conservative and more realistic than the analyses requested by the reviewer.

We are not sure what is intended by the request to "*provide an alternative perspective to the loading scenario."* We conclude that modelling conservative flow statistics, existing water quality and proposed maximum effluent loadings represents a highly protective scenario.

Furthermore, Ontario's Ministry of Environment, Conservation and Parks (MECP) are the governing authority with respect to discharge requirements for WWTPs in the Province of Ontario. The two documents that direct the discharge requirements for effluent to surface water are:

1. *Policies, Guidelines and Provincial Water Quality Objectives of the Ministry of Environment and Energy*[1], which provides direction on the management of surface water and groundwater quality and quantity for the Province of Ontario, and
2. *Deriving Receiving Water Based, Point-Source Effluent Requirements for Ontario Waters*[2], which provides requirements for point-source discharges and the procedures for determining effluent requirements for an Environmental Compliance Approval (ECA).

The ACS was completed following MECP's published policies and guidelines, and in consultation with MECP, who reviewed and approved the work plan and final report.

*d. Will the summer low flow concentration increase? WWTP discharge phosphorous may be much more "bioavailable" than the stormwater phosphorous and what is the portion of the phosphorous load that is expected to increase the most.*

**Response -** "Technical Memorandum, Monthly Total Phosphorus Concentrations in Willow Creek Predicted at Phase 1 and Full Build Out of the Midhurst Secondary Plan Area, October 2016" which is included in App. M of the Draft ESR, provides predicted responses of Willow Creek to TP loadings from the WWTP as monthly average concentrations under minimum and median daily flows.

Figure 3 in that document (see below) shows no change in concentrations in May and June, a slight decrease in July and slight increases in August and September. In all cases, the changes are < 0.001 mg/L (i.e. non-detectable) and, in no case, does the WWTP discharge cause the creek to exceed the PWQO of 0.03 mg/L where it does not already do so.

[1] *Ontario Ministry of Environment and Energy. 1994. Water management policies guidelines and water quality objectives of the Ministry of Environment and Energy, July 1994. ISBN 0-7778-8473-9 rev.*

[2] *Ontario Ministry of the Environment (MOE). 1994b. Deriving receiving water based point source effluent requirements for Ontario waters. PIBS#3302 Procedure B-1-5*

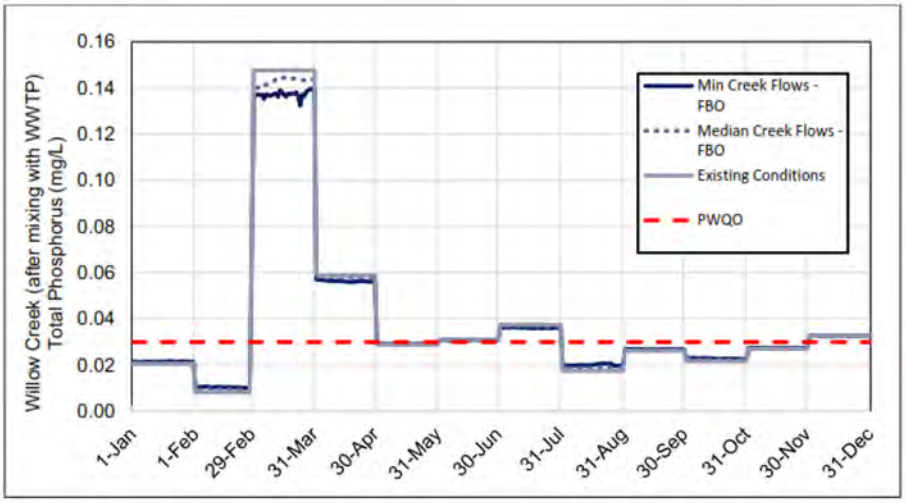


**Figure 3. Resulting Willow Creek Total Phosphorus Concentrations After Mixing with Midhurst WWTP (Full Build Out)**

We do not support a conclusion that "WWTP discharge phosphorous may be much more "bioavailable" than that stormwater phosphorous…" While this may seem intuitive, the phosphorus removal processes in modern plants combine the affinity of bioavailable phosphorus for coagulants such as alum with membrane filtration, such that any phosphorus that was reactive will have been bound to alum and mostly removed by the filtration step. Much of the phosphorus in the discharge will therefore be non-reactive, otherwise it would have been removed in the plant.

Brett and Li (2015[3]) studied the bioavailability of phosphorus from 17 WWTPs, of which 14 had effluent limits between 0.107 and 0.013 mg/L, "representing a wide range of phosphorus removal technologies, including enhanced biological phosphorus removal and chemical coagulant addition in secondary and tertiary treatment processes." They reported that "The results of this study suggest that the effluent total reactive phosphorus (TRP) concentration has, of the operational characterizations that the team assessed, the strongest statistical association with the total effluent [bioavailable phosphorus] (BAP) concentration (r2 = 0.81) with an average total BAP to TRP ratio of 0.61 ± 0.24….

**These results also indicate that the bioavailability and P species composition varies with the nutrient removal process and that in most cases a large portion (>50%) of the effluent P was recalcitrant to algal growth. Comparisons between different technologies indicate higher chemical doses, which also achieved lower effluent P concentrations, decreased the fraction of the phosphorus that was bioavailable."**

These results mean that only ~61% of the phosphorus in an effluent stream that is "reactive" in a chemical test will be biologically available and that <50% of the phosphorus in an effluent stream from advanced treatment will be biologically active. The paper also stated that "…the percent bioavailable particulate phosphorus averaged

[3] Brett, M.T. and B. Li. 2015. The bioavailable phosphorus (BAP) fraction in effluent from advanced secondary and tertiary treatment. Water Environment Research Foundation Report. 100pp.

15-30% for streams draining catchments with forested, mixed use and agricultural land cover, respectively…" Therefore:

i. The total phosphorus loading to Willow Creek from stormwater and the WWTP at full build out of the Midhurst Secondary Plan (MSP) represents <3% increase to the existing load in Willow Creek (see 10b above).
ii. Willow Creek is below the PWQO of 0.03 mg/L for most of the growing season and the MSP will produce minimum changes in total phosphorus concentrations in the creek during the growth period (see Figure 3 above).
iii. Less than <50% of the added load is likely to be bioavailable and,
iv. In 2017, we added soluble orthophosphate to our baseline parameter suite (which already included total phosphorus) at all sites in Willow Creek and its tributaries to allow future assessments of any changes.

Taken together, we conclude that the advanced WWTP treatment and advanced LID techniques for stormwater mean that there will be no adverse nutrient effect on the ecology of Willow Creek.

11. *Page 47 does address a 2.6% load increase to Willow Creek but does not flag a corresponding increase in the concentration during summer low flow conditions (e.g. 0.02 to 0.04mg/L?). It instead flags the net cumulative increase in total phosphorous of 66kg/yr. The analysis should look at various points along the stream and for each, show a series of total phosphorous concentrations in the summer growing season (June, July Aug. and Sept) tied to reference flows including 7Q20, 7Q2 and baseflow x 2. Pre and post conditions should be developed and presented for each scenario, noting that increasing the contribution of phosphorous from WWTP effluent will increase bioavailability, algal growth and corresponding environmental impact levels.*

**Response -**

i. There is no basis for a conclusion that phosphorus concentration in Willow Creek will double, from 0.02 to 0.04 mg/L. See Response 10d, above.
ii. Monthly changes in TP concentrations are provided in Response 10d, above and Response 10c addresses the fact that we used minimum daily flows for our predictions and that these are more conservative than the flow statistics that are requested.
iii. Figure 3, in Response 10d, above, provides pre and post development phosphorus concentrations in Willow Creek at Highway 26.
iv. Response 10d addresses the concern of bioavailability.

12. *On page 48 (Impacts to Minesing), bullet #4 report indicates that the assimilative capacity of Willow Creek between the discharge point and the edge of wetland is high. NVCA staff are not aware of any data set which confirms this situation. The stream in this area is very flat, particularly near Simcoe Road 28 which generally is consistent with a shifting sand bed substrate with poor assimilative capacity compared to riffle habitats with rock substrate. Most of assimilative capacity in these flat streams is provided by riparian vegetation and large instream wood, both of which are lacking in channelized sections near Simcoe Road 28, although NVCA restoration works downstream from this road are starting to improve riparian zone conditions. In a general sense, a stream channel where summer oxygen levels approach 0mg/L would not typically be considered as having a high assimilative capacity. Will increases in the bioavailable supply of phosphorous result in an upstream expansion of the hypoxic zone?*

**Response -** The conclusion that the assimilative capacity is high is based on the modelling results presented in the ACS. The complete text on p. 48 of Vol. 1 of 5 of the Draft ESR provides part of the rationale for that conclusion, specifically:

*"Modelling indicates that the mixing zone for un-ionized ammonia under any flow condition does not extend very far downstream of the effluent discharge point[4]"*, and *"Assimilative capacity of Willow Creek is high and the distance between the discharge point and Minesing wetland is so great that Provincial Water Quality Objectives will be met and in some cases, will be well below the PWQOs, by the time the water enters the wetland."*

The assimilation modelling was carried out using the 7Q20 flow of 430 L/sec and a creek temperature of 18.5°C and so is a conservative assessment of creek response[5]. We acknowledge that the assimilation conditions may not be ideal as described by the NVCA comment but this was accounted for and the modelling was based on observed values (i.e. 10% bottom coverage by attached algae (Section 2, Section 6.1.1.1 and Table 13 of ACS). We also note that assimilation is not confined to riparian vegetation and periphyton but also occurs by the actions of bacteria and phytoplankton suspended in the water column of slow-moving streams. Table 13 of the ACS also documents high nitrification rates (e.g. ammonia assimilation) in slow moving streams, as is the case in Willow Creek.

We are aware that portions of the interior of the Minesing Wetland experience anoxia at some times of the year. We note, however, that:

- p. 43 of the ACS, shows the maximum extent of dissolved oxygen (DO) decrease from the WWTP discharge occurring 4.4 km downstream of the outfall in Phase 1 and 2.4 km downstream of the outfall in Phase 2 (i.e. 1-3 km upstream of the wetland),
- the minimum DO value of 7.8 mg/L is well above the PWQO of 6 mg/L at 15°C, and
- oxygen increases after that point.

There is not, therefore, any potential for the WWTP discharge to degrade DO within the Minesing wetland and no potential that the discharge will increase the extent of the existing hypoxic zone.

*13. Page 55. Does the proposed collection, treatment and outfall system satisfactorily moderate discharge temperatures, particularly in the summer? (Willow Creek is a coldwater habitat at Highway 26).*

**Response -** The WWTP outfall will be installed below frost and have a length of ~ 4km from the Wilson Rd./Snow Valley Drive WWTP location to the discharge point at Highway 26. Therefore temperatures will be moderated by a long residence time below ground prior to discharging to Willow Creek which will result in water temperatures closer to groundwater temperatures than air temperatures.

HESL have prepared a Technical Memorandum, dated October 5, 2018, summarizing mass balance and near field (CORMIX) modelling of the thermal response of Willow Creek to the effluent discharge, a copy of the which is attached to this letter. This

[4] *P. 23 of the ACS (HESL 2018) provides details on the size of the mixing zone for un-ionized ammonia.*

[5] *Temperatures would exceed 18.5°C during a low flow period and this would increase the rate of assimilation processes. We also note that the 7Q20 flow of 430 L/sec is conservative. Table 5 in HESL (2018, 7Q20 Assessment, App. A of ACS) shows that the lowest 7 day flow observed over 10 years in Willow Creek was 499 L/sec. Figure 2 of that document shows that the lowest average daily flow over that period was just under 500 L/sec.*

Technical Memorandum will also be incorporated into the final ESR. The CORMIX and mass balance models predicted:

- a maximum downstream fully mixed Willow Creek temperature increase from 18.2°C to 18.6°C at average upstream Willow Creek water temperatures,
- a maximum downstream fully mixed Willow Creek temperature increase from 19.4°C to 19.5°C at 75$^{th}$ percentile upstream Willow Creek water temperatures, and
- a maximum increase in any season of 1.8°C.

These predictions were made for the rare 7Q20 low flow condition as a conservative estimate of change - flows will be higher and temperature changes smaller >95% of the time. These temperature changes resulting from the WWTP discharge will have no detrimental effect on growth rates or any other aspect of the cold water community in Willow Creek.

*The comments outlined below relate to April 5, 2018 Ainley Response to NVCA comments from June 30, 2017.*

*14. Page 2 refers to use of 75$^{th}$ percentile data for stream temperature. NVCA staff recommend use an episode-based approach for temperature looking at maximum daily temperatures, such as Stoneman and Jones, or Chu.*

**Response -** The thermal response was modelled at average and 75th percentile stream temperatures and effluent temperatures of 13ºC (November - March), 15ºC (April, May, September, October) and 20ºC (June - August) and the results are presented in the response to Comment 13, above. We do not support the need for an episode-based, thermal analysis because:

a) The effluent temperature of 20ºC would moderate and reduce the stream temperature at any thermal episodes > 20ºC. This conclusion was acknowledged by the NVCA in their June 30, 2017 comments on the Draft Reports associated with the Midhurst Class EA as *"NVCA logger data suggests summer daily maxima of 24-25 C from Highway 26 downstream to County Road 28 with minimal diurnal recovery (22-23 C minimums) during periods of heat. Effluent temperature of 20 C suggests that instream temperatures will not be impacted during periods of heat stress and that heat stresses may be slightly moderated downward by effluent discharge. This may benefit coldwater habitat on Willow Creek downstream of Highway 26."* (see April 5, 2018 Ainley response to NVCA)

*b)* The near field plume does not take up the entire stream width such that there are always coldwater refuge areas during any episodes of heat stress,

*15. Page 2 indicates that the use of 75$^{th}$ percentile phosphorous data represents a conservative approach for determining effluent objectives but this is an oversimplification. If the stream has a 75$^{th}$ percentile phosphorous [P] concentration greater than 0.03mg/L then by definition adding treated effluent at 0.03mg/L will dilute the P and decrease the P concentration. If however the actual phosphorous concentration at baseflow is less than 0.03mg/L then adding effluent at 0.03mg/L will increase the baseflow phosphorous concentration and represent a negative impact, although the stream may still have a combined flow concentration of less than*

*0.03mg/L. If there is any issue meeting the ambitious 0.03mg/L concentration, then it is possible that the proposed effluent could take a stream in compliance to a state out of compliance.*

**Response** - The NVCA concern applies to any and all WWTPs in the province – effluent limits above the concentrations of the receiver will increase receiver concentrations while those that are below receiver values will reduce receiver concentrations. The Draft ESR proposes protective, progressive and achievable effluent limits for total phosphorus. The ECA that will be issued for the WWTP by MECP will address the requirements to meet effluent limits.

The "Technical Memorandum, Monthly Total Phosphorus Concentrations in Willow Creek Predicted at Phase 1 and Full Build Out of the Midhurst Secondary Plan Area, October 2016" which is included in App. M of the Draft ESR provides predicted responses of Willow Creek to TP loadings from the WWTP as monthly average concentrations under minimum and median daily flows. These are discussed in our response to Comment #10 from the NVCA (see above).

16. *NVCA staff concur with the modeled simulated baseflow losses presented in the memorandum dated January 29, 2018 completed by Hutchinson. The monitoring locations are supported by NVCA staff and we encourage the long term upkeep of these stations after full build-out.*

**Response –** Agreed. All monitoring locations, protocols and adaptive responses will be documented in the "Monitoring and Adaptive Management Plan" that is being prepared by the Midhurst Landowners Group as part of the Master Drainage Plan.

17. *Ainley Response to 3c) on page 4 looks at the bioavailability of phosphorous from a WWTP perspective. Our comments are looking more at comparing the bioavailability of phosphorous in WWTP effluent (which will strongly increase) versus in stormwater where there is a proposed decrease. The WWTP effluent provides a consistent source of dissolved phosphorous that is available throughout the warm growing season (June – September) when most of the aquatic plant and algae growth is occurring and particularly during low and moderate summer flow conditions when water clarity provides the sunlight inputs needed to support plant growth. In contrast much of the phosphorous input from stormwater will occur during the high flow conditions in the non-growing season (e.g. spring runoff) when both temperatures and water clarity are unlikely to support plant and algae growth. The stormwater phosphorous may also be less bioavailable because a larger fraction is sediment-bound rather than dissolved.*

**Response -** The Ainley Response to 3c) on page 4 looks at the bioavailability of phosphorous from a WWTP perspective in response to the NVCA question: *"A greater proportion of TP will be reactive/soluble phosphorus which is more immediately available to biota. What are the potential impacts of this on Willow Creek?"* This issue is also discussed in our response to comment 10d, above, specifically:

Conclusions:

i. The total phosphorus loading to Willow Creek from stormwater and the WWTP at full build out of the Midhurst Secondary Plan (MSP) represents <3% increase to the existing load in Willow Creek (see 10b above).
ii. Willow Creek is below the PWQO of 0.03 mg/L for most of the growing season and the MSP will produce minimum changes in total phosphorus concentrations in the creek during the growth period (see Figure 3 above).

iii. Less than <50% of the added load from the WWTP is likely to be bioavailable and,
iv. In 2017, we added soluble orthophosphate to our baseline parameter suite (which already included total phosphorus) at all sites in Willow Creek and its tributaries to allow future assessments of any changes.

Taken together, we conclude that the advanced WWTP treatment and advanced LID techniques for stormwater mean that there will be no adverse nutrient effect on the ecology of Willow Creek.

18. *Page 6. Was the wetted perimeter analysis completed for a flat gradient shaped channel in the vicinity of Highway 26? Should an analysis have been completed for perspective in a riffle habitat located further upstream towards Midhurst?*

**Response –** We presume that this comment is directed at the January 29, 2018 HESL technical memo (Re: Assessment of Potential Fisheries Impacts due to Groundwater Drawdown at Midhurst) that is appended to the April 5, 2018 Ainley Response to NVCA comments from June 30, 2017.

The wetted perimeter analysis included in the technical memo was based on data collected at the Willow Creek monitoring site near Finlay Mill Road between 2015 and 2017, which is located approximately 70 m downstream of Finlay Mill Road. The Willow Creek monitoring site was not ideally suited to assess wetted perimeter method as it is located in a run. As noted in the memorandum, the assessment of wetted perimeter was limited due to the inability to determine a breakpoint below which aquatic habitat conditions for benthic invertebrates rapidly decline, but evidence was provided that predicted changes are minute and well within natural variation. Due to these limitations, the reach between Highway 27 and Finlay Mill Road was traversed in the spring of 2018 and two sites were selected specifically for monitoring wetted perimeter based on the presence of riffles, rectangular stream beds and determination of a clear point of hydraulic control. The sites are located in Doran Park and are approximately 25 m and 200 m downstream of Finlay Mill Road, respectively. We will continue to monitor these sites and will ensure that they are included in the Monitoring and Adaptive Management Plan which will be submitted to NVCA as part of the Master Drainage Plan.

19. *Page 7. The stream temperature data provided for Willow Creek was captured in 2017. This year provided the coldest summer conditions in at least 10 years and the data generated during these conditions is not representative of typical summer conditions. NVCA staff have developed a report for Black Ash Creek documenting that thermal class rankings based on 2017 data consistently place stream stations in the next lower thermal category than rankings developed from more typical summer conditions.*

**Response –** We used the site-specific data available to us at the time to prepare our model of thermal impacts and can update the model as our baseline data record is expanded. Although 2017 data were used for Willow Creek, the analyses for Black Creek and Matheson Creeks used data from 2015 and 2016 respectively. We concluded that "*Daily temperatures in Black Creek and Matheson Creek are <19°C at present and all predicted temperatures will remain below 19°C (Figures 2 and 3). Daily temperatures in Willow Creek exceeded the 19°C upper limit of the range defined to support good growth and survival on 25 of the 35 days modelled (Figure 4) and resident fish have adapted to these localized conditions and have the ability to seek cool water refuge. The thermal model predicted that temperatures will exceed 19°C on 27 of the 35 days under the maximum water taking, an increase of 2 days*."

We note several conservative factors in our analyses which increase the confidence in our conclusions of no significant thermal impact:

a) the Golder estimates of baseflow reduction are based on peak pumping rates at full build out,
b) The HESL thermal model is based on 7Q20 flow estimates which occur <1% of the time in the creek,
c) The 7Q20 flows may not occur at the time of peak creek temperatures,
d) The 7Q20 flows may not occur at the time of the peak Willow Creek response to the MSP water takings.

Effluent and stream temperatures and aquatic biota responses will be monitored as part of the Monitoring and Adaptive Management Plan for the Midhurst Secondary Plan Area.

20. *Temperature evaluations look at large scale changes assuming an even distribution of impacts to groundwater sources, but is this accurate? Will localized groundwater sources that support a particular brook trout spawning habitat in Black Creek be compromised in terms of flow rates and velocities? Willow Creek is a resident brown trout habitat that is likely functioning close to the upper limit for summer temperatures. NVCA staff believe that groundwater inputs entering Willow Creek in the vicinity of Midhurst are critically important for turning the upstream habitat leaving Little Lake which supports largemouth bass, into a coldwater habitat (with cool-warm or warm temperature regime) supporting resident brown trout. Will the proposed 0.7C increase in summer peak temperatures (see page 11) put it over the edge? Given the poor conditions for thermal evaluations in 2017, it is likely that the typical increase will be greater than 0.7C under normal summer conditions, even without adding a conservative component to the analysis designed to consider climate change. Given the warm summer temperatures in Willow Creek it is likely that brown trout rely heavily on localized thermal refuges rather than main-current (thalweg) locations during heat stress conditions. We know about the mass balance impacts to flow and temperature but how are these changes distributed and will important local groundwater refugia be highly impacted or eliminated? Do we know enough about longitudinal trends in summer temperatures and groundwater inputs in the three stream systems to confirm that the stations selected represent either typical or worse- case scenarios?*

**Response -** The Golder analysis is conservative, in that it assumes that any base flow loss occurs at all sites in the creek. We note that the maximum predicted losses are <10% of the base flow (7Q20) statistic and, in no case, would this eliminate groundwater inputs. Stream temperatures, groundwater levels, and aquatic biota responses will be monitored as part of the Monitoring and Adaptive Management Plan for the Midhurst Secondary Plan Area.

21. *It may be prudent to consider the cumulative impacts of an increase in phosphorous concentrations/loading, a flow reduction and temperature increases occurring in many cases at the same time in the same reach.*

**Response** - Our analyses of potential temperature changes in Willow Creek and tributaries include consideration of maximum potential losses in baseflow. The 7Q20 value used for the ACS to determine effluent limits for phosphorus and creek responses (CORMIX and QUAL2K) also considered maximum potential losses in baseflow as part of the receiving water assessment. These modelling exercises and our approach of

detailed monitoring and adaptive management represent an effective means of assessing any actual changes and a cumulative assessment, as proposed, is not considered necessary.

### *Hydrogeology*

22. *NVCA staff notes (and has attached relevant documentation to the email that accompanies this letter) that the Carson and Doran neighbourhood wells which will service the Midhurst development will be subject to O. Reg. 205/18: "MUNICIPAL RESIDENTIAL DRINKING WATER SYSTEMS IN SOURCE PROTECTION AREAS", under the Safe Drinking Water Act, which took effect July 1, 2018. This regulation applies in source protection areas identified under the Clean Water Act and ensures that municipal residential drinking water sources are protected before drinking water can be provided to the public, (e.g. the systems conform to the requirements under the Clean Water Act prior to issuing the operating license under the Safe Drinking Water Act.)*

**Response** – Acknowledged. O Reg 2015/18 requires a proponent to consider source water protection plans in any Permit To Take Water (PTTW) application. In practice this would involve pre-consultation with the NVCA. For the Midhurst project pre-consultation has been initiated and will be finalized prior to applying for the PTTW.

### *Conclusion*

*Nottawasaga Valley Conservation Authority staff appreciate the opportunity to provide these comments on the above noted submission materials. Our comments primarily focus on (but are not limited to) outstanding concerns related to phosphorous, thermal impacts to receiving watercourses as well as further works that should be completed as part of detailed design.*

*The study area includes lands that are regulated pursuant to Ontario Regulation 172/06, the Authority's Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation. Permits are required from NVCA prior to construction or grading on regulated portions of this property.*

**Response -** Applications will be submitted for all applicable NVCA Permits (as well as all other applicable Permits and Approvals) as part of the final design process.

We thank NVCA for the opportunity to respond to their questions and concerns and look forward to working with you as the project proceeds, and to implement the Monitoring and Adaptive Management Plan for the Midhurst Secondary Plan. If you have any other concerns, please do not hesitate to contact us.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P.Eng.
President & CEO

*S:\113027 Midhurst\Correspondence\Letter\113027 Midhurst Class EA - Response to NVCA (Mar 19 2019).docx*

cc: Heather Coleman - Township of Springwater (By Email)

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# Memorandum

**Date:** **October 5, 2018**

**To:** **Joe Mullan, Ainley Group**

**From:** **Deborah Sinclair, Brent Parsons, Neil Hutchinson**

**Re:** **HESL J130030 Midhurst WWTP – Effluent Thermal Mixing Model - Final**

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On March 1 2017, HESL prepared an internal draft memo on the thermal response of Willow Creek to the discharge of treated effluent from the proposed Midhurst WWTP, in response to questions from the NVCA. The memo was never finalized and was not part of the ESR that was submitted by Ainley in June of 2018. We have finalized the memo and submit it to you now in support of responses prepared by Golder Associates and ourselves to the Part II Order request from the Midhurst Ratepayers Association, specifically the following claim by the MRA:

***MRA Comment:*** *The proposal to vastly increase the volume of water being drawn from A3 for the new development, will have the following severe consequences:*

- *It will further deprive the wetlands of a source of cold groundwater needed to sustain its health.*
- *The diversion of this cold groundwater from A3, through the new homes and WWTP into Willow Creek, will increase it's temperature.*
- *The cold, clean groundwater currently flowing into the wetlands, will be replaced by warmer water laced with treated effluent and flowing from a different upstream source.*
- *This is tantamount to pumping water from its downstream outflow point in the wetlands to a point upstream in Willow Creek - a point already the source of flooding. This will add 12 million litres of water per day, every day of the year, exacerbating the chronic springtime flooding in the area where the creek enters the wetlands. (See Section 6, "Flooding and Drainage").*

***Purpose of Technical Memorandum***

On May 29, 2013, the Nottawasaga Valley Conservation Authority (NVCA) provided comment on the notice of “Study Commencement for Phase 3 and 4 of the Midhurst Water, Wastewater and Transportation Infrastructure Class Environmental Assessment (EA) for the Township of Springwater” in a letter to Springwater Township (Young to Sokach). One of the NVCA questions was “*Will there be thermal impacts to Willow* Creek [from the proposed Midhurst Wastewater Treatment Plant (WWTP) effluent discharge]?”

The purpose of this technical memorandum is to provide an understanding of the effect of the Midhurst WWTP effluent on temperatures in Willow Creek during all times of the year, at both Phase 1 and Full Build

Out effluent flows. Willow Creek temperatures, downstream of the Midhurst WWTP outfall location, were calculated using: 1) A mass balance model (i.e., conservative approach) to estimate water temperatures after complete mixing of effluent with the creek; and 2) A CORMIX model of temperatures in the mixing zone, which was originally developed for the *Willow Creek Assimilative Capacity Study*, draft report (Hutchinson Environmental Sciences Ltd., May 2016) to examine total phosphorus and total ammonia nitrogen in Willow Creek. CORMIX is a software system developed by Cornell University for the analysis, prediction, and design of aqueous toxic or conventional pollutant discharges into diverse water bodies[1]. CORMIX specializes in analyzing the effluent plume in the mixing zone region (i.e., the region between the outfall and the point of complete mixing of the plume with Willow Creek). Surface heat exchange between the water and the atmosphere was incorporated into the CORMIX model, making the model a more accurate representation of creek water temperatures than the mass balance model. We have now updated our original February 9 response to the NVCA questions to incorporate the results of the final modelling presented herein. The CORMIX model provides better resolution of temperatures in the creek but does not change the conclusions presented in the February 9 response.

***Methodology***

Water temperature data for Willow Creek was obtained from the MOECC's Provincial Water Quality Monitoring Network (PWQMN) station located at George Johnson Road (2002 through 2014 data), which was supplemented with water quality data collected by HESL in 2013, 2014 and 2016. THE PWQMN sites do not collect daily temperature data as the sites are generally visited monthly. The average and 75$^{th}$ percentile water temperatures were therefore calculated for each month (Table 1). Effluent temperatures were provided from seasonal data from the Alcona (Innisfil) WWTP by Black & Veatch (P. Coleman, Black & Veatch, pers. communication, February 8, 2017). These were converted to monthly temperatures by assigning the months of November through March as winter temperatures, April through May and September through October as spring/fall temperatures, and June through August as summer temperatures (Table 1). Effluent will always be warmer than the creek although it will be cooler than the values shown in Table 1 in the summer months as the force mains between the WWTP and the outfall will be buried and thus cooled by exposure to cooler (than the effluent) subsurface temperatures.

[1] *Doneker,, R.L. and Jirka, G.H. 2014. CORMIX User Manual.*

**Table 1. Monthly Temperatures in Midhurst WWTP Effluent and Willow Creek**

| Month | Effluent (°C) | Average Willow Creek (°C) | 75th Percentile Willow Creek (°C) |
|---|---|---|---|
| January | 13.0 | 1.2 | 1.2 |
| February | 13.0 | 0.02 | 0.02 |
| March | 13.0 | 2.9 | 2.9 |
| April | 15.0 | 5.5 | 6.8 |
| May | 15.0 | 12.7 | 13.1 |
| June | 20.0 | 16.0 | 17.9 |
| July | 20.0 | 18.2 | 19.4 |
| August | 20.0 | 16.7 | 18.1 |
| September | 15.0 | 13.5 | 14.1 |
| October | 15.0 | 8.4 | 10.3 |
| November | 13.0 | 4.7 | 6.4 |
| December | 13.0 | 2.3 | 2.3 |

- Note: (1) There were no PWQMN data collected during the month of January. The average temperature for January was therefore calculated as the average between the months of December and February. (2) There was one temperature data entry for the months of December, February and March. Therefore the average and 75th percentile temperatures for these months are identical.

Daily minimum and median Willow Creek flows were calculated using the 10-year period of flow measurements available from the Water Survey of Canada (WSC) Station 02ED032 located on Willow Creek at Highway 26 approximately 300 m upstream of the proposed outfall location. The daily minimum flow was the single lowest flow measured for each date of the year, and the median flow was calculated as the median of all flows measured for each date of the year over the period of record (i.e., 2006 – 2016). Figure 1 shows the resulting minimum and median Willow Creek flows. Flows were highest in spring and lowest in the summer and early fall months.

Both models were run on a monthly time step using the 5th percentile (Figure 1) of the minimum daily flows measured each month as a conservative estimate of low flow.

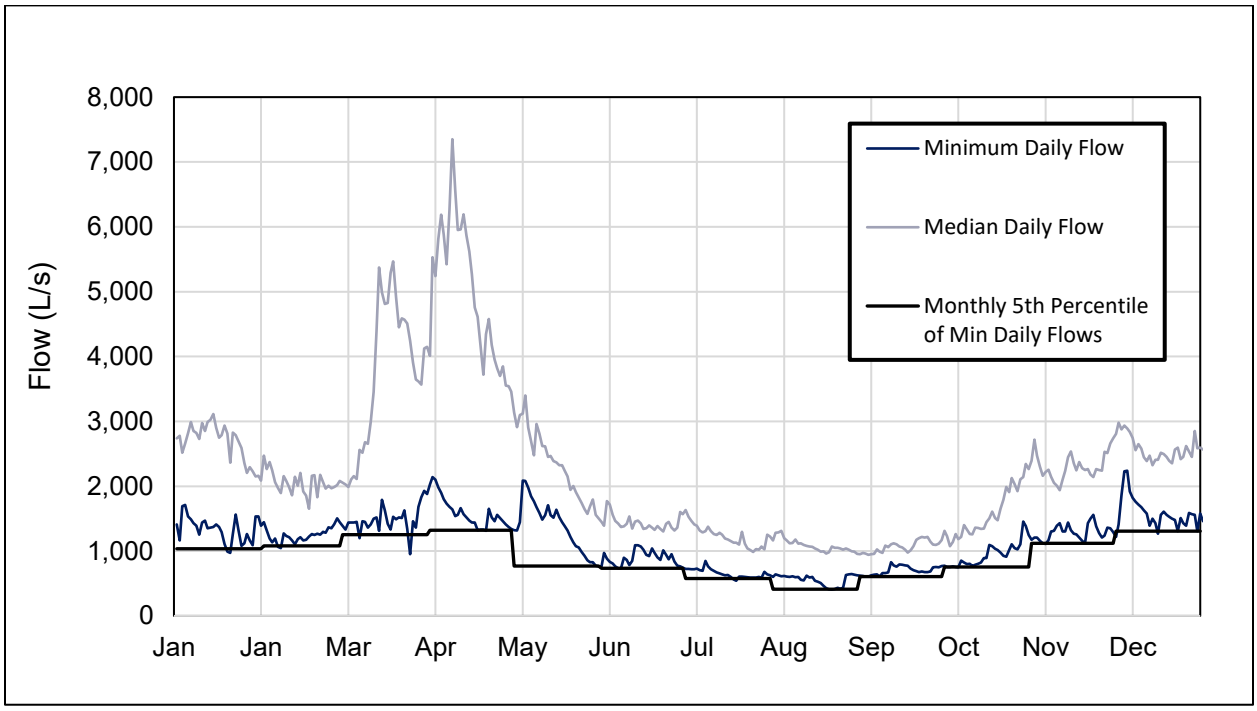


**Figure 1. Willow Creek Minimum and Median Daily Flows**

The CORMIX model inputs were those detailed in the *Willow Creek Assimilative Capacity Study*, draft report (Hutchinson Environmental Sciences Ltd., May 2016) with addition of a surface heat exchange coefficient for modelling temperature. The CORMIX user manual[2] suggests that, for conservative models, a value of 10 W/m$^2$,°C be used at low water temperatures and a value of value of 20 W/m$^2$,°C be used at high water temperatures. These values correspond to a wind speed of 0-2 m/sec - heat exchange would be greater at higher wind speeds. Following this, a surface heat exchange coefficient of 20 W/m$^2$,°C was used for the months of June through August, and a coefficient of 10 W/m$^2$,°C was used for all other months. A sensitivity analysis was also performed by adjusting the coefficient between 10 and 100 W/m$^2$,°C. The difference in the predicted downstream fully-mixed water temperature was 0.12°C using the high and low surface heat exchange coefficient, indicating that the model is minimally sensitive to changes in the coefficient.

***Mass Balance Model Results***

The resulting water temperatures in Willow Creek downstream of the proposed WWTP discharge as calculated by the mass balance (at both average and 75$^{th}$ percentile upstream water temperatures) are presented for Phase 1 and Full Build Out effluent flows of 74.7 L/s and 142.5 L/s in Figures 2 and 3 respectively, and in Table 2.

[2] *Doneker,, R.L. and Jirka, G.H. 2014. CORMIX User Manual.*

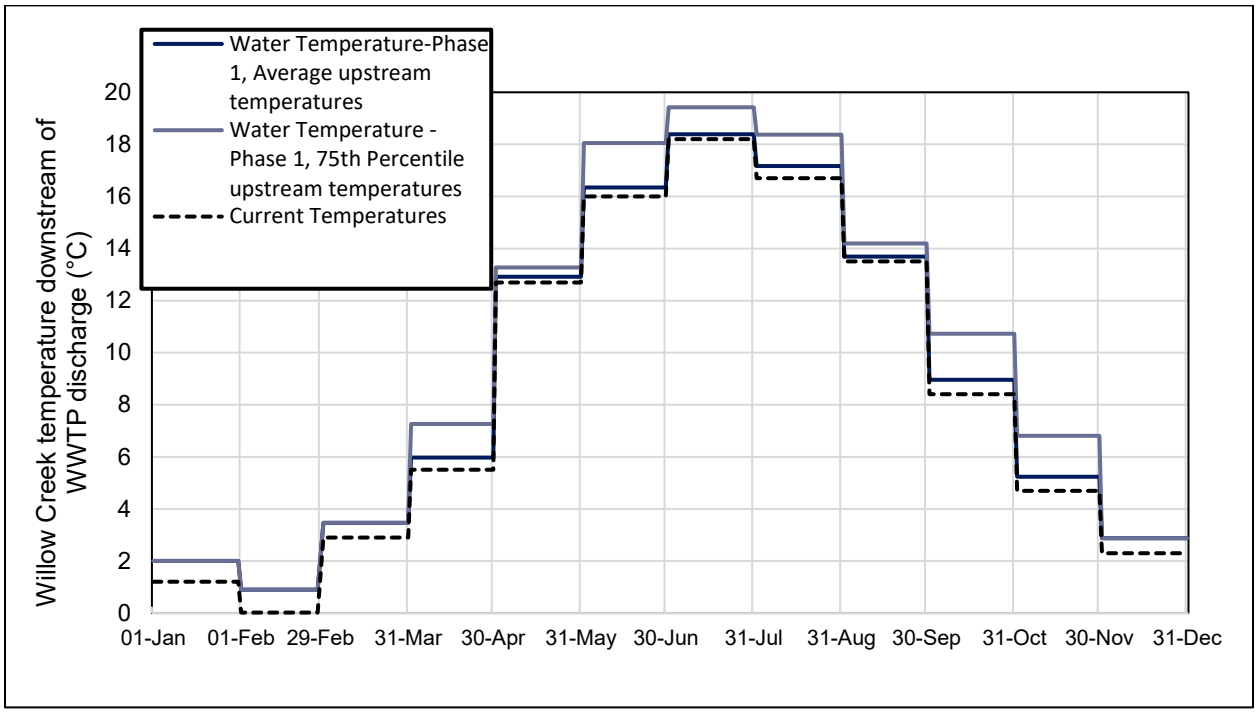


**Figure 2. Willow Creek Temperatures After Mixing with Midhurst WWTP (Phase 1), by Mass Balance Modelling**

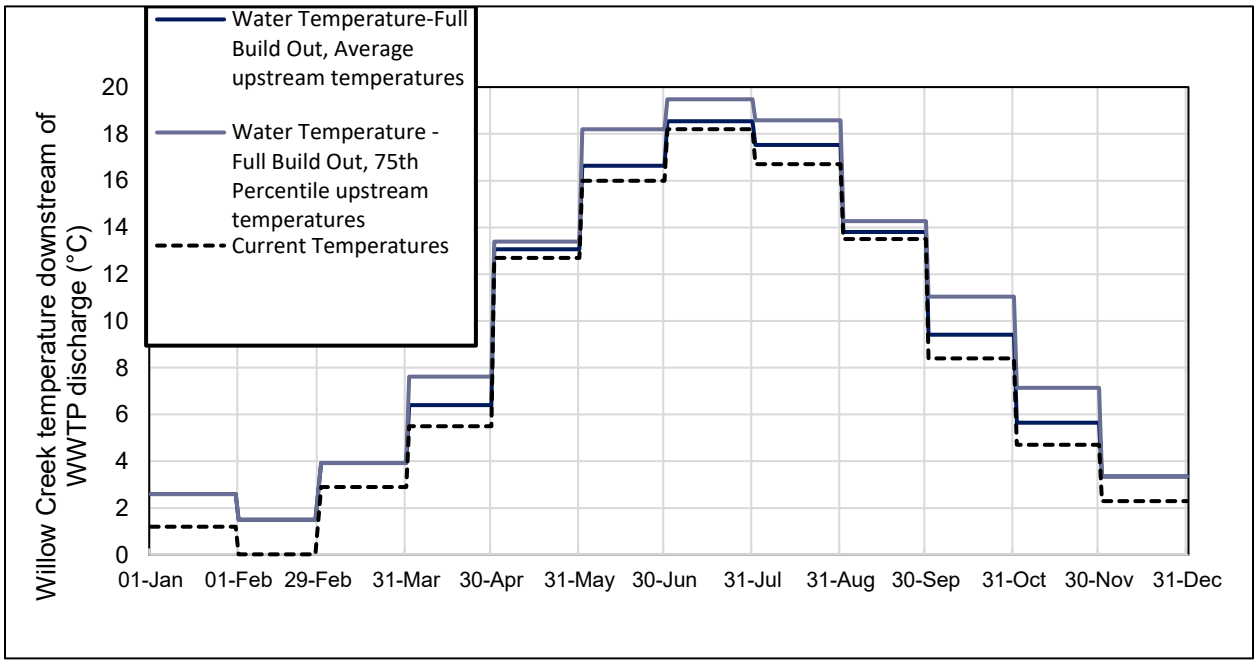


**Figure 3. Willow Creek Temperatures After Mixing with Midhurst WWTP (Full Build Out), by Mass Balance Modelling**

**Table 2. Monthly Fully-Mixed Water Temperatures in Willow Creek by Mass Balance Modelling**

| Month | Upstream Willow Creek Average Temp-erature (°C) | Upstream Willow Creek 75th percentile Temp-erature (°C) | Phase 1 | | Full Build Out | |
|---|---|---|---|---|---|---|
| | | | Downstream Temperature at Fully Mixed (°C) and average upstream temperatures | Downstream Temperature at Fully Mixed (°C) and 75th percentile upstream temperatures | Downstream Temperature at Fully Mixed (°C) and average upstream temperatures | Downstream Temperature at Fully Mixed (°C) and 75th percentile upstream temperatures |
| January | 1.2 | 1.2 | 2.0 | 2.0 | 2.6 | 2.6 |
| February | 0.02 | 0.02 | 0.9 | 0.9 | 1.5 | 1.5 |
| March | 2.9 | 2.9 | 3.5 | 3.5 | 3.9 | 3.9 |
| April | 5.5 | 6.8 | 6.0 | 7.3 | 6.4 | 7.6 |
| May | 12.7 | 13.1 | 12.9 | 13.3 | 13.1 | 13.4 |
| June | 16.0 | 17.9 | 16.3 | 18.0 | 16.6 | 18.2 |
| July | 18.2 | 19.4 | 18.4 | 19.4 | 18.5 | 19.5 |
| August | 16.7 | 18.1 | 17.2 | 18.4 | 17.5 | 18.6 |
| September | 13.5 | 14.1 | 13.7 | 14.2 | 13.8 | 14.3 |
| October | 8.4 | 10.3 | 9.0 | 10.7 | 9.4 | 11.0 |
| November | 4.7 | 6.4 | 5.2 | 6.8 | 5.7 | 7.1 |
| December | 2.3 | 2.3 | 2.9 | 2.9 | 3.4 | 3.4 |

- Note: There was one temperature data entry for the months of December, February and March. Therefore the average and 75th percentile temperatures for these months are identical. The temperature for January was calculated as the average between the months of December and February.

Effluent discharge will have minimal effect on water temperatures in Willow Creek. The maximum temperature increase was 1.5°C at Full Build Out in the month of February (Table 2). The maximum downstream temperature was calculated at 19.5°C at Full Build Out in the month of July with 75th percentile upstream water temperatures, an increase of 0.1°Cover upstream Willow Creek 75th percentile temperatures. The maximum summer increase was 0.8 °C in August, which raised the average creek temperature from 16.7 to 17.5 °C at Full Build Out (Table 2).

***CORMIX Model Results***

The CORMIX model was used to predict water temperatures in the initial mixing zone of Willow Creek downstream of the WWTP discharge. CORMIX is a mixing zone model and was used to predict temperatures within the discharge plume, as well as at the point of complete mixing between the effluent

and Willow Creek, downstream of the outfall. CORMIX accounts for the dynamics of effluent mixing with the stream water and for surface water heat exchange with the atmosphere.

The monthly fully-mixed downstream temperatures, at both a Phase 1 effluent flow of 74.7 L/s and a Full Build Out effluent flow of 142.5 L/s are presented in Table 3. At Full Build Out, the largest temperature increase was calculated to be 1.8°C in the month of January, with a resulting temperature of 1.8°C. The highest fully-mixed temperature was 19.5°C for the month of July calculated using 75$^{th}$ percentile upstream water temperatures, (a temperature increase of 0.1°C over current 75$^{th}$ percentile July water temperatures). The highest summer increase was for August average temperatures which increased by 1.1 °C to a final value of 17.8°C at full build out. There was good comparison between the mass balance model and the CORMIX model (Tables 2 and 3), with slightly warmer final temperatures predicted by CORMIX in the winter and summer months. These slight differences between the models were due to the fact that 1) the CORMIX model accounts for discharge conditions, flux characteristics (buoyancy, flows, momentum), and bank interaction; and 2) the CORMIX model included a surface heat exchange coefficient. The CORMIX model results should be used over the mass balance model since the CORMIX model is a more sophisticated model.

**Table 3. Monthly Fully-Mixed Water Temperatures in Willow Creek by CORMIX Modelling**

| Month | Upstream Willow Creek Average Temp-erature (°C) | Upstream Willow Creek 75$^{th}$ percentile Temp-erature (°C) | Phase 1 | | Full Build Out | |
|---|---|---|---|---|---|---|
| | | | Downstream Temperature at Fully Mixed (°C) and average upstream temperatures | Downstream Temperature at Fully Mixed (°C) and 75$^{th}$ percentile upstream temperatures | Downstream Temperature at Fully Mixed (°C) and average upstream temperatures | Downstream Temperature at Fully Mixed (°C) and 75$^{th}$ percentile upstream temperatures |
| January | 1.2 | 1.2 | 2.3 | 2.3 | 2.9 | 2.9 |
| February | 0.02 | 0.02 | 1.2 | 1.2 | 1.8 | 1.8 |
| March | 2.9 | 2.9 | 3.7 | 3.7 | 4.4 | 4.4 |
| April | 5.5 | 6.8 | 6.2 | 7.4 | 6.8 | 7.8 |
| May | 12.7 | 13.1 | 12.9 | 13.3 | 13.1 | 13.5 |
| June | 16.0 | 17.9 | 16.4 | 18.1 | 16.7 | 18.3 |
| July | 18.2 | 19.4 | 18.4 | 19.4 | 18.6 | 19.5 |
| August | 16.7 | 18.1 | 17.2 | 18.4 | 17.8 | 18.7 |
| September | 13.5 | 14.1 | 13.7 | 14.2 | 13.9 | 14.3 |
| October | 8.4 | 10.3 | 9.0 | 10.8 | 9.6 | 11.2 |
| November | 4.7 | 6.4 | 5.4 | 7.0 | 5.8 | 7.0 |
| December | 2.3 | 2.3 | 3.1 | 3.1 | 3.8 | 3.1 |

CORMIX predicted the point of complete mixing to typically occur between 320 m and 350 m downstream of the outfall. Tables 4 and 5 present the highest temperatures at the centreline of the plume at distances of 50 m and 100 m downstream of the outfall, calculated using average and 75$^{th}$ percentile upstream Willow Creek monthly temperatures, respectively. The plume width is also presented and expressed as a percentage, where 100% would represent a plume that had spread laterally across the entire width of Willow Creek.

**Table 4. Plume Water Temperatures and Percentage of Stream Width in Willow Creek by CORMIX Modelling at Average Upstream Water Temperatures**

| Month | Upstream Willow Creek Average Temperature (°C) | Phase 1 - Temperature at 50 m Downstream (°C) | Phase 1 - Temperature at 100 m Downstream (°C) | Full Build Out - Temperature at 50 m Downstream (°C) | Full Build Out- Temperature at 100 m Downstream (°C) |
|---|---|---|---|---|---|
| January | 1.2 | 3.9 (40%) | 3.2 (55%) | 4.6 (50%) | 4.0 (62%) |
| February | 0.02 | 2.8 (41%) | 2.1 (55%) | 3.1 (48%) | 2.5 (60%) |
| March | 2.9 | 4.9 (40%) | 4.3 (55%) | 6.4 (42%) | 5.5 (56%) |
| April | 5.5 | 7.4 (40%) | 6.8 (55%) | 8.4 (44%) | 7.7 (59%) |
| May | 12.7 | 13.2 (42%) | 13.1 (58%) | 13.6 (38%) | 13.4 (49%) |
| June | 16.0 | 16.9 (43%) | 16.7 (58%) | 17.7 (47%) | 17.3 (49%) |
| July | 18.2 | 18.7 (43%) | 18.6 (58%) | 19.0 (51%) | 18.9 (63%) |
| August | 16.7 | 17.6 (54%) | 17.5 (68%) | 18.4 (66%) | 18.2 (74%) |
| September | 13.5 | 14.0 (42%) | 13.8 (58%) | 14.2 (50%) | 14.1 (62%) |
| October | 8.4 | 10.0 (42%) | 9.5 (58%) | 11.1 (46%) | 10.5 (59%) |
| November | 4.7 | 6.5 (40%) | 6.0 (55%) | 6.9 (49%) | 6.5 (63%) |
| December | 2.3 | 4.3 (40%) | 3.7 (55%) | 5.9 (42%) | 5.0 (56%) |

**Table 5. Plume Water Temperatures and Percentage of Stream Width in Willow Creek by CORMIX Modelling at 75th Percentile Upstream Water Temperatures**

| Month | Upstream Willow Creek 75th Percentile Temperature (°C) | Phase 1 - Temperature at 50 m Downstream (°C) | Phase 1 - Temperature at 100 m Downstream (°C) | Full Build Out - Temperature at 50 m Downstream (°C) | Full Build Out- Temperature at 100 m Downstream (°C) |
|---|---|---|---|---|---|
| January | 1.2 | 3.9 (40%) | 3.2 (55%) | 4.6 (50%) | 4.0 (62%) |
| February | 0.02 | 2.8 (41%) | 2.1 (55%) | 3.1 (48%) | 2.5 (60%) |
| March | 2.9 | 4.9 (40%) | 4.3 (55%) | 6.4 (42%) | 5.5 (56%) |
| April | 6.8 | 8.4 (40%) | 8.0 (55%) | 9.1 (44%) | 8.6 (59%) |
| May | 13.1 | 13.5 (42%) | 13.4 (58%) | 13.9 (38%) | 13.7 (49%) |
| June | 17.9 | 18.4 (43%) | 18.3 (58%) | 18.8 (47%) | 18.6 (49%) |
| July | 19.4 | 19.6 (43%) | 19.5 (58%) | 19.7 (51%) | 19.6 (63%) |
| August | 18.1 | 18.8 (54%) | 18.7 (68%) | 19.2 (66%) | 19.0 (74%) |
| September | 14.1 | 14.5 (42%) | 14.4 (58%) | 14.5 (50%) | 14.4 (62%) |
| October | 10.3 | 11.4 (42%) | 11.1 (58%) | 12.2(46%) | 11.8 (59%) |
| November | 6.4 | 7.6 (40%) | 7.4 (55%) | 7.8 (49%) | 7.4 (63%) |
| December | 2.3 | 4.3 (40%) | 3.7 (55%) | 5.9 (42%) | 5.0 (56%) |

- Note: There was one temperature data entry for the months of December, February and March. Therefore the average and 75th percentile temperatures for these months are identical. The temperature for January was calculated as the average between the months of December and February.

The highest temperatures in the plume were experienced in the month of July. At full build out effluent flows and 75th percentile upstream water temperatures, a peak temperature of 19.7°C was predicted azt the centreline of the plume at 50 m downstream of the outfall (Table 5). At this point, the plume would extend approximately 51% laterally across the width of the creek. (Note that the entire plume at 50 m downstream is not 19.7°C in temperature, but instead this is the highest temperature, at the centreline of the plume at a distance of 50 m downstream). Temperature at the edge of the plume (at 51% of the creek width) would be the same as that upstream of the outfall because the plume has not mixed with the entire creek width. At a downstream distance of 100 m in the month of July, the plume spread to 63% of the width of Willow Creek, and was predicted to have a peak temperature of 19.6°C at this point. The maximum lateral extent of the plume occurred in August at Full Build Out (i.e., 74% at 100 m downstream).

***Thermal Impact on Fish and Other Aquatic Species***

The predicted increases in temperature in Willow Creek downstream of the outfall are minimal. The Provincial Water Quality Objective (PWQO) for water temperature is, "*The natural thermal regime of any body of water shall not be altered so as to impair the quality of the natural environment. In particular, the diversity, distribution and abundance of plant and animal life shall not be significantly changed."* (MOE 1994[3]). We reviewed the thermal tolerances of resident trout species as representative coldwater organisms and thus, sensitive indicators of the thermal environment in Willow Creek. We have captured Brown Trout within Willow Creek in our surveys (B. Parsons, HESL, pers. comm.) and MNRF have indicated that others have collected them in Willow Creek as well. Brook Trout have a lower thermal tolerance than Brown Trout and were included in fish species lists of Willow Creek provided by NVCA and MNRF. We have not captured Brook Trout in field surveys within Willow Creek, however, and Scientific Collection results provided by MNRF, as well as our own observations indicate Brook Trout are predominantly located in tributaries to Willow Creek and not in the main stem.

Water temperature appears to be the most important factor separating trout streams from non-trout streams (Stoneman and Jones, 2000[4]). The habitat requirements of brown trout are essentially the same as brook trout but they can remain active and thriving in slightly higher temperatures; the upper range of which has been reported as 24°C (Brynildson et al 1963[5]) or 25°C (Hasnain et al. 2010[6]). Elliot and Elliot (2010[7]) produced a growth model to assess the impacts of climate change and resulting changes to water temperature on Brown Trout. They found that water temperatures would have to increase by 4ºC in winter and spring or 3ºC in summer and fall before they had a marked negative impact on growth.

**Conclusion**

The CORMIX and mass balance models predicted:

- a maximum downstream fully mixed Willow Creek temperature increase from 18.2°C to 18.6°C at average upstream Willow Creek water temperatures,
- a maximum downstream fully mixed Willow Creek temperature increase from 19.4°C to 19.5°C at 75$^{th}$ percentile upstream Willow Creek water temperatures, and
- a maximum increase in any season of 1.8°C.

These predictions were made for the rare 5$^{th}$ percentile low flow condition as a conservative estimate of change - flows will be higher and temperature changes smaller 95% of the time. These temperature

[3] *Ontario Ministry of the Environment. Water Management Policies Guidelines and Water Quality Objectives of the Ministry of Environment and Energy, July 1994. ISBN 0-7778-8473-9 rev.*

[4] *Stoneman, C.L. and Jones, M.L. 2000. The influence of habitat features on the biomass and distribution of three species of southern Ontario stream salmonids. Transactions of the American Fisheries Society 129: 639-657.*

[5] *Brynildson, O. M., Hacker, V. A. and Klich, T. A. 1963. Brown Trout, Its Life History, Ecology and Management. Wisconsin Conservation Department.*

[6] *Hasnain, SS., Minns, K.M., Shuter, B.J. 2010. Key Ecological Temperature Metrics for Canadian Freshwater Fishes. Applied Research and Development Branch, Ontario Ministry of Natural Resources*

[7] *Elliot, J.M., and Elliott, J.A. 2010. Temperature requirements of Atlantic salmon, brown trout and Arctic charr: predicting the effects of climate change. Journal of Fish Biology. 77(8) 1793-1817.*

changes resulting from the WWTP discharge will have no detrimental effect on growth rates or any other aspect of the cold water community in Willow Creek.

Nottawasaga Valley
Conservation Authority

17 September 2018

Ms. Heather Coleman
Director of Public Works
Township of Springwater
2231 Nursery Road
Minesing, ON L9X 1A8

Dear Ms. Coleman

**RE: Midhurst Water, Wastewater & Transportation Class EA (Phase 4)**

Nottawasaga Valley Conservation Authority [NVCA] staff are pleased to provide further comment on the Midhurst Water, Wastewater and Transportation Class EA.

NVCA staff has reviewed the following documentation:

- Ainley Group's "Midhurst Water, Wastewater & Transportation (Phase 3 and 4) Environmental Study Report [ESR]" (Draft) dated June 2018.
- Ainley Group's correspondence "Response to NVCA Comments dated June 30, 2017" dated April 5, 2018
- Palmer Environmental Consulting Group's "Fluvial Geomorphological Assessment of Willow Creek Downstream of Proposed WWTP Discharge near Highway 26, Midhurst, ON" dated April 17, 2014.
- Hutchinson Environmental Sciences' "Estimating Phosphorus Loads to the Minesing Wetland" dated August 6, 2016.
- Hutchinson Environmental Sciences' "Monthly Total Phosphorus Concentrations in Willow Creek Predicted at Phase 1 and Full Build Out of the Midhurst Secondary Plan Area" dated October 13, 2016.
- Hutchinson Environmental Sciences' "Response to XCG Review of Midhurst Phosphorus Budget" dated March 7, 2017.
- XCG's "Midhurst Secondary Plan: Phosphorus Budget" comments dated January 29, 2016.
- XCG's "Midhurst Secondary Plan: Phosphorus Budget" comments dated June 22, 2016.
- Hutchinson Environmental Sciences' "Midhurst Secondary Plan Area Phosphorus Budget" dated May 2018.
- Golder Associates Ltd., "Hydrogeological Study, Midhurst Water Supply Exploration Program Volume 3 of 5, Appendix J - N of ESR" dated May 2018.
- Golder Associates Ltd., "Report on Carson and Doran Neighbourhoods Water Supply – Midhurst Secondary Plan; Supplementary Hydrologic Modelling; Volume 3 of 5, Appendix J - N of ESR" dated May 2018.

Upon review of the above noted materials, we offer the following comments:

## ENGINEERING

1. It was noted in the May 2018 Phosphorus Budget Report that phosphorus loading to Willow Creek would increase under Phase 1 and Full Build Out conditions. Although it was noted that this increase would not negatively impact Willow Creek or the Minesing Wetlands, as discussed previously, at future stages we will be looking for additional phosphorus removal measures in the Willow Creek watershed to achieve no net increase in phosphorus loading. This is consistent with the OMB Minutes of Settlement criteria. Further comments on phosphorus can be found under the heading of "Aquatic Habitat".
2. The report also suggests that infiltration facilities should be designed to capture the 23 mm event, however, consistent with the OMB Minutes of Settlement, a target of 25 mm will be applied at future stages of the design.
3. At future stages of the design, we will review the proposed waste water treatment plant [WWTP] outlet to Willow Creek in more detail including long-term protection against erosion surrounding the outfall. In addition, stormwater management and natural hazards will be reviewed for the study area.

## ECOLOGY

The comments listed below pertain to natural impacts associated with wastewater infrastructure, as outlined in Beacon's report, "*Willow Creek and Wilson Drive Terrestrial Habitat Assessment"* (Appendix O in the Environmental Study Report [ESR]).

4. *Outfall Option Selection*: Beacon's assessment report notes that terrestrial site investigations were undertaken out of season. Therefore, any conclusions regarding a lack of sensitive vegetation in either outfall location should be solidified by in-season follow-up investigations. Provided that these findings are verified, NVCA staff agree that the proposed Outfall Option 2 likely presents the least amount of impact from a terrestrial natural heritage perspective.

5. *Outfall Restoration/Enhancement*: Beacon's report further discusses the need for restoration and stream bank rehabilitation following proposed installation of Outfall Option 2. NVCA staff agrees that a detailed restoration plan should be submitted to outline a strategy for restoring and enhancing the riparian area associated with the outfall. Likewise, enhancement measures should be extended to the small meadow community associated with this proposed outfall location, in an effort to demonstrate a net gain to the affected areas post-development. Given the observations of Barn Swallow nests in the vicinity of this proposed outfall location, the construction of supplemental nesting structures would represent one of many potential habitat enhancement measures that could be employed.

6. *Wilson Rd. Sewer Alignment*:

    a. Beacon's assessment of impacts associated with the proposed sewer alignment are reasonable given the level of detail available. However, a more detailed impact assessment should be provided at the time of detailed design to accurately describe and map vegetation communities along Wilson Rd.

Assessment should be undertaken to determine if the proposed sewer alignment will require encroachment into any of the vegetation communities along Wilson Rd.

b. If encroachment into roadside vegetation will occur, further assessment should determine the impacts associated with this. Provincial mapping applications delineate areas of unevaluated wetland along parts of the west side of Wilson Rd. Has there been consideration for impacts to roadside wetlands as a result of excavation and earthworks associated with the pipeline installation? Likewise, if mature trees will be removed as a result of pipeline installation, will the applicant be conducting appropriate assessments (and obtaining clearance, as required) pertaining to potential Species at Risk habitat (e.g. bat roosting habitat)?

c. A restoration plan should be prepared to re-vegetate areas of roadside vegetation post-construction with site-appropriate native species.

## AQUATIC HABITAT

The comments listed below are based upon a review of: Ainley's Group, "Township of Springwater Midhurst Water, Wastewater & Transportation (Phase 3 and 4), Environmental Report, Volume 1 of 5 (Main Body)" dated June 2018.

7. Although the Doran Road development area may have a significant potential impact on brown trout habitat in Willow Creek, the potential impacts to brook trout habitat in the headwaters of Black Creek on either side of Carson Road may be even greater as the brook trout population status is more likely to be impacted by change in groundwater [gw] contributions to gw upwelling spawning habitats, as well as the importance of maintaining cold summer water temperatures for this species.

8. On page 44 the stated 430L/s 7Q20 for Willow Creek should reference a specific point along the creek (e.g. Highway 26).

9. The stated existing concentration of phosphorus of 0.035mg/L should reference a specific location in the creek (e.g. Highway 26), and a specific flow scenario (e.g. 7Q20).

10. Page 46 notes that "all increases are considered to be minor compared to overall discharge in the watershed".

    a. Please clarify which watershed is being referred to (Nottawasaga River or Willow Creek)?

    b. Please indicate the current loading (i.e. what would be the percentage increase in the Willow Creek Sub-watershed.)

    c. What are the changes in concentrations for various scenarios (e.g. 7Q20, 7Q2, 2X baseflow etc.) during summer growing season conditions and provide an alternative perspective to the loading scenario.

    d. Will the summer low flow concentration increase? WWTP discharge phosphorous may be much more "bioavailable" than that stormwater

phosphorous and that is the portion of the phosphorous load that is expected to increase the most.

11. Page 47 does address a 2.6% load increase to Willow Creek but does not flag a corresponding increase in the concentration during summer low flow conditions (e.g. 0.02 to 0.04mg/L?). It instead flags the net cumulative increase in total phosphorous of 66kg/yr. The analysis should look at various points along the stream and for each,show a series of total phosphorous concentrations in the summer growing season (June, July Aug. and Sept) tied to reference flows including 7Q20, 7Q2 and baseflow x 2. Pre and post conditions should be developed and presented for each scenario, noting that increasing the contribution of phosphorous from WWTP effluent will increase bioavailability, algal growth and corresponding environmental impact levels.

12. On page 48 (Impacts to Minesing), bullet #4 report indicates that the assimilative capacity of Willow Creek between the discharge point and the edge of wetland is high. NVCA staff are not aware of any data set which confirms this situation. The stream in this area is very flat, particularly near Simcoe Road 28 which generally is consistent with a shifting sand bed substrate with poor assimilative capacity compared to riffle habitats with rock substrate. Most of assimilative capacity in these flat streams is provided by riparian vegetation and large instream wood, both of which are lacking in channelized sections near Simcoe Road 28, although NVCA restoration works downstream from this road are starting to improve riparian zone conditions. In a general sense, a stream channel where summer oxygen levels approach 0mg/L would not typically be considered as having a high assimilative capacity. Will increases in the bioavailable supply of phosphorous result in an upstream expansion of the hypoxic zone?

13. Page 55. Does the proposed collection, treatment and outfall system satisfactorily moderate discharge temperatures, particularly in the summer? (Willow Creek is a coldwater habitat at Highway 26).

**The comments outlined below relate to April 5, 2018 Ainley Response to NVCA comments from June 30, 2017.**

14. Page 2 refers to use of 75$^{th}$ percentile data for stream temperature. NVCA staff recommend use an episode-based approach for temperature looking at maximum daily temperatures, such as Stoneman and Jones, or Chu.

15. Page 2 indicates that the use of 75$^{th}$ percentile phosphorous data represents a conservative approach for determining effluent objectives but this is an oversimplification. If the stream has a 75$^{th}$ percentile phosphorous [P] concentration greater than 0.03mg/L then by definition adding treated effluent at 0.03mg/L will dilute the P and decrease the P concentration. If however the actual phosphorous concentration at baseflow is less than 0.03mg/L then adding effluent at 0.03mg/L will increase the baseflow phosphorous concentration and represent a negative impact, although the stream may still have a combined flow concentration of less than 0.03mg/L. If there is any issue meeting the ambitious 0.03mg/L concentration, then

it is possible that the proposed effluent could take a stream in compliance to a state out of compliance.

16. NVCA staff concur with the modeled simulated baseflow losses presented in the memorandum dated January 29, 2018 completed by Hutchinson. The monitoring locations are supported by NVCA staff and we encourage the long term upkeep of these stations after full build-out.

17. Ainley Response to 3c) on page 4 looks at the bioavailability of phosphorous from a WWTP perspective. Our comments are looking more at comparing the bioavailability of phosphorous in WWTP effluent (which will strongly increase) versus in stormwater where there is a proposed decrease. The WWTP effluent provides a consistent source of dissolved phosphorous that is available throughout the warm growing season (June – September) when most of the aquatic plant and algae growth is occurring and particularly during low and moderate summer flow conditions when water clarity provides the sunlight inputs needed to support plant growth. In contrast much of the phosphorous input from stormwater will occur during the high flow conditions in the non-growing season (e.g. spring runoff) when both temperatures and water clarity are unlikely to support plant and algae growth. The stormwater phosphorous may also be less bioavailable because a larger fraction is sediment-bound rather than dissolved.

18. Page 6. Was the wetted perimeter analysis completed for a flat gradient shaped channel in the vicinity of Highway 26? Should an analysis have been completed for perspective in a riffle habitat located further upstream towards Midhurst?

19. Page 7. The stream temperature data provided for Willow Creek was captured in 2017. This year provided the coldest summer conditions in at least 10 years and the data generated during these conditions is not representative of typical summer conditions. NVCA staff have developed a report for Black Ash Creek documenting that thermal class rankings based on 2017 data consistently place stream stations in the next lower thermal category than rankings developed from more typical summer conditions.

20. Temperature evaluations look at large scale changes assuming an even distribution of impacts to groundwater sources, but is this accurate? Will localized groundwater sources that support a particular brook trout spawning habitat in Black Creek be compromised in terms of flow rates and velocities? Willow Creek is a resident brown trout habitat that is likely functioning close to the upper limit for summer temperatures. NVCA staff believe that groundwater inputs entering Willow Creek in the vicinity of Midhurst are critically important for turning the upstream habitat leaving Little Lake which supports largemouth bass, into a coldwater habitat (with cool-warm or warm temperature regime) supporting resident brown trout. Will the proposed 0.7C increase in summer peak temperatures (see page 11) put it over the edge? Given the poor conditions for thermal evaluations in 2017, it is likely that the typical increase will be greater than 0.7C under normal summer conditions, even without adding a conservative component to the analysis designed to consider climate change. Given the warm summer temperatures in Willow Creek it is likely that brown trout rely heavily on localized thermal refuges rather than main-current (thalweg) locations

during heat stress conditions. We know about the mass balance impacts to flow and temperature but how are these changes distributed and will important local groundwater refugia be highly impacted or eliminated? Do we know enough about longitudinal trends in summer temperatures and groundwater inputs in the three stream systems to confirm that the stations selected represent either typical or worse-case scenarios?

21. It may be prudent to consider the cumulative impacts of an increase in phosphorous concentrations/loading, a flow reduction and temperature increases occurring in many cases at the same time in the same reach.

## Hydrogeology

22. NVCA staff notes (and has attached relevant documentation to the email that accompanies this letter) that the Carson and Doran neighbourhood wells which will service the Midhurst development will be subject to O. Reg. 205/18: "MUNICIPAL RESIDENTIAL DRINKING WATER SYSTEMS IN SOURCE PROTECTION AREAS", under the Safe Drinking Water Act, which took effect July 1, 2018. This regulation applies in source protection areas identified under the Clean Water Act and ensures that municipal residential drinking water sources are protected before drinking water can be provided to the public, (e.g. the systems conform to the requirements under the Clean Water Act prior to issuing the operating license under the Safe Drinking Water Act.)

## Conclusion

Nottawasaga Valley Conservation Authority staff appreciate the opportunity to provide these comments on the above noted submission materials. Our comments primarily focus on (but are not limited to) outstanding concerns related to phosphorous, thermal impacts to receiving watercourses as well as further works that should be completed as part of detailed design.

The study area includes lands that are regulated pursuant to Ontario Regulation 172/06, the Authority's Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation. Permits are required from NVCA prior to construction or grading on regulated portions of this property.

Should you require any further information, please feel free to contact the undersigned at extension 231 or lbull@nvca.on.ca.

Sincerely,

Lee J. Bull, MCIP, RPP
Manager, Planning Services

C: Mr. J. Mullan – Ainley & Associates Limited

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July 10, 2017

File #113027

**"BY EMAIL"**

MTO Central Region Engineering Office
Corridor Management Section
159 Sir William Hearst Avenue, 7th Floor
Toronto, Ontario
M3M 0B7

Attn: **Mr. Peter Dorton**
**Senior Project Manager**

Ref: **Township of Springwater, Midhurst Servicing EA**
**Response to MTO Comments**

Dear Mr. Dorton:

We provide the following answers to questions received from the MTO, in an e-mail of June 14, 2016, regarding the April 26, 2016 Memo (Hwy 400 / Forbes Rd. IC Analysis). As background reference, we have attached an Operational Analysis Memorandum that provides background information on the development of our traffic analysis for area intersections under the jurisdiction of the MTO.

The purpose of the earlier traffic analysis provided by AECOM was to determine if the existing interchange at Hwy 400 and Forbes Road, with any necessary improvements, would beneficial for traffic flow for the proposed development after the possibility of proving a new interchange at Hwy 400 and Pooles Road was eliminated. There trip routing is determined by general area linkages. The conclusion of the AECOM report was that the Hwy 400 / Forbes Road interchange will be a benefit to traffic flow for development in the Russell Road, Doran Road area (eastern portion of the Midhurst Secondary Plan). Following that conclusion; Ainley Group embarked on a traffic analysis for the Midhurst Secondary Plan area and looking at impacted intersections in a broader but more focused manner. Traffic forecasts were based on adding trips generated by development to background traffic. Trip generation was based on ITE trip generation rates and initial traffic as measured in June 2013 had a 1% per year growth factor applied. Trip distribution was based on information contained in the County Master Transportation Study and reliance on some rudimentary trip time trials. The attached Operational Analysis Memo is a summary of that study. The study provides analysis for the horizon years as 2031 and 2041 which correspond to the anticipated build out of Stage 1 and Stage 2 respectively.

1. **Please clarify how the 2041 background traffic is derived**.

   Base traffic for the year 2013 were collected for the AM and PM peak traffic hours on Tuesday, June 11, 2013. Background growth without the Mdhurst Secondary Plan Development was determined to be approximately 1% per year. The growth data was derived from historic AADT data on the section of Highway 26 from Barrie north limit to County Road 27 for the years 2006 to 2010. Observed traffic volumes were then extrapolated to the year 2041.

2. **Exhibit 16, 2041 AM Westbound traffic turning south onto Hwy 400 is shown as 98, which is much less than the 2031 number of 389 shown in exhibit 13, Also, the LOS in 2031 is shown as LOS C, but in 2041, with much less traffic, it is LOS D, please clarify.**

   In the current Operational Analysis, the projected Total Traffic Volumes for 2031 and 2041 are presented in Appendices E and F. In the current analysis, the westbound traffic on Forbes Road turning left in the AM peak to take the southbound Hwy 400 on ramp increases from 92 to 102. This is simple 1% background growth for the 10 year interval.

   Tables 6 and 7 provide a summary of the LOS projected for 2031 traffic with and without intersection improvements and Tables 8 and 9 provide a summary for 2041 traffic projections.

3. **In the text explaining Exhibit 17, "To accommodate the 2041 traffic, there is a need for a left turn storage lane for eastbound left at the west ramp terminal." Please confirm this is a typo (and should be westbound left). Please clarify how the 2041 background traffic is derived**.

   Yes, it is a typo and should be "westbound". Copies of the operational analysis for the various intersections have been attached to this e-mail.

4. **While the 2012 volumes used are acceptable, attached for your future reference are the latest July 2014 counts.**

   We thank you for the information provided but find that our 2013 traffic counts are comparable and slightly higher than the MTO figures and will continue with our numbers for consistency with the overall traffic count program that was completed. Our 2013 counts are provided in Appendix A.

5. **Please provide electronic copies of the Synchro analysis in order for us to complete our review.**

   Digital files have attached to this e-mail.

6. **Please provide conceptual drawings showing the highway improvements recommended to accommodate Secondary Plan build out.**

   We have attached schematics of the proposed intersection improvements for:
   - Highway 26 at Carson Road
   - Highway 26 at Snow Valley Road/Finlay Mill Road
   - Highway 26 at County Road 27 / Spence Ave.
   - Schematic of Hwy 400 Interchange

7. **Please provide an assessment of Secondary Plan impacts on Highway 26 in Midhurst for MTO to review.**

   The digital files noted in the response to item 5 include the Syncro files for Highway 26 intersections at Carson Road, Snow Valley Road and County Road 27. Pages 8 thru 13 of the attached Operational Analysis provide a summary of LOS for those intersections for the 2031 and 2041 horizons. That section also describes the improvements required at those intersection for those horizon years to maintain acceptable Levels of Service.

If you have any questions on the above, please do not hesitate to contact our office.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

J. A. Mullan, P.Eng.
President & CEO

*S:\113027\MTO Package\JM Response to MTO Comments (Jul 5 2017).docx*

Ainley GROUP CONSULTING ENGINEERS PLANNERS

# MEMORANDUM

**Ainley & Associates Limited**
550 Welham Road, Barrie, ON, L4N 8Z7
Tel: (705) 726-3371 P Fax: (705) 726-4391
Email: Barrie@ainleygroup.com

To: **MTO**

Copies to: **Joe Mullan – Ainley Group**
**Steve Fournier – Ainley Group**

From: **Lilly Chen**

Date: **July 3, 2017**

Ref: **Township of Springwater – Midhurst Phase 3 & 4 Operational Analysis**

File: **113027-311**

The analysis and results presented in this Memo has been derived from our overall Operational Analysis dated March 2017 which was prepared in conjunction with a Municipal Class Environmental Assessment for the Midhurst area road network improvements.

A Transportation Report had been prepared in 2008 to identify the major transportation needs in the area. However, significant changes have been made to the development plans, such as the numbers of units, land uses, timing and phasing of the developments etc. To fulfill the requirements of the EA, updated road and intersection improvement needs and timing of the improvements to the area road network are to be identified. In addition, traffic count data and traffic volume projections need to be updated given the 2008 traffic counts in the Transportation Report are out-of-date.

The overall purpose of this memo is to assess the transportation needs of the section of Highway 26 from Carson Road to Spence Ave/County Road 27, and the intersections of Hwy 400 ramps at Forbes Road under existing conditions and future traffic projections for the horizon years of 2031 (full build-out of Phase 1) and 2041 (ultimate horizon).

## 1. Existing Traffic Volumes

Weekday AM and PM peak hour Traffic Counts conducted on Tuesday June 11, 2013 from 7:45 to 8:45 and from 16:30 to 17:30 are available from BA Group's Midhurst Transportation Work Update Memo dated November 12, 2013.

A review of the traffic volumes along the boundary roads and key area intersections from March 2008 weekday and June 2013 weekday indicated the following:

- In most cases, 2013 traffic volumes are higher than the 2008 traffic volumes;
- 2013 traffic volumes are in the order of 77 % to 154% of the 2008 volumes at the locations where traffic volumes are higher (more than 100 vehicles per hour per lane for both AM and PM peak hours);
- Should a seasonal variation factor is considered, based on MTO Seasonal Variation Graphs for Commuter Recreation road character for Highway 26, June counts are approximately 30% higher than March counts;
- Higher growth is on the east-west oriented roads, such as Snow Valley Road (18% to 42%), Finlay Mill Road (27%) and Highway 26 west of County Road 27 (6 % to 54%); and
- Lower growth is on the north-south oriented roads, such as Bayfield Street (-23% to 15%), Wilson Drive (-3% to 22%).

Historic AADT data on the section of Highway 26 from Barrie northerly limits to County Road 27 obtained from

MTO indicates a 1.1% annual growth rate from 2006 to 2010. To reflect the current 2015 traffic volumes, the 2013 traffic counts were increased by 2.2%. The corresponding 2015 weekday peak hour traffic volumes are shown in Figure 1 for the three study intersections.

**2. Speed Limit & Existing 2015 Lane Configuration**

An 80 km/hr speed limit is posted on the following roads in the study area:

- Highway 26/27
- County Road 27
- Snow Valley Road west of Highway 26 to the west
- Forbes Road

A 60 km/hr speed limit is posted on the following roads in the study area:

- Snow Valley Road near Highway 26

A 50 km/hr speed limit is posted on the following roads in the study area:

- Carson Road from Anne Street to Highway 26/27
- Finlay Mill Road

The existing configurations of the key intersections are illustrated in Figure 2.

**3. Existing Intersection Operations**

Based on the existing intersection lane configurations and control, analyses of the Highway 26 intersections and Hwy 400 ramps/Forbes Road intersections were conducted for the existing peak hour traffic volumes. The methodology applied was consistent with the 2010 *Highway Capacity Manual* method for unsignalized and signalized intersections and the Synchro Delay method for signalized intersections as employed in the software program Synchro 8.

Table 1 summarizes the results of the analysis with level of service (LOS), estimated delays (measured in seconds) and volume to capacity (v/c) ratio provided. Level of service A, corresponding to minimal delays, is the best whereas level of service F, corresponding to high delays, is generally considered poor conditions. When volume is less than capacity, v/c ratio is less than 1. Otherwise, v/c ratio equals to 1 or more than 1, which means volume reaches capacity or is more than capacity.

For unsignalized intersections, the level of service corresponds to the minor street lane groups given that the major street movements proceed relatively unimpeded. For signalized intersections, the results pertain to the average intersection delay, lane group delay and assume optimal signal timing and phasing to achieve the most efficient overall network operations through signal coordination. If the actual situations are under expectations, adjustments to the signal timing and/or phasing can be readily implemented. Level of service definitions and the corresponding detailed worksheets are included in Appendix B.

**Table 1 – 2015 Intersection Operations**

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| Highway 26 & Carson Rd | all | signal | 8.6 | A | | 9.9 | A | |
| | EBL | | 15.9 | B | 0.26 | 16.5 | B | 0.37 |
| | EBT-R | | 15.6 | B | 0.28 | 15.0 | B | 0.21 |

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| | WBL | | 16.0 | A | 0.06 | 15.5 | B | 0.06 |
| | WBT-R | | 14.4 | B | 0.03 | 14.2 | B | 0.05 |
| | NBL | | 9.8 | A | 0.08 | 11.8 | B | 0.18 |
| | NBT | | 6.3 | A | 0.37 | 9.2 | A | 0.64 |
| | NBR | | 4.7 | A | 0.01 | 5.1 | A | 0.02 |
| | SBL | | 7.3 | A | 0.02 | 11.4 | B | 0.03 |
| | SBT | | 8.7 | A | 0.53 | 9.2 | A | 0.54 |
| | SBT-R | | 8.6 | B | 0.53 | 9.2 | A | 0.54 |
| Highway 26 & Snow Valley Rd/Finlay Mill Rd | all | signal | 15.2 | B | | 16.3 | B | |
| | EBL | | 19.1 | B | 0.09 | 18.3 | B | 0.10 |
| | EBT-R | | 21.9 | C | 0.14 | 22.1 | C | 0.30 |
| | WBL | | 15.0 | B | 0.38 | 15.4 | B | 0.28 |
| | WBT-R | | 17.8 | B | 0.27 | 19.4 | B | 0.30 |
| | NBL | | 9.8 | A | 0.10 | 9.4 | A | 0.18 |
| | NBT | | 13.9 | B | 0.44 | 17.0 | B | 0.68 |
| | NBR | | 11.7 | B | 0.12 | 14.9 | B | 0.44 |
| | SBL | | 9.8 | A | 0.06 | 10.1 | B | 0.24 |
| | SBT | | 16.4 | B | 0.51 | 16.5 | B | 0.55 |
| | SBT-R | | 16.4 | B | 0.51 | 16.4 | B | 0.55 |
| Hwy 26/CR 27 & Spence Ave | EB | stop | 42.3 | E | 0.08 | **59.9** | **F** | 0.30 |
| | WB | | 41.1 | E | 0.05 | **50.2** | **F** | 0.12 |
| | | | | | | | | |
| HWY 400 SB Off Ramp & Forbes Rd. | NBL | stop | 11 | B | 0.05 | 10.9 | B | 0.04 |
| | | | | | | | | |
| HWY 400 NB Off Ramp & Forbes Road | SBL | stop | 10.3 | B | 0.04 | 11.4 | B | 0.14 |
| | | | | | | | | |

As per the analyses, good levels of service (C or better) occur at the intersections of Highway 26/Snow Valley Road/Finley Mill Road, Hwy 26/Carson Rd, and Hwy 400 ramps on Forbes Road under the existing weekday conditions. However, at the intersection of Highway 26 at CR 27 and Spence Avenue, a poor level of service "F" is provided during the PM peak hour and thus improvements to the intersection should be considered.

The need for a traffic signal at the intersection of Highway 26 with CR27/Spence Avenue was reviewed. A signal warrant analysis was carried out based on the 2015 traffic volumes. A traffic signal is warranted (a completed signal warrant analysis is provided in Appendix C). Thus a traffic signal is recommended at the intersection.

**4. Historic Traffic Growth**

Historic traffic data for the area provincial highways and County Roads is available from MTO and the County of Simcoe. Growth rates were calculated based on the historic data as specified in Table 2.

**Table 2 - AADT Growth on the Area Major Roads**

| Section of Roads | Year | AADT | Year | AADT | Annual Growth Rate |
|---|---|---|---|---|---|
| Hwy 26 from Barrie N Limits to CR 27 | 2006 | 20,300 | 2010 | 21,200 | 1.09% |
| CR 27 from Hwy 26 to CR 22 | 2003 | 10,700 | 2012 | 11,200 | 0.51% |
| Snow Valley Rd from Hwy 26 to Wilson Dr | 2009 | 2,600 | 2012 | 2,700 | 1.27% |
| Forbes Road from CR 93 to Hwy 400 | 2008 | 3,000 | 2014 | 3,700 | 3.56% |

**5. Projected Growth**

In developing future traffic projections, consideration has been given to population and employment forecasts in addition to the Midhurst developments.

**Population & Employment Trends**

Traffic growth will depend largely on the population and employment growth of an area. The population and employment forecasts for the Township of Springwater are documented in the following reports:

- *Simcoe County Land Budget Data Collection and Analysis Phase 1: Population Growth* prepared by Simcoe County Planning Department dated February 2015
- *Proposed Amendment 1 to the Growth Plan for the Greater Golden Horseshoe, 2006* by the Ministry of Infrastructure dated October 2010
- *Simcoe Area Growth Plan* prepared by Hemson Consulting Ltd. Dated May 2008.

Future population and employment projections are provided in Table 3.

**Table 3 - Population and Employment Forecasts**

| Community | Population | | | Employment | | |
|---|---|---|---|---|---|---|
| | 2011 | 2031 | Annual Growth | 2006 | 2031 | Annual Growth |
| Township of Springwater | 18,749 | 24,000 | 1.2% | 5,000 | 5,600 | 0.5% |

It is assumed that projected growth includes partially Midhurst developments, but not all Phase 1 of the Midhurst developments.

**Growth from Midhurst Developments**

The Midhurst developments located within the Midhurst Settlement Area are illustrated in Figure 3 and are listed below:

1) Neighbourhood #1 Carson Road Development – 2559 residential units plus employment land equivalent to 350 residential units;
2) Neighbourhood #2 Doran Road North Development – 1440 residential units;
3) Neighbourhood #3 Doran Road South Development – 3859 residential units;
4) Employment land #1 located on the north side of Snow Valley Road and east side of Wilson Drive – 2655 jobs; and
5) Employment land #2 located on the south side of Snow Valley Road and west side of Highway 26 – 475 jobs and 495,000 sq. ft. GFA commercial.

Trips generated by the above Midhurst developments have been specifically estimated, as per the *ITE Trip Generation Manual*. For the residential developments, trip rates were calculated by using the equations and a combination of 77% single family detached units (land use code 210) and 23% residential condo/townhouse units (land use code 230) given that the percentage of townhouse units in Phase 1 is 23%. For the employment lands, trip rates were estimated by using the equations for general light industrial (land use code 110) and shopping centre land use (land use code 820).

Trips can be made between Carson Road development and the Employment Lands via an internal road between Snow Valley Road and Carson Road without using the boundary roads. These trips are considered internal trips and should be deduced from the total trips. An internal capture rate of 5% was assumed.

There are also trips to the commercial land use when people are on the way home or on the way to work etc. These are by-pass trips. These trips are already on the road network and should be deducted from the total trips. 25% by-pass trips for the commercial land use were assumed.

Trip estimates for the peak hours of the road network are provided in Table 4. In total, the Midhurst developments are expected to generate 6204 primary trips in the AM peak hour and 7842 trips in the PM peak hour (both inbound and outbound trips).

**Table 4 – Midhurst Developments Trip Generation Estimates**

| Development | Rate/ Estimate | Unit/ Size | Weekday AM Peak | | | Weekday PM Peak | | |
|---|---|---|---|---|---|---|---|---|
| | | | In | Out | Total | In | Out | Total |
| Carson Road | rate | unit | 0.15 | 0.47 | 0.62 | 0.443 | 0.254 | 0.697 |
| | estimate | 2909 | 435 | 1381 | 1816 | 1289 | 739 | 2028 |
| | 5% Internal Capture | | -22 | -69 | -91 | -64 | -37 | -101 |
| | Sub-total | | 413 | 1312 | 1725 | 1225 | 702 | 1927 |
| Doran Road North | rate | unit | 0.15 | 0.47 | 0.62 | 0.443 | 0.254 | 0.697 |
| | estimate | 1440 | 216 | 684 | 900 | 638 | 366 | 1004 |
| Doran Road South | rate | unit | 0.15 | 0.47 | 0.62 | 0.443 | 0.254 | 0.697 |
| | estimate | 3859 | 578 | 1832 | 2410 | 1710 | 980 | 2690 |
| Sub-total | | 8208 | 1207 | 3828 | 5035 | 3573 | 2048 | 5621 |

| Development | Rate/ Estimate | Unit/ Size | Weekday AM Peak | | | Weekday PM Peak | | |
|---|---|---|---|---|---|---|---|---|
| | | | In | Out | Total | In | Out | Total |
| Employment Land #1 | rate | employee | 0.25 | 0.05 | 0.3 | 0.07 | 0.24 | 0.31 |
| | estimate | 2655 | 661 | 136 | 797 | 173 | 650 | 823 |
| | 5% Internal Capture | | -33 | -7 | -40 | -9 | -32 | -41 |
| | Sub-total | | 628 | 129 | 757 | 164 | 618 | 782 |
| Employment Land #2 | rate | employee | 0.25 | 0.05 | 0.3 | 0.07 | 0.24 | 0.31 |
| | estimate | 475 | 118 | 25 | 143 | 31 | 116 | 147 |
| | rate | 1000 sq ft GFA | 0.49 | 0.31 | 0.8 | 1.84 | 1.91 | 3.75 |
| | estimate | 495 | 242 | 154 | 396 | 909 | 947 | 1856 |
| | 5% Internal Capture | | -18 | -9 | -27 | -47 | -53 | -100 |
| | 25% By-pass Trips | | -60 | -39 | -99 | -227 | -237 | -464 |
| | Sub-total | | 282 | 131 | 413 | 666 | 773 | 1439 |
| Total | | | 2117 | 4087 | 6204 | 4403 | 3439 | 7842 |

For the three residential developments, development phasing is shown in Figure 3 and Table 5. For the employment lands, it is anticipated that they will be completed during Phase 1 by 2031. By 2027, all approved units (3850 units) would be built. By 2031 Phase 1 of the Midhurst developments are expected to generated 4209 trips in the AM peak hour and 5615 trips in the PM peak hour (both inbound and outbound trips).

**Table 5 – Development Phasing**

| Build Out Timing/Phasing | Carson Rd Development | | | Doran Road North Dev. | | Doran Road South Dev. | | Cumulative Total Units |
|---|---|---|---|---|---|---|---|---|
| | Residential Units | Emp. Units | % Build Out | Units | % Build Out | Units | % Build Out | |
| Stage 1 - 2018 | 748 | 100 | 29 | 232 | 16 | | | 1080 |
| Stage 2 -2022 | 819 | 100 | 61 | 297 | 37 | | | 2296 |
| Stage 3 - 2025 | 487 | 100 | 81 | 291 | 57 | | | 3174 |
| Stage 4 - 2027 | 219 | 50 | 90 | 407 | 85 | | | 3850 |
| Stage 5- 2031 | 27 | | 91 | 213 | 100 | 910 | 24 | 5000 |
| Ph1 Subtotal 2031 | 2300 | 350 | 91 | 1440 | 100 | 910 | 24 | 5000 |
| Stage 6 - 2034 | 259 | | 100 | | | 750 | 43 | 6009 |
| Stage 7 - 2036 | | | | | | 750 | 62 | 6759 |
| Stage 8 - 2039 | | | | | | 725 | 81 | 7484 |
| Stage 9 - 2041 | | | | | | 724 | 100 | 8208 |
| Total 2041 | 2909 | | 100 | 1440 | 100 | 3859 | 100 | 8208 |

The Transportation Master Plan prepared by the County of Simcoe and the analysis of the area traffic during the assessment of a potential partial interchange on Highway 400 at Pooles Road (AECOM June 2015) describe the prime origin / destination for the Midhurst area as 70% to and from the south. No other guidance is provided on the other directions and we have assigned 10% to each of the other cardinal directions. There are several north south options available to existing and future residents of Midhurst and the route selection will be dependent on where they are situated within Midhurst. We have assumed that if you are in the Carson Road area development

the traffic to and from the south would typically use Highway 26/Bayfield or Anne Street or Wilson Road and unlikely to use St. Vincent Street or Highway 400. For those in the Russell Road/Doran Road area developments the route selection to and from the south would be on Highway 400 or St. Vincent Street or Highway 26/Bayfield Street.

Rudimentary time trials were carried out on the north south routes from Doran Road between Russell Road and St. Vincent Street to the intersection of Highway 400 and Bayfield Street by taking Russell to Forbes to Highway 400 and by taking Findley Mill Road/Highway 26/Bayfield and by taking Pooles to St. Vincent Street to Cundles Road to Bayfield to Highway 400. The data collected shows that the Forbes to Highway 400 route is the quickest during the PM Peak at approximately 10 minutes followed by the Highway 26 route at 11.5 minutes and then the St. Vincent Route at 13.5 minutes.

For the western development area of Carson Road between Highway 26 and Wilson Road we have assigned the 70% of traffic to and from the south as 30% along Highway 26, 20% along Anne Street and 20% along Wilson Road. For the eastern development area in the vicinity north of Doran Road between Russell and St Vincent we have assigned the 70% of traffic to and from the south as 45% to Forbes and Hwy 400, 5% to Findley Mill Road / Highway 26 and 10% to Craig Road to CR 27 / Hwy 26 and 5% to Pooles Road and St. Vincent. For the eastern development area in the vicinity south of Doran Road between Russell and St Vincent we have assigned the 70% of traffic to and from the south as 50% to Forbes and Hwy 400, 5% to Findley Mill Road and Highway 26 and 15% to Pooles Road and St. Vincent.

Based on the above, the following distributions were developed:

Carson Road Development

- 20% to/from the south via Wilson Drive
- 20% to/from the south via Anne Street
- 30% to/from the south via Highway 26
- 10% to/from the north via County Road 27
- 5% to/from the west via Highway 26
- 5% to/from the northwest via Wilson Drive/Snow Valley Rd.
- 5% to/from the west via Snow Valley Road / Hwy 26
- 5% to/from the east via Forbes Road

Doran Road North Development

- 45% to/from the south via Highway 400 and Forbes Road
- 5% to/from the south via St Vincent
- 5% to/from the south via Highway 26 and Finlay Mill Road
- 10% to/from the south via Highway 26 and Craig Road
- 5% to/from the north via County Road 27 and Craig Road
- 5% to/from the north via Highway 400 and Forbes Road
- 5% to/from the west via Doran, Spence and Highway 26
- 5% to/from the west via Snow Valley Road
- 10% to/from the east via Forbes Road
- 5% to/from the south via Russell and Pooles Road

Doran Road South Development

- 50% to/from the south via Highway 400 and Forbes Road
- 15% to/from the south via St Vincent
- 5% to/from the south via Highway 26 and Finlay Mill Road
- 0% to/from the south via Highway 26 and Craig Road
- 5% to/from the north via Russell – Craig Rd - County Road 27
- 5% to/from the north via Highway 400

- 5% to/from the west via Doran, Spence and Highway 26
- 5% to/from the west via Snow Valley Road
- 10% to/from the east via Forbes Road

Employment Land #1
- 20% to/from the south via Wilson Drive
- 10% to/from the south via Anne Street
- 20% to/from the south via Highway 26
- 13% to/from the east via Finlay Mill Road
- 5% to/from the east via Craig Road
- 1% to/from the east via Doran Road
- 1% to/from the east via Carson Road east
- 15 % to/from north via CR 27
- 2% to/from the west via Snow Valley Road
- 13% to/from the northwest via Wilson Drive

Employment Land #2
- 10% to/from the south via Wilson Drive
- 10% to/from the south via Anne Street
- 30% to/from the south via Highway 26
- 13% to/from the east via Finlay Mill Road
- 5% to/from the east via Craig Road
- 1% to/from the east via Doran Road
- 1% to/from the east via Carson Road east
- 15 % to/from north via CR 27
- 2% to/from the west via Snow Valley Road
- 13% to/from the northwest via Wilson Drive

The development specific trip estimates were assigned to the area road network. The resulting traffic volumes attributed to the above noted developments are presented in Appendix D.

**6. Future Traffic Volumes**

Given that development growth has been considered specifically and that the average growth rate for the section of Highway 26 is 1.09% for the past five years, an annual general background growth rate of 1.0% was applied for traffic volumes on Highway 26, CR 27, Wilson Drive, Snow Valley Road and Finlay Mill Road – Doran Road – Forbes Road corridor.

Estimates of future traffic volumes for the years 2031 and 2041 have been determined based on the following:
- 2015 traffic volumes;
- development specific trip generation volumes; and
- consideration for the 2031and 2041 horizon year growth rates.

The resulting future traffic projections are provided in Figures 4 and 5 for the 2031 and 2041 horizon respectively. The AM and PM peak hour volumes are provided, reflective of weekday conditions.

**7. Future Road Network**

The County of Simcoe has recently completed an updated Transportation Master Plan. The final draft report dated September 2014 has identified the following improvements in the study area:
- Snow Valley Road from CR 28 to Highway 26 widening to 4 lanes by 2021
- Wilson Drive from Barrie limit to Highway 26 widening to 4 lanes by 2031

- Widening of CR 93 from CR 11 (Forbes Road) to City of Barrie limit shall be coordinated with MTO's widening of Highway 11
- CR 27 from Highway 26 to CR 22 widening to 4 lanes by 2041

It is assumed that the following road connections will be in place by 2025:

- Craig Road is opened from Russell Road to County Road 27 2018
- St Vincent Street is connected between Belmont Crescent and Park Trail

The timing for the above improvements should be sooner than later. The 10 year horizon is considered the worst case scenario and is to allow time for design and construction.

Route selection for the Craig Road link between Russell Road and County Road 27 along the north limits of the study area is still in the preliminary stages which will be refined as the overall design of the transportation improvements proceeds. Completion of this link during the first stage of Phase 1 development is necessary as it provides alternate routing for some development traffic to access the County Road 27/Hwy 26/ Bayfield corridor and to some extent Hwy 400 without using existing Midhurst community roads. This Craig Road link is proposed as a two lane rural roadway.

**8. Future 2031 Operations**

The following improvements have been assumed:

- Add a traffic signal and an exclusive left turn lane on the SB, EB and WB approaches at the intersection of Highway 26 / CR 27 / Spence Ave
- Add a NB advance green phase at the intersection of Highway 26 / Carson Road.

The operations of the key study area intersections were investigated based upon the existing configurations, the above improvements and the 2031 traffic projections. The results of the 2031 analyses are presented in Table 6 whereas the corresponding worksheets are provided in Appendix C.

**Table 6 – 2031 Intersection Operations**

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| Highway 26 & Carson Rd | all | signal | 26.3 | C | | 39.3 | D | |
| | EBL | | 32.6 | C | 0.64 | 76.9 | E | 0.87 |
| | EBT-R | | 42.5 | D | 0.84 | 57.8 | E | 0.77 |
| | WBL | | 40.6 | D | 0.15 | 58.9 | E | 0.20 |
| | WBT-R | | 31.3 | C | 0.07 | 52.9 | D | 0.16 |
| | NBL | | 21.2 | C | 0.57 | 79.7 | E | 0.96 |
| | NBT | | 13.4 | B | 0.52 | 13.3 | B | 0.70 |
| | NBR | | 13.3 | B | 0.52 | 13.2 | B | 0.70 |
| | SBL | | 17.1 | B | 0.05 | 24.0 | C | 0.14 |
| | SBT | | 30.5 | C | 0.85 | 46.5 | D | 0.94 |
| | SBT-R | | 31.2 | C | 0.86 | 53.7 | D | 0.98 |
| Highway 26 & Snow Valley Rd/Finlay Mill Rd | all | signal | 35.5 | D | | 60.9 | E | |
| | EBL | | 24.5 | C | 0.39 | 31.4 | C | 0.62 |
| | EBT-R | | 44.4 | D | 0.79 | **115.9** | **F** | **1.09** |

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| | WBL | | 24.3 | C | 0.72 | 57.6 | E | 0.86 |
| | WBT-R | | 28.3 | C | 0.58 | 43.4 | D | 0.46 |
| | NBL | | 39.1 | D | 0.82 | **105.9** | **F** | **1.00** |
| | NBT | | 23.6 | C | 0.65 | 45.0 | D | 0.88 |
| | NBR | | 17.7 | B | 0.18 | 36.0 | D | 0.63 |
| | SBL | | 17.7 | B | 0.14 | 37.2 | D | 0.59 |
| | SBT | | 50.6 | D | 0.94 | 66.6 | E | 0.96 |
| | SBT-R | | 51.5 | D | 0.94 | 68.6 | E | 0.97 |
| Hwy 26/CR 27 & Spence Ave | all | signal | 12.8 | B | | 10.7 | B | |
| | EBL | | 34.1 | C | 0.29 | 33.6 | C | 0.54 |
| | EBT | | 32.3 | C | 0.12 | 28.5 | C | 0.17 |
| | EBR | | 0.5 | A | 0.30 | 0.7 | A | 0.39 |
| | WBL | | 31.6 | C | 0.03 | 27.8 | C | 0.03 |
| | WBT-R | | 35.2 | D | 0.37 | 28.3 | C | 0.12 |
| | NBL | | 14.8 | B | 0.76 | 14.8 | B | 0.74 |
| | NBT-R | | 2.1 | A | 0.20 | 3.8 | A | 0.45 |
| | SBL | | 15.6 | B | 0.00 | 14.7 | B | 0.04 |
| | SBT-R | | 23.6 | C | 0.76 | 21.7 | C | 0.74 |
| HWY 400 SB Off Ramp & Forbes Rd. | NBL | stop | 35.1 | E | 0.15 | 26.3 | D | 0.33 |
| | WB L | | 10.7 | B | 0.13 | 9 | A | 0.54 |
| | | | | | | | | |
| HWY 400 NB Off Ramp & Forbes Road | SBL | stop | 18.1 | C | 0.10 | 21.0 | C | 0.32 |
| | EBL | | 8.1 | A | 0.10 | | | |

Given the assumed improvements, all intersections and their lane groups will operate acceptably at a level of service "E" or better in the 2031 horizon except for the intersection of Highway 26 at Snow Valley Road where a poor level of service "F" occurs on the eastbound through-right shared lane and the northbound left turn lane, volumes are at or over capacity during the PM peak hour. Thus, improvements at the intersection are required.

Should an eastbound right turn lane be added at the intersection of Highway 26 at Snow Valley Road/Finlay Mill Road, the intersection would operate acceptably. The results of the analysis are summarized in Table 7.

As traffic grows the LOS for the Hwy 400 SB Off Ramp will soon reach unacceptable levels. Signalization of that intersection s proposed in 2031 to accommodate growth in the Russell Road – Doran Road area

**Table 7 – 2031 Intersection Operations with Improvements**

| Intersection | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| Highway 26 & Snow Valley Rd/Finlay Mill Rd | all | signal | 31.7 | C | | 36.8 | D | |
| | EBL | | 25.2 | C | 0.40 | 30.2 | C | 0.71 |
| | EBT | | 30.9 | C | 0.26 | 45.2 | D | 0.75 |
| | EBR | | 35.2 | D | 0.63 | 51.9 | D | 0.81 |
| | WBL | | 21.0 | C | 0.58 | 28.9 | C | 0.62 |
| | WBT-R | | 29.4 | C | 0.63 | 41.1 | D | 0.70 |
| | NBL | | 32.7 | C | 0.78 | 42.5 | D | 0.83 |
| | NBT | | 22.0 | C | 0.63 | 30.1 | C | 0.85 |
| | NBR | | 16.5 | B | 0.18 | 24.4 | C | 0.60 |
| | SBL | | 16.5 | B | 0.13 | 22.8 | C | 047 |
| | SBT | | 44.9 | D | 0.91 | 44.3 | D | 0.91 |
| | SBT-R | | 45.7 | D | 0.91 | 45.6 | D | 0.92 |
| | | | | | | | | |

**9. Future 2041 Operations**

Given the future 2041 total traffic volumes, an additional through lane in each direction for a total of 4 lanes are required on Forbes Road from Russell Road to Highway 400.

A traffic signal warrant analysis was carried out at Forbes Road / Highway 400 SB off-ramp intersection. A traffic signal is warranted at the intersection for the 2041 horizon.

The operations of the key study area intersections were investigated based upon the existing configurations, the 2031 improvements, the above noted improvements, and the 2041 traffic projections. It is assumed that significant improvements would be provided in the area of the Highway 400/Forbes Road interchange, Forbes Road and Russell Road. The results of the 2041 analyses are presented in Table 8 whereas the corresponding worksheets are provided in Appendix B.

**Table 8 – 2041 Intersection Operations**

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| Highway 26 & Carson Rd | all | signal | 26.3 | C | | 39.3 | D | |
| | EBL | | 32.6 | C | 0.64 | 76.9 | E | 0.87 |
| | EBT-R | | 42.5 | D | 0.84 | 57.8 | E | 0.77 |
| | WBL | | 40.6 | D | 0.15 | 58.9 | E | 0.20 |
| | WBT-R | | 31.3 | C | 0.07 | 52.9 | D | 0.16 |
| | NBL | | 21.2 | C | 0.57 | 79.7 | E | 0.96 |
| | NBT | | 13.4 | B | 0.52 | 13.3 | B | 0.70 |
| | NBT-R | | 13.3 | B | 0.52 | 13.2 | B | 0.70 |
| | SBL | | 17.1 | B | 0.05 | 24.0 | C | 0.14 |

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| | SBT | | 30.5 | C | 0.85 | 46.5 | D | 0.94 |
| | SBT-R | | 38.1 | D | | 52.6 | D | |
| Highway 26 & Snow Valley Rd/Finlay Mill Rd | all | signal | 46.7 | D | | 51.3 | D | |
| | EBL | | 27.4 | C | 0.46 | 46.3 | D | 0.82 |
| | EBT | | 33.3 | C | 0.34 | 88.4 | F | 0.97 |
| | EBR | | 39.3 | D | 0.67 | 68.4 | E | 0.86 |
| | WBL | | 23.8 | C | 0.71 | 48.9 | D | 0.86 |
| | WBT-R | | 30.7 | C | 0.69 | 51.8 | D | 0.74 |
| | NBL | | 63.7 | E | 0.94 | **81.6** | **F** | 0.95 |
| | NBT | | 27.9 | C | 0.74 | 36.5 | D | 0.88 |
| | NBR | | 20.0 | C | 0.24 | 31.6 | C | 0.71 |
| | SBL | | 19.9 | B | 0.18 | 31.6 | C | 0.60 |
| | SBT | | 79.3 | **F** | **1.05** | 57.5 | E | 0.96 |
| | SBT-R | | **81.5** | **F** | **1.05** | 60.6 | E | 0.97 |
| Hwy 26/CR 27 & Spence Ave | all | signal | 20.1 | C | | 15.0 | B | |
| | EBL | | 33.5 | C | 0.16 | 35.9 | D | 0.49 |
| | EBT | | 33.4 | C | 0.17 | 35.9 | D | 0.52 |
| | EBR | | 0.6 | A | 0.33 | 0.8 | A | 0.43 |
| | WBL | | 32.4 | C | 0.01 | 31.6 | C | 0.02 |
| | WBT-R | | 37.2 | D | 0.54 | 33.5 | C | 0.32 |
| | NBL | | 27.2 | C | 0.88 | 22.4 | C | 0.82 |
| | NBT-R | | 3.3 | A | 0.23 | 4.2 | A | 0.47 |
| | SBL | | 19.5 | B | 0.0 | 18.2 | B | 0.04 |
| | SBT-R | | 33.9 | C | 0.86 | 29.7 | C | 0.83 |
| | | | | | | | | |
| | | | | | | | | |
| HWY 400 SB Off Ramp & Forbes Rd. | all | | 11.3 | B | | 19.5 | B | |
| | NBL | signals | 11.8 | B | 0.12 | 19.5 | B | 0.32 |
| | WB L | | 15.3 | B | 0.29 | 9.5 | A | 0.10 |
| | WBT | | 11.0 | B | 0.46 | 22.6 | C | 0.93 |
| | EBT | | 10.8 | B | 0.43 | 7.9 | A | 0.23 |
| | | | | | | | | |
| HWY 400 NB Off Ramp & Forbes Road | SBL | stop | 34.8 | D | 0.22 | 52.4 | **F** | 0.63 |
| | EBL | | 8.6 | A | 0.18 | 9 | A | 0.14 |

Given the increase in traffic volumes, despite the assumed improvements, a poor level of service "F" occurs at the

following intersections:

- Highway 26 at Carson Road
- Highway 26 at Snow Valley Road
- Forbes Road at Highway 400 NB off-ramp

Thus improvements at these intersections should be considered. The following improvements are recommended:

Intersection of Forbes Road at Highway 400 NB off-ramp

- Add an eastbound left turn lane

Intersection of Highway 26 at Carson Road

- Add an eastbound right turn lane; and
- Add a northbound left turn lane to a double left turn lane

Intersection of Highway 26 at Snow Valley Road

- Add a southbound right turn lane. Add an eastbound right turn lane

Intersection of Highway 400 NB Off Ramp with Forbes Rd.

- Add an eastbound to northbound left turn lane

Based on the above improvements, the above intersections would operate acceptably. The results of the analysis are summarized in Table 9.

**Table 9 – 2041 Intersection Operations with Improvements**

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| Highway 26 & Carson Rd | all | signal | 30.9 | C | | 30.2 | C | |
| | EBL | | 36.3 | D | 0.71 | 69.5 | E | 0.89 |
| | EBT | | 23.6 | C | 0.00 | 34.8 | C | 0.02 |
| | EBR | | 33.8 | C | 0.79 | 34.4 | C | 0.57 |
| | WBL | | 32.4 | C | 0.09 | 45.6 | D | 0.15 |
| | WBT-R | | 32.0 | C | 0.08 | 45.8 | D | 0.21 |
| | NBL | | 20.3 | C | 0.36 | 46.2 | D | 0.86 |
| | NBT | | 13.3 | B | 0.56 | 16.3 | B | 0.80 |
| | NBT-R | | 13.2 | B | 0.56 | 16.2 | B | 0.81 |
| | SBL | | 17.4 | B | 0.05 | 30.2 | C | 0.17 |
| | SBT | | 40.8 | D | 0.95 | 31.9 | C | 0.91 |
| | SBR | | 44.4 | D | 0.97 | 39.4 | D | 0.96 |
| Highway 26 & Snow Valley Rd/Finlay Mill Rd | all | signal | 32.4 | C | | 38.0 | D | |
| | EBL | | 23.1 | C | 0.42 | 45.3 | D | 0.81 |
| | EBT | | 29.1 | C | 0.33 | 79.3 | E | 0.96 |
| | EBR | | 24.2 | C | 0.42 | 35.3 | D | 0.59 |
| | WBL | | 19.4 | B | 0.68 | 39.5 | D | 0.83 |
| | WBT-R | | 26.7 | C | 0.68 | 41.1 | D | 0.66 |
| | NBL | | 38.1 | D | 0.82 | 43.3 | D | 0.83 |
| | NBT | | 30.3 | C | 0.82 | 39.1 | D | 0.92 |

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| | NBR | | 8.4 | A | 0.16 | 15.3 | B | 0.55 |
| | SBL | | 20.1 | C | 0.18 | 28.8 | C | 0.59 |
| | SBT | | 50.8 | D | 0.98 | 35.9 | D | 0.85 |
| | SBR | | 20.0 | C | 0.38 | 15.4 | B | 0.27 |
| | | | | | | | | |
| HWY 400 NB Off Ramp & Forbes Road wt EB Lt | SBL | stop | 20.3 | C | 0.13 | 22.3 | C | 0.36 |
| | EBL | | 8.6 | A | 0.18 | 9 | A | 0.14 |

**10. Roundabout Alternative Considerations**

A roundabout alternative was considered at each of the future signalized intersections. Because of geometric and other constrains (i.e. train track, slope, sightline, property, natural environment etc.), only the following intersections were considered further:

- Highway 26 and Carson Road
- Highway 26 and County Road 27

Roundabout operational analysis was carried out for the above two intersections based on the 2041 traffic volumes and 2041 area road lane configurations. The results of the 2041 roundabout analyses are presented in Table 10 whereas the corresponding worksheets are provided in Appendix B.

**Table 10 – 2041 Intersection Operations - Roundabout**

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| Highway 26 & Carson Rd | all | 2 lane round-about | **98.9** | **F** | | **160.9** | **F** | |
| | EB | | **430.7** | **F** | **1.88** | **260.1** | **F** | **1.48** |
| | WB | | 11.9 | B | 0.11 | 29.8 | D | 0.27 |
| | NBL-T | | 17.3 | C | 0.71 | **145.2** | **F** | **1.27** |
| | NBT-R | | 21.7 | C | 0.79 | **204.2** | **F** | **1.41** |
| | SBL-T | | 21.7 | C | 0.82 | **95.7** | **F** | **1.13** |
| | SBT-R | | 32.0 | D | 0.91 | **141.8** | **F** | **1.25** |
| Hwy 26/CR 27 & Spence Ave | all | 2 lane round-about with an EB right turn bypass | 13.8 | B | | 25.4 | D | |
| | EBL-T | | 6.7 | A | 0.09 | 9.9 | A | 0.27 |
| | EBR | | 0 | A | 0.28 | 0 | A | 0.36 |
| | WB | | 11.9 | B | 0.23 | 17.1 | C | 0.22 |
| | NBL-T | | 13.0 | B | 0.66 | 28.8 | D | 0.89 |
| | NBT-R | | 10.3 | B | 0.56 | 47.4 | E | 0.99 |
| | SBL-T | | 23.4 | C | 0.72 | 19.6 | C | 0.68 |
| | SBT-R | | 27.0 | D | 0.78 | 22.3 | C | 0.74 |

As indicated in Table 10, volumes are over capacity on several lane groups/approaches at the intersection of Highway 26 with Carson Road. A roundabout is not a viable option for the intersection. Although, an eastbound right turn bypass has been added to the roundabout at the intersection of Highway 26 at County Road 27, the northbound through-right shared lane reaches its capacity. Thus a roundabout is not recommended at the intersection.

## 11. Conclusion

Based on the above analyses, it is concluded that the following timing and improvements are recommended.

**2015 horizon**

- Add a traffic signal at the intersection of Highway 26/Spence Avenue with Highway 26/County Road 27 including an exclusive left turn lane on the north, east and west approaches

**2031 horizon**

- Add an eastbound right turn lane at the intersection of Highway 26 with Snow Valley Road

**2041 horizon**

- Add an eastbound right turn lane on Carson Road at Highway 26, and add a northbound left turn lane (double northbound left turn lane) on Highway 26 at Carson Road
- Add a southbound right turn lane on Highway 26 at Snow Valley Road.
- Add an additional through lane in each direction for a total of 4 lanes on Forbes Road from Russell Road to Highway 400
- Add a traffic signal at the intersection of Forbes Road/Highway 400 SB on/off ramp along with a westbound left turn lane and an eastbound channelized right turn lane.
- Add an eastbound left turn lane on Forbes Road at Highway 400 NB on/off ramp.

S:\113027\Steve's ESR DRAFT\Correspondance County and MTO Summary\MEMO_Midhurst_Traffic_Analysis_to MTO_SLF.doc

## Joe Mullan

**From:** Dorton, Peter (MTO) <Peter.Dorton@ontario.ca>
**Sent:** Wednesday, October 18, 2017 2:26 PM
**To:** Joe Mullan
**Cc:** Steve Fournier; Heather Coleman; brent.spagnol@springwater.ca; Meile, Christian (Christian.Meile@simcoe.ca); Vandenberg, Robert (MTO); Uddin, Zaka (MTO); Diczki, Tarita (MTO); Janke, Aaron (MTO); Aurini, Shawn (MTO); Tai, Arthur (MTO); Hao, Jiang Yang (MTO)
**Subject:** FW: Township of Springwater, Midhurst Secondary Plan - Hwy 400 / Forbes Road Interchange Analysis
**Attachments:** Midhurst 2041 Total PM Revised on Oct 10.syn; Hwy 26 at Spence Ave(Simcoe Rd 27).pdf; Figure 3.pdf

Joe:

We've completed our review of your July 12, 2017 circulation and offer the following comments:

We have noted the following discrepancies in the traffic volumes, trip generation rates and LOS values:

Figure 11, Total traffic volumes 2031

- Hwy 26/Spence Ave: the NBL pm traffic counts should be 514, not 534
- Hwy 400/Forbes Rd NB off ramp: the WBT and WBR traffic counts are not shown

Figure 12, Total traffic volumes 2041

- Hwy 400/Forbes Rd: NB off ramp traffic counts are not shown. Please show these on existing IC configuration and on Parclo A-4 configuration (per schematic)

Table 6, 2031 Intersection operations

- Hwy 400/Forbes Rd SB off ramp: AM NBL LOS should be C instead of E

Table 8, 2041 Intersection operations

- Hwy 26/Carson Rd SB: AM overall LOS should be D instead of C
  AM SBT LOS should be D instead of C
  AM overall LOS should be E instead of D

Table 4, Trip generation rates used are slightly lower than ITE trip generation manual.

| Land Use Code | Report | | ITE Trip Generation Manual | |
|---|---|---|---|---|
| | (AM) | (PM) | (AM) | (PM) |
| Single family detached units (210) | 0.62 | 0.697 | 0.75 | 1.00 |
| Residential Condo/Townhouse Units (230) | -- | -- | 0.44 | 0.52 |
| General Light Industrial (110) | 0.3 | 0.31 | 0.44 | 0.42 |
| Shopping Center (820) | 0.8 | 3.75 | 0.96 | 3.71 |

While the analysis in the report should be updated to reflect the above comments, please address also the following:

- P. 4, 2nd paragraph, there is mention of existing warrant for signals at Hwy 26 / CR27. Please see attached the latest traffic counts taken on March 4, 2017 by MTO, including signal warrants showing that signals are not warranted under the current traffic conditions. We have also reviewed the 5 year collision history for this intersection and could not identify any collision pattern that could be prevented if signals were in place. Please provide projected signal warrants for 2031 and 2041 to see if signals will become warranted in the future.

- P. 5 / Growth from Midhurst developments: there is reference to a Figure 3. We did not see this figure in the TIS, and ask that you confirm that the reference is to Exhibit 3 (attached) from Aecom's memo dated Apr 26/16.

- P. 8 / Sec. 7 / Future Road Network: please confirm if road authorities have confirmed these will all be constructed within time frames noted.

- P.9: proposed new Craig Rd. extension out to CR27 is said to be opened by either 2018 or 2025 (not clear). Is this a local or County road, and has Simcoe County agreed to this new intersection being opened at CR27 by either 2018 or 2025?

- There is also mention of new St. Vincent St. connection between Belmont Cr. and Park Trail by 2025; please provide a plan to show where this is.

- P. 9 / Sec. 8 / 2031 Operations: signal at west ramp terminal of Hwy 400/Forbes IC said to be required, but this is also a recommendation for 2041 (on P.11 / Sec. 9). The schematic provided for 2031 at the IC shows both ramp terminals signalised in 2031. Please provide projected signal warrants to demonstrate signals will be warranted at both ramp terminals.

- P. 13: need for EB to NB LTL on Forbes at NB off-ramp (east ramp terminal) is mentioned twice. Please provide the LTL warrant analysis.

- P.15 / Conclusion: 2015 Horizon recommends signal at Hwy 26 / CR27; year 2015 recommendations are no longer appropriate. Please see comments above pertaining to signal warrants at this intersection.

- P. 15 Conclusions, recommended second NBLTL (double LTL) on Hwy 26/ @ Carson Rd. The analysis has the following discrepancies:
    - The NBLTL has 95th %-ile queue length of more than 153m, but the storage length is only 100m.
    - NB double left turn lane has only one receiving lane on Carson Rd west approach instead of 3 lanes. The 3rd lane is typically required to accommodate the truck turning radius if there is a high percentage of heavy vehicles.

  We've revised the Hwy 26/Carson Rd (2041) PM Total analysis (attached) keeping one NBLTL and reducing the cycle length to 110 sec from 140 sec and the result shows an improvement in the LOS of all the moves except that of the SB direction. Please revisit analysis and recommendation for the NB double LTL.

- 2031: the only recommendation is for EB RTL on Snow Valley Rd. at Hwy 26. Why is there no mention of the signals at Forbes IC shown in the 2031 schematic?

- 2041: please provide clarification on if 2041 recommendations may be required sooner. The signal recommendations for the IC seem 10 years late, as they are shown in 2031 schematic.

- There is no reference in the TIS to the schematic for 2041 showing a Parclo A-4 IC at Hwy 400 / Forbes Rd.. Please confirm how this requirement was determined, and note that the Township, as proponent, will be required to undertake an EA Study for reconfigured interchange.

Additional Comments on Schematics:

Highway 400 / Forbes Rd.:

- Please confirm the posted and design speed of Forbes through the interchange, and provide a Design Criteria table showing existing, standard, proposed.

- Is an EB LTL required at the east ramp terminal?

- If yes, does the Ramp N-E merge lane need to be extended beyond the left turn lane?

- The lane balancing/drops/tapers/curves at the west ramp terminal are all “compressed”.

- Consider moving west the entrance near to the west terminal intersection.

With respect to the 3 intersections on Highway 26:

- General:
    - Provide dimensions (storage, parallel, taper) radii, posted (and design) speeds, intersection skews, etc. for all roads.

- Carson/Hwy 26:
    - Existing the building in the SE quadrant is missing; aerials look to old.
    - Why has the existing NB RTL been removed?

- Snow Valley/Hwy 26:
    - Consider closing the southerly plaza entrance in the NE quadrant.
    - There is a new SB RTL shown, but is not identified in the TIS.
    - Please clarify what the red lines represent.

- CR 27/Hwy 26
    - Design is for signalized condition, but as noted earlier confirmation on need for signals is required.
    - LTL on west approach looks to be on curve; tangential approach would be needed for signals.
    - Show the existing WB RTL to the commuter parking lot in the NW quadrant.

Finally, please confirm that this TIS, including schematics, has been shared with and reviewed by Simcoe County.

Please feel free to contact me if you have any questions.

Thanks,
Peter Dorton
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MTO Central Region Engineering Office
Corridor Management Section
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June 5, 2018 File #113027

**"BY EMAIL"**

MTO Central Region Engineering Office
Corridor Management Section
159 Sir William Hearst Avenue, 7th Floor
Toronto, Ontario
M3M 0B7

Attn: **Mr. Peter Dorton**
**Senior Project Manager**

Ref: **Township of Springwater,**
**Midhurst Class EA**
**Response to MTO Comments**

Dear Mr. Dorton:

We provide the following answers to questions received from the MTO, in an e-mail of October 18, 2017, regarding the Midhurst Secondary Plan Operational Analysis Memorandum of June 12, 2017. For ease of reference we have repeated the original question (shown in blue italics) followed by our response.

1. *Figure 11, Total traffic volumes 2031*
   *Hwy 26/Spence Ave: the NBL pm traffic counts should be 514, not 534*
   *Hwy 400/Forbes Rd NB off ramp: the WBT and WBR traffic counts are not shown*

The Operational Analysis Memorandum (OAM) has been updated to correct this. The cells in question were accidentally formatted for a text colour that did not print. With regards to the left turn volume at Hwy 26 and Spencer the difference is immaterial.

2. *Figure 12, Total traffic volumes 2041*
   *Hwy 400/Forbes Rd: NB off ramp traffic counts are not shown. Please show these on existing IC configuration and on Parclo A-4 configuration (per schematic).*

The OAM has been updated to correct this. The cells in question were accidentally formatted for a text colour that did not print.

3. *Table 6, 2031 Intersection operations*
   *Hwy 400/Forbes Rd SB off ramp: AM NBL LOS should be C instead of E*

Agreed, as per the Appendix C Operational Analysis, the LOS is B and the delay is 19.2 seconds not 35.1 seconds. The OAM has been updated.

4. *Table 8, 2041 Intersection operations*
   *Hwy 26/Carson Rd SB: AM overall LOS should be D instead of C*
   *AM SBT LOS should be D instead of C*
   *AM overall LOS should be E instead of D*

Agreed, there were several LOS values that were transposed incorrectly. We have revised the Table. Table 8 reflects LOS prior to the proposed improvements.

5. *Table 4, Trip generation rates used are slightly lower than ITE trip generation manual.*

| Land Use Code | Report | | ITE Trip Generation Manual | |
|---|---|---|---|---|
| | (AM) | (PM) | (AM) | (PM) |
| Single family detached units (210) | 0.62 | 0.697 | 0.75 | 1.00 |
| Residential Condo/Townhouse Units (230) | -- | -- | 0.44 | 0.52 |
| General Light Industrial (110) | 0.3 | 0.31 | 0.44 | 0.42 |
| Shopping Center (820) | .08 | 3.75 | 0.96 | 3.71 |

We did not apply the "Average Rate" listed under land use 210. Because of the sample size (8,208 units) we used the Fitted Curve Equation. For the PM peak hour this is Ln(T) = 0.901 Ln(X) + 0.527 where T is Trip ends and X is the number of single family dwellings. For 8208 units this generates 5696 trips or approximately 0.69 trips per dwelling but used 0.77 as conservative. The same was applied to the townhouse rate with the assumption they made up 23 % of the total units and then applied a 5% internal trip reduction. The 0.67 is the resulting average. We have attached a summary of the trip generation calculations to Appendix A.

For land use 110 the PM peak equation based on employees is T = 0.286(X) + 58.028 where X is number of employees estimated at approximately 2655 in employment lands #1. This estimates the trip ends at 817 or 0.31 trips per employee.

The same method was used for the AM peak.

6. P. 4, 2nd paragraph, there is mention of existing warrant for signals at Hwy 26 / CR27. Please see attached the latest traffic counts taken on March 4, 2017 by MTO, including signal warrants showing that signals are not warranted under the current traffic conditions. We have also reviewed the 5-year collision history for this intersection and could not identify any collision pattern that could be prevented if signals were in place. Please provide projected signal warrants for 2031 and 2041 to see if signals will become warranted in the future.

Analysis was based on data initially developed by BA Group in 2008. However, the analysis has been redone for the more recent 2017 traffic counts provided by MTO and these show that signalization warrants for existing traffic is not met. Traffic signal warrants for the 2031 traffic projections with the Phase 1 development in place do fulfill the traffic signal warrants. The report has been revised accordingly.

7. P. 5 / Growth from Midhurst developments: there is reference to a Figure 3. We did not see this figure in the TIS, and ask that you confirm that the reference is to Exhibit 3 (attached) from Aecom's memo dated Apr 26/16.

We have attached Figure 7.4.1 to Appendix A. It is similar to Aecom's Exhibit 3.

8. P. 8 / Sec. 7 / Future Road Network: please confirm if road authorities have confirmed these will all be constructed within time frames noted.

We have had discussions with the County of Simcoe and the Township of Springwater regarding the proposed road improvements identified. With regard to the proposed timelines identified in the OAM and overall ESR, these were "estimates" of when the various stages of development would proceed in the future, which may or may not be accurate. However, we can confirm that the Township and the

County are on board with requiring the identified improvements be completed when the corresponding stage of development proceeds.

9. *P.9: proposed new Craig Rd. extension out to CR27 is said to be opened by either 2018 or 2025 (not clear). Is this a local or County Road, and has Simcoe County agreed to this new intersection being opened at CR27 by either 2018 or 2025?*

We have had discussions with the County of Simcoe regarding the proposed Craig Road, including its connection to CR27. Currently Forbes Rd. between Hwy 400 and Russell Rd. is a Township road; however, during the discussions between the County and the Township it was acknowledged by both parties that Craig Road (Hwy 400 to CR27) should be a County Road and that further discussions should take place regarding when and how this should happen.

With regard to the timing for Craig Rd. Extension it is intended that Craig Road be constructed in conjunction with Phase 1 Stage 1 of development in the Doran Road area.

10. There is also mention of new St. Vincent St. connection between Belmont Cr. And Park Trail by 2025; please provide a plan to show where this is.

St. Vincent currently dead ends just north of Belmont Cr. and it is proposed to extend it approximately 280 metres northly, through an unopened road allowance, to connect with St. Vincent, south of Doran Road, at Park Trail.

11. *P. 9 / Sec. 8 / 2031 Operations: signal at west ramp terminal of Hwy 400/Forbes IC said to be required, but this is also a recommendation for 2041 (on P.11 / Sec. 9). The schematic provided for 2031 at the IC shows both ramp terminals signalised in 2031. Please provide projected signal warrants to demonstrate signals will be warranted at both ramp terminals.*

12. *P. 13: need for EB to NB LTL on Forbes at NB off-ramp (east ramp terminal) is mentioned twice. Please provide the LTL warrant analysis.*

Left Turn Lane Warrant Analysis is now provided in Appendix G. Left turn lane warrants are not met for the NB nor SB off ramp in 2031. Traffic signals are warranted for the SB Off Ramp by 2041 for the 2041 traffic projections. An eastbound left turn lane is warranted for the NB Off Ramp by 2041. It is assumed that the Phase 2 Development will occur between 2031 and 2041 but at this time approval has only been given to Phase 1. If Phase 2 proceeds the Highway 400 / Forbes Road intersection needs to be monitored to identify the required timing of the off ramp intersection improvements. Once the improvements are provided the LOS for the 2041 build out traffic is very good but there are constraints on the length of the left turn lanes to be provided with the ramps at their current offset from Highway 400. Prior to commencing development of Phase 2 the Municipality is committed to undertaking a Municipal Class Environmental Assessment with inclusion of MTO requirements. This may identify the need to increasing the ramp offset or considerable alteration of the interchange as a whole. Considering the long time interval and non-status of Phase 2, starting the Municipal Class EA process towards the latter half of Phase 1 provides an opportunity to measure, test and refine the assumptions on traffic growth and distribution for the proposed development.

13. P.15 / Conclusion: 2015 Horizon recommends signal at Hwy 26 / CR27; year 2015 recommendations are no longer appropriate. Please see comments above pertaining to signal warrants at this intersection.

Acknowledged, refer to revised analysis in comment 6 summary. Signalization is required before 2031 to accommodate Phase 1 development, but is not warranted for existing traffic.

14. P. 15 Conclusions, recommended second NBLTL (double LTL) on Hwy 26/ @ Carson Rd. The analysis has the following discrepancies:
    - The NBLTL has 95th %-ile queue length of more than 153m, but the storage length is only 100m.

Storage lengths can be adjusted during detailed design using more up to date traffic data available at that time. As a rough approximation using Table B7-5 for a cycle length of 140 seconds and 355 movements one gets an average arrival rate per cycle of 14 vehicles which is 20 vehicles or less for 95% confidence level and with 60% in one lane that is a storage requirement of 12 vehicles or approximately 90 metres.

- *NB double left turn lane has only one receiving lane on Carson Rd west approach instead of 3 lanes. The 3rd lane is typically required to accommodate the truck turning radius if there is a high percentage of heavy vehicles.*

Carson Road has been provided with two westbound lanes to receive the two northbound left turn lanes. Median position and lane widths can be reviewed at detailed design and adjusted as necessary.

*We've revised the Hwy 26/Carson Rd (2041) PM Total analysis (attached) keeping one NBLTL and reducing the cycle length to 110 sec from 140 sec and the result shows an improvement in the LOS of all the moves except that of the SB direction. Please revisit analysis and recommendation for the NB double LTL.*

We did run an analysis with one northbound left turn lane but found the LOS to be very poor on several movements. In our opinion the added left turn lane is advantageous and provides more efficient time assignment to the heavy north-south movements.

15. *2031: the only recommendation is for EB RTL on Snow Valley Rd. at Hwy 26. Why is there no mention of the signals at Forbes IC shown in the 2031 schematic?*

The 2031 recommended improvements (for intersections involving Hwy 26 or Hwy 400) are the EB RTL on Snow Valley Road, and the addition of a NB Protected Left on Hwy 26 at Carson Road. No improvements are proposed at the Hwy 400 Off Ramps on Forbes Road. The schematic of Forbes IC has been revised. The Figure was simply a representation of proposed ramps to convey a sense of the area required for possible long term improvements beyond 2031.

16. 2041: please provide clarification on if 2041 recommendations may be required sooner. The signal recommendations for the IC seem 10 years late, as they are shown in 2031 schematic.

The operational analysis shows that for the 2031 traffic projections (5,000 residential units) the Hwy 400 Ramps at Forbes Road operate well, in their current configuration. The 2041 recommendations include the proposed Phase 2 development lands which were appealed by MMAH in 2012 and are still in front of the OMB (i.e. not yet approved). We acknowledge that if Phase 2 proceeds after 2031 it will require improvements as a minimum to the Hwy 400 ramps. We have proposed that the remedy may be a re-arrangement of the ramps or it may be a complete revision of the interchange. However, we suggest that trying to define the details of those improvements this far in advance is impractical and we acknowledge that the Township would have to undertake EA Study prior to the approval of Phase 2 to clearly define the required works. We also acknowledge that the cost is to be borne by Township/County Development Charges.

It should be noted that the Township currently has included $6,000,000 for the interchange ramp works associated with the future Phase 2 works.

17. There is no reference in the TIS to the schematic for 2041 showing a Parclo A-4 IC at Hwy 400 / Forbes Rd. Please confirm how this requirement was determined, and note that the Township, as proponent, will be required to undertake an EA Study for reconfigured interchange.

See the response to the previous question.

*Additional Comments on Schematics:*
*Highway 400 / Forbes Rd.:*

18. *Please confirm the posted and design speed of Forbes through the interchange, and provide a Design Criteria table showing existing, standard, proposed.*

It is proposed that the speed limit between County Road 27 and Russell Road and on Forbes Road between Russell Road and Old Second Road be 60km/hr. If the lands immediately adjacent to that portion of the road are developed at some time in the future then the posted speed will be dropped to 50 km/hr. For the segment from Old Second Road to east of Highway 400 interchange the posted speed is 80 km/hr. We would recommend that the zone through the interchange ramp terminals be reduced to 60 km/hr but detailed design is to be completed following a Municipal Class EA process.

19. Is an EB LTL required at the east ramp terminal?

Our analysis indicates that an eastbound to northbound left turn lane at the east ramp terminal is required by the 2041 horizon not the 2031 horizon.

If yes, does the Ramp N-E merge lane need to be extended beyond the left turn lane?

We suggest that it would need to be extended and the merge condition dealt with after the left turn movement is done. The drivers making this left will typically be coming from further west. Those in the merge lane have just come from Hwy 400 south and very few of those will be trying to turn left onto the northbound ramp. By extending the merge lane beyond that left turn point means only one maneuver at a time is dealt with.

20. The lane balancing/drops/tapers/curves at the west ramp terminal are all "compressed".

See the response to item 16.

21. *Consider moving west the entrance near to the west terminal intersection.*

Acknowledged, this can be addressed during detailed design. As noted previously the ramp offset may be one possible solution determined in a Municipal Class EA or it may determine that more extensive improvements are required. We suggest that the process is best commenced once we see how Phase 1 progresses and how our traffic model assumptions match actual traffic growth during Phase 1 development.

*With respect to the 3 intersections on Highway 26:*
*General:*

22. *Provide dimensions (storage, parallel, taper) radii, posted (and design) speeds, intersection skews, etc. for all roads.*

On the updated schematics we have included a Table with that information and identified proposed taper and parallel segment widths.

*23. Carson/Hwy 26:*

- *Existing the building in the SE quadrant is missing; aerials look to old.*
- *Why has the existing NB RTL been removed?*

The aerial photography has been updated. The deletion of the right turn lane is based on the very low number of right turn movements. The 2041 PM peak projection is 17. The right turn lane was deleted as a partial balance to the addition of a second left turn lane.

*24. Snow Valley/Hwy 26:*

- *Consider closing the southerly plaza entrance in the NE quadrant.*
- *There is a new SB RTL shown, but is not identified in the TIS.*
- *Please clarify what the red lines represent.*

The existing plaza is operating under an approved Site Plan. However, your comments are acknowledged and perhaps the southerly entrance can be modified to a right in right out only access during detailed design.

The additional SB RTL is identified in Appendix B Operational Analysis for the "2041 with improvements analysis" and the improvement is included as one of the requirements between Tables 8 and 9 of the Operational Analysis Memo. The red lines show the proposed 23 m ROW.

*25. CR 27/Hwy 26*

- *Design is for signalized condition, but as noted earlier confirmation on need for signals is required.*

Our reference to signal warrants were based on previous findings by BA Group. We accept the analysis provided by MTO using April 2017 traffic data and have revised our summary.

*26. LTL on west approach looks to be on curve; tangential approach would be needed for signals.*

The alignment follows the existing alignment. Refinement of the alignment can be undertaken in detailed design.

*27. Show the existing WB RTL to the commuter parking lot in the NW quadrant.*

Schematic has been revised

*28. Finally, please confirm that this TIS, including schematics, has been shared with and reviewed by Simcoe County.*

We confirm that we have had discussions with the County of Simcoe regarding the road improvements and particularly where they relate to County Road and that the OAM has been submitted to the County.

If you have any questions on the above, please do not hesitate to contact our office.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

Steve Fournier P. Eng.
Senior Project Engineer

*S:\113027\Steve's ESR DRAFT\Correspondance County and MTO Summary\RESPONSE TO MTO QUESTIONS\MTO Response Attachments May 2018\Midhurst - Response to MTO Comments (Jun 5 2018).docx*

Ainley GROUP CONSULTING ENGINEERS PLANNERS

# MEMORANDUM

**Ainley & Associates Limited**
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To: **MTO**

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**Steve Fournier – Ainley Group**

From: **Lilly Chen**

Date: **May 30, 2018**

Ref: **Township of Springwater – Midhurst Phase 3 & 4 Operational Analysis**

File: **113027-311**

The analysis and results presented in this Memo has been derived from our overall Operational Analysis dated March 2017 which was prepared in conjunction with a Municipal Class Environmental Assessment for the Midhurst area road network improvements.

A Transportation Report had been prepared in 2008 to identify the major transportation needs in the area. However, significant changes have been made to the development plans, such as the numbers of units, land uses, timing and phasing of the developments etc. To fulfill the requirements of the EA, updated road and intersection improvement needs and timing of the improvements to the area road network are to be identified. In addition, traffic count data and traffic volume projections need to be updated given the 2008 traffic counts in the Transportation Report are out-of-date.

The overall purpose of this memo is to assess the transportation needs of the section of Highway 26 from Carson Road to Spence Ave/County Road 27, and the intersections of Hwy 400 ramps at Forbes Road under existing conditions and future traffic projections for the horizon years of 2031 (full build-out of Phase 1) and 2041 (ultimate horizon).

## 1. Existing Traffic Volumes

Weekday AM and PM peak hour Traffic Counts conducted on Tuesday June 11, 2013 from 7:45 to 8:45 and from 16:30 to 17:30 are available from BA Group's Midhurst Transportation Work Update Memo dated November 12, 2013.

A review of the traffic volumes along the boundary roads and key area intersections from March 2008 weekday and June 2013 weekday indicated the following:

- In most cases, 2013 traffic volumes are higher than the 2008 traffic volumes;
- 2013 traffic volumes are in the order of 77 % to 154% of the 2008 volumes at the locations where traffic volumes are higher (more than 100 vehicles per hour per lane for both AM and PM peak hours);
- Should a seasonal variation factor is considered, based on MTO Seasonal Variation Graphs for Commuter Recreation road character for Highway 26, June counts are approximately 30% higher than March counts;
- Higher growth is on the east-west oriented roads, such as Snow Valley Road (18% to 42%), Finlay Mill Road (27%) and Highway 26 west of County Road 27 (6 % to 54%); and
- Lower growth is on the north-south oriented roads, such as Bayfield Street (-23% to 15%), Wilson Drive (-3% to 22%).

Historic AADT data on the section of Highway 26 from Barrie northerly limits to County Road 27 obtained from

MTO indicates a 1.1% annual growth rate from 2006 to 2010. To reflect the current 2015 traffic volumes, the 2013 traffic counts were increased by 2.2%. The corresponding 2015 weekday peak hour traffic volumes are shown in Figure 2, Appendix A.

**2. Speed Limit & Existing 2015 Lane Configuration**

An 80 km/hr speed limit is posted on the following roads in the study area:

- Highway 26/27
- County Road 27
- Snow Valley Road west of Highway 26 to the west
- Forbes Road

A 60 km/hr speed limit is posted on the following roads in the study area:

- Snow Valley Road near Highway 26

A 50 km/hr speed limit is posted on the following roads in the study area:

- Carson Road from Anne Street to Highway 26/27
- Finlay Mill Road

The existing configurations of the key intersections are illustrated in Figure 1 Appendix A.

**3. Existing Intersection Operations**

Based on the existing intersection lane configurations and control, analyses of the Highway 26 intersections and Hwy 400 ramps/Forbes Road intersections were conducted for the existing peak hour traffic volumes. The methodology applied was consistent with the 2010 *Highway Capacity Manual* method for unsignalized and signalized intersections and the Synchro Delay method for signalized intersections as employed in the software program Synchro 8.

Table 1 summarizes the results of the analysis with level of service (LOS), estimated delays (measured in seconds) and volume to capacity (v/c) ratio provided. Level of service A, corresponding to minimal delays, is the best whereas level of service F, corresponding to high delays, is generally considered poor conditions. When volume is less than capacity, v/c ratio is less than 1. Otherwise, v/c ratio equals to 1 or more than 1, which means volume reaches capacity or is more than capacity.

For unsignalized intersections, the level of service corresponds to the minor street lane groups given that the major street movements proceed relatively unimpeded. For signalized intersections, the results pertain to the average intersection delay, lane group delay and assume optimal signal timing and phasing to achieve the most efficient overall network operations through signal coordination. If the actual situations are under expectations, adjustments to the signal timing and/or phasing can be readily implemented. Level of service definitions and the corresponding detailed worksheets are included in Appendix C.

**Table 1 – 2015 Intersection Operations**

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| Highway 26 & Carson Rd | all | signal | 8.6 | A | | 9.9 | A | |
| | EBL | | 15.9 | B | 0.26 | 16.5 | B | 0.37 |
| | EBT-R | | 15.6 | B | 0.28 | 15.0 | B | 0.21 |
| | WBL | | 16.0 | A | 0.06 | 15.5 | B | 0.06 |
| | WBT-R | | 14.4 | B | 0.03 | 14.2 | B | 0.05 |

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| | NBL | | 9.8 | A | 0.08 | 11.8 | B | 0.18 |
| | NBT | | 6.3 | A | 0.37 | 9.2 | A | 0.64 |
| | NBR | | 4.7 | A | 0.01 | 5.1 | A | 0.02 |
| | SBL | | 7.3 | A | 0.02 | 11.4 | B | 0.03 |
| | SBT | | 8.7 | A | 0.53 | 9.2 | A | 0.54 |
| | SBT-R | | 8.6 | B | 0.53 | 9.2 | A | 0.54 |
| Highway 26 & Snow Valley Rd/Finlay Mill Rd | all | signal | 15.2 | B | | 16.3 | B | |
| | EBL | | 19.1 | B | 0.09 | 18.3 | B | 0.10 |
| | EBT-R | | 21.9 | C | 0.14 | 22.1 | C | 0.30 |
| | WBL | | 15.0 | B | 0.38 | 15.4 | B | 0.28 |
| | WBT-R | | 17.8 | B | 0.27 | 19.4 | B | 0.30 |
| | NBL | | 9.8 | A | 0.10 | 9.4 | A | 0.18 |
| | NBT | | 13.9 | B | 0.44 | 17.0 | B | 0.68 |
| | NBR | | 11.7 | B | 0.12 | 14.9 | B | 0.44 |
| | SBL | | 9.8 | A | 0.06 | 10.1 | B | 0.24 |
| | SBT | | 16.4 | B | 0.51 | 16.5 | B | 0.55 |
| | SBT-R | | 16.4 | B | 0.51 | 16.4 | B | 0.55 |
| Hwy 26/CR 27 & Spence Ave | EB | stop | 42.3 | E | 0.08 | **59.9** | **F** | 0.30 |
| | WB | | 41.1 | E | 0.05 | **50.2** | **F** | 0.12 |
| HWY 400 SB Off Ramp & Forbes Rd. | NBL | stop | 11 | B | 0.05 | 10.9 | B | 0.04 |
| HWY 400 NB Off Ramp & Forbes Road | SBL | stop | 10.3 | B | 0.04 | 11.4 | B | 0.14 |

As per the analyses, good levels of service (C or better) occur at the intersections of Highway 26/Snow Valley Road/Finley Mill Road, Hwy 26/Carson Rd, and Hwy 400 ramps on Forbes Road under the existing weekday conditions. However, at the intersection of Highway 26 at CR 27 and Spence Avenue, a poor level of service "F" is provided during the PM peak hour and thus improvements to the intersection should be considered.

The need for a traffic signal at the intersection of Highway 26 with CR27/Spence Avenue was reviewed. A signal warrant analysis was carried out based on recent 2017 traffic data provided by MTO. Traffic signal warrants for current traffic are not met. A traffic signal warrants were completed for 2031 traffic projections with Phase 1 development in place and the signal warrants are met for those conditions. As development proceeds the intersection operation is to be monitored and signals implemented when development traffic warrants the improvement.

**4. Historic Traffic Growth**

Historic traffic data for the area provincial highways and County Roads is available from MTO and the County of Simcoe. Growth rates were calculated based on the historic data as specified in Table 2.

**Table 2 - AADT Growth on the Area Major Roads**

| Section of Roads | Year | AADT | Year | AADT | Annual Growth Rate |
|---|---|---|---|---|---|

| Section of Roads | Year | AADT | Year | AADT | Annual Growth Rate |
|---|---|---|---|---|---|
| Hwy 26 from Barrie N Limits to CR 27 | 2006 | 20,300 | 2010 | 21,200 | 1.09% |
| CR 27 from Hwy 26 to CR 22 | 2003 | 10,700 | 2012 | 11,200 | 0.51% |
| Snow Valley Rd from Hwy 26 to Wilson Dr | 2009 | 2,600 | 2012 | 2,700 | 1.27% |
| Forbes Road from CR 93 to Hwy 400 | 2008 | 3,000 | 2014 | 3,700 | 3.56% |

## 5. Projected Growth

In developing future traffic projections, consideration has been given to population and employment forecasts in addition to the Midhurst developments.

### Population & Employment Trends

Traffic growth will depend largely on the population and employment growth of an area. The population and employment forecasts for the Township of Springwater are documented in the following reports:

- *Simcoe County Land Budget Data Collection and Analysis Phase 1: Population Growth* prepared by Simcoe County Planning Department dated February 2015
- *Proposed Amendment 1 to the Growth Plan for the Greater Golden Horseshoe, 2006* by the Ministry of Infrastructure dated October 2010
- *Simcoe Area Growth Plan* prepared by Hemson Consulting Ltd. Dated May 2008.

Future population and employment projections are provided in Table 3.

**Table 3 - Population and Employment Forecasts**

| Community | Population | | | Employment | | |
|---|---|---|---|---|---|---|
| | 2011 | 2031 | Annual Growth | 2006 | 2031 | Annual Growth |
| Township of Springwater | 18,749 | 24,000 | 1.2% | 5,000 | 5,600 | 0.5% |

It is assumed that projected growth includes partially Midhurst developments, but not all Phase 1 of the Midhurst developments.

### Growth from Midhurst Developments

The Midhurst developments located within the Midhurst Settlement Area are illustrated in Figure 3 of Appendix A and are listed below:

1) Neighbourhood #1 Carson Road Development – 2559 residential units plus employment land equivalent to 350 residential units;
2) Neighbourhood #2 Doran Road North Development – 1815 residential units;
3) Neighbourhood #3 Doran Road South Development – 3484 residential units;
4) Employment land #1 located on the north side of Snow Valley Road and east side of Wilson Drive – 2655 jobs; and
5) Employment land #2 located on the south side of Snow Valley Road and west side of Highway 26 – 475 jobs and 495,000 sq. ft. GFA commercial.

Trips generated by the above Midhurst developments have been specifically estimated, as per the *ITE Trip Generation Manual*. For the residential developments, trip rates were calculated by using the trip estimate equations and a combination of 77% single family detached units (land use code 210) and 23% residential condo/townhouse units (land use code 230) given that the percentage of townhouse units in Phase 1 is 23%. For

the employment lands, trip rates were estimated by using the equations for general light industrial (land use code 110) and shopping centre land use (land use code 820).

Trips can be made between Carson Road development and the Employment Lands via an internal road between Snow Valley Road and Carson Road without using the boundary roads. These trips are considered internal trips and should be deduced from the total trips. An internal capture rate of 5% was assumed.

There are also trips to the commercial land use when people are on the way home or on the way to work etc. These are by-pass trips. These trips are already on the road network and should be deducted from the total trips. 25% by-pass trips for the commercial land use were assumed.

Trip estimates for the peak hours of the road network are provided in Table 4. In total, the Midhurst developments are expected to generate 6204 primary trips in the AM peak hour and 7842 trips in the PM peak hour (both inbound and outbound trips).

**Table 4 – Midhurst Developments Trip Generation Estimates**

| Development | Rate/ Estimate | Unit/ Size | Weekday AM Peak | | | Weekday PM Peak | | |
|---|---|---|---|---|---|---|---|---|
| | | | In | Out | Total | In | Out | Total |
| Carson Road | rate | unit | 0.15 | 0.47 | 0.62 | 0.443 | 0.254 | 0.697 |
| | estimate | 2909 | 435 | 1381 | 1816 | 1289 | 739 | 2028 |
| | 5% Internal Capture | | -22 | -69 | -91 | -64 | -37 | -101 |
| | Sub-total | | 413 | 1312 | 1725 | 1225 | 702 | 1927 |
| Doran Road North | rate | unit | 0.15 | 0.47 | 0.62 | 0.443 | 0.254 | 0.697 |
| | estimate | 1440 | 216 | 684 | 900 | 638 | 366 | 1004 |
| Doran Road South | rate | unit | 0.15 | 0.47 | 0.62 | 0.443 | 0.254 | 0.697 |
| | estimate | 3859 | 578 | 1832 | 2410 | 1710 | 980 | 2690 |
| Sub-total | | 8208 | 1207 | 3828 | 5035 | 3573 | 2048 | 5621 |
| Employment Land #1 | rate | employee | 0.25 | 0.05 | 0.3 | 0.07 | 0.24 | 0.31 |
| | estimate | 2655 | 661 | 136 | 797 | 173 | 650 | 823 |
| | 5% Internal Capture | | -33 | -7 | -40 | -9 | -32 | -41 |
| | Sub-total | | 628 | 129 | 757 | 164 | 618 | 782 |
| Employment Land #2 | rate | employee | 0.25 | 0.05 | 0.3 | 0.07 | 0.24 | 0.31 |
| | estimate | 475 | 118 | 25 | 143 | 31 | 116 | 147 |
| | rate | 1000 sq ft GFA | 0.49 | 0.31 | 0.8 | 1.84 | 1.91 | 3.75 |
| | estimate | 495 | 242 | 154 | 396 | 909 | 947 | 1856 |
| | 5% Internal Capture | | -18 | -9 | -27 | -47 | -53 | -100 |
| | 25% By-pass Trips | | -60 | -39 | -99 | -227 | -237 | -464 |
| | Sub-total | | 282 | 131 | 413 | 666 | 773 | 1439 |
| Total | | | 2117 | 4087 | 6204 | 4403 | 3439 | 7842 |

For the three residential developments, development phasing is shown in Figure 3 and Table 5. For the employment lands, it is anticipated that they will be completed during Phase 1 by 2031. By 2027, all approved units (3850 units) would be built. By 2031 Phase 1 of the Midhurst developments are expected to generated 4209 trips in the AM peak hour and 5615 trips in the PM peak hour (both inbound and outbound trips).

**Table 5 – Development Phasing**

| Build Out Timing/Phasing | Carson Rd Development | | | Doran Road North Dev. | | Doran Road South Dev. | | Cumulative Total Units |
|---|---|---|---|---|---|---|---|---|
| | Residential Units | Emp. Units | % Build Out | Units | % Build Out | Units | % Build Out | |
| Stage 1 - 2018 | 748 | 100 | 29 | 232 | 16 | | | 1080 |
| Stage 2 -2022 | 819 | 100 | 61 | 297 | 37 | | | 2296 |
| Stage 3 - 2025 | 487 | 100 | 81 | 291 | 57 | | | 3174 |
| Stage 4 - 2027 | 219 | 50 | 90 | 407 | 85 | | | 3850 |
| Stage 5- 2031 | 27 | | 91 | 213 | 100 | 910 | 24 | 5000 |
| Ph1 Subtotal 2031 | 2300 | 350 | 91 | 1440 | 100 | 910 | 24 | 5000 |
| Stage 6 - 2034 | 259 | | 100 | 375 | | 375 | 43 | 6009 |
| Stage 7 - 2036 | | | | | | 750 | 62 | 6759 |
| Stage 8 - 2039 | | | | | | 725 | 81 | 7484 |
| Stage 9 - 2041 | | | | | | 724 | 100 | 8208 |
| Total 2041 | 2909 | | 100 | 1815 | 100 | 3484 | 100 | 8208 |

The Transportation Master Plan prepared by the County of Simcoe and the analysis of the area traffic during the assessment of a potential partial interchange on Highway 400 at Pooles Road (AECOM June 2015) describe the prime origin / destination for the Midhurst area as 70% to and from the south. No other guidance is provided on the other directions and we have assigned 10% to each of the other cardinal directions. There are several north south options available to existing and future residents of Midhurst and the route selection will be dependent on where they are situated within Midhurst. We have assumed that if you are in the Carson Road area development the traffic to and from the south would typically use Highway 26/Bayfield or Anne Street or Wilson Road and unlikely to use St. Vincent Street or Highway 400. For those in the Russell Road/Doran Road area developments the route selection to and from the south would be on Highway 400 or St. Vincent Street or Highway 26/Bayfield Street.

Rudimentary time trials were carried out on the north south routes from Doran Road between Russell Road and St. Vincent Street to the intersection of Highway 400 and Bayfield Street by taking Russell to Forbes to Highway 400 and by taking Findley Mill Road/Highway 26/Bayfield and by taking Pooles to St. Vincent Street to Cundles Road to Bayfield to Highway 400. The data collected shows that the Forbes to Highway 400 route is the quickest during the PM Peak at approximately 10 minutes followed by the Highway 26 route at 11.5 minutes and then the St. Vincent Route at 13.5 minutes.

For the western development area of Carson Road between Highway 26 and Wilson Road we have assigned the 70% of traffic to and from the south as 30% along Highway 26, 20% along Anne Street and 20% along Wilson Road. For the eastern development area in the vicinity north of Doran Road between Russell and St Vincent we have assigned the 70% of traffic to and from the south as 45% to Forbes and Hwy 400, 5% to Findley Mill Road / Highway 26 and 10% to Craig Road to CR 27 / Hwy 26 and 5% to Pooles Road and St. Vincent. For the eastern development area in the vicinity south of Doran Road between Russell and St Vincent we have assigned the 70% of traffic to and from the south as 50% to Forbes and Hwy 400, 5% to Findley Mill Road and Highway 26 and 15% to Pooles Road and St. Vincent.

Based on the above, the following distributions were developed:

Carson Road Development

- 20% to/from the south via Wilson Drive

- 20% to/from the south via Anne Street
- 30% to/from the south via Highway 26
- 10% to/from the north via County Road 27
- 5% to/from the west via Highway 26
- 5% to/from the northwest via Wilson Drive/Snow Valley Rd.
- 5% to/from the west via Snow Valley Road / Hwy 26
- 5% to/from the east via Forbes Road

Doran Road North Development

- 45% to/from the south via Highway 400 and Forbes Road
- 5% to/from the south via St Vincent
- 5% to/from the south via Highway 26 and Finlay Mill Road
- 10% to/from the south via Highway 26 and Craig Road
- 5% to/from the north via County Road 27 and Craig Road
- 5% to/from the north via Highway 400 and Forbes Road
- 5% to/from the west via Doran, Spence and Highway 26
- 5% to/from the west via Snow Valley Road
- 10% to/from the east via Forbes Road
- 5% to/from the south via Russell and Pooles Road

Doran Road South Development

- 50% to/from the south via Highway 400 and Forbes Road
- 15% to/from the south via St Vincent
- 5% to/from the south via Highway 26 and Finlay Mill Road
- 0% to/from the south via Highway 26 and Craig Road
- 5% to/from the north via Russell – Craig Rd - County Road 27
- 5% to/from the north via Highway 400
- 5% to/from the west via Doran, Spence and Highway 26
- 5% to/from the west via Snow Valley Road
- 10% to/from the east via Forbes Road

Employment Land #1

- 20% to/from the south via Wilson Drive
- 10% to/from the south via Anne Street
- 20% to/from the south via Highway 26
- 13% to/from the east via Finlay Mill Road
- 5% to/from the east via Craig Road
- 1% to/from the east via Doran Road
- 1% to/from the east via Carson Road east
- 15 % to/from north via CR 27
- 2% to/from the west via Snow Valley Road
- 13% to/from the northwest via Wilson Drive

Employment Land #2

- 10% to/from the south via Wilson Drive
- 10% to/from the south via Anne Street
- 30% to/from the south via Highway 26
- 13% to/from the east via Finlay Mill Road
- 5% to/from the east via Craig Road
- 1% to/from the east via Doran Road
- 1% to/from the east via Carson Road east

- 15 % to/from north via CR 27
- 2% to/from the west via Snow Valley Road
- 13% to/from the northwest via Wilson Drive

The development specific trip estimates were assigned to the area road network. The resulting traffic volumes attributed to the above noted developments are presented in Appendix B figures B1 thru B5.

**6. Future Traffic Volumes**

Given that development growth has been considered specifically and that the average growth rate for the section of Highway 26 is 1.09% for the past five years, an annual general background growth rate of 1.0% was applied for traffic volumes on Highway 26, CR 27, Wilson Drive, Snow Valley Road and Finlay Mill Road – Doran Road – Forbes Road corridor.

Estimates of future traffic volumes for the years 2031 and 2041 have been determined based on the following:
- 2015 traffic volumes;
- development specific trip generation volumes; and
- consideration for the 2031and 2041 horizon year growth rates.

The resulting future traffic projections are provided in Appendices E and F Figures 4 and 5 for the 2031 and 2041 horizon respectively. The AM and PM peak hour volumes are provided, reflective of weekday conditions. Initial assumption when this study was started was that Phase 1 development would commence in 2018. Obviously this will not be the case and the year 2018, as referred to here, represents the beginning of lot development.

**7. Future Road Network**

The County of Simcoe has recently completed an updated Transportation Master Plan. The final draft report dated September 2014 has identified the following improvements in the study area:
- Snow Valley Road from CR 28 to Highway 26 widening to 4 lanes by 2021
- Wilson Drive from Barrie limit to Highway 26 widening to 4 lanes by 2031
- Widening of CR 93 from CR 11 (Forbes Road) to City of Barrie limit shall be coordinated with MTO's widening of Highway 11
- CR 27 from Highway 26 to CR 22 widening to 4 lanes by 2041

It is assumed that the following road connections will be in place by 2025:
- Craig Road is opened from Russell Road to County Road 27 2018
- St Vincent Street is connected between Belmont Crescent and Park Trail

The timing for the above improvements should be sooner than later. The 10 year horizon is considered the worst case scenario and is to allow time for design and construction.

Route selection for the Craig Road link between Russell Road and County Road 27 along the north limits of the study area is still in the preliminary stages which will be refined as the overall design of the transportation improvements proceeds. Completion of this link during the first stage of Phase 1 development is necessary as it provides alternate routing for some development traffic to access the County Road 27/Hwy 26/ Bayfield corridor and to some extent Hwy 400 without using existing Midhurst community roads. This Craig Road link is proposed as a two lane rural roadway.

**8. Future 2031 Operations**

The following improvements have been assumed:
- Add a traffic signal and an exclusive left turn lane on the SB, EB and WB approaches at the intersection of Highway 26 / CR 27 / Spence Ave

- Add a NB advance green phase at the intersection of Highway 26 / Carson Road.

The operations of the key study area intersections were investigated based upon the existing configurations, the above improvements and the 2031 traffic projections. The results of the 2031 analyses are presented in Table 6 whereas the corresponding worksheets are provided in Appendix C.

**Table 6 – 2031 Intersection Operations**

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| Highway 26 & Carson Rd | all | signal | 26.3 | C | | 39.3 | D | |
| | EBL | | 32.6 | C | 0.64 | 76.9 | E | 0.87 |
| | EBT-R | | 42.5 | D | 0.84 | 57.8 | E | 0.77 |
| | WBL | | 40.6 | D | 0.15 | 58.9 | E | 0.20 |
| | WBT-R | | 31.3 | C | 0.07 | 52.9 | D | 0.16 |
| | NBL | | 21.2 | C | 0.57 | 79.7 | E | 0.96 |
| | NBT | | 13.4 | B | 0.52 | 13.3 | B | 0.70 |
| | NBR | | 13.3 | B | 0.52 | 13.2 | B | 0.70 |
| | SBL | | 17.1 | B | 0.05 | 24.0 | C | 0.14 |
| | SBT | | 30.5 | C | 0.85 | 46.5 | D | 0.94 |
| | SBT-R | | 31.2 | C | 0.86 | 53.7 | D | 0.98 |
| Highway 26 & Snow Valley Rd/Finlay Mill Rd | all | signal | 35.5 | D | | 60.9 | E | |
| | EBL | | 24.5 | C | 0.39 | 31.4 | C | 0.62 |
| | EBT-R | | 44.4 | D | 0.79 | **115.9** | **F** | **1.09** |
| | WBL | | 24.3 | C | 0.72 | 57.6 | E | 0.86 |
| | WBT-R | | 28.3 | C | 0.58 | 43.4 | D | 0.46 |
| | NBL | | 39.1 | D | 0.82 | **105.9** | **F** | **1.00** |
| | NBT | | 23.6 | C | 0.65 | 45.0 | D | 0.88 |
| | NBR | | 17.7 | B | 0.18 | 36.0 | D | 0.63 |
| | SBL | | 17.7 | B | 0.14 | 37.2 | D | 0.59 |
| | SBT | | 50.6 | D | 0.94 | 66.6 | E | 0.96 |
| | SBT-R | | 51.5 | D | 0.94 | 68.6 | E | 0.97 |
| Hwy 26/CR 27 & Spence Ave | all | signal | 12.8 | B | | 10.7 | B | |
| | EBL | | 34.1 | C | 0.29 | 33.6 | C | 0.54 |
| | EBT | | 32.3 | C | 0.12 | 28.5 | C | 0.17 |
| | EBR | | 0.5 | A | 0.30 | 0.7 | A | 0.39 |
| | WBL | | 31.6 | C | 0.03 | 27.8 | C | 0.03 |
| | WBT-R | | 35.2 | D | 0.37 | 28.3 | C | 0.12 |
| | NBL | | 14.8 | B | 0.76 | 14.8 | B | 0.74 |
| | NBT-R | | 2.1 | A | 0.20 | 3.8 | A | 0.45 |
| | SBL | | 15.6 | B | 0.00 | 14.7 | B | 0.04 |
| | SBT-R | | 23.6 | C | 0.76 | 21.7 | C | 0.74 |

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| HWY 400 SB Off Ramp & Forbes Rd. | NBL | stop | 19.2 | C | 0.15 | 26.3 | D | 0.33 |
| | WB L | free | 10.7 | B | 0.13 | 9 | A | 0.54 |
| HWY 400 NB Off Ramp & Forbes Road | SBL | stop | 18.1 | C | 0.10 | 21.0 | C | 0.32 |
| | EBL | free | 8.1 | A | 0.10 | 8.3 | A | 0.08 |

Given the assumed improvements, all intersections and their lane groups will operate acceptably at a level of service "E" or better in the 2031 horizon except for the intersection of Highway 26 at Snow Valley Road where a poor level of service "F" occurs on the eastbound through-right shared lane and the northbound left turn lane, volumes are at or over capacity during the PM peak hour. Thus, improvements at the intersection are required.

With an eastbound right turn lane added at the intersection of Highway 26 at Snow Valley Road/Finlay Mill Road, the intersection would operate acceptably. The results of the analysis are summarized in Table 7.

**Table 7 – 2031 Intersection Operations with Improvements**

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| Highway 26 & Snow Valley Rd/Finlay Mill Rd | all | signal | 31.7 | C | | 36.8 | D | |
| | EBL | | 25.2 | C | 0.40 | 30.2 | C | 0.71 |
| | EBT | | 30.9 | C | 0.26 | 45.2 | D | 0.75 |
| | EBR | | 35.2 | D | 0.63 | 51.9 | D | 0.81 |
| | WBL | | 21.0 | C | 0.58 | 28.9 | C | 0.62 |
| | WBT-R | | 29.4 | C | 0.63 | 41.1 | D | 0.70 |
| | NBL | | 32.7 | C | 0.78 | 42.5 | D | 0.83 |
| | NBT | | 22.0 | C | 0.63 | 30.1 | C | 0.85 |
| | NBR | | 16.5 | B | 0.18 | 24.4 | C | 0.60 |
| | SBL | | 16.5 | B | 0.13 | 22.8 | C | 047 |
| | SBT | | 44.9 | D | 0.91 | 44.3 | D | 0.91 |
| | SBT-R | | 45.7 | D | 0.91 | 45.6 | D | 0.92 |

**9. Future 2041 Operations**

Given the future 2041 total traffic volumes, an additional through lane in each direction for a total of 4 lanes are required on Forbes Road from Russell Road to Highway 400.

A traffic signal warrant analysis was carried out at Forbes Road / Highway 400 SB off-ramp intersection. A traffic signal is warranted at the SB Off Ramp intersection for the 2041 horizon. The SB off-ramp intersection also warrants a west bound to southbound left turn lane. The intersection of the Highway 400 NB Off Ramp does not warrant traffic signal in 2041 but does warrant a left turn lane. As Phase 2 develops the Highway 400 / Forbes Road intersection needs to be monitored to identify the required timing of the off ramp intersection improvements. Once the improvements are provided the LOS for the 2041 build out traffic is very good but there are constraints on the length of the left turn lanes to be provided with the ramps at their current offset from Highway 400. Prior to commencing development of Phase 2 the Municipality is committed to undertaking a Municipal Class Environmental Assessment with inclusion of MTO requirements. This may identify increasing the ramp offset or

considerable alteration of the interchange as a whole. Starting the process towards the latter half of Phase 1 provides an opportunity to test and refine the assumptions on traffic growth and distribution for the proposed development.

The operations of the key study area intersections were investigated based upon the existing configurations, the 2031 improvements, the above noted improvements, and the 2041 traffic projections. It is assumed that significant improvements would be provided in the area of the Highway 400/Forbes Road interchange, Forbes Road and Russell Road. The results of the 2041 analyses are presented in Table 8 whereas the corresponding worksheets are provided in Appendix C.

**Table 8 – 2041 Intersection Operations**

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| Highway 26 & Carson Rd | all | signal | 38.1 | D | | 52.6 | D | |
| | EBL | | 32.6 | C | 0.64 | 83.8 | F | 0.89 |
| | EBT-R | | 42.5 | D | 0.84 | 75.3 | E | 0.81 |
| | WBL | | 40.6 | D | 0.15 | 65.3 | E | 0.22 |
| | WBT-R | | 31.3 | C | 0.07 | 57.2 | E | 0.15 |
| | NBL | | 21.2 | C | 0.57 | 117.3 | F | 1.07 |
| | NBT-R | | 13.3 | B | 0.52 | 16.9 | B | 0.78 |
| | SBL | | 17.1 | B | 0.05 | 34.3 | C | 0.18 |
| | SBT-R | | 51.2 | D | 0.99 | 63.8 | F | 1.01 |
| Highway 26 & Snow Valley Rd/Finlay Mill Rd | all | signal | 46.7 | D | | 51.3 | D | |
| | EBL | | 27.4 | C | 0.46 | 46.3 | D | 0.82 |
| | EBT | | 33.3 | C | 0.34 | 88.4 | F | 0.97 |
| | EBR | | 39.3 | D | 0.67 | 68.4 | E | 0.86 |
| | WBL | | 23.8 | C | 0.71 | 48.9 | D | 0.86 |
| | WBT-R | | 30.7 | C | 0.69 | 51.8 | D | 0.74 |
| | NBL | | 63.7 | E | 0.94 | **81.6** | **F** | 0.95 |
| | NBT | | 27.9 | C | 0.74 | 36.5 | D | 0.88 |
| | NBR | | 20.0 | C | 0.24 | 31.6 | C | 0.71 |
| | SBL | | 19.9 | B | 0.18 | 31.6 | C | 0.60 |
| | SBT | | 79.3 | **F** | **1.05** | 57.5 | E | 0.96 |
| | SBT-R | | **81.5** | **F** | **1.05** | 60.6 | E | 0.97 |
| Hwy 26/CR 27 & Spence Ave | all | signal | 20.1 | C | | 15.0 | B | |
| | EBL | | 33.5 | C | 0.16 | 35.9 | D | 0.49 |
| | EBT | | 33.4 | C | 0.17 | 35.9 | D | 0.52 |
| | EBR | | 0.6 | A | 0.33 | 0.8 | A | 0.43 |
| | WBL | | 32.4 | C | 0.01 | 31.6 | C | 0.02 |
| | WBT-R | | 37.2 | D | 0.54 | 33.5 | C | 0.32 |
| | NBL | | 27.2 | C | 0.88 | 22.4 | C | 0.82 |
| | NBT-R | | 3.3 | A | 0.23 | 4.2 | A | 0.47 |

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| | SBL | | 19.5 | B | 0.0 | 18.2 | B | 0.04 |
| | SBT-R | | 33.9 | C | 0.86 | 29.7 | C | 0.83 |
| HWY 400 SB Off Ramp & Forbes Rd. | all | signals | 11.3 | B | | 19.5 | B | |
| | NBL | | 11.8 | B | 0.12 | 19.5 | B | 0.32 |
| | WB L | | 15.3 | B | 0.29 | 9.5 | A | 0.10 |
| | WBT | | 11.0 | B | 0.46 | 22.6 | C | 0.93 |
| | EBT | | 10.8 | B | 0.43 | 7.9 | A | 0.23 |
| HWY 400 NB Off Ramp & Forbes Road | SBL | stop | 34.8 | D | 0.22 | 52.4 | **F** | 0.63 |
| | EBL | free | 8.6 | A | 0.18 | 9 | A | 0.14 |

Given the increase in traffic volumes, despite the assumed improvements, a poor level of service "F" occurs at the following intersections:

- Highway 26 at Carson Road
- Highway 26 at Snow Valley Road
- Forbes Road at Highway 400 NB off-ramp

Thus improvements at these intersections should be considered. The following improvements are recommended:

Intersection of Highway 26 at Carson Road

- Add an eastbound right turn lane; and
- Add a northbound left turn lane to a double left turn lane

Intersection of Highway 26 at Snow Valley Road

- Add a southbound right turn lane. Add an eastbound right turn lane

Intersection of Highway 400 NB Off Ramp with Forbes Rd.

- Add an eastbound to northbound left turn lane

Based on the above improvements, the above intersections would operate acceptably. The results of the analysis are summarized in Table 9.

**Table 9 – 2041 Intersection Operations with Improvements**

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| Highway 26 & Carson Rd | all | signal | 30.9 | C | | 30.2 | C | |
| | EBL | | 36.3 | D | 0.71 | 69.5 | E | 0.89 |
| | EBT | | 23.6 | C | 0.00 | 34.8 | C | 0.02 |
| | EBR | | 33.8 | C | 0.79 | 34.4 | C | 0.57 |
| | WBL | | 32.4 | C | 0.09 | 45.6 | D | 0.15 |
| | WBT-R | | 32.0 | C | 0.08 | 45.8 | D | 0.21 |
| | NBL | | 20.3 | C | 0.36 | 46.2 | D | 0.86 |
| | NBT | | 13.3 | B | 0.56 | 16.3 | B | 0.80 |
| | NBT-R | | 13.2 | B | 0.56 | 16.2 | B | 0.81 |
| | SBL | | 17.4 | B | 0.05 | 30.2 | C | 0.17 |

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| | SBT | | 40.8 | D | 0.95 | 31.9 | C | 0.91 |
| | SBR | | 44.4 | D | 0.97 | 39.4 | D | 0.96 |
| Highway 26 & Snow Valley Rd/Finlay Mill Rd | all | signal | 32.4 | C | | 38.0 | D | |
| | EBL | | 23.1 | C | 0.42 | 45.3 | D | 0.81 |
| | EBT | | 29.1 | C | 0.33 | 79.3 | E | 0.96 |
| | EBR | | 24.2 | C | 0.42 | 35.3 | D | 0.59 |
| | WBL | | 19.4 | B | 0.68 | 39.5 | D | 0.83 |
| | WBT-R | | 26.7 | C | 0.68 | 41.1 | D | 0.66 |
| | NBL | | 38.1 | D | 0.82 | 43.3 | D | 0.83 |
| | NBT | | 30.3 | C | 0.82 | 39.1 | D | 0.92 |
| | NBR | | 8.4 | A | 0.16 | 15.3 | B | 0.55 |
| | SBL | | 20.1 | C | 0.18 | 28.8 | C | 0.59 |
| | SBT | | 50.8 | D | 0.98 | 35.9 | D | 0.85 |
| | SBR | | 20.0 | C | 0.38 | 15.4 | B | 0.27 |
| HWY 400 NB Off Ramp & Forbes Road wt EB Lt | SBL | stop | 20.3 | C | 0.13 | 22.3 | C | 0.36 |
| | EBL | free | 8.6 | A | 0.18 | 9 | A | 0.14 |

**10. Roundabout Alternative Considerations**

A roundabout alternative was considered at each of the future signalized intersections. Because of geometric and other constrains (i.e. train track, slope, sightline, property, natural environment etc.), only the following Highway intersections were considered further:

- Highway 26 and Carson Road
- Highway 26 and County Road 27

Roundabout operational analysis was carried out for the above two intersections based on the 2041 traffic volumes and 2041 area road lane configurations. The results of the 2041 roundabout analyses are presented in Table 10 whereas the corresponding worksheets are provided in Appendix C.

**Table 10 – 2041 Intersection Operations - Roundabout**

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| Highway 26 & Carson Rd | all | 2 lane round-about | **98.9** | **F** | | **160.9** | **F** | |
| | EB | | **430.7** | **F** | **1.88** | **260.1** | **F** | **1.48** |
| | WB | | 11.9 | B | 0.11 | 29.8 | D | 0.27 |
| | NBL-T | | 17.3 | C | 0.71 | **145.2** | **F** | **1.27** |
| | NBT-R | | 21.7 | C | 0.79 | **204.2** | **F** | **1.41** |
| | SBL-T | | 21.7 | C | 0.82 | **95.7** | **F** | **1.13** |
| | SBT-R | | 32.0 | D | 0.91 | **141.8** | **F** | **1.25** |
| Hwy 26/CR 27 & Spence Ave | all | 2 lane round- | 13.8 | B | | 25.4 | D | |
| | EBL-T | | 6.7 | A | 0.09 | 9.9 | A | 0.27 |

| Intersection | | Control | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Delays(s) | LOS | v/c | Delays(s) | LOS | v/c |
| | EBR | about with an EB right turn bypass | 0 | A | 0.28 | 0 | A | 0.36 |
| | WB | | 11.9 | B | 0.23 | 17.1 | C | 0.22 |
| | NBL-T | | 13.0 | B | 0.66 | 28.8 | D | 0.89 |
| | NBT-R | | 10.3 | B | 0.56 | 47.4 | E | 0.99 |
| | SBL-T | | 23.4 | C | 0.72 | 19.6 | C | 0.68 |
| | SBT-R | | 27.0 | D | 0.78 | 22.3 | C | 0.74 |

As indicated in Table 10, volumes are over capacity on several lane groups/approaches at the intersection of Highway 26 with Carson Road. A roundabout is not a viable option for the intersection. With regards to the Hwy 26/ County Road 27 intersection, even with an eastbound right turn bypass has been added to the roundabout, the northbound through-right shared lane reaches its capacity. Thus a roundabout is not recommended at that intersection either.

## 11. Conclusion

Based on the above analyses, it is concluded that the following timing and improvements are recommended at intersections involving Hwy 26 or Hwy 400.

**2018 horizon**

- With the start of development construct Craig Road from Russell Road to County Road 27.

**2031 horizon**

- Monitor traffic growth and prior to 2031 add a traffic signal at the intersection of Highway 26/Spence Avenue with Highway 26/County Road 27 including an exclusive left turn lane on the north, east and west approaches
- Add an eastbound right turn lane at the intersection of Highway 26 with Snow Valley Road
- Add a northbound protected left phase at the intersection of Highway 26 and Carson Road

**2041 horizon**

- Add an eastbound right turn lane on Carson Road at Highway 26, and add a northbound left turn lane (double northbound left turn lane) on Highway 26 at Carson Road
- Add a southbound right turn lane on Highway 26 at Snow Valley Road.
- Add an additional through lane in each direction for a total of 4 lanes on Forbes Road from Russell Road to Highway 400
- Add a traffic signal at the intersection of Forbes Road/Highway 400 SB on/off ramp along with a westbound left turn lane and an eastbound channelized right turn lane.
- Add an eastbound left turn lane on Forbes Road at Highway 400 NB on/off ramp.

S:\113027\Steve's ESR DRAFT\Correspondance County and MTO Summary\MEMO_Midhurst_Traffic_Analysis_to MTO_SLF.doc

## Joe Mullan

**From:** Dorton, Peter (MTO) <Peter.Dorton@ontario.ca>
**Sent:** Monday, September 17, 2018 3:51 PM
**To:** Steve Fournier, P.Eng.
**Cc:** Joe Mullan; brent.spagnol@springwater.ca; heather.coleman@springwater.ca; Meile, Christian; Shen, Rey (MTO); MacKinnon, John (MTO); Munro, Janice (MTO); Janke, Aaron (MTO); Uddin, Zaka (MTO); Diczki, Tarita (MTO); Mac, Frank (MTO); Vandenberg, Robert (MTO); Hao, Jiang Yang (MTO); Van Voorst, John (MTO); Sieradzki, Susan (MTO)
**Subject:** RE: Midhurst Secondary Plan EA Ph 3 and 4, Traffic
**Attachments:** Midhurst 2041 Total PM September 14 Zaka.syn

Steve:

We have completed our review of the May 30, 2018 Traffic Operations Analysis, and the Summary letter, and we offer the following comments:

1. Appendix B includes 5 figures (Figure B1 – B5), which illustrate the distribution of site generated traffic from individual development zones but the report does not present a figure to indicate the overall total trips produced by the entire secondary plan. Please provide the figure.

2. The summary of trip generation calculations is not appended in Appendix A (ref comment # 5).

3. Appendix H - Hwy 26/CR27 intersection; there are discrepancies in the traffic volumes used for signal warrant calculations. For instance in justification 1, traffic volumes under 'Hour 1 and 8' should be 465 and 700 instead of 863 and 1033 respectively.

4. The trip generation calculations summary in Appendix 'A' has fonts so small that makes it illegible. Please provide in a format that can be easily read.

5. While we agree in principle to the improvements suggested in the report, we have the following few comments for your consideration:

    a) Hwy 26/CR 27/Spence Ave intersection – The report recommends traffic signals at the intersection in 2031 horizon. Please note the operations at the intersection will be monitored, and signals shall only be installed when the warrants are met. As per ministry policy, consideration will also be given to the option of converting the intersection to a roundabout.

    b) Hwy 26/Carson Rd intersection – double northbound left turn lane on Hwy 26 is recommended; the ministry discourages dual LT lanes due to associated safety issues. We have run a SYNCHRO analysis (copy attached), which demonstrates that the intersection will operate satisfactorily with a single left turn lane in 2041 with the addition of a SBRT lane since the southbound right turn volumes are very high (284 v/h) and warrant an exclusive lane.

    c) Hwy 400/Forbes Rd Ramp Terminal intersections – the schematic provided for 2031 does not comply with geometric design standards. The additional lanes recommended at the west terminal are of substandard lengths. The WBLT lane cannot be accommodated due to the insufficient offset distance between the intersection and the bridge. To accommodate additional lanes, widening of the underpass structure may be required, or alternatively there may be a need to accelerate consideration of a Parclo A-4 interchange

configuration. Also, with signalization of the ramp terminal intersections, removal of the right turn channels may be required.

d) In future, when undertaking detail design for highway improvements, please conduct a feasibility review to accommodate active transportation at the Hwy 400/Forbes Rd IC and other highway intersections.

6. We did not see any cost estimates for the highway improvements in the information provided, including the ESR or Open House materials. Please acknowledge that all highway improvements noted as required to accommodate secondary plan development will undertake at the Township's expense (recognizing that these should be recovered from the developer groups).

7. We recommend and request that the Township endorse in principle the need for the Township and MTO to enter into a legal agreement whereby the Township agrees to fund, design and construct the recommended highway improvements in the timelines / horizon years noted, including updating the Traffic Operational Analysis every 5 years to confirm that the timelines / horizon years noted remain applicable (ie. we can consider revisions to schedules for highway improvement works if supported by updated traffic analysis). I will then draft an agreement for the Township to review.

8. Finally, with respect to proposed servicing to support secondary plan development, any proposed works within and/or crossing highway rights-of-way will require MTO Encroachment permit approvals. We would suggest that preliminary design proposals be shared with this office early in the planning process, to ensure acceptability in principle prior to undertaking any detail design work.

Please feel free to contact me if you have any questions.

Thanks,
Peter Dorton
Senior Project Manager
MTO Central Region Engineering Office
Corridor Management Section
159 Sir William Hearst Ave., 7th Floor
Toronto, ON M3M 0B7
Ph: 416-235-4280
Fx: 416-235-4267
Email: peter.dorton@ontario.ca

---

**From:** Dorton, Peter (MTO)
**Sent:** August 8, 2018 9:50 AM
**To:** 'Steve Fournier, P.Eng.'
**Cc:** 'brent.spagnol@springwater.ca'; 'heather.coleman@springwater.ca'; 'Meile, Christian'; Vandenberg, Robert (MTO); Uddin, Zaka (MTO); Diczki, Tarita (MTO); Janke, Aaron (MTO); 'Shawn.Aurini@ontraio.ca'; Mac, Frank (MTO); Shen, Rey (MTO)
**Subject:** RE: Midhurst Secondary Plan EA Ph 3 and 4, Traffic

Thanks Steve.

---

**From:** Steve Fournier, P.Eng. [mailto:fournier@ainleygroup.com]
**Sent:** August 8, 2018 9:38 AM
**To:** Dorton, Peter (MTO)
**Subject:** RE: Midhurst Secondary Plan EA Ph 3 and 4, Traffic

Ainley & Associates Limited
550 Welham Road, Barrie, Ontario, L4N 8Z7
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E-mail barrie@ainleygroup.com

November 9, 2018

File #113027

**"BY EMAIL"**

MTO Central Region Engineering Office
Corridor Management Section
159 Sir William Hearst Avenue, 7th Floor
Toronto, Ontario
M3M 0B7

Attn: **Mr. Peter Dorton**
**Senior Project Manager**

Ref: **Township of Springwater,**
**Midhurst Class EA**
**Response to MTO Comments**

Dear Mr. Dorton:

We provide the following answers to the questions in your September 17, 2018 email regarding the Midhurst Class EA and in particular the Traffic Operational Analysis Memorandum of May 30, 2018. For ease of reference we have repeated the original question (shown in blue) followed by our response.

1. *Appendix B includes 5 figures (Figure B1 – B5), which illustrate the distribution of site generated traffic from individual development zones, but the report does not present a figure to indicate the overall total trips produced by the entire secondary plan. Please provide the figure.*

   Appendix E contained total traffic volume (background + development traffic) for the horizon year 2031 and Appendix F provides that information for the horizon year 2041. We have attached the Schematics for the Total 2041 traffic (Trip Gen. and Traffic Projections). It includes sheets for the various development areas, existing traffic, background traffic growth and the first three sheets contain the Trip Generation summary

2. *The summary of trip generation calculations is not appended in Appendix A (ref comment # 5).*

   See the attached summary table (first three sheets in attached Trip Gen. and Traffic Projections).

3. *Appendix H - Hwy 26/CR27 intersection; there are discrepancies in the traffic volumes used for signal warrant calculations. For instance, in justification 1, traffic volumes under 'Hour 1 and 8' should be 465 and 700 instead of 863 and 1033 respectively.*

   We have re-run the analysis and attached a copy. The conclusion is unchanged.

4. *The trip generation calculations summary in Appendix 'A' has fonts so small that makes it illegible. Please provide in a format that can be easily read.*

   See the attached Excel Spreadsheet (first three sheets titled Trip Gen).

5. *While we agree in principle to the improvements suggested in the report, we have the following few comments for your consideration:*

   a) *Hwy 26/CR 27/Spence Ave intersection – The report recommends traffic signals at the intersection in 2031 horizon. Please note the operations at the intersection will be monitored, and signals shall only be installed when the warrants are met. As per ministry policy, consideration will also be given to the option of converting the intersection to a roundabout.*

      Acknowledged. The analysis in the ESR identifies that the warrant for signalization is not met for existing traffic. Using the traffic projections and assumed development schedules it is anticipated that signals will be warranted by 2031. As time and development progress, traffic growth will be monitored at this and other locations. Improvements may be advanced or delayed as required by actual traffic measurement. We did review the possibility of a roundabout at this location but found the grade of the north approach and, commercial access points along the east side, problematic, however we acknowledge that the option of installing traffic signals or a roundabout will be re-evaluated by the ministry in the future.

   b) *Hwy 26/Carson Rd intersection – double northbound left turn lane on Hwy 26 is recommended; the ministry discourages dual LT lanes due to associated safety issues. We have run a SYNCHRO analysis (copy attached), which demonstrates that the intersection will operate satisfactorily with a single left turn lane in 2041 with the addition of a SBRT lane since the southbound right turn volumes are very high (284 v/h) and warrant an exclusive lane.*

      We acknowledge the analysis you have provided and will update the ESR to note that this should be analyzed further in conjunction with the ministry at the detailed design stage, however we would like to keep the protected northbound left phase as was included in our original design.

   c) *Hwy 400/Forbes Rd Ramp Terminal intersections – the schematic provided for 2031 does not comply with geometric design standards. The additional lanes recommended at the west terminal are of substandard lengths. The WBLT lane cannot be accommodated due to the insufficient offset distance between the intersection and the bridge. To accommodate additional lanes, widening of the underpass structure may be required, or alternatively there may be a need to accelerate consideration of a Parclo A-4 interchange configuration. Also, with signalization of the ramp terminal intersections, removal of the right turn channels may be required.*

      Acknowledged

   d) *In future, when undertaking the detail design for highway improvements, please conduct a feasibility review to accommodate active transportation at the Hwy 400/Forbes Rd IC and other highway intersections.*

      Acknowledged.

6. *We did not see any cost estimates for the highway improvements in the information provided, including the ESR or Open House materials. Please acknowledge that all highway improvements noted as required to accommodate secondary plan development will undertake at the Township's expense (recognizing that these should be recovered from the developer groups).*

The ESR provided preliminary cost estimates for the various improvements in Table 7.6.6-1. Copy attached. The last Open House presentation material provided a general summary of road improvement costs by phase on board #13 with a total rounded to $137,300,000. With regard to the construction costs, Section 7.6.6 of the ESR states that "The cost of road improvements will be borne by the developers through Development Charges".

7. *We recommend and request that the Township endorse in principle the need for the Township and MTO to enter into a legal agreement whereby the Township agrees to fund, design and construct the recommended highway improvements in the timelines / horizon years noted, including updating the Traffic Operational Analysis every 5 years to confirm that the timelines / horizon years noted remain applicable (i.e. we can consider revisions to schedules for highway improvement works if supported by updated traffic analysis). I will then draft an agreement for the Township to review.*

   Acknowledged; however given that this is still at the Class EA stage, we propose to update Section 7.6.6 of the ESR to state *"The cost of road improvements will be borne by the developers through Development Charges. Further in advance of the identified highway improvements associated with MTO controlled roads, proceeding the Township will enter into a legal agreement with the MTO (and possibly Simcoe County) regarding the funding for the proposed highway improvements within the specified timelines. In addition, the Township will update the Traffic Operational Analysis every five (5) years to confirm that the timelines/horizon years noted remain applicable."*

8. *Finally, with respect to proposed servicing to support secondary plan development, any proposed works within and/or crossing highway rights-of-way will require MTO Encroachment permit approvals. We would suggest that preliminary design proposals be shared with this office early in the planning process, to ensure acceptability in principle prior to undertaking any detail design work.*

   Acknowledged.

If you have any questions on the above, please do not hesitate to contact our office.

Yours truly,

**AINLEY & ASSOCIATES LIMITED**

Steve Fournier P. Eng.
Senior Project Engineer

*S:\113027\Response to MTO Nov 9, 2018.docx*

## Table 7.6.6-1 – Opinion of Cost of Transportation Improvements

| Phase | Stage | Street Name | From | To | Intersections | Approx. Length (km) | No. of Proposed Lanes | Urban or Rural | Active Transportation Lanes | Existing R.O.W. Width | Proposed R.O.W. Width | Required Property Acquisition (Sqm.) | Asphalt Platform Width | Total Boulevard Width | Sidewalk or Multi Use Trail | Comments | Cost Per Metre for Construction | Feature Comments | Cost for Feature | Total Estimated Construction Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phase 1 | | Finlay Mill Road | Hwy 26 | Wattie Road | | 0.85 | 3 | Urban | NO | 20 | 20 | 0 | 10.5 | 4.25 | 2 - 1.5m each side | No room for Active Transportation lanes | $3,900 | Bridge at Finlay Mills and Wattie and Retaining Walls | $2,109,300 | $5,424,300 |
| | | Finlay Mill Road | Wattie Road | Doran Road | | 0.60 | 2 | Urban | NO | 20 | 20 | 0 | 11 | 4 | 2 - 1.5m each side | No room for Active Transportation lanes | $3,800 | | $0 | $2,280,000 |
| | | Snow Valley Road | Wilson Drive | Hwy 26 | | 2.80 | 2 | Rural | 2 -2.0m each | 20 | 26 | 16800 | 12.5 | 3.75 | Paved Shoulder | County Road | $2,800 | Hydro Relocation for Overhead Transformers on Snowvalley Road | $1,560,000 | $9,400,000 |
| | | Doran Road | Finlay Mill Road | West limit of Draft Plans | | 0.75 | 2 | Urban | 2 - 1.5m each | varies | varies | Given by Dev | 11 | | 2 - 1.5m each side | Need various widenings | $3,900 | Retaining Walls | $136,500 | $3,061,500 |
| | | Gill Road | Doran Road | North limit of Draft Plan | | 0.85 | 2 | Urban | 2 - 1.5m each | 20 - 21.5 | 23 | 2550 | 11 | min. 4.0 | 2 - 1.5m each side | 1.5m widening from Alliance | $3,900 | | $0 | $3,315,000 |
| | | Gill Road | North Limit of Draft Plan | Craig Road | | 0.40 | 2 | Rural | 2 - 2.0m each | 20 | 23 | 1200 | 11 | 4.5 | NO | Ganaraska Trail | $2,700 | | $0 | $1,080,000 |
| | 1 | Carson Road | Anne Street | West of Glenbrook Drive | 2 Subdivision Entrances | 0.70 | 2 | Urban | 2 - 1.5m each | 20 - 28 | 28 | Given by Dev | 11 | | 1.5m on South side | Carson Trail Sub. on North side | $3,900 | | $0 | $2,730,000 |
| | | Carson Road | West of Glenbrook Drive | Hwy 26 | | 0.70 | 2 - 5 | Urban | 2 - 1.5m each | 20 - 27 | 40 | 14000 | 11.0 - 20.5 | | 1.5m on South side | Open ditch on North side | $3,800 | | $0 | $2,660,000 |
| | | | | | Carson Road - Wilson Drive | | | | | | | | | | | | $500,000 | | | $500,000 |
| | | | | | Carson Road - Hwy 26 | | | | | | | | | | | | $2,000,000 | | | $2,000,000 |
| | | | | | Finlay Mill - Wattie Road | | | | | | | | | | | | $250,000 | | | $250,000 |
| | | | | | Finlay Mill -HWY 26/27 | | | | | | | | | | | | $400,000 | | | $400,000 |
| | | | | | Gill Road - Doran Road | | | | | | | | | | | | $250,000 | | | $250,000 |
| | | | | | HWY 26 - HWY 27 | | | | | | | | | | | | $750,000 | | | $750,000 |
| | | | | | | **7.65** | | | | | | | | | | | | | | **$34,100,800** |
| | | St. Vincent Street | Doran Road | Belmont Crescent link | | 0.50 | 2 | Urban | 2 - 1.5m each | 20 - 30 | 20 | 0 | 11 | min. 4.0 | 2 - 1.5m each side | Opening of unopened road allowance | $4,000 | Retaining Walls | $201,500 | $2,201,500 |
| | | St. Vincent Street | Belmont Crescent | Willow Creek Bridge | | 1.70 | 2 | Urban | 2 - 1.5m each | 20 | 20 | 0 | 11 | 4.0 | 2 - 1.5m each side | | $4,000 | | $0 | $6,800,000 |
| | 2 | Carson Road | Wilson Drive | Black Creek | | 0.60 | 2 | Rural | 2 - 1.5m each | 20 | 20 | 0 | 11 | 4.5 | Paved Shoulder | | $4,200 | Culvert For Carson Road at Black Cre | $1,560,000 | $4,080,000 |
| | | Carson Road | Black Creek | Anne Street | 4 Subdivision Entrances | 0.80 | 2 - 3 | Urban | 2 - 1.5m each | 36 | 36 | Given by Dev | 11 - 13.5 | min. 4.0 | 2 - 1.5m each side | | $2,400 | | $0 | $1,920,000 |
| | | | | | HWY 400 - Forbes Rd. | | | | | | | | | | | | $1,000,000 | | | $1,000,000 |
| | | | | | | **3.60** | | | | | | | | | | | | | | **$16,001,500** |
| | | Forbes Road | Russell Road | Old Second Road South | | 1.10 | 2 | Rural | 2 - 2.0m each | 20 - 30 | 30 | 0 | 12.5 | 3.75 | Paved Shoulder | Interim scenario | $3,400 | | $0 | $3,740,000 |
| | | St. Vincent Street | Willow Creek bridge | City of Barrie Limits | | 1.70 | 2 | Rural | 2 - 2.0m each | 20 | 20 | 0 | 11 | 4.5 | ? | Possible MUT on East side | $2,700 | | $0 | $4,590,000 |
| | | Anne Street | Carson Road | South limit of Draft Plans | | 0.65 | 2 | Urban | 2 - 1.5m each | 26 | 26 | Given by Dev | 11 | 7.0 | 2 - 1.5m each side | | $2,700 | Retaining Walls | $390,000 | $2,145,000 |
| | 3 | Anne Street | South limit of Draft Plans | City of Barrie Limits | | 1.25 | 2 | Rural | 2 - 2.0m each | 20 | 20 | 0 | 11 | 4.5 | Paved Shoulder | | $2,700 | | $0 | $3,375,000 |
| | | Wilson Drive | City of Barrie limits | Snow Valley Road | | 3.80 | 4 | Rural | 2 -2.0m each | 26 | 40 | 53200 | 17 | | | County Road | $3,000 | | $0 | $11,400,000 |
| | | Russell Road (Interim) | Pooles Road | Forbes Road | | 1.00 | 2 | Rural | 2 -2.0m each | 20 | 20 | 0 | 11 | | | | $300 | | $0 | $300,000 |
| | | | | | Craig Rd. - County Rd 27 | | | | | | | | | | | | $1,500,000 | | | $1,500,000 |
| | | | | | | **9.50** | | | | | | | | | | | | | | **$27,050,000** |
| | | Doran Road | West limit of Draft Plans | Russell Road | | 1.40 | 2 - 3 | Urban | 2 - 1.5m each | 29.5 | 30 | Given by Dev | 11 - 13.5 | min. 4.0 | 2 - 1.5m each side | | $3,800 | | $0 | $5,320,000 |
| | 4 | | | | 4 Subdivision Entrances | | | | | | | | | | | | | | | $0 |
| | | | | | | **1.40** | | | | | | | | | | | | | | **$5,320,000** |
| | | Forbes Road (interim) | Old Second Road South | Hwy 400 | | 1.20 | 2 | Rural | NO | 20 | 40 | 24000 | 12.5 | 3.75 | | | $200 | | $0 | $240,000 |
| | | Pooles Road | St. Vincent Street | Silverwood Crescent | | 0.75 | 2 | Urban | 2 - 1.5m each | 17 - 20 | 20 | 2250 | 11 | max. 4.0 | 2 - 1.5m each side | Need various widenings (also Midves) | $3,800 | | $0 | $2,850,000 |
| | | Pooles Road | Silverwood Crescent | Russell Road | | 0.75 | 2 | Rural | 2 - 1.5m each | 10 | 23 | 9750 | 11 | | | | $2,500 | Retaining Walls | $91,000 | $1,966,000 |
| | 5 | Russell Road | Pooles Road | Walt Road | 3 Subdivision Entrances | 0.60 | 2 | Urban | 2 - 1.5m each | 20 - 28 | 28 | 4800 | 11 | min. 4.0 | 1.5m on West side | 8m widening on Geranium Draft Plan | $3,700 | | $0 | $2,220,000 |
| | | Russell Road | Walt Road | Forbes Road | | 0.50 | 4 | Urban | 2 - 1.5m each | 26 | 26 | 0 | 18 | | | | $3,900 | | $0 | $1,950,000 |
| | | | | | Russell Rd. - Walt Rd. | | | | | | | | | | | | | | | $0 |
| | | | | | Pooles Rd. - St. Vincent | | | | | | | | | | | | | | | $0 |
| | | | | | | **3.8** | | | | | | | | | | | | | | **$9,226,000** |
| | | | | PHASE 1 LENGTH | | **25.95** | | | | | | | | | | | | | | **$91,698,300** |
| Phase 2 | | Forbes Road | Russell Road | Hwy 400 | | 2.3 | 4 | Rural | 2-2.0m each | 40 | | | 19 | | | Ultimate scenario | $2,500 | | $0 | $5,750,000 |
| | 1 | | | | Russell Road - Forbes Road | | | | | | | | | | | | | | $800,000 | $800,000 |
| | | | | | Russell Road - Doran Road | | | | | | | | | | | | | | | $350,000 |
| | | | | | | | | | | | | | | | | | | | | |
| | | Walt Road | Old Second Rd. | Russell Rd | | 1.1 | 2 | Urban | 2-2.0m each | 20 | | | 11 | | | | $3,700 | | $0 | $4,070,000 |
| | 2 | | | | Pooles Road - Russell Road | | | | | | | | | | | | | | $300,000 | |
| | | | | | | | | | | | | | | | | | | | | |
| | | Old 2nd Road South | Walt Rd. | Pooles Rd. | | 1.2 | 2 | Rural | 2-2.0m each | 20 | | | 11.5 | | | | $2,500 | | $0 | $3,000,000 |
| | 3 | Pooles Road | Old Second Rd | Russell Rd. | | 1.1 | 2 | Rural | 2-2.0m each | 20 | | | 11.5 | | | | $2,500 | | $0 | $2,750,000 |
| | | | | | Hwy 400 - Forbes Road | | | | | | | | | | | | | | $6,000,000 | $6,000,000 |
| | | | | PHASE 2 LENGTH | | **5.7** | | | | | | | | | | | | | | **$22,720,000** |
| **SUB-Total Phase 1 & 2** | | | | | | | | | | | | | | | | | | | | **$114,418,300** |
| **Contingency Allowance (5%)** | | | | | | | | | | | | | | | | | | | | **$5,700,000** |
| **Engineering (15%)** | | | | | | | | | | | | | | | | | | | | **$17,200,000** |
| **TOTAL PHASE 1 & 2 (Excl HST)** | | | | | | | | | | | | | | | | | | | | **$137,318,300** |

Note: This excludes the costs associated Craig Road Extension (Russell Rd to Cty Rd 27), as these costs are within the Township Wide Development Charges

Ainley GROUP CONSULTING ENGINEERS PLANNERS

# TRAFFIC SIGNAL WARRANT

| | | | | | |
|---|---|---|---|---|---|
| Analyst | Lilly Chen | | Jurisdiction/Date | Springwater | 24 Jan 2018 |
| Agency or Company | Ainley Group | | East-West Street | Highway 26/Spence Ave | |
| Analysis Period | 2017 | | North-South Street | Highway 26/CR 27 | |
| Flow Conditions | Free flow (rural) | | Major Street | North-South | |
| T Intersection | No | | Approach Lanes per Direction | 2 | |
| Other Notes | existing road configuration | | Hours of Traffic Volume Data | 8 hours | |

| Hour Ending | | Hour 1 7:00 | Hour 2 8:00 | Hour 3 9:00 | Hour 4 10:00 | Hour 5 16:00 | Hour 6 17:00 | Hour 7 18:00 | Hour 8 19:00 | AM + PM 4 |
|---|---|---|---|---|---|---|---|---|---|---|
| MAJOR STREET | | | | | | | | | | |
| Northbound | right | 1 | 4 | 12 | 4 | 11 | 8 | 13 | 6 | |
| | thru | 83 | 220 | 223 | 216 | 415 | 598 | 499 | 299 | |
| | left | 90 | 218 | 372 | 188 | 277 | 329 | 257 | 175 | |
| Southbound | right | 12 | 30 | 71 | 19 | 9 | 9 | 7 | 10 | |
| | thru | 277 | 493 | 446 | 415 | 292 | 303 | 292 | 196 | |
| | left | 1 | 1 | 2 | 4 | 2 | 1 | 3 | 1 | |
| MINOR STREET | | | | | | | | | | |
| Eastbound | right | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | thru | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | left | 1 | 5 | 11 | 9 | 19 | 37 | 7 | 5 | |
| Westbound | right | 0 | 1 | 1 | 4 | 1 | 4 | 3 | 4 | |
| | thru | 0 | 1 | 2 | 2 | 2 | 4 | 2 | 1 | |
| | left | 0 | 1 | 0 | 2 | 5 | 3 | 2 | 3 | |
| PEDESTRIANS | | | | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| crossing MAJOR street | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| delayed pedestrians | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| crossing MINOR street | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **APPROACH VOLUMES** | | | | | | | | |
| major | 464 | 966 | 1126 | 846 | 1006 | 1248 | 1071 | 687 |
| minor | 1 | 9 | 14 | 17 | 27 | 48 | 14 | 13 |
| TOTAL | 465 | 975 | 1140 | 863 | 1033 | 1296 | 1085 | 700 |
| **CROSSING VOLUMES** | | | | | | | | |
| TOTAL | 1 | 7 | 199 | 13 | 26 | 44 | 11 | 9 |
| note 1 | 1 | 6 | 11 | 11 | 24 | 40 | 9 | 8 |
| note 2 | 0 | 1 | 2 | 2 | 2 | 4 | 2 | 1 |
| note 3 | 0 | 0 | 186 | 0 | 0 | 0 | 0 | 0 |
| 3a | no | yes | yes | yes | yes | yes | yes | yes |
| 3b | no | no | yes | no | no | no | no | no |
| note 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| note 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**NOTES**

Traffic crossing MAJOR street defined as:

note 1: Left turns from both minor street approaches

note 2: The heaviest through volume from the minor street

note 3: 50% of the heavier left turn movement from the major street when both of the following are met:

3a: the left turn volume > 120

3b: the left turn volume + opposing volume > 720

note 4: Pedestrians crossing the major street

note 5: Pedestrians experiencing delays of 10 seconds or more in crossing the major street

**ACCIDENT HISTORY**

Reportable accidents over the past 36 months susceptible to correction by a traffic signal.

## JUSTIFICATION 1 - MINIMUM VEHICLE VOLUME

| JUSTIFICATION | GUIDANCE | HOUR ENDING | | | | | | | | No. of hours with compliance | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Hour 1 | Hour 2 | Hour 3 | Hour 4 | Hour 5 | Hour 6 | Hour 7 | Hour 8 | 100% | 80% + | |
| 1A | TOTAL TRAFFIC VOLUME ENTERING INTERSECTION (vph) (2 way Total) | 465 | 975 | 1140 | 863 | 1033 | 1296 | 1085 | 700 | | | Average Compliance |
| | COMPLIANCE % VOL x 100 / 480 (1 lane approach on main road) OR VOL x 100 / 600 (2 or more lane approach on main road) | 78% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 7 | 7 | 97% |
| 1B | TRAFFIC VOLUME ON MINOR STREET | 17 | 9 | 14 | 17 | 27 | 48 | 14 | 27 | 100% | 80% + | Average Compliance |
| | COMPLIANCE % VOL x 100 / 120 (full intersection) OR VOL x 100 / 180 (tee intersection) | 14% | 8% | 12% | 14% | 23% | 40% | 12% | 23% | 0 | 0 | 18% |
| (FREE FLOW) SIGNAL JUSTIFICATION 1: | | BOTH 1A AND 1B 100% FULFILLED EACH OF 8 HOURS | | | | | | | | | | NO |
| | | LESSER OF 1A OR 1B AT LEAST 80% FULFILLED EACH OF 8 HOURS | | | | | | | | | | NO |

## JUSTIFICATION 2 - DELAY TO CROSS TRAFFIC

| JUSTIFICATION | GUIDANCE | HOUR ENDING | | | | | | | | No. of hours with compliance | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Hour 1 | Hour 2 | Hour 3 | Hour 4 | Hour 5 | Hour 6 | Hour 7 | Hour 8 | 100% | 80% + | |
| 2A | MAIN ROAD TRAFFIC VOLUME (vph) (2 way Total) | 1006 | 966 | 1126 | 846 | 1006 | 1248 | 1071 | 1006 | | | Average Compliance |
| | COMPLIANCE % VOL x 100 / 480 (1 lane approach on main road) OR VOL x 100 / 600 (2 or more lane approach on main road) | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 8 | 8 | 100% |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2B | CROSSING TRAFFIC VOLUME (Vph in 2 sec Inter.) | 13 | 7 | 199 | 13 | 26 | 44 | 11 | 26 | 100% | 80% + | Average Compliance |
| | COMPLIANCE % VOL x 100 / 50 | 26% | 14% | 100% | 26% | 52% | 88% | 22% | 52% | 1 | 2 | 48% |

(FREE FLOW)

| SIGNAL JUSTIFICATION 2: | | |
|---|---|---|
| | BOTH 2A AND 2B 100% FULFILLED EACH OF 8 HOURS | NO |
| | LESSER OF 2A OR 2B AT LEAST 80% FULFILLED EACH OF 8 HOURS | NO |

## JUSTIFICATION 3 - VOLUME/DELAY COMBINATION JUSTIFICATION

| JUSTIFICATION SATISFIED 80% OR MORE | | Two Justifications Satisfied 80% or more |
|---|---|---|
| Justification - Minimum Vehicle Volume | NO | |
| Justification - Delay to Cross Traffic | NO | NO |

## JUSTIFICATION 4 - MINIMUM FOUR-HOUR VEHICLE VOLUME

## JUSTIFICATION 5 - COLLISION EXPERIENCE

| | Warrant Value | Number of Collisions | % Fulfillment |
|---|---|---|---|
| A. Reportable collisions over 36 consecutive months susceptible to correction by a traffic signal | 15 | - | - |
| B. Adequate trial of less restrictive remedies has failed to reduce collision frequency. | ☐ YES | ☑ NO | 0% |

| SIGNAL JUSTIFICATION 5: | | | |
|---|---|---|---|
| | BOTH OF 3A, 3B FULFILLED TO 100%? | ☐ | ☐ NO |
| | BOTH OF 3A, 3B FULFILLED TO 80%? | | NO |

## JUSTIFICATION 6 - PEDESTRIAN VOLUME AND DELAY

NET 8 HOUR PEDESTRIAN VOLUME AT CROSSIN: 0 — NET 8 HOUR VEHICULAR VOLUME ON STREET BE: 7357

| 6A PED VOLUME | 8 Hr Veh. Vol. | Net 8 Hour Pedestrian Volume | | | | |
|---|---|---|---|---|---|---|
| | | < 200 | 200 - 275 | 276 - 475 | 476 - 1000 | > 1000 |
| | < 1440 | | | | | |
| | 1440 - 2600 | | | | | |
| | 2601 - 7000 | | | | | |
| | > 7000 | Not Justified | | | | |

NET 8 HOUR VOLUME OF TOTAL PEDESTRIANS: 0 — NET 8 HOUR VOLUME OF DELAYED PEDESTRIANS: 0

| 6B PED DELAY | Net Total 8 Hour Vol. of | Net Total 8 Hour Volume of Delayed Pedestrians | | |
|---|---|---|---|---|
| | | < 75 | 75 - 130 | > 130 |
| | < 200 | Not Justified | | |
| | 200 - 300 | | | |
| | > 300 | | | |

| SIGNAL JUSTIFICATION 6: | | |
|---|---|---|
| | BOTH JUSTIFICATION 5A AND JUSTIFICATI | NO |

## JUSTIFCATION SUMMARY

| OVERALL | | |
|---|---|---|
| | AT LEAST ONE JUSTIFICATION (1 - 5) MET? | NO |

**Reid Mitchell**

**From:** Dorton, Peter (MTO) <Peter.Dorton@ontario.ca>
**Sent:** November-20-18 11:22 AM
**To:** Joe Mullan
**Cc:** Brent Spagnol; Reid Mitchell ; Woo, Douglas; Hewitt, Tom (MTO); Singh, Christian (MTO); Sieradzki, Susan (MTO); Diczki, Tarita (MTO)
**Subject:** RE: Request for Engineering Drawings - Township of Springwater
**Attachments:** RE: Midhurst Secondary Plan EA Ph 3 and 4, Traffic (284 KB)

Hi Joe:

Thank you for sharing these forcemain details with us.

We have not been asked previously to consider the installation of a 400mm diameter effluent forcemain on the south side Highway 26, from Wilson Dr. westerly, with an outfall from Highway 26 at Willow Creek. As noted in the attached September 17, 2018 email, early consultation on plans to work within or crossing of highway rights – of – way is recommended, and we note from the plans included in the link to the ESR that there are other sections of Highway 26 in Midhurst that are being recommended for servicing infrastructure associated with the Midhurst Secondary Plan.

We recommend that alternatives other than parallel installations along our ROW be explored for both this forcemain and other servicing proposals in the ESR. We would be pleased to host a meeting if you wish to discuss options for servicing planned for Midhurst.

Please feel free to contact me if you have any questions.

Thanks,
Peter Dorton
Senior Project Manager
MTO Central Region Engineering Office
Corridor Management Section
159 Sir William Hearst Ave., 7th Floor
Toronto, ON M3M 0B7
Ph: 416-235-4280
Fx: 416-235-4267
Email: peter.dorton@ontario.ca

**From:** Joe Mullan [mailto:mullan@ainleygroup.com]
**Sent:** November 6, 2018 10:05 AM
**To:** Dorton, Peter (MTO) <Peter.Dorton@ontario.ca>
**Cc:** Brent Spagnol <brent.spagnol@springwater.ca>; Reid Mitchell <mitchell@ainleygroup.com>
**Subject:** Request for Engineering Drawings - Township of Springwater

**Hi Peter:**

The proposed Sanitary Forcemain is part of the Environmental Study Report (ESR) for the Midhurst Class EA (Water Wastewater & Transportation) that was published in Jun 2018. The ESR can be accessed on the Township's website at:

http://www.springwater.ca/municipal_services/planning_development/midhurst_development/m_s_p_environmental_assessment.

Section 6.4 of the ESR, contains information relating to the forcemain route, along Conceptual Plan Drawings in Appendix V and a Terrestrial Habitat Assessment in Appendix O.

Regards,

J. A. Mullan, P.Eng.
President & CEO

Ainley

www.ainleygroup.com
Tel: (705) 445-3451 Ext. 126
Cell: (705) 718-7230

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**From:** Brent Spagnol <Brent.Spagnol@springwater.ca>
**Sent:** Tuesday, October 23, 2018 2:28 PM
**To:** Joe Mullan <mullan@ainleygroup.com>
**Cc:** Dorton, Peter (MTO) <Peter.Dorton@ontario.ca>
**Subject:** FW: Request for Engineering Drawings - Township of Springwater
**Importance:** High

Good afternoon Joe,

Can you please provided Peter with the information that he is seeking regarding any E.A work completed in Midhurst?

Regards,

Brent Spagnol, MCIP, RPP
Director of Planning Services and By-law Enforcement
Township of Springwater
2231 Nursery Road
Minesing, ON L9X 1A8
P. 705-728-4784 Ext. 2049
F. 705-728-6957

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**From:** Dorton, Peter (MTO) [mailto:Peter.Dorton@ontario.ca]
**Sent:** October 23, 2018 12:17 PM
**To:** Brent Spagnol <Brent.Spagnol@springwater.ca>
**Cc:** Singh, Christian (MTO) <Christian.Singh@ontario.ca>
**Subject:** FW: Request for Engineering Drawings - Township of Springwater

Hi Brent:

I recently received request below from design consultant pertaining to a Wastewater Treatment Plant. We've been in touch with SCS Consulting , and I believe they will be sharing details and applying for MTO Encroachment permit likely next year, but I was wondering if there is municipal EA Study that deals with this proposal?

Thanks,
Peter Dorton
Senior Project Manager
MTO Central Region Engineering Office
Corridor Management Section
159 Sir William Hearst Ave., 7th Floor
Toronto, ON M3M 0B7
Ph: 416-235-4280
Fx: 416-235-4267
Email: peter.dorton@ontario.ca

---

**From:** Woo, Douglas [mailto:dwoo@scsconsultinggroup.com]
**Sent:** October 15, 2018 4:27 PM
**To:** Dorton, Peter (MTO) <Peter.Dorton@ontario.ca>
**Subject:** Request for Engineering Drawings - Township of Springwater

Good afternoon Peter,

We are undertaking a preliminary engineering design for the outfall of a proposed Wastewater Treatment Plant in the Town of Springwater. (Please see attached figure for your reference). Can you kindly let us know who at the MTO we can contact to obtain plan and profiles for Highway 26 in this area.

Should you have any questions or require any clarification, please feel free to contact me.

**Douglas Woo**, P.Eng.
SCS Consulting Group Ltd.
30 Centurian Drive, Suite 100
Markham, ON, L3R 8B8
Phone: (905) 475-1900 (ext. 2228)
Fax: **(905) 475-8335**
E-Mail: dwoo@scsconsultinggroup.com
http://www.scsconsultinggroup.com

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| | |
|---|---|
| **From:** | Dorton, Peter (MTO) |
| **To:** | Steve Fournier, P.Eng. |
| **Cc:** | Joe Mullan; brent.spagnol@springwater.ca; heather.coleman@springwater.ca; "Meile, Christian"; Shen, Rey (MTO); MacKinnon, John (MTO); Munro, Janice (MTO); Janke, Aaron (MTO); Uddin, Zaka (MTO); Diczki, Tarita (MTO); Mac, Frank (MTO); Vandenberg, Robert (MTO); Hao, Jiang Yang (MTO); Van Voorst, John (MTO); Sieradzki, Susan (MTO) |
| **Subject:** | RE: Midhurst Secondary Plan EA Ph 3 and 4, Traffic |
| **Date:** | Tuesday, January 29, 2019 4:27:03 PM |
| **Attachments:** | Midhurst - Response to MTO Comments (Nov 8 2018).pdf<br>Prelim Const Improvement Cost Est.pdf |

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Hi Steve:

Thanks for the response letter.

While the responses provided are generally acceptable, we recommend that a final report be submitted incorporating the improvements identified in the Conclusions as being attributable to Secondary Plan development (with the exception that the northbound double LTL is not required at Hwy 26 / Carson Rd.). We would further suggest that the Conclusions for the Hwy 400 / Forbes Rd. IC be revised to identify that additional works may be required, as per the comments provided under Responses 5(c) and (d).

The final report should also confirm that 5 year updates will be undertaken, to confirm the timing and extent of improvements recommended, and include reference to the requirement for the Township of Springwater to enter into legal agreements with MTO for its design and construction of highway improvements required to accommodate development. While we acknowledge that Development Charges are intended to fund the improvements, MTO is not party to the collection of such funds, and the ESR should note that the legal agreements will be between the municipality and MTO.

We have briefly reviewed the cost estimates provided (Table 7.6.6-1) and have some comments / concerns with respect to the estimates for highway works. The Highway 26 cost estimates look to be low, and based on Responses 5(c) and (d), the estimate of $6M for Hwy 400 / Forbes Rd. IC could be insufficient, especially if structure widening and / or reconfiguration to a Parclo A-4 design is required.

Were the various estimates considered as:

- Per centre line/kilometer cost or Cost per lane km?
- Major items quantities?
- Experienced staff providing a lump sum based on experience?
- And, have the costs of signals/property/illumination etc.. been considered?

In addition, are the proposed estimates in today's dollars? If the recommended improvements should be considered for 2031 or 2041 horizon years, has inflation been considered, or has a factor been added to account for the increase in construction costs 12 to 22 years from now?

More detailed cost estimates would assist in ensuring that adequate developer

charges can be collected by the Township to pay for the future highway work. We would be pleased to review a detailed breakdown of how the cost estimates were arrived at. Once more information is provided we can compare with MTO estimating tools and comment further.

Please feel free to contact me if you have any questions.

Thanks,
Peter Dorton
Senior Project Manager
MTO Central Region Engineering Office
Corridor Management Section
159 Sir William Hearst Ave., 7th Floor
Toronto, ON  M3M 0B7
Ph: 416-235-4280
Fx: 416-235-4267
Email: peter.dorton@ontario.ca

---

**From:** Steve Fournier, P.Eng. [mailto:fournier@ainleygroup.com]
**Sent:** November 9, 2018 1:25 PM
**To:** Dorton, Peter (MTO) <Peter.Dorton@ontario.ca>
**Cc:** 'Joe Mullan' <mullan@ainleygroup.com>; brent.spagnol@springwater.ca; heather.coleman@springwater.ca; 'Meile, Christian' <Christian.Meile@simcoe.ca>; Shen, Rey (MTO) <Rey.Shen@ontario.ca>; MacKinnon, John (MTO) <John.MacKinnon@ontario.ca>; Munro, Janice (MTO) <Janice.Munro@ontario.ca>; Janke, Aaron (MTO) <Aaron.Janke@ontario.ca>; Uddin, Zaka (MTO) <Zaka.Uddin@ontario.ca>; Diczki, Tarita (MTO) <Tarita.Diczki@ontario.ca>; Mac, Frank (MTO) <Frank.Mac@ontario.ca>; Vandenberg, Robert (MTO) <Robert.Vandenberg@ontario.ca>; Hao, Jiang Yang (MTO) <JiangYang.Hao@ontario.ca>; Van Voorst, John (MTO) <John.VanVoorst@ontario.ca>; Sieradzki, Susan (MTO) <Susan.Sieradzki@ontario.ca>
**Subject:** RE: Midhurst Secondary Plan EA Ph 3 and 4, Traffic

Mr. Dorton

We have prepared the attached response to your questions regarding aspects of traffic analysis on the Midhurst Secondary Plan EA.  Please call if you have any questions or require additional information.

Regards,

Steve Fournier, P.Eng.
Senior Engineer

www.ainleygroup.com

Ainley & Associates Limited
550 Welham Road, Barrie, Ontario, L4N 8Z7
Tel: (705) 726-3371
E-mail barrie@ainleygroup.com

April 7, 2020

File #113027

**"By Email"**

MTO Central Region Engineering Office
Corridor Management Section
159 Sir William Hearst Avenue, 7th Floor
Toronto, Ontario
M3M 0B7

Attn: **Mr. Peter Dorton**
**Senior Project Manager**

Ref: **Township of Springwater,**
**Midhurst Class EA**
**Response to MTO Comments**

Dear Mr. Dorton:

We provide the following responses to the questions in your e-mail of March 4, 2020 and January 29, 2019. We apologise for the delay in responding to the Jan. 2019 email; however, subsequent to publishing the Draft Environmental Study Report (ESR) for Public comment in June 2018, five (5) Part II Orders Requests were submitted to the MECP and we were waiting for those to be resolved by the Minister, unfortunately this took longer than anticipated. However, now that Minister Yurek of the MECP has issued their decision denying the five (5) Part II Orders Requests which were submitted, we have proceeded to update and finalize the ESR for the Midhurst Class EA, along with responding to your comments.

For ease of refence we have repeated the portion of the comments from your last email (shown in blue) followed by our response. Please note that the page numbers referenced in the following sections are referring to the Final ESR, which may be slightly different than the Draft version that was published in June 2018.

1. *…we recommend that a final report be submitted incorporating the improvements identified in the Conclusions as being attributable to Secondary Plan development (with the exception that the northbound double LTL is not required at Hwy 26 / Carson Rd.).*

   We acknowledge discussions with your office regarding signal analysis that indicated that suitable LOS could be achieved without the Double Left Turn Lane which we had included in our earlier analysis. Reference to the double left turn lane for the northbound to westbound movement have been deleted from the proposed 2041 improvements for the intersection of Hwy 26 and Carson Road.

   In addition, the following wording has been added to the Recommended Transportation Improvements section of the Executive Summary of the ESR:

   "A complete list of recommended transportation improvements attributable to the development of the Midhurst Secondary Plan is included in Section 7.6."

2. *We would further suggest that the Conclusions for the Hwy 400 / Forbes Rd. IC be revised to identify that additional works may be required…*

The following wording has been added to the Recommended Transportation Improvements section of the Executive Summary and to Section 7.6 of the ESR:

"It should be noted that in conjunction with the Upgrade for the Hwy. 400 & Forbes Road Interchange, as part of Phase 2 Stage 3, (By or before 2041) a re-evaluation of the proposed improvements will be undertaken in conjunction with the MTO."

3. *The final report should confirm that 5 year updates will be undertaken to confirm the timing and extent of improvements recommended…*

Text has been added to the 2031 and 2041 traffic projection section and in the Summary of Improvement section for each of those horizons. In particular Section 7.5.3 on Page 101 of the ESR has been updated to note:

"Operational analysis and traffic growth should be reassessed on a five-year basis to confirm assumptions on traffic growth development progress and trip distribution are accurate and revise improvement scheduling as necessary."

In addition, Section 7.6, on Page 109 of the ESR, has been updated to note:

"Traffic projections for 10- and 20-year horizons are only approximations and should be checked with 5-year updates or more frequently based on development stages to confirm assumptions on traffic growth and development progress are accurate and the proposed improvement type and schedule are appropriate."

4. *While we acknowledge that Development Charges are intended to fund the improvements, MTO is not party to the collection of such funds, and the ESR should note that the legal agreements will be between the municipality and MTO.*

Text in the Introduction of the Traffic Section on page 62 of the ESR after describing some Schedule "C" EA projects has been updated to state:

"In addition to some projects requiring a Schedule "C" EA any projects involving roads or intersections within the jurisdiction of the MTO will require the Municipality and/or the County of Simcoe (depending upon who has local jurisdiction) to enter into a legal agreements with the MTO regarding encroachment on the MTO and obtain permission to undertake the proposed highway improvements within the specified timelines. Any proposed works within and/or crossing highway rights-of-way will also require MTO Encroachment permits."

The text in Section 7.6.6 of the ESR page 117 has been updated to state:

"The cost of the road improvements will be borne by Developers and funded through Development Charges. Further, in advance of the identified highway improvements associated with MTO controlled roads proceeding, the Township and/or the County of Simcoe (depending upon who has local jurisdiction) will enter into a legal Agreement(s) with the MTO regarding the funding for the proposed highway improvements within specified timelines. In addition, the Township will update the Traffic Operational Analysis every five (5) years to confirm that the timelines/horizon years noted remain applicable."

5. *How were the cost estimates developed? The cost for Hwy 26 improvements appear too low…*

   The basic road costs were developed from the ground up, by staff with extensive Municipal Road reconstruction experience, on a cost per metre basis, for the various road cross-sections such as two-lane rural, two-lane urban, four-lane urban with or without additional widening for Active Transportation and/or sidewalks. In addition, key features on each section of road such as a bridge, signalized intersection or roundabout were estimated as an approximate lump sum cost. The estimated cost per metre along with the estimates for any key features are included in Table 7.6.6.1 on page 120 for the ESR. The various road segments were reviewed, and, in several instances, additional costs were applied to address specific constraints such as topography challenges, property requirements and extraordinary utility requirements. For items such as manholes, catchbasins, street lighting or boulevard trees an industry spacing was assumed and the unit price per unit divided by the spacing and applied as a per metre cost.

6. *In addition, are the proposed estimates in today's dollars? If the recommended improvements should be considered for 2031 or 2041 horizon years, has inflation been considered, or has a factor been added to account for the increase in construction costs 12 to 22 years from now?*

   *More detailed cost estimates would assist in ensuring that adequate developer charges can be collected by the Township to pay for the future highway work.*

   The estimates were prepared in 2018 dollars to be consistent with the cost estimates prepared for the Water & Wastewater infrastructure. However, it is acknowledged that in the future these estimates will need, at minimum, to be increased using the annual construction index, along with more detailed construction estimates being prepared at the Preliminary and Detailed Design stages for each specific segment of infrastructure, prior to proceeding to construction.

If you have any questions on the above, please do not hesitate to contact our office.
Yours truly,

**AINLEY & ASSOCIATES LIMITED**

Steve Fournier P. Eng.
Senior Project Engineer

*S:\113027\Response to MTO Apr 07, 2020.docx*

# CHIPPEWAS OF THE THAMES FIRST NATION

June 14, 2018

Heather Coleman
Director of Public Works
Township of Springwater
2231 Nursery Road
Minesing, ON L9X 1A8

**RE: Midhurst Water, Wastewater & Transportation Class Environmental Assessment**

Ms. Coleman,

We have received information concerning the abovementioned project, dated May 31, 2018.

Thank you for forwarding the information. In our screening of your correspondence we have identified no concerns with your project or the information that you have presented to us as this time.

Please do not hesitate to contact me if you need further clarification of this letter.

Sincerely,

Rochelle Smith
A/Consultation Coordinator
Chippewa of the Thames First Nation
[redacted]

cc: Joe Mullan, P. Eng., President & CEO, Ainley & Associates Ltd.

[redacted]

## Rebecca Weatherall

**From:** Joe Mullan <mullan@ainleygroup.com>
**Sent:** June-08-18 9:20 AM
**To:** Reid Mitchell
**Subject:** Midhurst Water, Wastewater and Transportation
**Attachments:** 180531 Ainley - Township of Springwater Notice of Completion.pdf

Hi Reid:

As discussed.

Regards,

J. A. Mullan, P.Eng.
President & CEO
Ainley
www.ainleygroup.com
Tel: (705) 445-3451 Ext. 126
Cell: (705) 718-7230

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**From:** Maxime Picard [mailto:[redacted]]
**Sent:** Tuesday, June 5, 2018 11:17 AM
**To:** Joe Mullan <mullan@ainleygroup.com>
**Subject:** Midhurst Water, Wastewater and Transportation

Good morning Mr. Mullan,

Thanks for your letter and update on the Midhurst Water, Wastewater and Transportation Project.

Could you please let us know if any archaeological assessment have been done as part of the EA ?

Best regards,

Maxime Picard

**NATION HURONNE-WENDAT**
**Bureau du Nionwentsïo**

**Maxime Picard, B. Sc. A.**
Coordonnateur de projets - Ontario
[redacted]

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MISSISSAUGAS OF THE NEW CREDIT FIRST NATION
DEPARTMENT OF CONSULTATION AND ACCOMMODATION

August 13, 2018

Heather Coleman
Director of Public Works
Township of Springwater
2231 Nursery Road
Minesing,On.
Midhurst.classea@springwater.ca

Dear Heather,

Thank you for the notification on Township of Springwater Class EA Phase 4 Midhurst Water, Wastewater and Transportation dated June 19, 2018. Your project is out of our Treaty Territory. You may want to contact Doran Ritchie at [redacted] or Kathleen Ryan at [redacted] of Saugeen First Nation. I believe this project is in their Territory.

Please let me know if I can help you with anything else.

Miigwetch

Fawn D. Sault
Consultation Manager
Department of Consultation and Accommodation
Mississaugas of the New Credit First Nation
[redacted]

## Rebecca Weatherall

**From:** Joe Mullan <mullan@ainleygroup.com>
**Sent:** June-12-18 10:52 PM
**To:** Reid Mitchell
**Subject:** FW: Ainley - Township of Springwater - Class Environmental Assessment - Midhurst Water Wastewater and Transportation - Notice of Completion of Environmental Study Report and Open House

FYI

Regards,

J. A. Mullan, P.Eng.
President & CEO
Ainley
www.ainleygroup.com
Tel: (705) 445-3451 Ext. 126
Cell: (705) 718-7230

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**From:** Hollie Nolan [mailto:[redacted]] **On Behalf Of** Chief Rodney Noganosh
**Sent:** June 12, 2018 2:13 PM
**To:** collingwood@ainleygroup.com
**Subject:** re: Ainley – Township of Springwater – Class Environmental Assessment – Midhurst Water Wastewater and Transportation – Notice of Completion of Environmental Study Report and Open House

Dear J.A. Mullan;

Thank you for your letter re: Ainley – Township of Springwater – Class Environmental Assessment – Midhurst Water Wastewater and Transportation – Notice of Completion of Environmental Study Report and Open House.

Please be advised that we reviewed your letter. I have shared it with Council and we've forwarded the information to Karry Sandy McKenzie, Williams Treaties First Nation Process Co-ordinator/Negotiator. Ms. McKenzie will review your letter and take the necessary action if required. In the interim, should you wish to contact Ms. McKenzie directly, please do so at [redacted]

Thank you,

Chief Rodney Noganosh

**Hollie Nolan**
***Executive Assistant to the Chief, Administration***
**Chippewas of Rama First Nation**
[redacted]

[redacted]
[redacted]
[redacted]

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