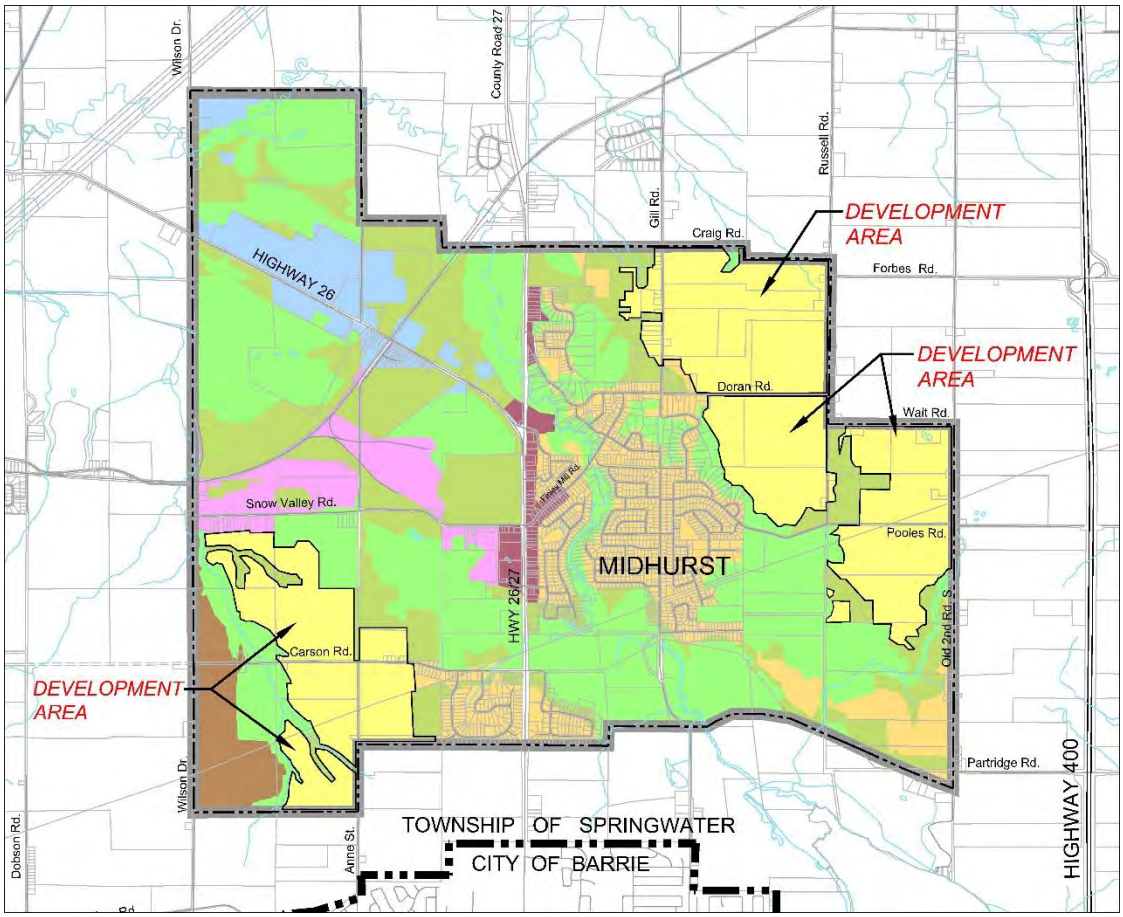
Township of Springwater

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

Environmental Study Report



Ainley Group
Consulting Engineers and Planners
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Telephone: 705-445-3451
www.ainleygroup.com

File: 113027
March 2020

Volume 4 of 6
Appendix N to Y

APPENDIX 'N'

Willow Creek and Wilson Drive Terrestrial Habitat Assessment – Beacon Environmental, May 30, 2016

May 30, 2016 BEL 213030

Joe Mullan
President & CEO
Ainley Group on behalf of the Township of Springwater
550 Welham Rd
Barrie, ON L4N 9H3

Re: Willow Creek and Wilson Drive Terrestrial Habitat Assessment

Dear Mr. Mullan :

Beacon Environmental is pleased to provide you with the enclosed report summarizing the terrestrial and riparian habitat along Willow Creek near the two proposed Waste Water Treatment Plant outfall locations: Willow Creek at Golf Course Road, and Willow Creek at Highway 26. A summary is also presented of the vegetation communities and natural features found along the portion of the proposed sewer alignment along Wilson Drive between Snow Valley Road and Highway 26. Based on the investigations completed to date, Option 2 – Highway 26 is the more appropriate location for the WWTP outfall from a terrestrial natural heritage perspective.

Should you have any further questions or comments, please contact me at your earliest convenience.

Yours truly,
Beacon Environmental

Geri Poisson, B.A. Hon., Certified Arborist
Terrestrial Ecologist

Background

The Township of Springwater is presently carrying out Phases 3 and 4 of a Municipal Class Environmental Assessment (EA) to determine the servicing/infrastructure (water, wastewater, transportation) requirements for the Midhurst Secondary Plan. A new Waste Water Treatment Plant (WWTP) is proposed to be located along Snow Valley Road near Wilson Drive. The treated effluent from the WWTP is proposed to be conveyed via a new sewer west along Snow Valley Road and north on Wilson Drive to discharge into Willow Creek either at Golf Course Road or Highway 26. The WWTP will be built in stages as the Midhurst Secondary Plan area is built out. The first phase of the development will consist of 5000 equivalent units, with an effluent discharge volume of 74.65 L/sec. At full build out, the plant will service approximately 10,000 equivalent units and the total discharge volume, including flows from existing development in Midhurst, will be 142.53 L/sec (SCS Consulting Group, March 14, 2014).

On April 22, 2014, site investigations were conducted to characterize the vegetation communities and natural features along Willow Creek near the two potential WWTP outfall locations shown as Option 1 and Option 2 on **Figure 1**. A roadside survey was conducted to generally characterize the vegetation communities and natural features along the Wilson Drive portion of the potential outfall sewer alignment shown in **Figure 2**. It should be noted that the information regarding vegetation species and communities is not considered complete. Due to the timing of these site investigations in early spring, most of the vegetation was dormant. Further investigations should be conducted at the detailed design stage, during the growing season to provide a more fulsome inventory. However, given the disturbed condition of the vegetation communities, it is unlikely species of conservation concern would be present. Should a species of concern be detected, mitigation measures would be provided during the detailed design stage.

Terrestrial Habitat and Vegetation Communities

Option 1 - Willow Creek Outfall at Golf Course Road

A summary of the vegetation communities found adjacent to the reach of Willow Creek crossed by Golf Course Road (WWTP outfall site Option 1) is provided below. These are depicted on **Figure 1**.

FOC4-1 – Fresh – Moist White Cedar Coniferous Forest
This community is located upstream of the potential outfall site on the south side of the creek. It is a closed canopy forest dominated by Eastern White Cedar with some Trembling Aspen and other deciduous tree species.

FOD7-2 – Fresh – Moist Ash Lowland Deciduous Forest
Located along the banks of the creek both upstream and downstream of Golf Course Road, this community consists of Green Ash, American Basswood, Crack Willow, Manitoba Maple and Black Walnut (**Photograph 1**). The trees range in age from mature to saplings. The portion of this community on the south side of the creek forms part of a residential property with manicured lawn and ornamental shrubs in the understory and some planted, mature Silver Maple and Norway Spruce.

Shrub species along the creek banks include Red-osier Dogwood, Common Buckthorn, High-bush Cranberry and Tartarian Honeysuckle.

FOD7-3 – Fresh – Moist Willow Lowland Deciduous Forest
This community is located on the banks of the former creek channel, an ox-bow formation, on the north side of the creek, upstream of Golf Course Road. It is characterized by mature Crack Willow with some Manitoba Maple, American Basswood and Green Ash.

CUT – Cultural Thicket
This community is found in two areas on the north side of the creek, upstream of Golf Course Road. Resulting from past clearing, it is characterized by regenerating saplings of American Basswood, Green Ash and some Black Walnut. Shrub cover is moderately dense with High-bush Cranberry, Red-osier Dogwood, Common Blackberry, Wild Red Raspberry, Tartarian Honeysuckle and Riverbank Grape. Ground cover is typical old field species, such as grasses and Canada Goldenrod.

Option 2 - Willow Creek Outfall at Highway 26

A summary of the vegetation communities found adjacent to the reach of Willow Creek crossed by Highway 26 (WWTP outfall site Option 2) is provided below. These are depicted on **Figure 1**.

CUM1-1 – Dry – Moist Old Field Meadow
Located on the upstream and downstream side of Highway 26 and on either side of the creek these are previously disturbed areas, partly within the road right of way (**Photograph 2**). This community is dominated by Canada Goldenrod, asters and grasses such as Reed Canary Grass and Smooth Brome. The larger area located northeast of the Highway 26 bridge also supports a row of planted Eastern White Cedar, a large Crack Willow and some High-bush Cranberry shrubs. Scattered throughout this community are a few small low-lying areas supporting wetland plants such as Tussock Sedge, horsetails and cattails.

CUP3 – Coniferous Plantation
This community is located on the northwest side of the creek downstream of Golf Course Road and upstream of Highway 26. It begins at the top of a streamside cut-bank and consists of a mix of early-mature, planted White Spruce, Scots Pine and Red Pine (**Photograph 3**).

Photograph 1. View of Willow Creek looking upstream from Golf Course Road (April 22, 2014).

Photograph 2. View of Willow Creek looking downstream toward Highway 26 (April 22, 2014).

Photograph 3. View of Willow Creek looking downstream from Golf Course Road with a mixed coniferous plantation (CUP3) on the west bank (April 22, 2014).

Wilson Drive Sewer Alignment

A summary of the vegetation communities found adjacent to the Wilson Drive right-of-way between the proposed site of the WWTP site on Snow Valley Road and Highway 26 is provided below. These are depicted on **Figure 2**.

FOM – Mixed Forest
This community is the most commonly found along Wilson Drive. These areas consist of mature forests on fresh to moist soils. Tree species include Eastern White Cedar, Trembling Aspen, Green Ash, White Spruce and Paper Birch, with lesser amounts of Eastern White Pine, Black Ash and Eastern Hemlock.

CUM1-1 – Dry – Moist Old Field Meadow
This area is a vacant property located at Wilson Drive and Snow Valley Road that consists of weedy old field species such as Smooth Brome, Gray Goldenrod, Canada Goldenrod, asters and Staghorn Sumac. There is also a small patch of immature Trembling Aspen near the roadside.

CUP3-1 – Red Pine Coniferous Plantation
This community is a managed forest plantation of early mature Red Pine with some native tree species regenerating in the understory, such as Sugar Maple, Red Oak, Trembling Aspen and White Birch. It is found on either side of Wilson Drive in the southern portion and to a smaller extent on the east side of Wilson Drive at Highway 26.

CUP3-8 – White Spruce Coniferous Plantation
This community is found on the west side of Wilson Drive. It is a narrow band of immature planted White Spruce, with small amounts of Trembling Aspen, Scots Pine and Green Ash.

CUP3-9 – Norway Spruce Coniferous Plantation
This community is found on the east side of Wilson Drive just south of Highway 26. It is an area of immature, pole-sized planted Norway Spruce with small amounts of Trembling Aspen, Scots Pine and Green Ash.

SWC – Coniferous Swamp
Located on the east side of Wilson Drive, approximately midway between Snow Valley Road and Highway 26, this community is found on both sides of a small watercourse that flows from east to west through a culvert under Wilson Drive. This wetland community consists mainly of Eastern White Cedar with a few Green Ash and Yellow Birch.

MAM – Meadow Marsh
This is a small area located on the west side of Wilson Drive and is associated with the watercourse that flows north, parallel with Wilson Drive. There a few smaller trees such a Balsam Poplar in this area but it is mostly open and dominated by herbaceous wetland species such as Spotted Joe-pye-weed, Canada Goldenrod, Cattails and Boneset.

Impact Assessment

Willow Creek Outfall, Option 1 – Golf Course Road

No vegetation communities were noted in this area that may be considered rare either nationally, provincially or locally. No plant or wildlife species of national, provincial or local significance were observed. The stream banks in this area are stable and well vegetated with mature trees shrubs and herbaceous vegetation (PECG 2014). The construction of a WWTP outfall would require the removal of mature trees and vegetation and the destabilizing and restoration of the stream banks.

Willow Creek Outfall, Option 2 – Highway 26

No vegetation communities were noted in this area that may be considered rare either nationally, provincially or locally. No plant species of national, provincial or local significance were observed. The vegetation community in this area has been disturbed in the recent past as a result of the construction and maintenance of Highway 26 and the bridge over Willow Creek. The stream bank is vegetated with some herbaceous species but almost completely devoid of woody species of shrubs or

trees. This lack of woody vegetation and some minor straightening of the channel (PECG 2014), has contributed to some minor erosion of the banks on the upstream side of the Highway 26 bridge (see **Photograph 4**). The stream banks on the downstream side of the bridge are more stable. The banks in the area of Option 2 outfall location support herbaceous vegetation with mature trees and shrubs on both banks further downstream (**Photograph 5**). Construction of a WWTP outfall in this location would likely not result in the removal of any trees. The vegetation community that would be disturbed is a previously disturbed old field meadow and of low ecological integrity. Restoration and stream bank rehabilitation that would be required post-construction would result in an improvement of the vegetation community, stabilize the stream bank and improve wildlife habitat.

During our site investigations a total of eight (8) Barn Swallow (*Hirundo rustica*) nests or remnants of nests were observed under the deck of the Highway 26 bridge over Willow Creek (see **Photograph 6**). Due to population declines across the northern portion of its North American breeding range, the Barn Swallow is listed as threatened under Ontario's *Endangered Species Act, 2007* (ESA) and has been designated as threatened in Canada by COSEWIC. The meadow adjacent to the north side of Highway 26 may be considered foraging habitat for the Barn Swallow and as such may be regulated by the MNR. In any case, the construction of a WWTP outfall in the riparian zone on the south side of the Highway 26 bridge would not be located within this possible foraging habitat, resulting in no impact to this vegetated meadow. If construction is timed to occur outside of the breeding and nesting season, then there would be no impacts to the species.

Photograph 4. View of east bank of Willow Creek looking upstream from Highway 26 showing unstable, eroding bank and cultural meadow on the right. (April 22, 2014).

Photograph 5. View of Option 2 location and treed stream banks downstream. (April 22, 2014).

Photograph 6. Barn Swallow nests under Hwy 26 bridge crossing Willow Creek. (April 22, 2014).

Wilson Drive Sewer Alignment

No vegetation communities were noted in this area that may be considered rare either nationally, provincially or locally. No plant species of national, provincial or local significance were observed. Field investigations should be conducted, at the detailed design stage, during the growing season for a more complete inventory of vegetation species and communities. It is our understanding that the potential sewer alignment would be constructed entirely within the Wilson Drive road right-of-way. As such, a minimal number of trees would require removal, if any. One small watercourse crossing was noted. Further studies, during detailed design (i.e., flow and temperature regime, fish habitat assessment) should be undertaken to more fully determine any potential impacts on this feature.

Conclusions

Based on the studies completed to date, from a terrestrial perspective, Option 2 – Highway 26 is the more appropriate location for the WWTP outfall. The vegetation community is of lesser quality and more recently disturbed here than at Option 1 – Golf Course Road. Option 2 supports no trees so none would require removal. Option 1 would require the removal of mature trees that are currently growing on the stream bank and contributing to its stability. Should Option 2 be selected, site rehabilitation should include stream bank planting of woody plant material to stabilize the bank and enhance wildlife habitat. Proper timing of construction works would avoid any impacts to Bank Swallows nesting under the Highway 26 bridge.

Based on studies of the roadside vegetation and characterization of the watercourse crossing conducted to date, the impacts to natural features along Wilson Drive are considered minor and temporary. Further environmental studies will be completed at the detail design stage. If proper construction methods are selected and best management practices for erosion and sedimentation control measures are properly designed, implemented and monitored to protect the single watercourse that is crossed and adjacent vegetation communities, construction of the WWTP sewer within the Wilson Drive right-of-way will have no significant negative impacts.

References

PECG, 2014. Fluvial Geomorphological Assessment of Willow Creek Downstream of Proposed WWTP Discharge near Highway 26, Midhurst, ON. April 17, 2014. Palmer Environmental Consulting Group Inc., Toronto.

APPENDIX 'O'

Memorandum – Potential Impacts to Minesing Swamp Related to Proposed Discharge of Treated Effluent From Midhurst Waste Water Treatment Plant to Willow Creek – Beacon Environmental, September 19, 2013

Memorandum

PRIVILEGED & CONFIDENTIAL

To: The Midhurst Landowners Group c/o Vimal Patel, Geranium Corporation

From: Don Fraser, Beacon Environmental

Date: September 19, 2013

Ref: BEL 213030

Re: Potential Impacts to Minesing Swamp Related to Proposed Discharge of Treated Effluent From Midhurst Waste Water Treatment Plant to Willow Creek

Background

The Township of Springwater is presently carrying out Phases 3 and 4 of a Class EA to determine the servicing/infrastructure (water, wastewater, transportation) requirements to accommodate growth associated with the Midhurst Secondary Plan area. One of the objectives of the Class EA is to ensure that impacts to the natural environment are minimized and that appropriate mitigation measures are employed. The Class EA work is being undertaken by Ainley & Associates on behalf of the Township.

One of the key elements of the required infrastructure is a new Waste Water Treatment Plant (WWTP), to be located along Snow Valley Road near Wilson Drive. The treated effluent from the WWTP is proposed to be conveyed via a new sewer west along Snow Valley Road, north on Wilson Drive, west along Highway 26 and north on Golf Course Road, where it will then be discharged into Willow Creek. The proposed discharge location on Willow Creek (**Figure 1**) is situated 4.07 km upstream of where the flow enters the Minesing Swamp, a Provincially Significant Wetland (PSW).

Beacon Environmental has been retained by the Midhurst Landowners Group to provide an opinion as to whether the discharge of treated effluent into Willow Creek at this location will impact the features and function of the Minesing Swamp PSW.

Minesing Swamp

The Minesing Swamp (also referred to as the Minesing Wetlands) is one of the largest wetlands in southern Ontario, with an area of approximately 60 km^2. It is comprised of all four wetland types (swamps, fens, bogs and marshes) and provides habitat for over 400 plant species, including some that are regionally and/or provincially rare. The wetland is also an important staging area for migratory waterfowl and one of the largest wintering grounds for white-tailed deer in southern Ontario. It has been classified by the Ministry of Natural Resources (MNR) as both a Provincially Significant Wetland (PSW) and a Provincially Significant Life Science Area of Natural and Scientific Interest (ANSI).

The hydrology of the Minesing Wetlands is influenced by surface water flows associated with the major creek systems that feed the deciduous swamps and marshes, as well as groundwater discharge that sustains the boreal forest, bog and fen communities in the southeastern portion of the wetlands.

Willow Creek – General Health Conditions

The Minesing Swamp has an extremely large (approximately 2600 km^2) overall catchment area and is fed by a number of major rivers and creeks, including Willow Creek at its northeast corner. The reach of Willow Creek that flows into the swamp is downstream of the confluence of two major sub-watersheds, Willow Creek and Matheson Creek (see **Figure 1**). Collectively, these two sub-watersheds have an upstream drainage area of 230 km^2. Willow Creek and its tributaries (including Matheson Creek) enter the wetlands from the northeast and flow through an extensive area of marsh, before entering the Nottawasaga River 3.6 km south of Edenvale.

The Nottawasaga Valley Conservation Authority (NVCA) periodically issues "report cards" on the health of the major watersheds within its area of jurisdiction. As of 2013, NVCA considers the surface water quality and stream health in the Willow Creek subwatershed as generally "unimpaired" to "below potential" [i.e., somewhat impaired]. Although the section of Willow Creek upstream of the Village of Midhurst and Little Lake is considered "below potential", stream health generally improves through Midhurst itself where the creek enters a well-forested valley that receives groundwater contributions from baseflow in the form of springs and seepage areas.

Along much of its length Matheson Creek exhibits unimpaired stream health from its headwaters downstream to west of Highway 27. However, near their confluence (located 1.67 km upstream of the proposed effluent discharge point; see **Figure 1**), both Matheson and Willow Creeks are considered "below potential", with stream health continuing to decline as Willow Creek enters an agricultural plain upstream of Minesing Swamp. NVCA has identified several factors that contribute to the existing water quality impacts to this reach of Willow Creek, namely the general absence of riparian cover and unrestricted livestock access. Stream health is considered "below potential" from the confluence of Willow and Matheson Creeks to the point where the main branch of Willow Creek enters the Minesing Wetlands (which is approximately 4.0 km downstream of the proposed effluent discharge point). During low flow conditions, nutrient concentrations (total phosphorus) are moderate in Willow Creek at George Johnston Road (situated over 3.5 km downstream of the proposed effluent discharge point), which also contribute to the "below potential" stream health condition ascribed by NVCA to this section of the creek. NVCA concludes that the overall stream health of Willow Creek in 2013 has remained unchanged since the previous 2007 report card.

Assimilative Capacity of Willow Creek

The assimilative capacity of Willow Creek to receive the proposed Midhurst WWTP effluent has been modeled by Hutchinson Environmental Services Limited (HESL) in 2013, building upon an interim analysis prepared by AECOM Limited in 2009. HESL's 2013 assessment has used three additional

years of data. The modeling exercise has also been supported by field investigations that have measured actual "time-of-travel" under various flow conditions, including moderate flow and low flow.

The assimilative capacity of the creek is discussed in greater detail in the companion memorandum prepared by Dr. Neil Hutchinson (HESL). However, the principal findings of these studies, as they pertain to the potential impacts of effluent discharge on the downstream Minesing Swamp PSW, are summarized below.

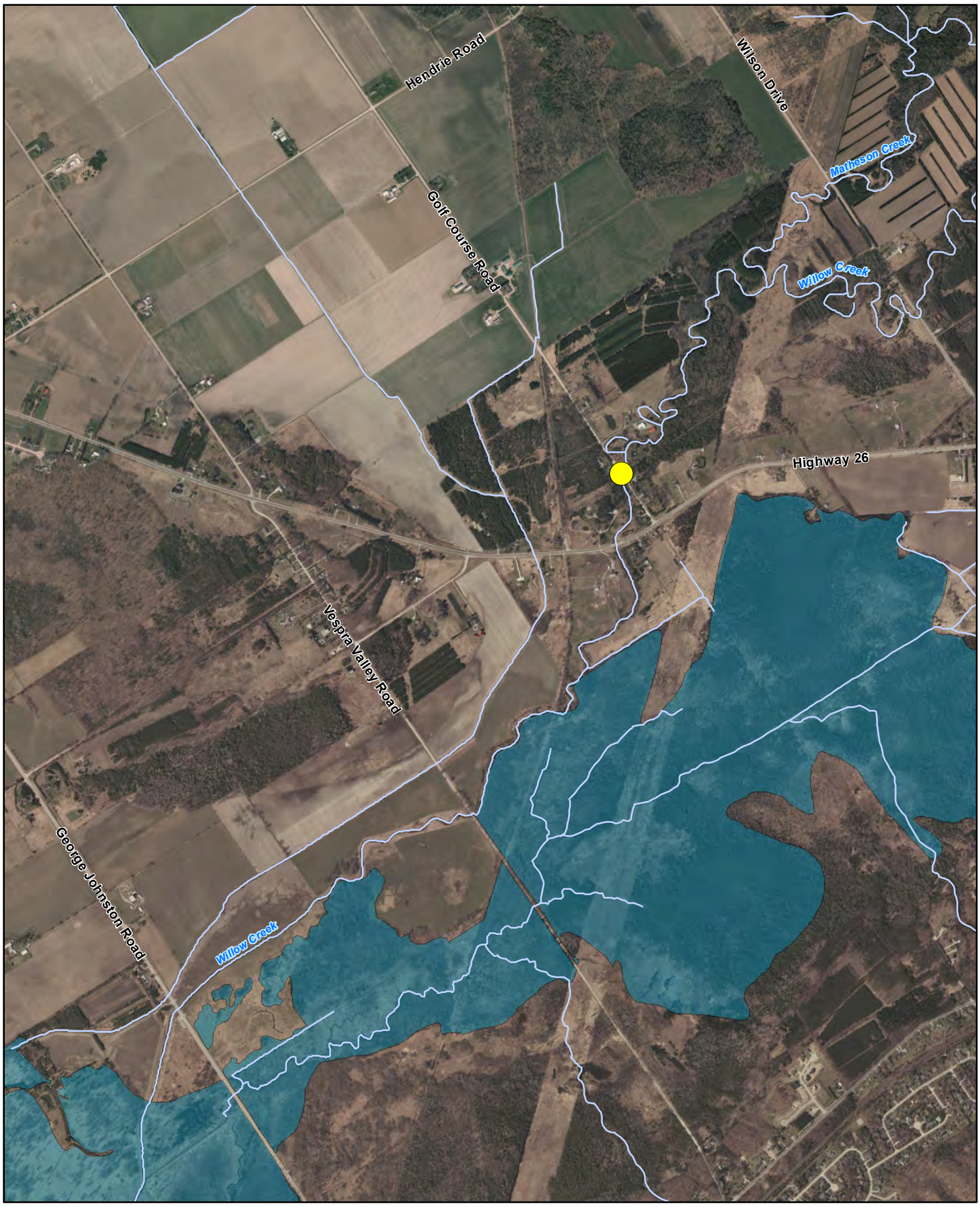
HESL's (2013) investigations have concluded that the assimilation processes in Willow Creek will maintain un-ionized ammonia levels in the creek below Provincial Water Quality Objectives (PWQO) by the time the water reaches Minesing Swamp. It is predicted that under a "worst case" scenario, un-ionized ammonia concentrations would be approximately 0.01 mg/L (well below the PWQO) at the point where Willow Creek enters the wetland.

For total Phosphorus the proposed effluent limit for Phase 1 is 0.05 mg/L. This will maintain phosphorus concentrations in the creek at 0.04 mg/L or lower, an insignificant (<10%) change from the present day values of 0.037 mg/L. However, there will likely be a program to off-set WWTP Phosphorus loadings through reductions from other sources in the watershed, such that water quality in the creek will be maintained and improved. Furthermore, the plants growing in the wetland, particularly narrow-leaved emergent such as cattails (*Typha* spp.) play a natural role in the uptake of nutrients and are already well adapted to higher nutrient inputs from agricultural activities immediately upstream of the swamp.

Conclusion

Given the foregoing, it is concluded that there will be no impact to Minesing Swamp as a result of the proposed discharge of treated effluent from the Midhurst WWTP at Golf Course Road. The reasons for this conclusion are as follows:

- Flow in Willow Creek enters the Minesing Swamp 4.07 km downstream of the discharge point;
- The existing water quality in the section of Willow Creek downstream of the discharge point is already considered "below potential" due to agricultural inputs;
- Modeling indicates that the mixing zone for un-ionized ammonia under any flow condition scenario does not extend very far downstream of the discharge point; and
- Even under low flow conditions, the assimilative capacity of Willow Creek is so high and the distance between the discharge point and Minesing Swamp so great, that PWQOs will be met and, in some cases, well below the PWQOs by the time the water in the creek enters the wetland.



Legend

- Proposed Effluent Discharge to Willow Creek
- Watercourse
- Minesing Swamp - Provincially Significant Wetland

Willow Creek and Minesing Swamp

Figure 1

Geranium Corporation

UTM Zone 17 N, NAD 83

First Base Solutions
Web Mapping Service 2000

N
W E
S

0 215 430 860 Meters

1:17,000

BEACON ENVIRONMENTAL

Project 213030
July 2013

APPENDIX 'P'

Fluvial Geomorphological Assessment of Willow Creek Downstream of Proposed WWTP Discharge at Highway 26, Midhurst On. – Palmer Environmental Consulting Group Inc., December 13, 2013

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

*357 Bay Street, Suite 800, Toronto, ON M5H 2T7 **t** 647-795-8153*

December 13, 2013

Midhurst Landowners Group
c/o Neil Hutchinson, Ph.D.
President, Principal Aquatic Scientist
Hutchinson Environmental Sciences Ltd.
3-1 Taylor Road
Bracebridge, ON P1L 1S6

Dear Dr. Hutchinson,

Re: Fluvial Geomorphological Assessment of Willow Creek Downstream of Proposed WWTP Discharge at Highway 26, Midhurst, ON

Palmer Environmental Consulting Group Inc. (PECG) is pleased to submit to Hutchinson Environmental Sciences Ltd. (HESL), on behalf of Midhurst Landowners Group, the results of a two-phase fluvial geomorphology study of Willow Creek, in the Midhurst Settlement Area, in connection with the assessment of potential downstream impacts from wastewater treatment plant (WWTP) effluent on channel morphology.

This report represents a synthesis of work completed under the direction of Robin McKillop, M.Sc., P.Geo. in 2009 (while with AECOM) and in 2013 (now with PECG). Based on field investigations and desktop analyses, the addition of proposed effluent discharge to Willow Creek at Highway 26 is not anticipated to increase downstream erosion above existing, natural rates.

Should you or your client have any questions pertaining to this assessment, please feel free to contact Robin McKillop at 647-795-8153 or robin@pecg.ca.

Yours truly,

Palmer Environmental Consulting Group Inc.

Robin McKillop, M.Sc., P.Geo.
Senior Fluvial Geomorphologist

Introduction

Midhurst Landowners Group will construct a WWTP that discharges treated effluent to Willow Creek, at its crossing of Highway 26, in the Midhurst Settlement Area (hereinafter referred to as "Midhurst"), in the Township of Springwater. At full development, the total discharge, including flows from existing development in Midhurst, will be about 0.17[1] m^3/s. In order to assess potential erosional impacts of the discharge on Willow Creek, downstream of Highway 26, a two-phase fluvial geomorphological assessment was completed under the direction of Robin McKillop, M.Sc., P.Geo. Mr. McKillop led the first phase of work in 2009, while working with AECOM, and completed the second phase of work in 2013, now with PECG. This report represents the culmination of both work programs.

The geomorphological assessment was completed to meet four main objectives:

1. Characterize existing channel morphology of Willow Creek from the proposed discharge point at Highway 26 to the Minesing Wetlands Conservation Area;
2. Assess existing channel stability and areas potentially susceptible to erosion;
3. Assess the existing geomorphic capacity of Willow Creek to convey flows; and
4. Assess the potential for changes in geomorphic processes, including changes in erosion rates and channel form, following the proposed increase in discharge from municipal effluent.

The 2013 follow-up assessment was completed to verify that the channel morphology and erosion conditions documented by the 2009 assessment are still valid, given the potential for morphological changes to have occurred since the first phase of the assessment was completed in 2009. This memorandum summarizes the methods used in this study; characterizes the physical setting, as a basis for understanding channel form and function; describes three reaches with reference to channel dimensions and watercourse functions, flow conveyance and channel stability; documents existing erosion; and evaluates the sensitivity of the watercourse to the proposed effluent discharge.

Methods

Several sources of information provided the basis for completing the initial desktop component of the geomorphological assessment:

- Regional topographic and drainage mapping;
- Surficial geology mapping completed by the Ontario Geological Survey and Geological Survey of Canada; and
- Historical aerial photography (1978) and recent orthophotography (2009).

[1] This value is rounded conservatively from the anticipated 0.164 m^3/s total.

The topographic, drainage and surficial geology mapping were reviewed to identify surface features that define the drainage characteristics within the Willow Creek watershed. Special attention was given to the characteristics of, and changes in, valley confinement, headwater tributaries, breaks in slope and stream substrate. Orthophotography of the watershed and surrounding areas provided an overview of surface features influencing drainage, and facilitated preliminary geomorphic characterization of the watercourse. Differences in meander pattern, channel gradient, floodplain characteristics and vegetation were used to delineate stream reaches. Surrounding land use, possible sites of erosion and existing anthropogenic constraints that may provide insight on stream flow characteristics were noted. Historical aerial photography was examined to identify any changes in land use or stream configuration between 1978 and 2009.

Preliminary field reconnaissance was completed on February 13, 2009 at road crossings along Willow Creek, from Midhurst to the Minesing Wetlands Conservation Area at George Johnson Road. The purpose of this initial visit, conducted during baseflow (low-flow) conditions, was to make qualitative observations of geomorphic form and function, topographic variability and valley confinement, substrate characteristics, vegetative cover, and land use and anthropogenic influence. Snow and ice cover precluded detailed geomorphic analysis at the time, but the observations assisted with the delineation of channel reaches and identification of sites for further investigation.

A geomorphic survey was completed on August 18, 19 and 26, 2009 along Willow Creek from the proposed discharge point at Highway 26 to approximately 2 km west of George Johnson Road, in the Minesing Wetland area. Within each of the stream reaches, observations of channel morphology, including valley confinement, floodplain dimensions, channel pattern, bankfull shape, bed material composition, and riparian vegetation were recorded in a field notebook, with key features additionally documented in photographs (Appendix A). Special attention was given to areas influenced by anthropogenic activities and to any existing flow obstructions, erosion features and areas potentially susceptible to erosion.

As a basis for assessing the present geomorphic capacity of the subject watercourse to convey flows and the potential for changes in geomorphic processes from the proposed addition of effluent discharge, channel cross-sections and energy gradients (~water surface slopes) were measured in representative locations along each reach. An assessment of the flow at which the channel bed and banks are susceptible to erosion was completed, based on Hjulstrom's relation and ASCE (1967), which account for both fine and coarse substrates.

Follow-up field investigations were completed on November 15, 2013, with a focus on sites originally assessed in 2009, in order to confirm that previous descriptions and measurements are still representative. Channel cross-sections were measured and photographed (Appendix B) at the approximate locations originally established in 2009, as identified by field maps and photographs, and a comparison was made of the channel and erosion descriptions from 2009 with current conditions.

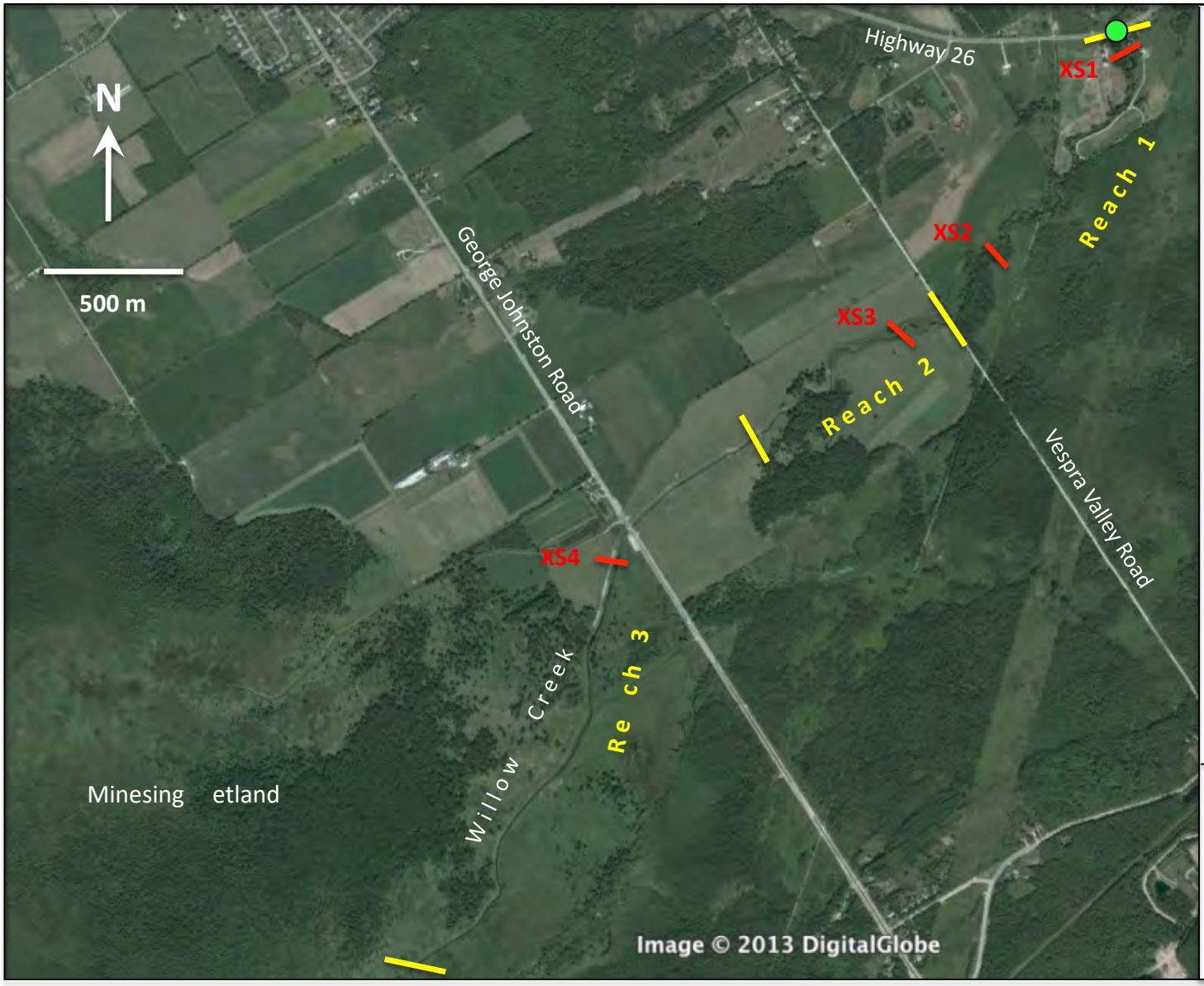
Physiography and Land Use

Most of Willow Creek is within the Lake Simcoe Lowlands physiographic region, which encompasses nearly 3,000 km^2 of lowland areas bordering Georgian Bay and Lake Simcoe (Chapman and Putnam, 1984). The region was inundated by Glacial Lake Algonquin and, in part, Glacial Lake Nipissing. It is covered in sand, silt and clay that settled on the bottom of these glacial lakes. Willow Creek flows across clay/silt glaciolacustrine deposits within all three study reaches and ultimately drains into the vast Minesing Wetland, a wetland complex of poorly drained, peaty soils (Figure 1). Parts of the margin of the wetland, west of George Johnston Road, appear to have been reclaimed for agricultural use in historical times through land draining and berm construction.

The Willow Creek subwatershed is partially within the limits of the Township of Springwater, west of Lake Simcoe. The subwatershed is about 229 km^2. Willow creek drains the south portion of the subwatershed over the sand-rich Simcoe Uplands, through Little Lake, and north through Midhurst. Through Midhurst and downstream, Willow Creek is confined in a deep, wooded valley incised into littoral and foreshore deposits. East of Nursery Road, the valley widens and Willow Creek flows over low-relief foreshore deposits. The present land use of this area is predominantly agricultural. Matheson Creek, a tributary that drains the north portion of the subwatershed, joins Willow Creek west of Wilson Drive. Willow Creek continues to flow westward over glaciolacustrine deposits and ultimately into the Minesing Wetlands Conservation Area. Willow Creek is a tributary to the Nottawasaga River, which it joins within the Minesing Wetlands. The Nottawasaga River ultimately drains northeasterly into Georgian Bay.

Geomorphological Description

Willow Creek has been divided into three distinct reaches for descriptive and analysis purposes (Figure 1). An emphasis has been placed on characterizing geomorphic form (channel planform and cross-section characteristics) and function (erosion, transport and depositional processes) to assist in defining the channel's present stability and geomorphic capacity to convey flows under various conditions. Additional emphasis has been placed on documenting areas potentially susceptible to erosion as well as existing evidence for erosive processes. Qualitative characteristics of each reach are described below, based on both the 2009 and 2013 field investigations, and quantitative details from 2009 are summarized in Table 1. Key photographs from the 2009 and 2013 assessments are contained in Appendix A and Appendix B, respectively.



Legend

- Proposed Discharge Locaon
- Cross-section (XS)
- Reach eak

Note: Base imagery (2006) from Google Earth

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

Midhurst Landowners oup

Willow eek eaches

Figure

Table 1. Estimated Channel Characteristics under Observed, Proposed and Full-Capacity Flow Conditions

Reach	Cross-section	Energy Gradient (m/m)	Observed Low-Flow Conditions				Observed + Proposed Effluent Discharge				Full-Capacity Flow Conditions[2]			
			Width (m)	Depth (m)	Average Velocity[1] (m/s)	Discharge (m^3/s)	Width (m)	Depth (m)	Average Velocity[1] (m/s)	Discharge (m^3/s)	Width (m)	Depth (m)	Average Velocity[1] (m/s)	Discharge (m^3/s)
1	1	0.0010	12.73	0.66	0.26	1.09	12.77	0.69	0.27	1.26	14.17	2.16	0.70	17.2
1	2	0.0011	4.89	1.35	0.23	1.07	5.39	1.47	0.24	1.24	9.13	3.02	0.71	11.9
2	3	0.0002	5.92	1.02	0.32	1.25	6.16	1.09	0.34	1.42	12.79	2.48	0.54	10.1
3	4	0.0001	10.84	0.72	0.22	1.26	10.91	0.76	0.23	1.43	11.69	1.25	0.33	3.8

Manning's n values based on back-calculation from flow values, based on measurements from nearby flow stations, and field observations of channel roughness.

[1] *Average velocities estimated based on field measurements.*

[2] *Full-capacity channel defined by physical (geometric) tops of bank.*

Reach 1

Reach 1 extends from Highway 26 (Photographs 1, 2) to Vespra Valley Road. The upstream 750 m of the reach flows between agricultural lands with a narrow, wooded, riparian buffer in most areas. The downstream 1,000 m of the creek is bounded by agricultural lands, with wooded banks to the north and a wooded wetland to the south (Figure 1).

Through the reach, relief is low and the creek exhibits an unconfined, sinuous to irregularly meandering pattern. The upstream end of the reach, near Highway 26, may have undergone minor straightening in the past. Local irregularity in channel pattern is attributed to large flow obstructions (fallen trees and accumulated anthropogenic debris), which are common throughout the reach. Such obstructions are associated with bank erosion, as evident by exposed tree roots and steep or undercut banks (Photographs 5, 6, 7).

Channel dimensions and the distribution of bed material are also influenced by the abundance of in-stream debris. Anthropogenic debris is commonly pinned against the upstream side of fallen trees. Sandy sediment has accumulated where the flow has been obstructed, and diverted flow has led to local bank erosion and channel widening. Cross-section 1 was selected to represent this channel condition (Photograph 3). Where fallen trees or other obstructions are absent, the channel tends to exhibit a narrower, deeper form with a greater proportion of the underlying glaciolacustrine clay/silt exposed on the channel bed. Cross-section 2 was selected to represent this channel condition (Photograph 4). These two channel conditions alternate throughout the length of the reach, creating a sequence of debris, sand accumulation and pools.

Glaciolacustrine clay/silt, which is highly resistant to erosion, is exposed along the channel banks (Photograph 8) and approximately 50% of the channel bed. Fine to medium sand forms a discontinuous veneer over the glaciolacustrine deposit. The majority of this sand has been transported downstream from headwater sources such as the Simcoe Uplands. However, some cut-banks in glaciolacustrine clay/silt expose overlying, patchy sandy veneers, which are erodible and undoubtedly also contribute some sand to the channel. The sandy bed material is continuously transported through the system by observation of grain movement during baseflow conditions and by the lack of algal or macrophyte growth on the frequently disturbed bedforms.

Channel dimensions are well-defined throughout the reach, but irregularly-shaped, varying in cross-section between broad and rectangular, and narrow, deep and triangular. Steep, unvegetated banks testify to the cohesive material with which they are composed. As Willow Creek enters the wetland area in the downstream portion of Reach 1, it is expected that a substantial fraction of streamflow floods overbank and dissipates in the surrounding swamp land. This process would account for the modelled decrease in stream discharge during full-capacity flow events between Cross-section 1 and Cross-section 2, as interpreted between tops of bank (Table 1).

Reach 2

Reach 2 extends approximately 1,000 m downstream from Vespra Valley Road. Relief is low, land use along both banks is agricultural, and vegetation is limited to grasses with the exception of a few trees and a small wooded patch. Throughout the reach, Willow Creek follows an unconfined, regularly meandering pattern (Figure 1, Photographs 9, 10).

Reach 2 overlies glaciolacustrine clay/silt that is exposed along channel banks and about 50% of the channel bed. Channel dimensions are well-defined and irregular in cross-section. Bed material is composed of fine to medium sand, which forms regularly-spaced bedforms, alternating with deeper pools that commonly contain vegetated mats along the banks (Photograph 12). Sparsely-vegetated sandy side bars exposed during field reconnaissance (low-flow conditions) are likely transported and deposited during moderately high flows. As in Reach 1, banks are steep to undercut with locally exposed tree roots (Photographs 13, 14, 15). Bank failures are more common where sandy deposits overlie clay bank material. Large woody debris is less common in Reach 2 due to the rarity of tree cover. With less in-stream material available to obstruct flows, there is less variation in channel dimensions.

Due to the low relief and distribution of wetland in surrounding areas, it is expected that Reach 2 may once have passed through a wetland area. A slightly greater proportion of high flows likely spills overbank in the vicinity of Cross-section 3 (Reach 2, Photograph 11) than in the vicinity of Cross-section 2 (Reach 1), which explains the downstream reduction in estimated full-capacity flow conditions (Table 1).

Reach 3

Reach 3 extends from 700 m upstream of George Johnson Road, to 2,000 m downstream of George Johnson Road. Upstream of the road crossing, land use is agricultural and bank vegetation is composed predominantly of grasses (Photograph 16). Downstream of the road crossing, Willow Creek enters the Minesing Wetland area, where bank vegetation includes a mixture of grasses, cattails and riparian shrubs, with a greater abundance of trees near the downstream end of the reach (Photographs 17, 18).

The entire length of the reach has been artificially straightened, pre-dating aerial photography that was obtained (1978), although some recent attempts have been made to naturalize the reach through the in-stream placement of woody debris and the deliberate displacement of bed material downstream of George Johnson Road. The channel is unconfined as it flows across level ground, except where it parallels a 350 m-long berm constructed along the north bank downstream of George Johnson Road. The downstream extent of the reach is defined based on the change in channel form from straightened to natural, irregularly meandering, narrow and locally multi-threaded. Based on aerial photography, Willow Creek becomes smaller as it enters the wetland. The majority of the streamflow contained within the channel during high-flow events in upstream reaches would likely flood overbank and attenuate through the wetland. Indeed, the estimate of full-capacity flow at Cross-section 4 (Reach 3, Photograph 19) was substantially less than that at the upstream cross-sections.

Similar to the areas characterized upstream, Reach 3 of Willow Creek overlies glaciolacustrine clay/silt. Due to the extremely low energy gradient and swamp-like characteristics, clay/silt bed and bank material is exposed in few areas along Reach 3. Upstream of George Johnson Road, erosion is exacerbated by the frequent disturbance of stream banks by cattle (Photograph 16). Downstream of George Johnson Road, there is little evidence of erosion. Stream banks in some areas were undercut (e.g., downstream of the confluence with a tributary channel approximately 750 m downstream from George Johnson Road – Photograph 20), but the dense bank vegetation contributes greatly to stability. Bed material was composed of fine to medium sand, which was mobile even during low flows.

Assessment of Potential Morphological Impacts from Effluent Discharge

As described above, bed and bank erosion occurs naturally along Willow Creek downstream of Highway 26. The pattern and rates of erosion reflect the existing hydrologic regime, substrate characteristics and channel morphology. An increase in stream flow has the potential to accelerate erosion, depending on the magnitude of change in depths and velocities. Over prolonged periods, increased erosion can lead to changes in channel form, which could adversely affect aquatic habitat or damage property. Thus, it is important to assess what effect the proposed WWTP discharge may have on flow conditions and erosional processes in Willow Creek.

Observed and proposed flow conditions within Willow Creek were originally estimated based on field surveys conducted in 2009 (Table 1). The downstream decrease in full-capacity channel conditions (from 17.2 m^3/s at Cross-section 1 to 3.8 m^3/s at Cross-section 4), based on the physical (geometric) tops of bank, relates to the anthropogenic history and morphological trends along Willow Creek. The highest capacities are closest to Highway 26, where Willow Creek exhibits natural morphology within a forested setting with the steepest gradient relative to downstream reaches. Farther downstream, where the creek appears to have been artificially excavated within an area reclaimed from the Minesing Wetland, its dimensions are unnatural and its gradient is nearly flat. Flows are backwatered from the wetland, have little energy available for erosion, and readily spill overbank into the adjacent floodplain.

The addition of 0.17 m^3/s would be most evident during low-flow conditions, when it comprises a greater relative proportion of total stream discharge. During low-flow conditions observed during the 2009 field investigations, this increase in stream discharge would result in an average increase in flow depth of just 7 cm (Table 1). During higher flow conditions, this increase in depth would be much lower. During full-capacity flow conditions, the effect of effluent discharge on flow parameters would be unmeasurable.

The potential impacts from the addition of effluent discharge have been assessed by an examination of substrate composition and by determining threshold conditions for sediment transport under different depth and velocity scenarios. Downstream of Highway 26, Willow Creek overlies cohesive glaciolacustrine silty clay, which is highly resistant to erosion. Regular “loose boundary” analysis of erosion thresholds is not applicable to channels with clay and silt beds, which are held together by cohesion. Clay tends to erode irregularly, through pot-hole development, percussive wear and

bioturbation. According to Hjulstrom's relation and ASCE (1967), the velocity threshold for clay erosion is approximately 1 m/s. As indicated in Table 1, even the velocity at full-capacity flow conditions (0.33-0.70 m/s) does not exceed this threshold. Therefore, the proposed increase in streamflow from effluent discharge is not anticipated to exceed the erosion threshold of silty clay. Erosion of clayey substrates in these reaches of Willow Creek likely only occurs in association with locally increased velocities around in-stream flow obstructions, and through post-flood bank collapses caused by more rapid drops in stream level than can be achieved through drawdown in the adjacent, saturated banks.

The discontinuous veneer of fine to medium sand was observed to be mobile even during low-flow conditions. During extreme low-flow conditions (e.g., 7Q20 flows), velocities may be sufficiently low that there is little to no movement of sand along the bed. Based on the daily discharges for Willow Creek near Highway 26, this condition is rare. With the supplemental flow contributed by the effluent discharge, the recurrence of periods during which there is *no* movement of sand may be reduced slightly. Regardless, the sand moves continuously during 'normal' baseflow conditions to which aquatic species are adapted, and the transport of the surface veneer of sand does not affect overall channel morphology, so any minor differences would be imperceptible.

"Bankfull", or channel-forming, flows were estimated based on the new field measurements from 2013 at approximately the same locations originally surveyed in 2009. The bankfull stage was based on field indicators such as changes in vegetation, scour patterns or bank steepness, providing a slightly more conservative reference than does the full-capacity channel defined in 2009 by the physical (geometric) tops of bank. A comparison was made between the existing (natural) "bankfull" flows at each cross-section and the proposed conditions with the addition of 0.17 m^3/s of effluent discharge (Table 2).

Table 2. Estimated Bankfull Characteristics under Existing and Proposed Conditions

Reach	XS[1]	Energy gradient[2] (m/m)	Manning's n[3]	"Bankfull" flow[4]				"Bankfull" flow + proposed effluent discharge			
				Width (m)	Depth (m)	Average velocity (m/s)	Discharge (m^3/s)	Width (m)	Depth (m)	Average velocity (m/s)	Discharge (m^3/s)
1	1	0.0010	0.045	13.50	1.48	0.65	8.0	13.50	1.49	0.65	8.2
1	2	0.0011	0.045	9.10	1.61	0.76	8.2	9.10	1.63	0.77	8.4
2	3	0.0002	0.035	11.80	1.46	0.34	3.5	11.80	1.49	0.35	3.7
3	4	0.0001	0.035	13.50	1.09	0.24	2.5	13.50	1.12	0.24	2.7

[1] Locations selected as close to original (2009) sites as possible, based on site map and photographs

[2] Estimated based on water surface slope measured in 2009

[3] Estimated visually, based on pictorial guide (Hicks and Mason, 1998)

[4] Bankfull stage based on indicators such as change in vegetation, scour patterns and bank steepness, not physical (geometric) tops of bank as considered above in Table 1

The addition of 0.17 m^3/s of effluent to the bankfull condition increases water depth by only 0.01 to 0.03 m and average velocity by no more than about 0.01 m/s. Such changes would be virtually unmeasurable in Willow Creek, and the velocities are still below the ~1 m/s threshold for erosion of clayey substrates (Hjulström's relation and ASCE, 1967). The minor increase in velocity would also have no measurable effect on the observed, continuous throughput of fine sands along the three reaches downstream of Highway 26.

Conclusion

Erosion is a natural process that occurs along Willow Creek. Bed and bank erosion are most extensive immediately downstream of Highway 26, within forested areas, and least extensive farther downstream due to the channel's cohesive, clayey substrates, low gradient and densely vegetated banks. The channel is sufficiently wide that the addition of proposed effluent discharge would have such a small effect on depths and velocities that bed and bank erosion rates would be unaffected. In conclusion, the addition of the treated effluent discharge to Willow Creek at its crossing of Highway 26 is not anticipated to increase downstream erosion rates above existing, natural levels.

References

ASCE, 1967. River Hydraulics (USCE Technical and Engineering Design Guide 18), Washington.

Chapman, L.J., Putnam, D.F., 1984. Physiography of Southern Ontario. Ontario Geological Survey, Special Volume 2, 270 pp.

Hicks, D.M., and Mason, P.D., 1998. Roughness characteristics of New Zealand rivers. National Institute of Water and Atmospheric Research Ltd., Water Resources Publications, LLC, 329 p.

Appendix A – Photograph Log (August 2009, from AECOM)

Photograph 1 ↑
Reach 1 - Downstream of Hwy 26 – August 26, 2009

Photograph 2 ↑
Reach 1 - Downstream of Hwy 26 – February 13, 2009

Photograph 3 ↑
Reach 1 - Cross Section 1 downstream facing - August 26, 2009 - Representative of wider cross section containing woody/anthropogenic debris

Photograph 4 ↑
Reach 1 - Narrow, deep section of reach downstream from Cross Section 2 – August 26, 2009

Photograph 5
Reach 1 - Large erosion site on left bank, at south end of horse farm property – woody and anthropogenic debris accumulated in channel, deflecting flow to sandy bank – August 26, 2009

Photograph 6
Reach 1 - Large erosion site on left bank, at south end of horse farm property – collapsing fence over top of eroding sandy bank – August 26, 2009

Photograph 7
Reach 1 - Large sandy deposit on right bank and high cutbank on left bank – August 26, 2009

Photograph 8
Reach 1 - Glaciolacustrine clay bank material – August 26, 2009

Photograph 9 ↑
Reach 2 - Downstream of Vespra Valley Road – August 19 2009

Photograph 10 ↑
Reach 2 - Downstream of Vespra Valley Road – February 13, 2009

Photograph 11 ↑
Reach 2 - Cross section 3 – downstream facing – August 19, 2009

Photograph 12 ↑
Reach 2 - Large vegetation mat – August 19, 2009

Photograph 13 ↑
Reach 2 - Eroding banks near bases of two large trees – August 19, 2009

Photograph 14 ↑
Reach 2 - Woody debris on stream bed, sandy deposit on right bank and slumping of left bank – August 19, 2009

Photograph 15 ↑
Reach 2 - Steep cutbank – August 19, 2009

Photograph 16 ↑
Reach 3 - Exposed sandy sediment on stream bank – result of trampling from cows – August 18, 2009

Photograph 17 ↑
Reach 3 - Downstream of George Johnson Road – August 26, 2009 (lower water level)

Photograph 18 ↑
Reach 3 - Downstream of George Johnson Road – February 13, 2009

Photograph 19 ↑
Reach 3 - Cross section 4 – downstream facing – August 18, 2009

Photograph 20 ↑
Reach 3 - Erosion on right bank downstream of confluence – August 18, 2009

Appendix B – Cross-section Photograph Log (November 2013)

Appendix B – Cross-section Photograph Log (November 2013)

Photo 21 – Cross-section 1 (downstream view)

Photo 22 – Cross-section 2 (downstream view)

Photo 23 – Cross-section 3 (downstream view)

Photo 24 – Cross-section 4 (downstream view)

APPENDIX 'Q'

Design Basis for Midhurst Wastewater Treatment Plant – Black & Veatch, April 2014

TECHNICAL MEMORANDUM:

DESIGN BASIS FOR MIDHURST WASTEWATER TREATMENT PLANT

Class EA Phase 3 & 4 for the Midhurst Secondary Plan

B&V PROJECT NO. 180261

PREPARED FOR

Midhurst Landowners Group

APRIL 2014

BLACK & VEATCH
Building a world of difference.®

Table of Contents

LIST OF TABLES

1.0 Background

Infrastructure requirements to accommodate future growth planned within the Midhurst Secondary Plan were considered in accordance with Phases 1 and 2 of the Municipal Class EA (2000, as amended in 2007 and 2011) and documented in the "Midhurst Master Plan – Phase 1 & 2 - Water, Wastewater & Transportation, Ainley, July 2009" ("Master Plan"). The Master Plan determined that the Township of Springwater would construct a new sewage system to service growth within the Midhurst Secondary Plan area with the provision for expansion to service the currently developed area in Midhurst, including sanitary collection system, pump stations, treatment plant and outfall to a receiving water body.

The Master Plan concluded that additional Class EA Study will be required since the new sewage system is a Schedule C activity. Class EA Study to address Phases 3-4 of the Municipal Class EA planning process is being carried out by Ainley & Associates Limited on behalf of the Township of Springwater at this time.

2.0 Objective

The objective of this memorandum is to present the design basis for the proposed Midhurst Wastewater Treatment Plant (MWWTP). This design basis will be used to develop and evaluate alternative design concepts as part of the Phase 3 & 4 of the Midhurst Class EA Study. In accordance with the Master Plan, a new municipal wastewater treatment plant will be constructed to serve existing and proposed residential, commercial and light industrial development in the Midhurst Secondary Plan Area.

3.0 Units and Population

3.1 UNITS

The design basis is approximately 9,546 units of which 350 are Allowance for Existing and Future Public and Government Employment Lands (Equivalent Units) (SCS Consulting Group Ltd, 2013).

3.2 PHASING

For purposes of this assessment, we have divided the building out of the Midhurst Secondary Plan into a Phase 1 and full Build Out (described below). However, even within Phase 1, it is anticipated that construction will occur in sub-phases, with not all of Phase 1 being built at one time. The same is true of Full Build Out where sub-phasing is anticipated. While actual timing of construction is market dependent, for purposes of this assessment, it has been assumed that absorption will be between 350 to 400 units per year. There will be opportunity to phase the construction of the MWWTP, including the potential to construct a series of wastewater treatment plant modules for each sub-phase of construction within Phase 1 and Full Build Out to serve that sub-phase of development (i.e the plant will be constructed in phases to match the build out).

In accordance with the Master Plan, 2009, one unit is equivalent to 3 persons (Ainley Group, 2009).

Table 3-1 presents the summary of design basis for units and population.

Table 3-1 Units and Population

	PHASE 1	BUILD OUT
Units	5,000	9,546
Person Equivalents	15,000	28,638

4.0 Flows

4.1 FLOW GENERATION RATE

One unit is equivalent to 1.02 m^3/day of dry weather flow and 0.27 m^3/day of extraneous flow (Ainley Group, 2009). At three persons per unit, this equals to 0.34 m^3 plus 0.09 m^3 per person per day. This is equal to 430 L per person per day. Table 4-1 summarizes the flow generation per person.

Table 4-1 Flow Generation per Person

	VALUE	UNITS
Dry weather flow (G_{dwf})	340	L/d per person
Extraneous flow (G_{ext})	90	L/d per person
Average flow	430	L/d per person

4.2 PEAK HOURLY FLOW PEAKING FACTOR

The ratio of the peak day dry weather flow to the dry weather flow is given by the Harmon Formula (Ministry of the Environment (Ontario), 2008)(Page 5-11):

$$PF = 1 + \frac{14}{4 + P^{0.5}}$$

Where P is population in 1,000's.

Therefore, the peaking factor for Phase 1 is 2.78 and for the full Build Out 2.50.

4.3 PEAK HOURLY FLOW

The peak day flow is the average dry weather flow multiplied by the peaking factor plus the extraneous flow (Ministry of the Environment (Ontario), 2008).

$$Q_{PD=}\left(\left(G_{dwf} * PF\right) + G_{ext}\right) * Population$$

The peak hourly flow for Phase 1 is 15,519 m3/d and full Build Out is 26,891 m3/d.

4.4 PEAK INSTANTANEOUS FLOWS

The peak instantaneous flow to the plant will be the sum of the pumped flows from the terminal pump stations. It is recommended that a receiving chamber accept these flows and provide some balancing if there is no balancing at the pump stations.

4.5 SUMMARY

The design basis is that the peak flow to treatment will be the peak hourly flow. Table 4-2 presents the design basis for flows for various conditions.

Table 4-2 Flow Design Basis

	PHASE 1	BUILD OUT
Average dry weather flow (m^3/d)	6, 450	12,314
Peak hourly dry weather flow (m^3/d)	15,519	26,891

The Average Dry Weather Flow Rates are consistent with the flows used in the modeling to establish effluent limits (Hutchinson & Nesbitt, 2013).

5.0 Loads

5.1 GENERATION RATES

The generation rates and concentrations presented in Table 5-1 are obtained from the MOE Design Guidelines for Sewage Works (Ministry of the Environment (Ontario), 2008) : pages 8-9 and 8-17.

Table 5-1 Load Generation Rates

	g/(person*d)	mg/L
cBOD5	75	175
TSS	90	209
TKN	13	30
Total Phosphorus (TP)	3	7

5.2 PEAKING FACTORS

The maximum month loads are typically 1.25 times the average load.

5.3 DESIGN LOADS

Table 5-2 presents the summary of load for Phase 1 and Build Out conditions.

Table 5-2 Summary of Loads

LOAD IN KG/D	PHASE 1	BUILD OUT
cBOD5	1,125	2,148
TSS	1,350	2,577
TKN	195	372
Total Phosphorus (TP)	45	86

6.0 Characteristics

Table 6-1 presents characteristics of raw wastewater.

Table 6-1 Characteristics

	VALUE	UNITS
Inert to total suspended solids	15%	w/w
Which is at average flow	31	mg/L
COD to $cBOD_5$	2.1	w/w
Alkalinity	200	As mg/L $CaCO_3$

6.1 TEMPERATURE

Table 6-2 presents the air temperature data is from the 1971-2000 Climate Normals for the Barrie WPCC (Environment Canada).

Table 6-2 Design Basis for Temperature

	AIR (RH)	AIR (°C)	WASTEWATER
Peak day	100%	30	-
Peak over one SRT	80%	20	20

	AIR (RH)	AIR (°C)	WASTEWATER
Average	TBA	7	14
Minimum over one SRT	0%	-12	10
Minimum day	0%	-30	-

There are only 8 days over 30°C and less than one day less than -30°C.

6.2 FRACTIONATION

The design is based on default wastewater characteristics for raw sewage.

6.3 SLUDGE MANAGEMENT

The Biosolids will not be anaerobically digested therefore return liquor nutrient loading will not be a significant issue.

7.0 Effluent Quality

7.1 EFFLUENT LIMITS

Table 7-1 summarizes the effluent limits for Phase 1 of this project.

Table 7-1 Phase 1 Effluent Limits

DESCRIPTION	SAMPLE TYPE	CONCENTRATION	
		VALUE	UNITS
Carbonaceous Biochemical Oxygen Demand ($cBOD_5$)	Composite	15	mg/L Annual Average
Total Suspended Solids (TSS)	Composite	15	mg/L Annual Average
Ammonia-N	Composite		mg-N/L
June 1 to Oct 31		1.5	Monthly Average
Nov 1 to May 31		3.0	

DESCRIPTION	SAMPLE TYPE	CONCENTRATION	
		VALUE	UNITS
Total Inorganic Nitrogen (TIN) Ammonia-N + Oxidized-N	Composite	17	mg-N/L
Total Phosphorus (TP)	Daily Composite	0.05	mg/L
Disinfection (*e. coli*)	Monthly Geometric Mean Density	200	/100 mL

Table 7-2 lists the proposed build-out limits for the wastewater treatment plant.

Table 7-2 Build Out Limits

DESCRIPTION	SAMPLE TYPE	CONCENTRATION	
		VALUE	UNITS
Carbonaceous Biochemical Oxygen Demand ($cBOD_5$)	Composite	15	mg/L Annual Average
Total Suspended Solids (TSS)	Composite	15	mg/L Annual Average
Ammonia-N	Composite		mg-N/L
June 1 to Oct 31		1.0	Monthly Average
Nov 1 to May 31		2.0	
Total Inorganic Nitrogen (TIN) Ammonia-N + Oxidized-N	Composite	17	mg-N/L
Total Phosphorus (TP)	Daily Composite	0.03	mg/L
Disinfection (*e. coli*)	Monthly Geometric Mean Density	200	/100 mL

7.2 OBJECTIVES

In addition to the effluent limits, it is suggested to establish operational objectives for the design evaluation as listed in Table 7-3.

Table 7-3 Phase 1 Operational Objectives

DESCRIPTION	SAMPLE TYPE	CONCENTRATION	
		VALUE	UNITS
Carbonaceous Biochemical Oxygen Demand ($cBOD_5$)	Composite	10	mg/L Annual Average
Total Suspended Solids (TSS)	Composite	10	mg/L Annual Average
Ammonia-N	Composite		mg-N/L
June 1 to Oct 31		1.0	Daily Average
Nov 1 to May 31		2.0	
Oxidized Nitrogen	Composite	15	mg-N/L
Total Phosphorus (TP)	Daily Composite	0.03	mg/L
Disinfection (*e. coli*)	Monthly Geometric Mean Density	100	/100mL

8.0 Works Cited

Ainley Group. (2009, July). *Town of Springwater. Class Environmental Assessment Study for Midhurst Water, Wastewater and Transportation Master Plan. Phase 1 and 2 Report* . Ainley Group, Consulting Engineers and Planners.

Environment Canada. (n.d.). *Canadian Climate Normals 1971-2000 Station Data. Barrie WPCC, Climate ID 6110557.* Retrieved August 18, 2013

Hutchinson, N., & Nesbitt, R. (2013). *MEMO Dated December 11, 2013 RE: J130030 - Willow Creek Effluent Limits - Phase 3 EA Input.* Bracebridge: Hutchinson Environmental Sciences Ltd.

Ministry of the Environment (Ontario). (2008). *Design Guidelines for Sewage Works.* Retrieved August 15, 2013, from Ministry of the Environment (Ontario): http://www.ene.gov.on.ca/stdprodconsume/groups/lr/@ene/@resources/documents/resource/std01_079496.pdf

SCS Consulting Group Ltd. (2013, December 19). Projected Midhurst Populations. Based on Class EA and Proposed Draft Plans.

APPENDIX 'R'

Evaluation of Treatment Alternatives for Midhurst Wastewater Treatment Plant – Black & Veatch, May 2018

EVALUATION OF TREATMENT ALTERNATIVES FOR MIDHURST WASTEWATER TREATMENT PLANT

Class EA Phase 3 & 4 for the Midhurst Secondary Plan

B&V PROJECT NO. 180261

PREPARED FOR

The Township of Springwater

C/O AINLEY & ASSOCIATES LIMITED

MAY 2018

BLACK & VEATCH
Building a world of difference.®

Table of Contents

LIST OF TABLES

LIST OF FIGURES

APPENDICES

EXECUTIVE SUMMARY

The purpose of this report is to detail the treatment process unit selection for the proposed Midhurst Wastewater Treatment Plan (MWWTP) to accommodate future growth planned within the Midhurst Secondary Plan. This report presents the development and evaluation of alternative design concepts as part of Phases 3 and 4 of the Midhurst Class EA Study. The building out of the MWWTP has been divided into Phase 1 and (full) Build Out, where Phase 1 will accommodate the first 15,000 person equivalents (PE) and Build Out will add capacity for another 13,638 PE to increase the plant's capacity to 28,638 PE. Phase 1 is designed as a complete treatment process and does not depend on the expansion to full Build Out to meet the required effluent discharge limits.

The design basis for the MWWTP takes into account various factors with respect to population projection and wastewater flows and effluent limits. The evaluation of the alternative solutions for the liquid and biosolids streams was performed through the usage of a decision model consistent with the principles of environmental assessment planning and decision-making as outlined in the Municipal Class Environmental Assessment manual.

The liquid treatment train is the wastewater treatment process commencing at the head of the MWWTP and finishing with the discharge of treated effluent at Willow Creek. Based on the screening of a long list of treatment technologies available for each treatment process a short list of feasible technologies was developed. Four options were shortlisted for primary/secondary treatment technologies:

1. Step Feed Biological Nitrogen Removal (Step Feed BNR)
2. Sequencing Batch Reactor with Biological Nitrogen Removal (SBR BNR)
3. Biological Nitrogen and Phosphorous Removal (Bio P)
4. Membrane Bioreactor with Biological Nitrogen Removal (MBR BNR)

The shortlisted tertiary treatment technologies included:

1. Membrane Filtration
2. Two Stage Filtration
3. Blue PRO®

Each of the short listed options was evaluated for their advantages and disadvantages as well as their cost estimates for capital cost, operation and maintenance costs, and net present value (NPV) of a 25 year project period. Based on this analysis of primary/secondary and tertiary treatment technologies the following four train alternatives were developed.

1. Step Feed BNR with Membrane Filtration (NPV $34,143,000)
2. SBR BNR with Membrane Filtration (NPV $34,143,000)
3. Bio P with Membrane Filtration (NPV $33,667,000)
4. MBR BNR (NPV $27,485,000)

These four train alternatives were further investigated in a detailed evaluation which took account of several key factors including societal/cultural, technical, environmental, and economical aspects. Based on the detailed evaluation of the train alternatives, Option No. 1 – Step Feed BNR with membrane filtration returned the highest score.

Biosolids are nutrient-rich materials that result from the biological treatment of municipal wastewater and can be utilized in various beneficial practices including land application as soil amendment or fertilizer supplement. As in the evaluation of the liquid treatment train technologies a short list of feasible biosolids treatment technologies was screened from a long list of available technologies. The short list consisted of mechanical thickening, aerobic digestion, and autothermal thermophilic aerobic digestion (ATAD). Six biosolids management options were then identified as possible alternatives and evaluated for their advantages and disadvantages and costs:

1. Liquid Sludge with Aerobic Digestion (NPV $20,257,000)
2. Cake with Aerobic Digestion (NPV $28,453,000)
3. Pellets with Aerobic Digestion (NPV $28,471,000)
4. Liquid Sludge with ATAD (NPV $25,049,000)
5. Cake with ATAD (NPV $34,881,000)
6. Pellets with ATAD (NPV $35,139,000)

A detailed evaluation consisting of criteria including societal/cultural, technical, environmental, and economical factors was then conducted. Based on this detailed evaluation Option No. 4 – Liquid Sludge with ATAD achieved the highest score.

The MWWTP is proposed to be placed on the site at the intersection of Wilson Drive and Snow Valley Road. The proposed location for the MWWTP is in the north east area leaving sufficient space from the current and future land users as well as the current rail right of way. The headworks and tertiary treatment building will be located on the southern side whereas biosolids treatment and storage tanks will be located on the north side of the site. The process air blower building is located in the center of the site between the two bioreactors to eliminate any noise impact on neighbours. The site will have sufficient space for future expansions and buffer areas for landscaping and other site features. Phase 1 will be built along the west side of the site while the expansion will be built on the east side of Phase 1. The site road that circles both phases will be built in Phase 1. The grand total capital cost estimate for Phase 1 and Build Out is $51,568,350 and $38,953,440, respectively.

It should be noted that the Step Feed BNR with membrane filtration complete with liquid sludge treatment with ATAD for beneficial re-use will continue to be considered preliminary preferred until it is presented to public and review agencies and is confirmed as the preferred design concept based on any comments that may be received in the next stages of the Class EA Study. Upon confirmation of the preferred option design concept, a conceptual design will be developed.

1. BACKGROUND

Infrastructure requirements to accommodate future growth planned within the Midhurst Secondary Plan were considered in accordance with Phases 1 and 2 of the Municipal Class Environmental Assessment (EA) process (2000, as amended in 2007 and 2011) and documented in the "Midhurst Master Plan – Phase 1 & 2 - Water, Wastewater & Transportation, Ainley, July 2009" ("Master Plan"). The Master Plan determined that the Township of Springwater could construct a new sewerage system and treatment plant to service growth within the Midhurst Secondary Plan area with the provision for expansion to service the currently developed area in Midhurst. The new system includes a sanitary collection system, pump stations, treatment plant and effluent outfall to Willow Creek.

The Master Plan concluded that an additional Class EA Study will be required since the new sewerage system and treatment plant is a Schedule C activity. The Class EA Study to address Phases 3 & 4 of the Municipal Class EA planning process is being carried out by Ainley & Associates Limited on behalf of the Township of Springwater.

2. OBJECTIVE

The objective of this memorandum is to detail the treatment process unit selection for the proposed Midhurst Wastewater Treatment Plant (MWWTP). This memorandum presents the development and evaluation of alternative design concepts as part of the Phases 3 & 4 of the Midhurst Class EA Study. In accordance with the Master Plan, a new municipal wastewater treatment plant will be constructed to serve existing and proposed residential, commercial and industrial development in the Midhurst Secondary Plan Area.

3. DESIGN BASIS

The design basis for the MWWTP is detailed in the technical memorandum "Design Basis for Midhurst Wastewater Treatment Plant", which can be found in Appendix 9. A summary of the design criteria are provided below.

For purposes of this assessment the building out of the MWWTP has been divided into two parts: Phase 1 and (full) Build Out. Phase 1 will accommodate the first 15,000 person equivalents (PE) and Build Out will add capacity for another 13,638 PE to increase the plant's capacity to 28,638 PE.

For the purposes of this assessment, it has been assumed that the growth will be constant at 400 units (1200 PE) per year. The Phase 1 plant is sized to meet demands for the first ten years of growth in the area and the expansion to full Build Out on the site will meet the next 15 years of growth. However, it is recognized that growth in the area may vary and, after Phase 1 has been constructed, the timing of the next expansion to full Build Out will depend on actual absorption rates in the study area. Therefore, Phase 1 is designed as a complete treatment process and does not depend on the expansion to full Build Out to meet the required effluent discharge limits.

3.1 Population and Flows

The MWWTP design basis population projection and wastewater flows are presented in Table 3-1.

Table 3-1 Population and Flows to MWWTP

	PHASE 1	BUILD OUT
Person Equivalents	15,000	28,638
Average day dry weather flow (m^3/d)	6,450	12,314
Peak hourly dry weather flow (m^3/d)	15,519	26,891

3.2 Effluent Limits

The proposed effluent limits, for both Phase 1 and Build Out, are provided in Table 3-2.

Table 3-2 MWWTP Expected Effluent Limits

DESCRIPTION	CONCENTRATION		
	PHASE 1	BUILD OUT	UNITS
Carbonaceous Biochemical Oxygen Demand ($cBOD_5$)	15	15	mg/L
Total Suspended Solids (TSS) *	15	15	mg/L
Ammonia-N June 1 to Oct 31 Nov 1 to May 31	 1.5 3.0	 1.0 2.0	mg-N/L
Total Inorganic Nitrogen (TIN) (Ammonia-N + Oxidized-N)	15.4	15.4	mg-N/L
Total Phosphorus (TP) (annual average)	0.05	0.03	mg/L
Disinfection (*E. coli*) (geometric monthly mean)*	100	100	/100 mL
Monthly averages otherwise noted. * The objective will be set by the MOECC at the time the ECA is issued.			

The proposed operational objectives for design evaluation of Phase 1 are provided in Table 3-3.

Table 3-3 Phase 1 Operational Objectives

DESCRIPTION	SAMPLE TYPE	CONCENTRATION	
		VALUE	UNITS
Carbonaceous Biochemical Oxygen Demand (cBOD5)	Composite	10	mg/L
Total Suspended Solids (TSS) *	Composite	10	mg/L
Ammonia-N (Daily Average) June 1 to Oct 31 Nov 1 to May 31	Composite	 1.0 2.0	mg-N/L
Oxidized Nitrogen	Composite	13	mg-N/L
Total Phosphorus (TP)	Daily Composite	0.03	mg/L
Disinfection (*E. coli*) *	Grab	100	/100mL

All samples are 24-hour composite samples except for Disinfection which is a grab sample.
All values are monthly averages except for Disinfection which is a geometric monthly mean.
$cBOD_5$ and TSS are measured once a week while Ammonia-N, TIN and TP are measured three times a week
E. coli is measured once per week.
* The objective will be set by the MOECC at the time the ECA is issued.

4. OVERVIEW OF EVALUATION METHODOLOGY

The evaluation methodology used to select the preferred solution for the MWWTP of Midhurst Secondary Plan was established in a manner consistent with the principles of environmental assessment planning and decision-making as outlined in Municipal Class Environmental Assessment.

A decision model consistent with the principles of environmental assessment planning and decision-making as outlined in Municipal Class Environmental Assessment manual was developed to select the preferred liquid and biosolids streams. The liquid stream receives sewage and produces effluent of the required quality. The biosolids stream receives biosolids from the liquid stream and produces a product that can be exported offsite to another location. The evaluation methodology was customized to suit these two streams.

In general, both the liquid treatment and biosolids management evaluations follow the same approach described below:

1. Develop screening criteria for both the long and short list
2. Develop a long list of viable technologies
3. Screen the long list of strategies to create a short list of alternatives
4. Development of alternative design concepts for the short list of alternatives
5. Complete detailed evaluation of the short list of alternatives
6. Identify preliminary preferred alternative solution

The long list screening criteria identified alternatives that would meet the fundamental project requirements. The short list criteria are scored numerically in three categories: social, environment and economic.

5. LIQUID TREATMENT

5.1 Overview of Treatment Processes

The liquid treatment train is the wastewater treatment process commencing at the head of the MWWTP and finishing with the discharge of treated effluent at Willow Creek. All of the stages of the treatment process are listed in Table 5-1. Not all stages require detailed evaluation as part of this evaluation.

Table 5-1 Liquid Treatment Processes

PROCESS	BRIEF DESCRIPTION AND TREATMENT FOCUS	COMMENTS
Preliminary treatment	Conveyance to treatment plant and removal of screenings and grit	Possible alternatives for design concepts will not vary in terms of impact on land use or on the environment; therefore no further evaluation will be done at this stage of the project.
Primary treatment	Removal of settleable solids by gravity	Included in detailed evaluations
Secondary treatment	Processes to oxidize organics, oxidize ammonia, remove nitrogen and phosphorus	Included in detailed evaluations
Tertiary Treatment	Further removal of total phosphorus and suspended solids to meet the effluent criteria	Included in detailed evaluations
Disinfection	Inactivation of pathogenic organisms	Included in detailed evaluations
Effluent Pumping	Transfer the final effluent to the discharge point.	Possible alternatives for design concepts will not vary in terms of impact on land use or on the environment; therefore no further evaluation will be done at this stage of the project.

5.2 Evaluation Methodology for Liquid Treatment

5.2.1 Overview

The treatment of wastewater at the MWWTP is subject to the effluent limits detailed in Table 3-2 and the operational objectives detailed in Table 3-3. The development and evaluation of treatment process alternatives was then undertaken in accordance with the following steps:

1. Confirmation of the evaluation criteria by:
    a. Development of specific criteria to screen the long list of process alternatives; and
    b. Development of specific criteria to evaluate the short list of process alternatives

2. Development of the long list of process alternatives, with processes divided in to the following categories:
    a. Primary treatment process alternatives
    b. Secondary treatment process alternatives
    c. Tertiary treatment process alternatives
    d. Disinfection alternatives
3. Screening of long list of process alternatives and development of a short list of treatment train alternatives
4. Complete detailed evaluation of short list of treatment train alternatives
5. Identify the preliminary preferred alternative solution for wastewater treatment

5.2.2 Description of Evaluation Criteria

As indicated previously, two stages of evaluation were required to enable the preferred alternative solution for wastewater treatment to be identified: long list screening criteria and short list evaluation criteria

The first set of criteria was used to screen a long list of process options to a short list of treatment alternatives. The purpose of the preliminary screening is to identify only those treatment technologies that are considered "feasible" for this project and eliminate those technologies that do not suit the project constraints and opportunities. This step in the evaluation process ensures that only technologies that fit the project requirements are considered in the next step.

Table 5-2 sets out the criteria used to screen the long list of process options. As described previously only primary, secondary and tertiary treatment process unit options as well as the disinfection options were subject to the screening criteria.

Table 5-2 Liquid Treatment Long List Screening Criteria

CRITERIA	DESCRIPTION
Track Record	Demonstrated track record of ability to continuously meet and exceed the proposed treatment objectives
Scalability	Demonstrated reliability of full scale experience in similar size
Staging / phasing	Ability to expand to suit housing development's growth requirements
Operational and Maintenance (O&M)	Ability to maintain low operation and maintenance costs
Cost	Have a capital cost commensurate with the benefits provided

The short list of primary, secondary, tertiary and disinfection treatment alternatives resulting from screening the long list were then organized to create wastewater treatment train alternatives.

Four treatment trains were developed which constitute the short list of options for the MWWTP treatment process. Each of these treatment trains were then assessed using the evaluation criteria listed in Table 5-3. Weighting was applied to both the primary and secondary criteria to allow added importance to be placed on criteria considered to hold greater significance. The evaluation was conducted by ranking the four short listed options. A four ranking indicates the most desirable option with respect to the criteria through to a one ranking indicating the least desirable option.

The ranked score was then weighted and the short listed option with the total highest score summed for all criteria was put forward as the preliminary preferred solution.

Table 5-3 Liquid Treatment Short List Evaluation Criteria

PRIMARY CRITERIA		SECONDARY CRITERIA		
CRITERIA	**WEIGHT**	**CRITERIA**	**WEIGHT**	**DESCRIPTION**
Social / Culture	10%	Aesthetic impacts - architectural aesthetics (plant appearance)	10%	Ability to suit to the appearance of the community and property values
		Truck traffic (during operation)	10%	Truck traffic volume added to the area
		Noise impact (during operation)	40%	Potential for noise impact to the land users in the area
		Odour (during operation)	40%	Potential for odour impact to the land users in the area
Technical	40%	Ability to comply with the regulations or target objectives	30%	Ability of alternative to reliably meet or exceed regulations or target objectives
		Process robustness	30%	Demonstrated track record of operation in similar size facilities with similar operation performance
		Energy requirements	10%	Impacts to energy grid in the area
		Suitability for phasing	10%	Ability of the alternative to provide solution to varying growth rate of the development (slow or fast)
		Time to construct	5%	Ability to implement/construct the facility in a timely manner to meet the development in the area
		Operation and maintenance impacts (including staffing)	10%	Ease of operation and maintenance, operator training requirement as well as number of operators required
		Site Requirement	5%	Comparison of land requirement of each option - smaller treatment train footprint allows for more process expansion on site and will increase the ultimate capacity of the allocated site.
Environmental	20%	Sustainability	15%	Robustness of the model to meet constraints: cost, maintenance, staffing, emissions, level of treatment - throughout the project lifetime.

PRIMARY CRITERIA		SECONDARY CRITERIA		
CRITERIA	**WEIGHT**	**CRITERIA**	**WEIGHT**	**DESCRIPTION**
		Health and safety to the public	40%	Ability to minimize health and safety risks to the public
		Impact on biosolids treatment	30%	Impact on biosolids treatment, i.e. primary sludge consumes more energy in the biosolids stream
		Greenhouse gas	15%	Ability to minimize non-CO_2 greenhouse gas
Economic	30%	Capital cost estimates	30%	Capital cost estimates for all phases of the plant
		Operation and maintenance costs	40%	Annual operating and maintenance costs
		Life cycle analysis	30%	Net present values of 25 year operation and facility expansions as required

5.3 Screening of Long List of Treatment Technologies

A number of treatment technologies available for each treatment process were identified at the beginning of the project. The long list of primary, secondary, tertiary and disinfection treatment technologies are described and screened against the specific screening criteria in Table 5-4.

Table 5-4 Evaluation of Long List of Liquid Treatment Technologies

NO.	TREATMENT TECHNOLOGY	DESCRIPTION	SCREENING CRITERIA					CARRY FORWARD?	RATIONALE
			TRACK RECORD	SCALABILITY	STAGING / PHASING	O&M	COST		
PRIMARY TREATMENT									
P1	Conventional primary	Conventional primary clarifier	√	√	√	X	√	No	Higher operational complexity without adding significant benefit.
P2	Lamella primary	Side entry lamella clarifier (e.g., Super Settler™) enclosed in an odour controlled building	√	√	√	X	X	No	Higher operational complexity and cost without adding significant benefit.
P3	Activated primary	Primary clarifier with a deep sludge blanket and sludge recirculation to ferment the primary sludge in order to stimulate biological phosphorus removal in the secondary process.	√	√	√	√	√	**Yes**	This technology would improve operation efficiency and reduces secondary aeration tank size while producing the acids required for Option S5, rather than requiring addition of chemicals. The activated primary will be odour controlled.
P4	Mechanical primary	Mechanical (e.g. Salsnes Filter, Leap Membrane Bioreactor) units enclosed in an odour controlled building to protect membranes in the secondary process and to reduce the load to secondary process.	X	√	√	√	√	**Yes**	This option is only included for Option S8 because it provides micro-screening as well a reduction in aeration tank volume.
PRIMARY / SECONDARY TREATMENT									
S1	Modified Ludzack Ettinger process for nitrogen removal with chemical addition for phosphorus removal	This process consists of the modification of a conventional activated sludge process where an anoxic zone is upstream of the aerobic zone in a bioreactor. The process uses an internal recycle that returns nitrates created in the nitrification process in the aerobic zone along with the mixed liquor to the anoxic zone. The amount of nitrates removed in the anoxic zone depends on the recycle flow rate and the availability of influent BOD. Chemical addition would be used to meet the total phosphorus effluent criteria.	√	√	X	X	√	No	Staging/phasing requirements are not met by this option with reasonable cost. This option also includes large Return Activated Sludge (RAS) pumps that increase the cost of operation and maintenance.
S2	Step feed biological nitrogen removal with chemical addition for phosphorus removal	The alternative to pumping (Option 1) is to create anoxic zones throughout the reactor and feed a portion of the wastewater to each zone. The reactor consists of a series of lanes, each with an anoxic and aerobic zone. Chemical addition would be used to meet the total phosphorus effluent criteria.	√	√	√	√	√	**Yes**	This option is the simplest to operate because it does not require complex control of pumps or other appurtenances. All options, including this one, require aeration control.
S3	Sequencing Batch Reactor biological nitrogen removal with chemical addition for phosphorus removal	The Sequencing Batch Reactor (SBR) is an activated sludge process that processes the sewage in batches. The reactors process up to peak hourly flow in 4.8 hour cycles. Higher flows can be processed by reducing the cycle time or feeding during decant. The SBR effluent discharges into an equalization tank and is pumped to tertiary treatment. The SBR consist of two zones, one which will alternative between anoxic and aerobic conditions. An SBR plant does not require secondary clarifiers.	√	√	√	√	√	**Yes**	This option is the most adaptable secondary treatment process to variations in the incoming sewage.
S4	Integrated Fixed-Film Activated Sludge for nitrogen removal with chemical addition for phosphorus removal	Integrated Fixed Film Activated Sludge (IFAS) is a relatively new technology that incorporates an attached growth media like plastic media within the suspended growth reactor (aeration tanks) allowing more biomass to be held in a smaller volume.	√	√	√	X	X	No	This option achieves some objectives with higher cost and operational complexity than other options.

NO.	TREATMENT TECHNOLOGY	DESCRIPTION	SCREENING CRITERIA					CARRY FORWARD?	RATIONALE
			TRACK RECORD	SCALABILITY	STAGING / PHASING	O&M	COST		
S5	Biological nitrogen and phosphorus removal with activated primary clarifiers	The sewage is conditioned in the activated primary clarifiers to stimulate biological phosphorus removal in the secondary process. This reduces the volume of chemicals that are added to the process. The secondary process aeration tanks are smaller because the activated primary also reduces the load to secondary treatment.	√	√	√	√	√	**Yes**	This option uses the least chemical for phosphorus removal and consumes the least electricity of all options being carried forward.
S6	Biological nitrogen and phosphorus removal with primary sludge fermentation	This option is the same as the Option S5 except the primary sludge would be pumped to a gravity thickener fermenter. The supernatant would be sent to the anaerobic zone to stimulate phosphorus removal. The fermenter would be covered and odour controlled.	√	√	√	X	√	No	This Option achieves the same objective with more complexity than Option S5.
S7	Biological nitrogen and phosphorus removal with return activated sludge fermentation	This option is similar to S5 except for the inclusion of an anaerobic zone and a RAS fermenter to stimulate phosphorus removal. This option does not require a primary clarifier.	√	√	√	X	√	No	This Option is more complex and requires more chemicals than Option S5. This option achieves objectives same level with S5 with an increased complexity in operation and more chemical dosing.
S8	Membrane biological nitrogen removal with mechanical primary treatment and chemical addition for phosphorus removal	Mechanical primary treatment (acting as a fine screen) followed by a modified Ludzack Ettinger bioreactor complete with membranes instead of secondary clarifiers.	√	√	√	√	√	**Yes**	The only option that does not require tertiary treatment and requires the least space even though the O&M cost of operating a membrane bioreactor is higher than operating an activated sludge plant.
S9	Donut activated sludge	A modified Ludzack Ettinger process would be configured in donut style tanks with clarifier in the center and aeration basins in the outer annular ring.	√	√	X	√	√	No	Phasing/staging requirements are not met
S10	Two stage biological aerated filters	Biological aerated filters are preceded by at least a 2mm screen. The flow would pass through a carbonaceous biological aerated filter and then onto a nitrification/denitrification biological aerated filter. The process requires an imported carbon source (e.g. methanol).	√	X	√	X	X	No	This option would have high capital, operation and maintenance costs. It also has a high degree of operating complexity.
TERTIARY TREATMENT									
T1	Tertiary membrane filtration	Membrane filtration with chemical addition for further phosphorous removal.	√	√	√	√	√	**Yes**	Process has been proven to reduce total phosphorus levels in recent pilot trials in Ontario.
T2	Two stage filtration	Two stage filtration process designed to achieve total phosphorus reduction with chemical addition.	√	√	√	√	√	**Yes**	Process has been proven to reduce total phosphorus levels in recent pilot trials in Ontario.
T3	Cloth disc filters	Cloth media filtration system that uses proprietary designed cloth as primary filter media together with chemical addition to reduce the phosphorus levels.	X	√	√	√	√	No	No track record at these limits
T4	ActiFlo®	ACTIFLO® is a high rate compact water clarification process in which water is flocculated with microsand and polymer.	X	√	√	√	√	No	Track record is not consistent at the total phosphorus levels required.
T5	Deep bed filtration	Chemical is added in a coagulation process ahead of a deep bed filtration system to remove suspended solids from water by flowing the water downward via gravity through granular media at a high rate.	X	√	√	√	√	No	Not enough evidence that a single stage of filtration will meet the required total phosphorus levels.
T6	Blue PRO®	A proprietary gravity sand filtration system with advanced control techniques and a patented nutrient removal system.	√	√	√	√	√	**Yes**	Process has been proven to reduce total phosphorus levels in recent pilot trials in Ontario.

NO.	TREATMENT TECHNOLOGY	DESCRIPTION	SCREENING CRITERIA					CARRY FORWARD?	RATIONALE
			TRACK RECORD	SCALABILITY	STAGING / PHASING	O&M	COST		
DISINFECTION TREATMENT									
D1	Chlorination + Dechlorination	Chlorine is added to inactivate pathogens and the residual chlorine is removed so that organisms in the receiving water are not impacted. For treatment plants of this size, hypochlorite is used.	√	√	√	X	√	No	Requires handling of hazardous chemicals and requires close monitoring to meet new federal chlorine effluent limits.
D2	Ozone	Ozone is added to inactivate pathogens. Ozone is generated onsite using electricity and deteriorates quickly leaving no residual in the final effluent.	√	X	X	X	X	No	Process is more hazardous than the UV disinfection process and does not scale as well as the other two options.
D3	Ultraviolet	Ultraviolet light shone into the effluent inactivates pathogens.	√	√	√	√	√	**Yes**	Does not require chemicals and has proven track record in Ontario at plants this size.

5.4 Description of Short Listed Treatment Technologies

5.4.1 Overview

Based on the preceding evaluation, a short list of technologies was developed. Those technologies that are considered to be feasible candidates for the MWWTP are listed in Table 5-5 for each treatment process.

Table 5-5 Short Listed Liquid Treatment Technologies

PRIMARY TREATMENT	SECONDARY TREATMENT	TERTIARY TREATMENT	DISINFECTION
• Activated primary treatment (P3) (for primary/secondary treatment option S5) • Mechanical primary (P4)(for primary/secondary treatment option S8)	• Step feed biological nitrogen removal with chemical addition for phosphorus removal (S2) • Sequencing batch reactor biological nitrogen removal (S3) • Biological nitrogen and phosphorus removal with activated primary clarifiers (S5) • Membrane biological nitrogen removal with mechanical primary treatment and chemical addition for phosphorus removal (S8)	• Tertiary membrane filtration (T1) • Two stage filtration (T2) • Blue PRO® (T6)	• Ultraviolet (D3)

The two treatment technologies under the primary treatment are paired with the complementary secondary treatment options. In order to conduct a detailed evaluation, alternative design concepts were further developed for secondary and tertiary treatment technologies. The following sections describe the details of the design concepts.

5.4.2 Primary/Secondary Treatment Technologies

5.4.2.1 Option No 1 - Step Feed Biological Nitrogen Removal

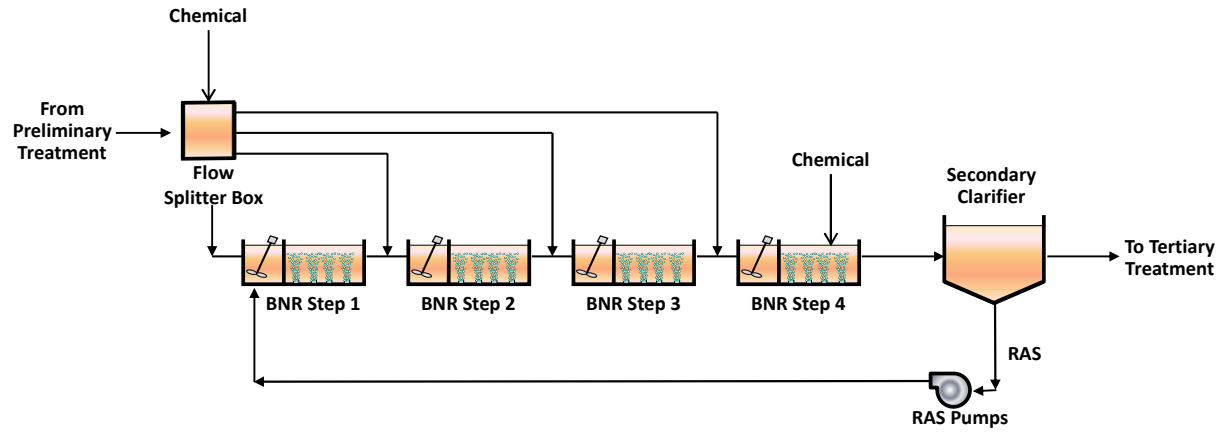


Figure 5-1 Process Flow for Step Feed Biological Nitrogen Removal

Following preliminary treatment the wastewater will flow to step feed bioreactors as shown in Figure 5-1. The bioreactor consists of four passes, each with an anoxic zone followed by an aerated aerobic / nitrification zone. Preliminary treated wastewater passes through a flow splitter and is fed into up to four different locations (step feed) in the bioreactor feed channel. RAS enters at one end of the bioreactor feed channel and the mixed liquor suspended solids (MLSS) effluent flows, via a splitter box, to the clarifiers at the other end of the feed channel. A diagram of the step feed bioreactor is provided in Figure 5-2.

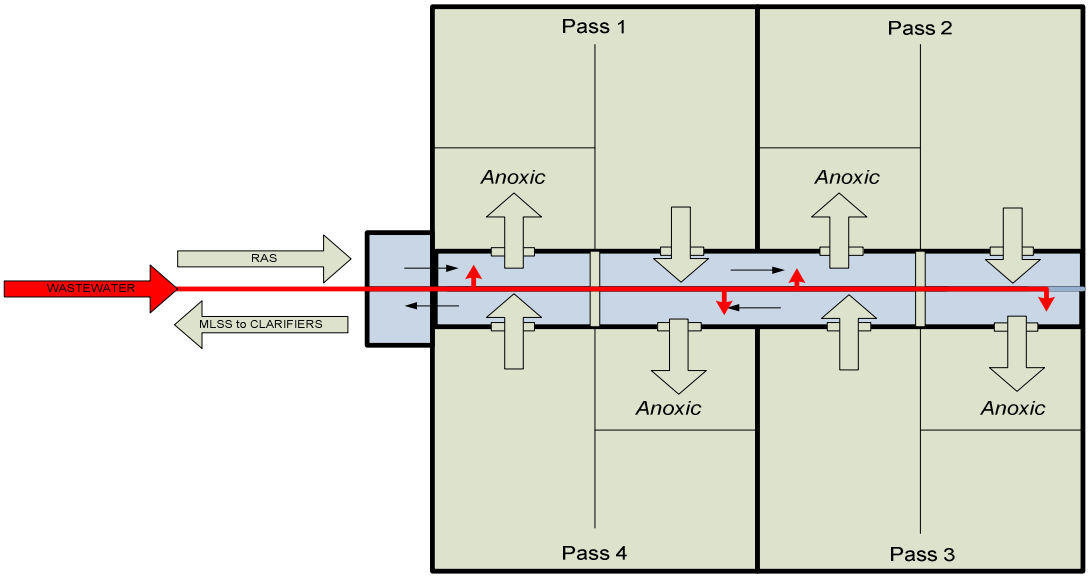


Figure 5-2 Step Feed Biological Nitrogen Removal Bioreactor

Once built, the bioreactor capacity can be brought online in 25% increments to accommodate population growth (Suitability for Phasing).

A phosphorous removal chemical (e.g. alum) is dosed at the bioreactor influent splitter box and/or the MLSS splitter box before the secondary clarifiers. The secondary clarifiers would be circular type with spiral sludge scrapers. Effluent from the clarifiers flows to the tertiary treatment process; RAS from the clarifiers is pumped to the bioreactor feed channels; and scum and waste activated sludge (WAS) are pumped to the biosolids management system. Advantages and disadvantages of this process are listed in the Table 5-6.

A general arrangement layout of this treatment technology is provided in Appendix 1.

Table 5-6 Advantages and Disadvantages of Step Feed with BNR

ADVANTAGES	DISADVANTAGES
• Simple to construct • Step up in 25% increments to match community growth • Produces single sludge • Low odour risk • Simple to operate • Control is passive except for aeration control • No requirement for nitrified mixed liquor pumps	• Complex site piping and flow splits • Clarifiers sensitive to extreme flows. • High chemical consumption for phosphorus removal • Requires a tertiary treatment stage to meet effluent phosphorus limits • High aeration cost because there is no primary treatment • Extra clarifier capacity built in Phase 1 that is not required until later

5.4.2.2 Option No 2 - Sequencing Batch Reactor with Biological Nitrogen Removal

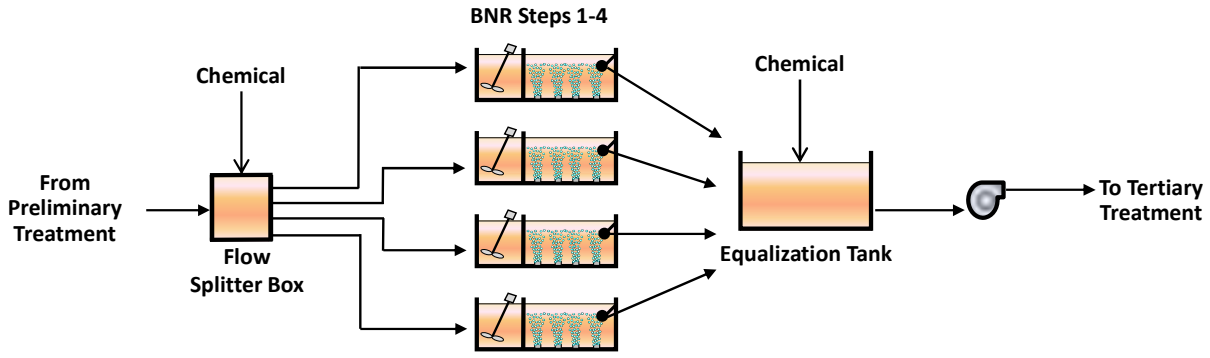


Figure 5-3 Process Flow for SBR Biological Nitrogen Removal

Preliminary treated wastewater flows to SBR modules, as shown in Figure 5-3, which consist of four reactors which can operate in batch or continuous feed mode. The SBR operates on a cycle of four phases: fill, react, settle and decant with each cycle normally taking 4.8 hours. After settling, the effluent is decanted to a flow equalization tank from where it is pumped at a steady rate to tertiary treatment. Nitrified mixed liquor return (NMLR) pumps located at the discharge end of the SBR returns nitrate rich MLSS to the prezone during the fill phase of a batch cycle to facilitate denitrification. WAS is removed from the SBRs during the decant phase and sent to the biosolids management system. A diagram of an SBR module with four SBRs is provided in Figure 5-4. A phosphorous removal chemical is dosed upstream of the SBRs.

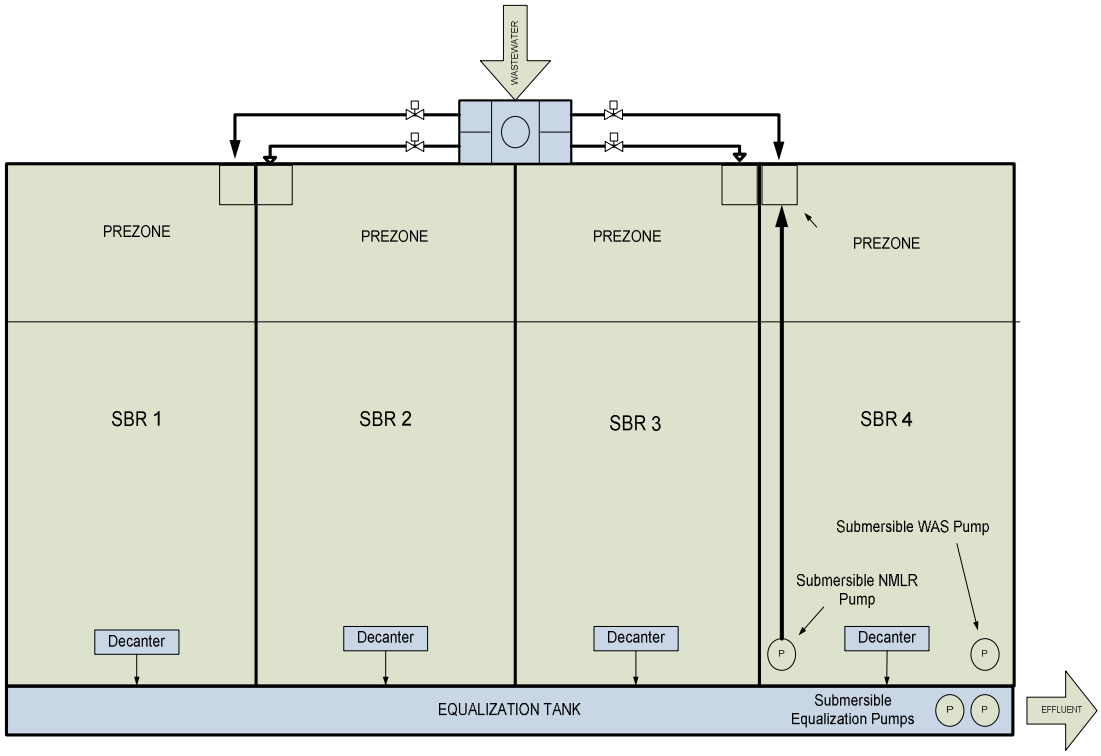


Figure 5-4 Sequencing Batch Reactor Biological Nitrogen Removal

Once built, the SBR capacity can be brought online in 25% increments to accommodate population growth (Suitability for Phasing).

Advantages and disadvantages of this process are listed in the Table 5-7. A general arrangement layout of this treatment train option is provided in Appendix 1.

Table 5-7 Advantages and Disadvantages of SBR BNR

ADVANTAGES	DISADVANTAGES
• Simple to construct • Site piping routing is simple • Step up in 25% increments to match community growth • Cycle times and feed during decant provide simple means to treat extreme flows automatically • Produces single sludge • Low odour risk • Flow equalization improves tertiary plant performance	• Complex control, operator must understand control sequence • Requires a tertiary treatment stage to meet effluent phosphorus limits • Requires flow equalization between SBRs and tertiary treatment • High aeration cost because there is no primary treatment • No effective method to control scum on SBRs

5.4.2.3 Option No 3 - Biological Nitrogen and Phosphorus Removal

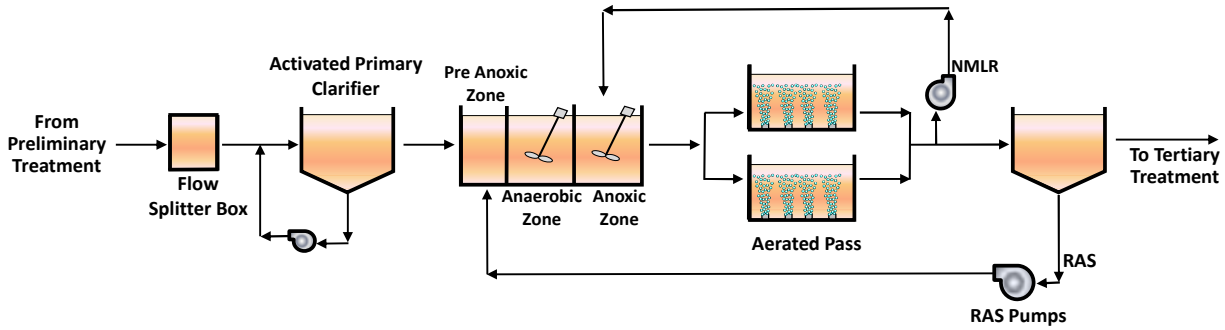


Figure 5-5 Process Flow for Biological Nitrogen and Phosphorus Removal

A process flow diagram of this option is provided in Figure 5-5. Following preliminary treatment, the wastewater undergoes primary treatment in activated primary clarifiers. These primary clarifiers are referred to as "activated" primaries because they retain a high sludge blanket to ferment the sewage. A primary sludge pump removes the sludge from the bottom of the clarifier and sends it to the biosolids processing facility. An elutriation pump circulates the sludge blanket back into the feed to the primary clarifier to separate volatile fatty acids formed in the sludge blanket. The activated primary clarifier is covered and the headspace is ventilated to control odour. Primary effluent from the clarifiers flows to bioreactors.

The bioreactor consists of three passes: one unaerated pass and two aerated passes. The first pass, located in the centre of the bioreactor is a common unaerated pass where primary effluent and RAS enter, initially passing through an anaerobic zone and then through an anoxic zone. NMLR pumps discharge into this anoxic zone to denitrify the wastewater. The denitrified wastewater is then split into two aerated passes and the nitrified MLSS is collected in a chamber and sent to the secondary clarifiers. The NMLR pumps collect nitrified MLSS from the collection chamber and pump it back to the anoxic zone. A diagram of a biological phosphorus and nitrogen removal bioreactor is provided in Figure 5-6. A standby phosphorous removal chemical is dosed at the MLSS collection chamber before the secondary clarifiers.

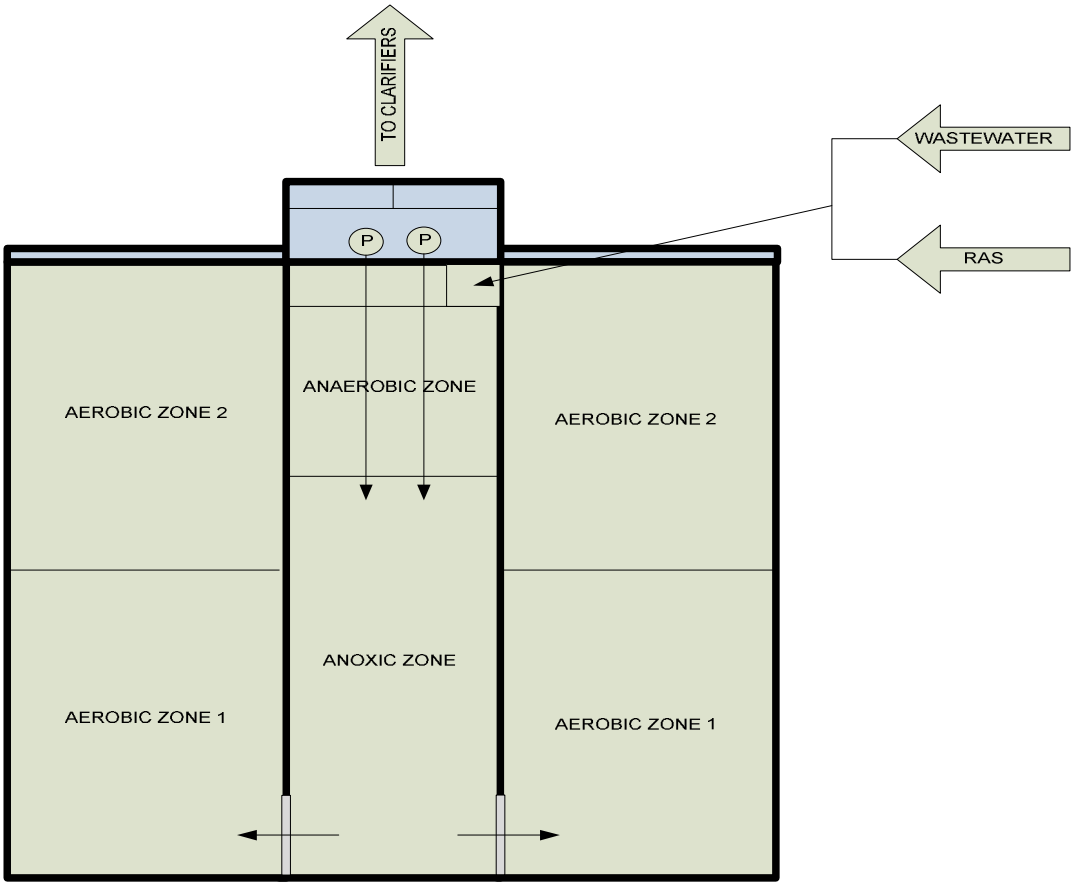


Figure 5-6 Biological Phosphorus and Nitrogen Removal Bioreactor

Once built, the bioreactor capacity can be brought online in 50% increments to accommodate population growth (Suitability for Phasing).

The secondary clarifiers would be circular type with spiral sludge scrapers. Effluent from the clarifiers flows to the tertiary treatment process; RAS from the clarifiers is pumped to the bioreactor anaerobic zone; and scum and WAS are pumped to the biosolids management system. Advantages and disadvantages of this process listed in the Table 5-8.

A general arrangement layout of this treatment train option is provided in Appendix 1.

Table 5-8 Advantages and Disadvantages of Biological Phosphorus and Nitrogen Removal

ADVANTAGES	DISADVANTAGES
• Biological phosphorus removal reduces the chemical required • Produces a better biosolids end product for beneficial re-use • Primary clarifier reduces load to secondary treatment reducing aeration power • Low chemical consumption for phosphorus removal	• May require standby acetate dosing to provide back up to activated primary clarifier to maintain biological phosphorus removal. • Complex construction and site piping and routing • Less tolerance to the community growth • Clarifiers sensitive to extreme flows • Higher load to biosolids processing because primary sludge is not oxidized

ADVANTAGES	DISADVANTAGES
	• Requires a tertiary treatment stage to meet effluent phosphorus limits • Additional cost to odour control activated primaries • Extra clarifier capacity built in Phase 1 that is not required until later • Complex flow splits

5.4.2.4 Option No 4 - Membrane Bioreactor with Biological Nitrogen Removal

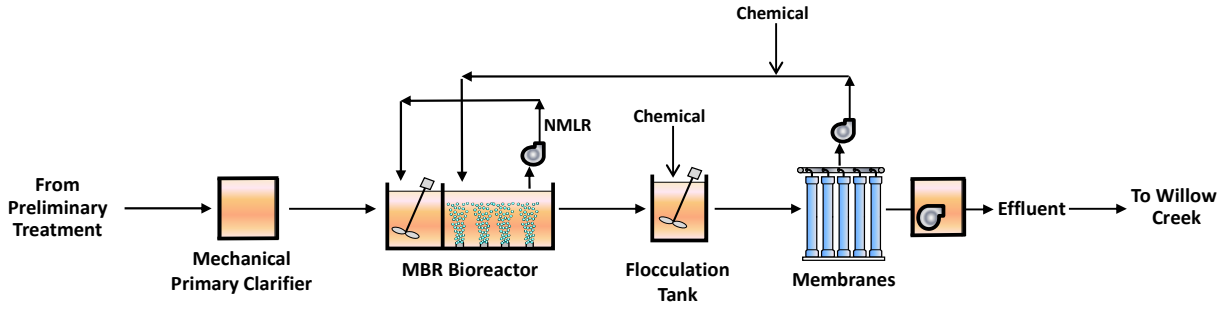


Figure 5-7 Process Flow for MBR Biological Nitrogen Removal

In this option, preliminary treated wastewater undergoes primary treatment in a mechanical primary clarifier before passing to the bioreactor. The bioreactor then flows to flocculation and membrane filtration. The sludge from the filtration process flows back to the bioreactor. The mechanical primary clarifier prevents material that would harm the membranes from entering the process. A process flow diagram of this option is provided in Figure 5-7.

The primary effluent is fed to the head of the bioreactor's anoxic zone. The flow passes through the anoxic zone into aerated zones and then is pumped to the membrane filtration building. The NMLR pumps recycle nitrified MLSS from the end of the final aerated zone to the head of the anoxic zone. A diagram of the bioreactor is provided in Figure 5-8.

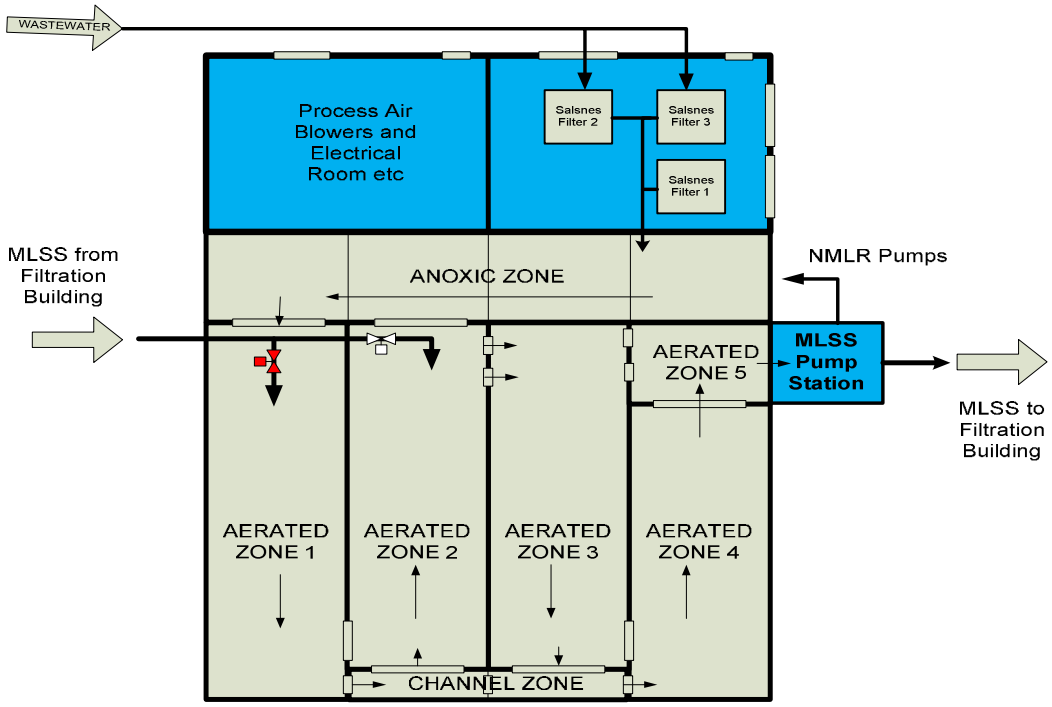


Figure 5-8 Overview of MBR Bioreactor

Once built, the bioreactor capacity can be brought online in 50% increments to accommodate population growth (Suitability for Phasing). The membrane capacity can be brought online in smaller increments than the bioreactor.

The membrane filtration facility consists of four trains. Each train includes a flocculation step followed by membrane filtration. The four trains overflow into a channel which flows back to the two bioreactor facilities. WAS is removed from the discharge channels and pumped to the biosolids management system. Scum is also removed using the WAS pumps. The filtration facility is shown in Figure 5-9.

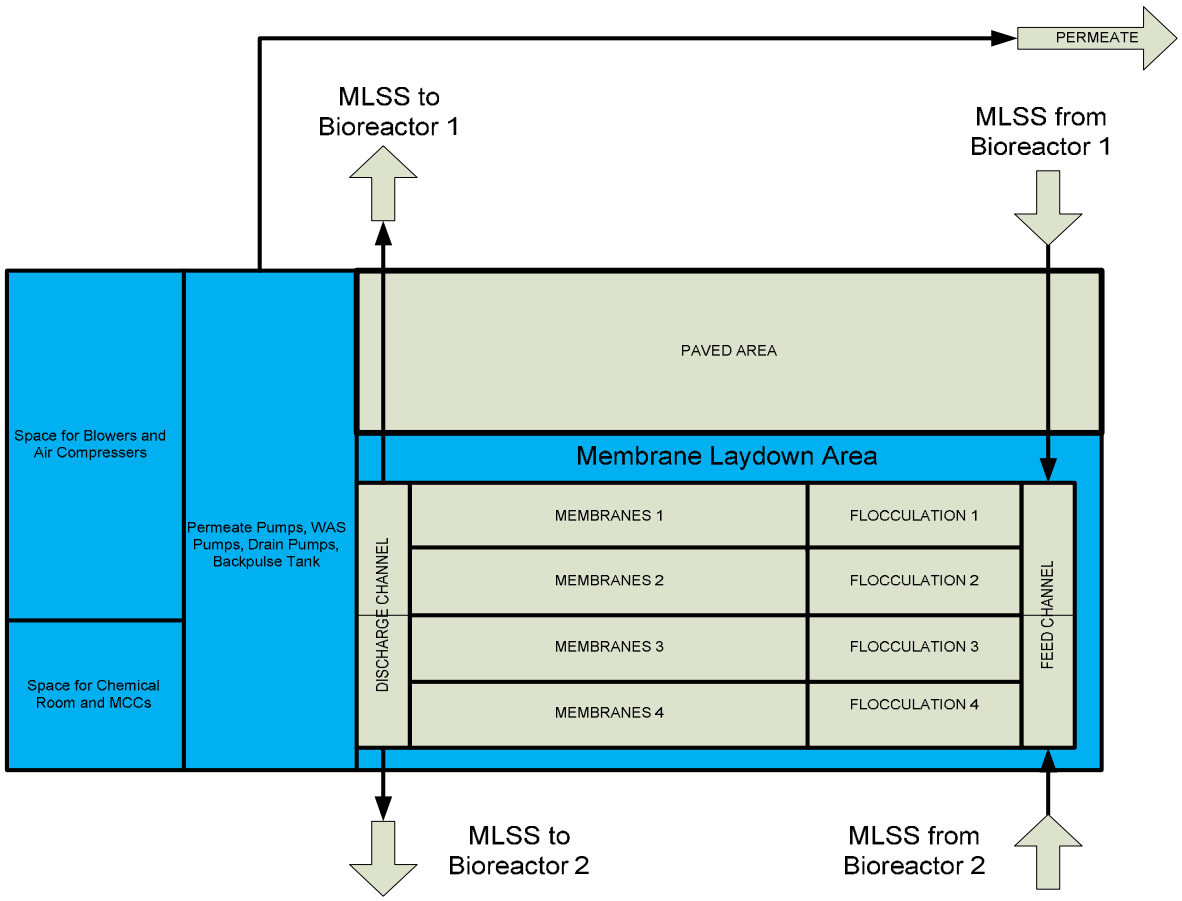


Figure 5-9 Overview of MBR Membrane Filtration Facility

Advantages and disadvantages of this process are listed in Table 5-9. A general arrangement layout of this treatment train option is provided in Appendix 1.

Table 5-9 Advantages and Disadvantages of MBR Biological Nitrogen Removal

ADVANTAGES	DISADVANTAGES
• Does not require tertiary treatment stage • Redundant membrane modules provide increased capacity to treat extreme flows • Requires less space on the site than the other three options	• Complex control, relies on a large number of instruments and proprietary algorithms • Large diameter piping and pump station connecting reactor and filtration buildings • MBR Bioreactor can only be stepped up in 50% increments • Chemicals required for membrane cleaning • High aeration cost because of membrane air scour • Membrane building for full Build Out is built in Phase 1

5.4.2.5 Cost Comparison of Secondary Treatment Technologies

The following general assumptions were made in preparation of the cost estimates:

- Estimates of probable capital costs have been developed based on prices obtained from suppliers and from data in Black & Veatch's possession from projects of similar nature and scope. However, the cost estimates presented in this report may be significantly affected by a number of factors which cannot be readily forecast which include amongst others, volume of work in hand or in prospect for contractors or suppliers at the time of the tender calls, future labour contract settlements, inflation and market escalation. For this reason, the actual costs may be different from those presented in this report. However, for the purpose of a relative economic evaluation amongst all options under consideration, it should be highlighted that costs for all options were calculated under the same assumptions and rationale, thus, should prices change over time, the changes would apply proportionally for all options and the results of the comparative cost evaluation would remain unaltered.
- Membrane diffuser replacement costs are not included in life cycle cost because they will be similar for each option.
- Operating costs are based upon an average daily flow as well as average chemical dosages starting from 2016 for 25 years of operation.
- Second expansion to reach to the Build Out capacity is assumed to be realized in 2026 which is approximately two years prior to wastewater flow generation reaching the plant capacity.
- Inflation and escalation to account for actual expected prices at the time of tendering cannot be accounted for at this time.
- All taxes have been excluded.
- Engineering, legal and administration costs have not been included.
- Life cycle costs have been estimated based on an inflation rate of 2% and an interest rate of 5% to give a market/discount rate of 3%.

Table 5-10 presents the life cycle cost estimates for the primary/secondary treatment technology alternatives. Appendix 2 includes the details of the cost estimates.

Table 5-10 Cost Estimates for Primary/Secondary Liquid Treatment Technologies

ITEM	STEP FEED BNR	SBR BNR	BIO P	MBR BNR
Capital Cost	$19,586,000	$20,533,000	$20,817,000	$23,560,000
Operation and Maintenance Costs	$2,109,000	$1,940,000	$1,180,000	$3,925,000
Net Present Value	$21,694,000	$22,474,000	$21,997,000	$27,485,000

5.4.3 Tertiary Treatment Technologies

5.4.3.1 Membrane Filtration

Following the secondary treatment process, the effluent will flow to a flocculation chamber where efficient chemical addition and mixing is provided to flocculate reactive phosphorus. The membrane filtration system will remove with fine filtration the flocculated phosphorus. Membrane systems use a pressure head to drive water through a permeable membrane. Membrane filtration is the most expensive of the tertiary technologies considered because of the energy required to drive the flow through the membrane and need to replace membranes every 8 to 10 years.

5.4.3.2 Two Stage Filtration

Effluent from the secondary treatment flows to a dual filtration system, which consists of two continuously Dynasand®, self-cleaning filters in series, filtering liquid suspensions as shown in Figure 5-10. The influent is released into the bottom of the first stage filter sand bed and flows up through the sand. The first stage of the filtration uses a larger sand grain size to increase its solids handling capacity, thus facilitating coagulation, flocculation and separation within the filter bed. The first stage filtrate is then fed to the second filtration unit, which acts as a polishing filter due to its smaller sand size.

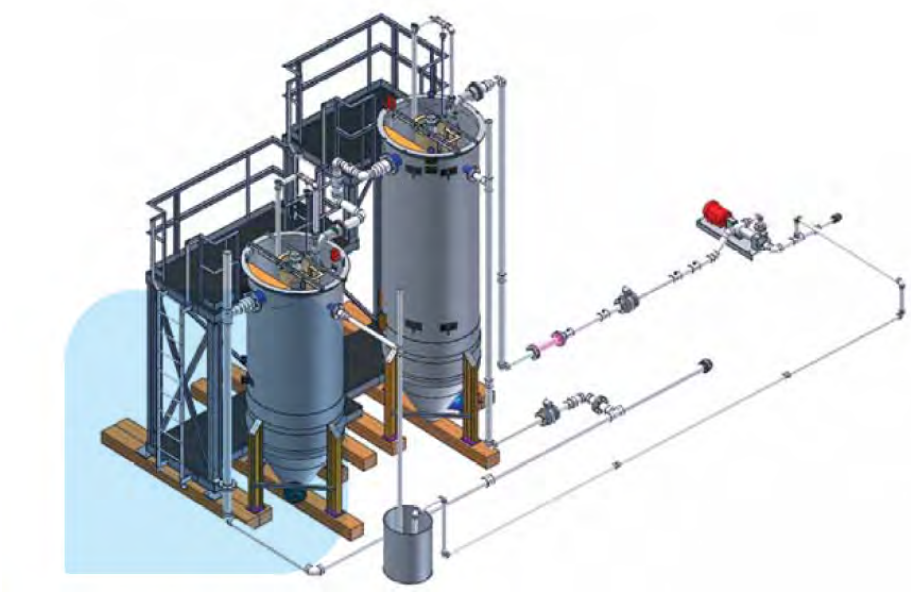


Figure 5-10 Parkson DynaSand D2

5.4.3.3 Blue PRO®

Following primary and secondary treatment, the effluent flows to the BluePRO® filtration system, illustrated in Figure 5-11, where phosphorus is removed by adsorption. To allow proper contact time and optimization of the adsorption process, an iron-based chemical is added to the wastewater before it enters the filters. The mixture enters the moving bed sand filter through radial arms located at the bottom of the sand bed, allowing it to flow upwards through the sand bed. The BluePRO® process uses ferric chloride or ferric sulfate to form a continuously regenerated hydrous ferric oxide coating that forms on the surface of the sand media for adsorption of phosphorus. Following filtration, filtrate discharges from the top of the filter. Internally, the sand moves slowly

from top to bottom, and is returned to the top of the filter by an airlift located in the centre of the filter. After adsorption, the iron and phosphorus are scraped off the sand both in the sand bed and in the airlift component. A washbox located at the top of the filter separates the sand from the iron and phosphorus waste particles. The sand is retained within the filter and falls back to the top of the bed. The residuals, including the iron and phosphorus or other contaminants, exit in a reject line.

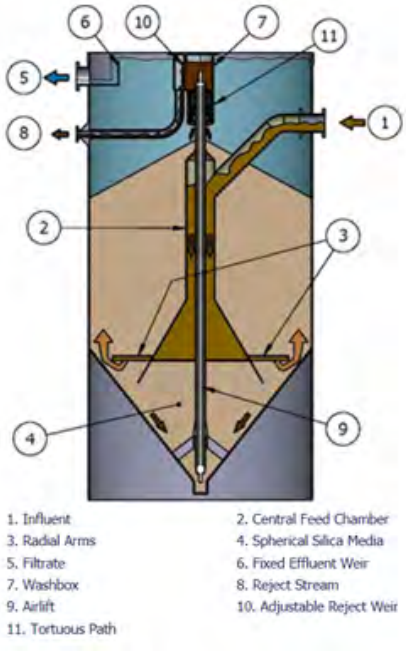


Figure 5-11 Blue Pro® (Blue Water technologies)

5.4.3.4 Cost Comparison of Tertiary Treatment Technologies

Economic evaluation that includes capital, operations and maintenance costs, and net present value of a 25 year project period for each tertiary treatment technology option are presented in Table 5-11. Similar assumptions were assumed as presented in Section 5.4.2.5. Appendix 3 presents the details of the cost estimates.

Table 5-11 Net Present Value of Tertiary Liquid Treatment Technologies

	Membrane Filtration	Two Stage Filtration	Blue Pro®
Capital Cost	$8,755,000	$4,322,000	$9,718,000
Operation and Maintenance Costs	$2,915,000	$2,553,000	$1,499,000
Net Present Value	**$11,670,000**	**$6,875,000**	**$11,217,000**

5.4.3.5 Preliminary Selected Tertiary Treatment Technology

It is important to note that effluent limits plants are required to achieve are set by the Ministry of Environment and Climate Change through the Environmental Compliance Certificate. Currently in

Ontario, there are no full scale plants operating at the limits proposed at the Midhurst WWTP and as a result, there currently is not a full scale data set generated in Ontario that shows the technologies consistently meeting the effluent limits expected at the Midhurst WWTP.

However, all of the short listed treatment technologies have shown at the pilot scale that they can meet the project's expected total phosphorus effluent limits with adequate chemical dosing and an efficient flocculation process. One of the most comparable pilot studies was done for the Lakeshore Water Pollution Control Plant in Innisfil, Ontario in 2010. All of the short listed treatment technologies achieved effluent total phosphorus concentrations lower than the 0.024 mg/L. On average, the Blue Pro and membrane filtration achieved slightly better results, by producing average total phosphorus concentrations in the range of 0.015 to 0.02 mg/L. However, it was also noted that it may have been possible for two stage sand filtration process to further optimize the operation and results of their systems.

Ontario municipalities currently discharging to Lake Simcoe will need to lower total phosphorus limits from between 0.1 and 0.3 mg/L to between 0.07 and 0.25 mg/L as per the new 2015 baseline tiered total phosphorus concentrations. There are a number of projects underway that will incorporate advanced treatment technologies to achieve low total phosphorus effluent limits. Membrane technologies are often the preferred technology when the limit is below 0.1 mg/L total phosphorus.

Membrane technology as tertiary treatment is currently installed at one wastewater treatment plant in Ontario to meet low total phosphorus limits (effluent limit for expanded capacity is 0.1 and objective is 0.07 mg/L). Obtaining an approval from Ministry of the Environment and Climate Change for similar limits brings a significant advantage for this option.

Currently, there are six installations in North America where the two stage sand filtration is used to achieve limits between 0.5 and 0.1 mg/L total phosphorus. There is only one running plant in Ontario with low total phosphorus effluent limits of 0.2 mg/L and an objective of 0.125 mg/L; however, the performance of the plant shows that the monthly average effluent concentrations are consistently lower than 0.11 mg/l and 62% of the time the total phosphorus recorded is lower than 0.05 mg/L. Almost 8 years of data from one of the installations in New York State show that lower than 0.05 mg/L of total phosphorus concentration is consistently achieved even though the design limit is 0.2 mg/L. The concentration exceeded 0.05 mg/L on only two occurrences within this period (based on 24 hour composite sample data collected 4 times in a month).

Blue Pro® technology also has a good track record outside of Ontario; however, it does not provide the same advantages as the membrane technology (smaller pore filtration) even though it has similar net present value. Therefore, it is recommended that Blue Pro® technology should not be carried forward to further evaluation.

The two stage sand filtration process shows the lowest net present value for 25 year operation, which is a result of approximately 50% lower capital cost compared with the other tertiary treatment technologies listed. However, the operating cost is only 14% lower because of a higher chemical dose requirement.

It is recommended that membrane filtration technology is selected as preferred tertiary filtration technology because the technology provides tighter barrier to fine particulars therefore provides higher security to achieve lower total phosphorus limits consistently. In addition, the Ministry of

the Environment and Climate Change has granted lower limits to plants with this technology than to those with two stage sand filtration.

5.4.4 Cost Comparison of Short Listed Liquid Treatment Trains

Based on analysis done for primary/secondary and tertiary treatment technologies, four treatment train alternatives were developed.

Table 5-12 presents the combined cost information for the four liquid treatment trains.

Table 5-12 Cost Comparison of Four Liquid Treatment Trains

	Option No 1 - Step Feed BNR with membrane filtration	Option No 2 - SBR BNR with membrane filtration	Option No 3 – Bio P with membrane filtration	Option No 4 - MBR BNR
Capital Cost	$28,341,000	$29,288,000	$29,572,000	$23,560,000
Operation and Maintenance Costs	$5,024,000	$4,855,000	$4,095,000	$3,925,000
Net Present Value	**$33,365,000**	**$34,143,000**	**$33,667,000**	**$27,485,000**

5.5 Detailed Evaluation of Short Listed Liquid Treatment Alternatives

The evaluation of the short list of treatment train options, using the criteria and weightings listed in Table 5-3 is provided in Table 5-13. The details of the scoring and rationale have been provided in Appendix 4.

Table 5-13 Weighted Scoring of Short Listed Liquid Treatment Train Alternatives

SECONDARY CRITERIA	Option No 1 - Step Feed BNR with tertiary treatment	Option No 2 - SBR BNR with two tertiary treatment	Option No 3 – Bio P with tertiary treatment	Option No 4 - MBR BNR
Social/ Culture				
Aesthetic impacts - Architectural Aesthetics (plant appearance)	3	2	1	4
Truck traffic (during construction and operation)	3	2	4	1
Noise Impact (during operation)	12	4	8	16
Odour (during operation)	16	12	4	8
Technical				
Ability to comply with the regulations or target objectives	48	12	36	24
Process robustness	48	12	24	36
Energy Requirements	16	12	8	4

SECONDARY CRITERIA	Option No 1 - Step Feed BNR with tertiary treatment	Option No 2 - SBR BNR with two tertiary treatment	Option No 3 – Bio P with tertiary treatment	Option No 4 - MBR BNR
Suitability for Phasing	12	16	4	8
Time to Construct	6	8	2	4
Operation and Maintenance impacts (including staffing)	16	12	4	8
Site Requirement	6	2	4	8
Environment				
Sustainability	9	12	6	3
Health and Safety to the public	24	32	8	16
Minimize waste	18	24	6	12
Greenhouse Gas	3	9	6	12
Economic				
Capital Cost estimates	27	9	18	36
Operation and Maintenance costs	12	24	36	48
Life cycle analysis	27	9	18	36
Total Weighted Score	**306**	**213**	**197**	**284**

Based on detailed evaluation of the alternatives, Option No 1 – Step Feed BNR with membrane filtration returns the highest score and therefore offers the most benefit. Figure 5-12 presents the breakdown between the main criteria.

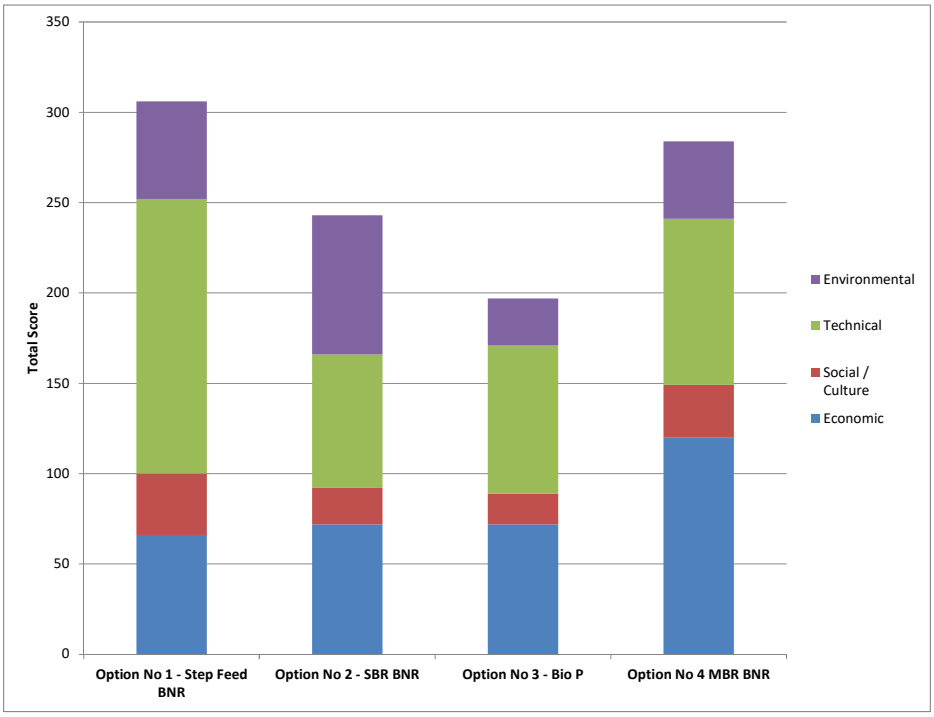


Figure 5-12 Summary of Evaluation of Short List of Liquid Treatment Alternatives

5.6 Preliminary Preferred Solution for Liquid Treatment

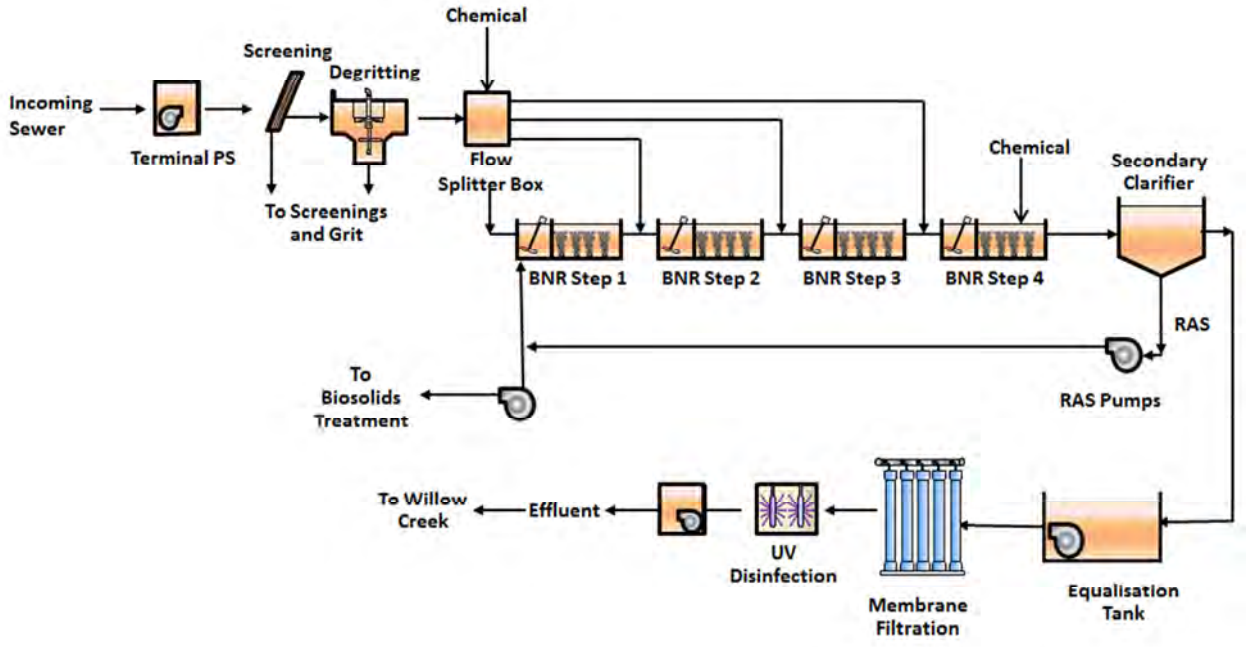


Figure 5-13 Process Flow Diagram of Preliminary Preferred Liquid Treatment Solution

Figure 5-13 presents the preliminary preferred liquid treatment solution: step feed BNR with tertiary treatment. After preliminary treatment including screening and degritting, the flow will be

distributed to two main bioreactors that have four steps. Tertiary treatment will follow the secondary clarifier. As stated previously, it is recommended membrane filtration technology is acceptable technologies for the tertiary treatment. Final treatment will include UV disinfection before pumping to the discharge point.

6. BIOSOLIDS MANAGEMENT

6.1 Overview and Definitions

The main objective of this part of the study is to define a biosolids management system that will be economically viable, meet regulatory requirements and will be operable and maintainable for the long term.

Biosolids are defined as nutrient-rich materials that result from the biological treatment of municipal wastewater. Biosolids are primarily organic and are of a quality that can be beneficially used for their nutrient, soil conditioning characteristics, or fuel properties. Beneficial practices include land application of biosolids as a soil amendment or fertilizer supplement, and a variety of procedures that derive energy from biosolids or convert them to useful products.

The biosolids are generated from various processes at wastewater treatment plants (WWTPs) including primary, secondary and tertiary liquid treatment processes. In general, the biosolids prior to processing can contain more than 99% water. The process at WWTPs are aimed to reduce the quantity of the biosolids product or obtain better quality sludge taking into consideration the value of the end use. Figure 6-1 presents the overview of the biosolids management alternatives at each treatment / use stage.

Figure 6-1 Overview of Biosolids Management

6.2 Evaluation Methodology for Biosolids Management

6.2.1 Overview of Evaluation Methodology

The first step in identifying the preferred biosolids management strategy was to define the constraints and opportunities associated with biosolids management in the area.

Alternative management solutions were then developed and evaluated using the following steps:

1. Develop screening criteria for evaluation of long list of biosolids management strategies
2. Develop the long list of biosolids management strategies

3. Screen of the long list of strategies and identification of preferred biosolids management strategy including the end use and required product
4. Develop alternative treatment technologies to suit the preferred biosolids management strategy
5. Evaluate the treatment technologies and develop a short list of treatment technologies
6. Develop design concepts for short listed treatment technologies
7. Complete detailed evaluation of the short listed design concepts
8. Identify the preferred alternative solution for biosolids management

6.2.2 Description of Evaluation Criteria

As with the liquid treatment, two sets of evaluation criteria were established to facilitate identification of the preferred alternative solution: long list screening criteria and short list evaluation criteria.

The first step in compiling a long list of biosolids management options was to identify the various end points available and which products could be sent to these end points. This long list was then screened using the criteria set out in Table 6-1.

Table 6-1 Biosolids Management End Use and Product Long List Screening Criteria

CRITERIA	DESCRIPTION
Compliance with Policies	Demonstrated track record of ability to continuously meet with the compliance requirement
Social Impact	Low potential for odour impact and low truck traffic volume added to the area
Technical and Operation	Low technical complexity and ease of operation and maintenance
Cost	Capital cost of facilities on-site
Security	Low risk that either disposal route costs will escalate or disposal route will close and a new route will be sought
Revenue	Opportunity to create a revenue stream
Resource Recovery	Potential to recover nutrients or energy (e.g. some form of beneficial re-use or resource recovery)

Alternative treatment technologies were then developed to suit the short listed biosolids management strategies. Each of these technologies were then evaluated with the criteria and weighting presented in Table 5-3, The same criteria and weighting were used as for the liquid treatment evaluation.

6.3 Long List of Biosolids Management Strategies

The long list of end use and product options are described and screened against the specific screening criteria in Table 6-2.

Table 6-2 Screening of Long List of Biosolids Management Strategies (End Use and Product Options)

END POINT ALTERNATIVES	PRODUCT ALTERNATIVES		SCREENING CRITERIA							CARRY FORWARD?	RATIONALE
	NO.	DESCRIPTION	COMPLIANCE	SOCIAL IMPACT	TECHNICAL AND OPERATION	COST	SECURITY	REVENUE	RESOURCE RECOVERY		
Beneficial Re-Use	1	Stabilized liquid sludge	√	X	√	X	√	X	√	**Yes**	This option is a proven technology that provides a product that can be taken from the plant to beneficial re-use; however, high truck traffic volume will be added to the area due to off-site trucking of liquid sludge during land application season. There is higher cost related with this option. Option does not allow for revenue opportunity.
	2	Stabilized cake	√	√	√	X	√	X	√	**Yes**	This option is a proven technology that provides a product that can be taken from the plant to beneficial re-use; however, high truck traffic volume will be added to the area due to off-site trucking during land application season. There is higher cost related to this option and no opportunity to create revenue.
	3	Lime stabilized cake to beneficial re-use or fuel	√	X	X	X	√	X	√	No	This option is a proven technology; however, there will be odour generated from this option due to the use of lime in the process, and higher traffic volume added to the area due to off-site trucking and the import of lime into the plant. There is higher operational complexity and cost with this option, and no opportunity to create revenue.
	4	Composted biosolids	√	X	X	X	√	X	√	No	This option is a proven technology; however, there will be odour generated from the composted biosolids. There will be higher traffic volume added to the area due to off-site trucking and the import of bulking agent into the plant. There is higher operational complexity and cost with this option, and no opportunity to create revenue.
	5	Solar dried pellets	√	√	√	X	√	√	√	**Yes**	This option is a proven technology; however, there is higher cost associated to this option. There is opportunity to create revenue, as the process provides a fertilizer quality product that can be stored and sold.
Another Facility	6	Unstabilized cake to another facility for thermal destruction	√	√	√	X	X	X	X	No	This option is a proven technology; however, there is higher cost related with this option. Disposal route may become unavailable or change. Option does not allow for revenue opportunity and there is no nutrient/energy recovery potential. There is a risk that end point (other facility) may close or the cost escalate. This option may require long trucking distances.
	7	Liquid stabilized sludge to another facility for disposal	√	X	√	X	X	X	X	No	This option is a proven technology; however, reliance on third party facility to store and land apply materials puts management strategy at risk. Higher traffic volume will be added weekly to the area due to off-site trucking of liquid sludge to another facility (non-dependent on land application season). The disposal route may become unavailable or change. There is higher cost related with this option. Option does not allow for revenue opportunity and there is no nutrient/energy recovery potential.
	8	Unstabilized liquid sludge to another facility for disposal	X	X	√	√	X	X	X	No	This option does not continuously meet compliance requirements. There will be odour generated from this option, as the liquid sludge is unstabilized, and higher traffic volume added to the area due to off-site trucking of liquid sludge. There is risk that end point (other facility) may close or costs will escalate. Option does not allow for revenue opportunity and there is no nutrient/energy recovery potential.

END POINT ALTERNATIVES	PRODUCT ALTERNATIVES		SCREENING CRITERIA							CARRY FORWARD?	RATIONALE
	NO.	DESCRIPTION	COMPLIANCE	SOCIAL IMPACT	TECHNICAL AND OPERATION	COST	SECURITY	REVENUE	RESOURCE RECOVERY		
	9	Unstabilized cake to an offsite contractor for lime treatment and storage	√	X	X	X	X	X	X	No	This option is a proven technology; however, reliance on third party operation to process unstabilized biosolids may put plant at risk. There will be higher traffic volume added to the area due to off-site trucking of liquid sludge. There is higher operational complexity and cost with this option, and risk that the disposal route may become unavailable or change. Option does not allow for revenue opportunity and there is no nutrient/energy recovery potential.
	10	Stabilized cake to another facility for disposal	√	√	√	X	X	X	X	No	This option is a proven technology; however, there is risk that end point (other facility) may close or costs will escalate. There is higher cost related to this option. Option does not allow for revenue nor resource recovery opportunity.
Landfill	11	Unstabilized cake	X	X	√	√	X	X	X	No	This option does not continuously meet compliance requirements. There will be odour generated from this option as the cake is unstabilized, and higher traffic volume added to the area due to off-site trucking of cake. The disposal route may become unavailable or change. Option does not allow for revenue opportunity and there is no nutrient/energy recovery potential. There is risk that disposal route may be closed during project lifetime.

6.4 Screening of Treatment Technologies for the Short Listed Biosolids Management Strategies

From the long list evaluation only beneficial re-use was identified as a preferred end point for biosolids generated at the MWWTP. Three product types were selected for further evaluation:

- Stabilized liquid sludge
- Stabilized cake
- Solar dried pellets

These product/end use alternatives were then aligned with possible biosolids treatment processes at the MWWTP. Processes were considered for the following treatment stages:

- Thickening
- Stabilization
- Dewatering
- Storage

The biosolids treatment alternatives were then further screened by applying a rationale to allow the short list of alternatives to be identified for further evaluation. Screening of the biosolids treatment alternatives is presented in Table 6-3.

Table 6-3 Screening of Long List of Treatment Technologies for Biosolids Treatment

PRODUCT / END POINT	NO.	TREATMENT PROCESSES AT THE MWWTP				CARRY FORWARD?	RATIONALE
		THICKENING	STABILIZATION	DEWATERING	# DAYS OF STORAGE ON SITE		
Stabilized liquid sludge to beneficial re-use	**1A**	**Mechanical Thickening**	**Aerobic Digestion**	**N/A**	**240 day as liquid**	**Yes**	
	1B	Gravity Thickening	Aerobic Digestion	N/A	240 day as liquid	No	Gravity thickening requires more storage volume as biosolids less concentrated.
	1C	**Mechanical Thickening**	**Autothermal Thermophilic Aerobic Digestion (ATAD)**	**N/A**	**240 day as liquid**	**Yes**	
	1 D	Mechanical Thickening	Anaerobic Digestion	N/A	240 day as liquid	No	Plant too small for anaerobic digestion
Stabilized cake to beneficial re-use	**2A**	**Mechanical Thickening**	**Aerobic Digestion**	**Dewater**	**240 day as cake**	**Yes**	
	2B	Gravity Thickening	Aerobic Digestion	Dewater	240 day as cake	No	Gravity thickening requires more storage volume as biosolids less concentrated.
	2C	**Mechanical Thickening**	**ATAD**	**Dewater**	**240 day as cake**	**Yes**	
	2D	Mechanical Thickening	Anaerobic	Dewater	240 day as cake	No	Plant too small for anaerobic digestion
Solar dried pellets to beneficial re-use	**5A**	**Mechanical Thickening**	**Aerobic Digestion**	**Dewater**	**Solar Dryer**	**Yes**	
	5B	Gravity Thickening	Aerobic Digestion	Dewater	Solar Dryer	No	Gravity thickening requires a larger aerobic digester
	5C	**Mechanical Thickening**	**ATAD**	**Dewater**	**Solar Dryer**	**Yes**	
	5D	Mechanical Thickening	Anaerobic Digestion	Dewater	Solar Dryer	No	Plant too small for anaerobic digestion

6.5 Description of Short Listed Treatment Technologies

6.5.1 Overview

From the screening of the biosolids treatment alternatives at the MWWTP, technologies identified for further evaluation are listed in Table 6-4 .

Table 6-4 Short Listed Biosolids Treatment Technologies

THICKENING	STABILIZATION
• Mechanical thickening	• Aerobic Digestion • ATAD

All cake and pellet product alternatives will require dewatering. Both liquid and cake products will require 240 days of onsite storage and the pellets will be stored in the solar drying onsite.

Six biosolids management options are carried forward from the long list screening process, three using aerobic digestion stabilization and three using ATAD stabilization. These options have been renumbered as follows:

Aerobic digestion:

Option No 1: Biological stabilized liquid sludge for beneficial re-use, treated with mechanical thickening and aerobic digestion

Option No 2: Biological stabilized cake for beneficial re-use, treated with mechanical thickening, aerobic digestion and dewatering

Option No 3: Solar dried, stabilized pellets for beneficial re-use with mechanical thickening, aerobic digestion, dewatering and solar drying

ATAD:

Option No 4: Biological stabilized liquid sludge for beneficial re-use, treated with mechanical thickening and ATAD

Option No 5: Biological stabilized cake for beneficial re-use, treated with mechanical thickening, ATAD and dewatering

Option No 6: Solar dried, stabilized pellets for beneficial re-use with mechanical thickening, ATAD, dewatering and solar drying

Each of the six biosolids management alternatives is described in more detail below.

6.5.2 Option No 1 - Liquid Sludge for Beneficial Re-use with Aerobic Digestion

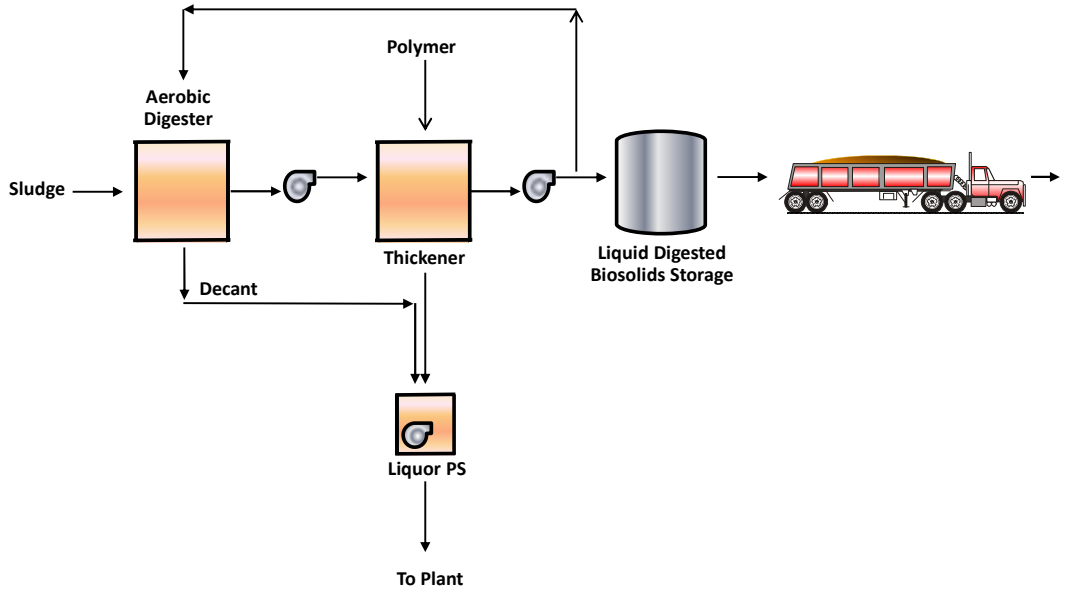


Figure 6-2 Liquid sludge production for beneficial re-use – aerobic digestion

A flow diagram of this option is provided in Figure 6-2. Biosolids and scum are pumped directly from the liquid treatment train to conventional aerobic digestion for stabilization. The digester operates in one of four modes; aerate, mix, settle and decant. The aerobic digester will be fitted with a diffused air system as well as mixers. The solids concentration of the digester is maintained at less than 1.5% by either recuperative mechanical thickening or decanting.

Digested biosolids are then sent to the mechanical thickener, which is dosed with polymer to assist thickening. The thickened, digested biosolids are pumped to liquid sludge storage tanks at 5% solids. The storage tanks have sufficient capacity to store 240 days production of liquid sludge and can be decanted by gravity. The sludge liquid from mechanical thickening and decanting is pumped back to the liquid stream process via a liquor pump station.

Advantages and disadvantages of this process are listed in the Table 6-5. A general arrangement layout of this treatment train option is provided in Appendix 5.

Table 6-5 Advantages and Disadvantages of liquid sludge for beneficial re-use with aerobic digestion

ADVANTAGES	DISADVANTAGES
• Least amount of process equipment required • Liquid sludge storage is safe and odour free • Market is well established for stabilized liquid biosolids	• Highest level of truck traffic as biosolids most dilute • Produces only one product – liquid biosolids • Stabilization is weather dependant • Phosphorus released in digester is sent back to the plant • Degree of stabilization is weather dependent

6.5.3 Option No 2 - Cake for Beneficial Re-use with Aerobic Digestion

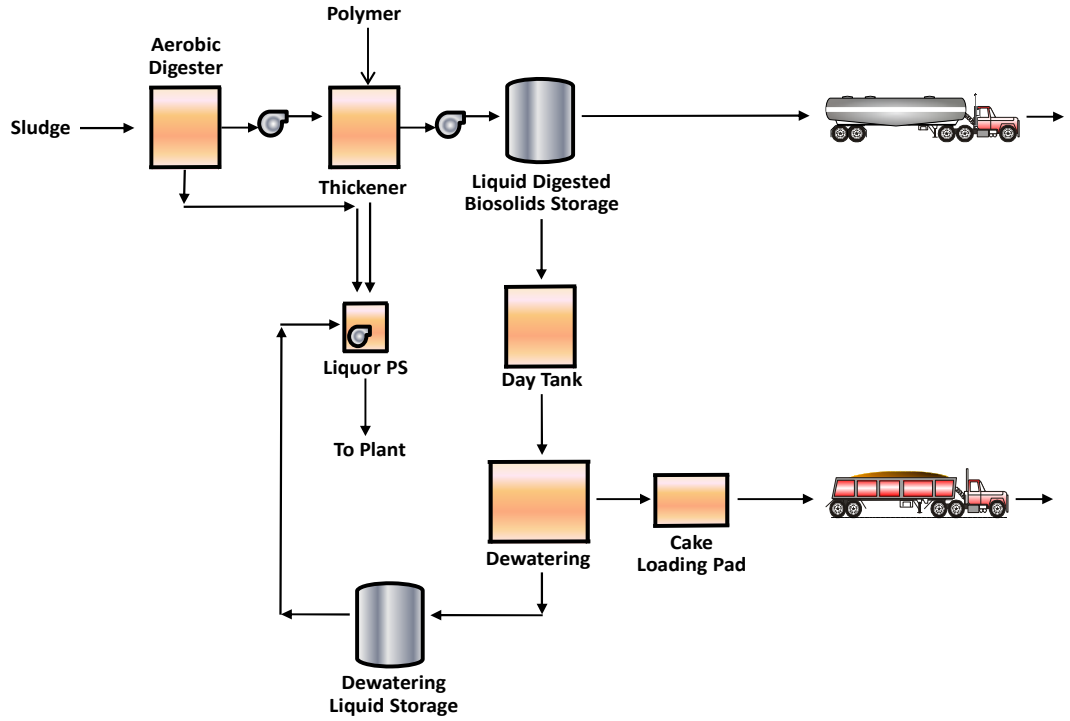


Figure 6-3 Cake production for beneficial re-use

A flow diagram of this option is provided in Figure 6-3. This option is the same as liquid sludge for beneficial re-use with aerobic digestion (Option 1A) but with the addition of dewatering and an above ground liquid storage tank.

Three options were investigated for cake storage:

- Open to atmosphere Dutch barn
- Cake storage in an enclosed tank
- Liquid storage with dewatering to produce cake as required

A Dutch barn requires a large footprint and does not address odours when the pile is disturbed, enclosed cake storage requires careful operation and extensive monitoring and ventilation, while liquid biosolids storage and on-demand dewatering addresses odour and facilitates both cake and liquid biosolids re-use. The third option, liquid biosolids storage with additional dewatering was selected as it offers the most process advantages.

The liquid sludge is pumped from the storage tanks to the dewatering units. Each dewatering unit has its own polymer system and flocculation tank. The dewatered biosolids are conveyed onto a cake pad and then loaded into a truck. The storage capacity of the pad is two days. The liquid is returned to the liquid storage tanks. When the liquid storage tank is full, the tank contents are transferred to an empty sludge storage tank. The liquid is fed to the plant over the year.

Advantages and disadvantages of this process are listed in the Table 6-6. A general arrangement layout of this treatment train option is provided in Appendix 5.

Table 6-6 Advantages and Disadvantages of cake for beneficial re-use with aerobic digestion

ADVANTAGES	DISADVANTAGES
• Produces two products • Cake is produced to match demand as biosolids stored as liquid • Sludge liquors can be batch pretreated to lower phosphorus load back to plant	• Moderate amount of truck traffic to haul cake • Sludge liquors must be stored and sent back to plant overtime • Phosphorus released in digester is sent back to the plant • Degree of stabilization is weather dependent

6.5.4 Option No 3 - Solar Dried Pellets for Beneficial Re-use with Aerobic Digestion

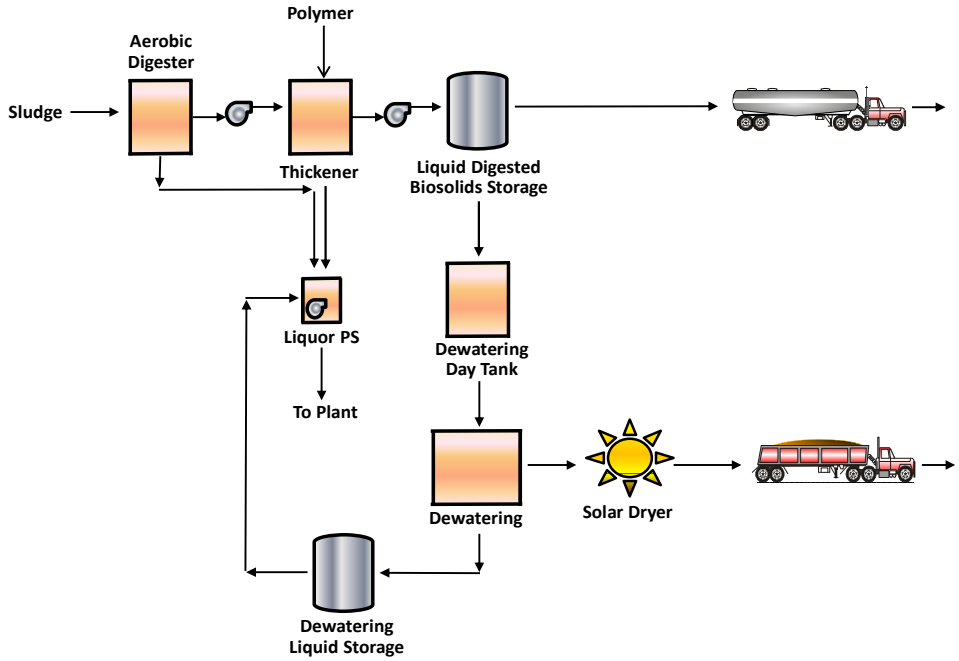


Figure 6-4 Pellet production for beneficial re-use

A flow diagram of this option is provided in Figure 6-4. This option follows the same process treatment steps as the cake for beneficial re-use with aerobic digestion (Option 2A); however, downstream of the dewatering units the biosolids are conveyed to solar dyers.

Without a source of waste heat, the solar dryer cannot be operated between December and March (~120 days storage required) when sufficient solar energy is available. Two solar dryer options were investigated:

- Cake storage in a solar dryer until the end of March
- Liquid sludge storage with dewatering between the end of March and beginning of December

As with the cake for beneficial re-use option, liquid biosolids storage with additional dewatering was selected as it offers the most process advantages. Between December and March, the thickened

solids are stored in the liquid sludge storage tanks. Outside of these months, the sludge is sent directly to dewatering.

From the dewatering units, the biosolids are conveyed to the solar dryer where it is spread. Inside the dryer a mechanical sludge turning and transport system turns over the complete sludge bed during one turning cycle and continuously transports the sludge through the dryer hall from the feed area to the discharge area. The dryers produce a granular, finished product at >75% which is taken offsite. The plant can also send biosolids offsite as liquid or cake.

Advantages and disadvantages of this process are listed in the Table 6-7. A general arrangement layout of this treatment train option is provided in Appendix 5.

Table 6-7 Advantages and Disadvantages of solar dried pellets for beneficial re-use with aerobic digestion

ADVANTAGES	DISADVANTAGES
• Opportunity to create revenue from product • Least amount of truck traffic as product is driest • Produces three products – liquid, cake and pellets • Sludge liquors can be batch pretreated to lower P load back to plant • Reduction in liquid storage required	• Most amount of treatment processes required • Moderate amount of truck traffic to haul dried material • Sludge liquors must be stored and sent back to plant overtime • Drying is weather dependant • Phosphorus released in digester is sent back to the plant • Degree of stabilization is weather dependent

6.5.5 Option No 4 - Liquid Sludge for Beneficial Re-use with ATAD

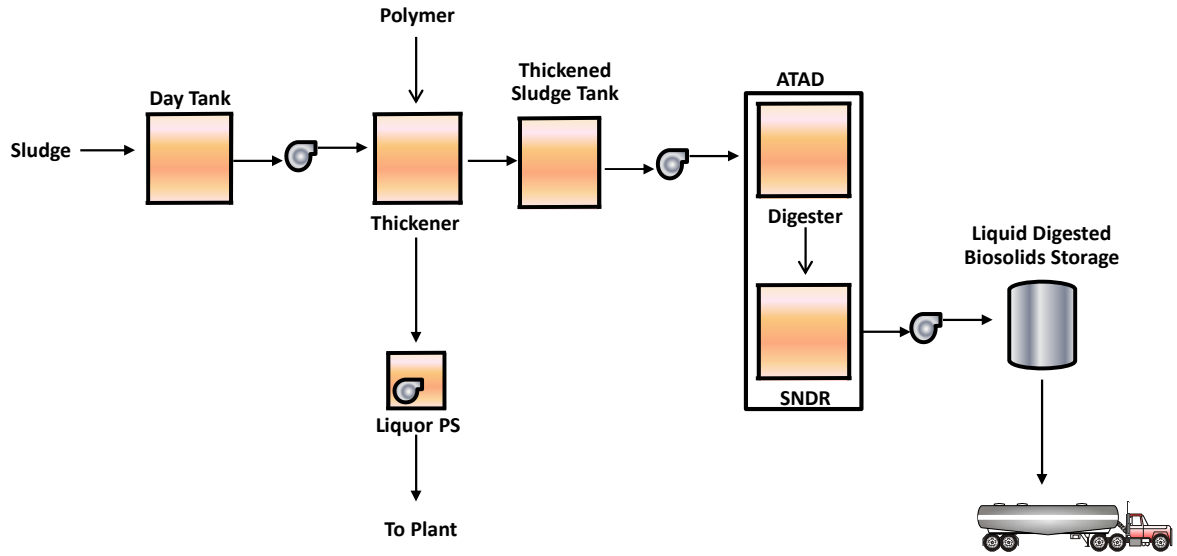


Figure 6-5 Liquid sludge for beneficial re-use – ATAD

A flow diagram of this option is provided in Figure 6-5. Biosolids and scum are pumped directly from the liquid treatment train to a day tank which feeds the mechanical thickener. The mechanical thickening process is dosed with polymer to assist thickening. From the thickener the biosolids are

sent to a thickened sludge tank where they are stored for up to three days (length of a long weekend).

Thickened biosolids are pumped from the sludge tank to the ATAD reactors five days per week. The ATAD process is not weather dependent. From the ATAD, the biosolids pass through a storage nitrification denitrification reactor (SNDR) and then to liquor storage tanks. The liquid biosolids are both stabilized and pasteurized as compared to stabilized only through conventional aerobic digestion (Options No 1 through 3).

The storage tanks have sufficient capacity to store 240 days production of liquid sludge and can be decanted by gravity. The sludge liquid from mechanical thickening and decanting is pumped back to the liquid stream process.

The plant may decide to not use the SNDR reactor if the liquid biosolids are more valuable with high ammonia nitrogen content.

Advantages and disadvantages of this process are listed in the Table 6-8. A general arrangement layout of this treatment train option is provided in Appendix 5.

Table 6-8 Advantages and Disadvantages of liquid sludge for beneficial re-use with ATAD

ADVANTAGES	DISADVANTAGES
• Least amount of process equipment required • Biosolids can be pasteurized in ATAD • Pre-thickening traps phosphorus in liquid biosolids product • Option to adjust ammonia concentration of liquid biosolids to match farm requirements • Storage is safe and odour free • Market is well established for stabilized liquid biosolids • Smaller digesters • Digestion is not weather dependant	• Higher mass of biosolids must be thickened mechanically, leading to higher polymer costs • Highest level of truck traffic as biosolids most dilute • Requires biofilter for odour control

6.5.6 Option No 5 - Cake for Beneficial Re-use with ATAD

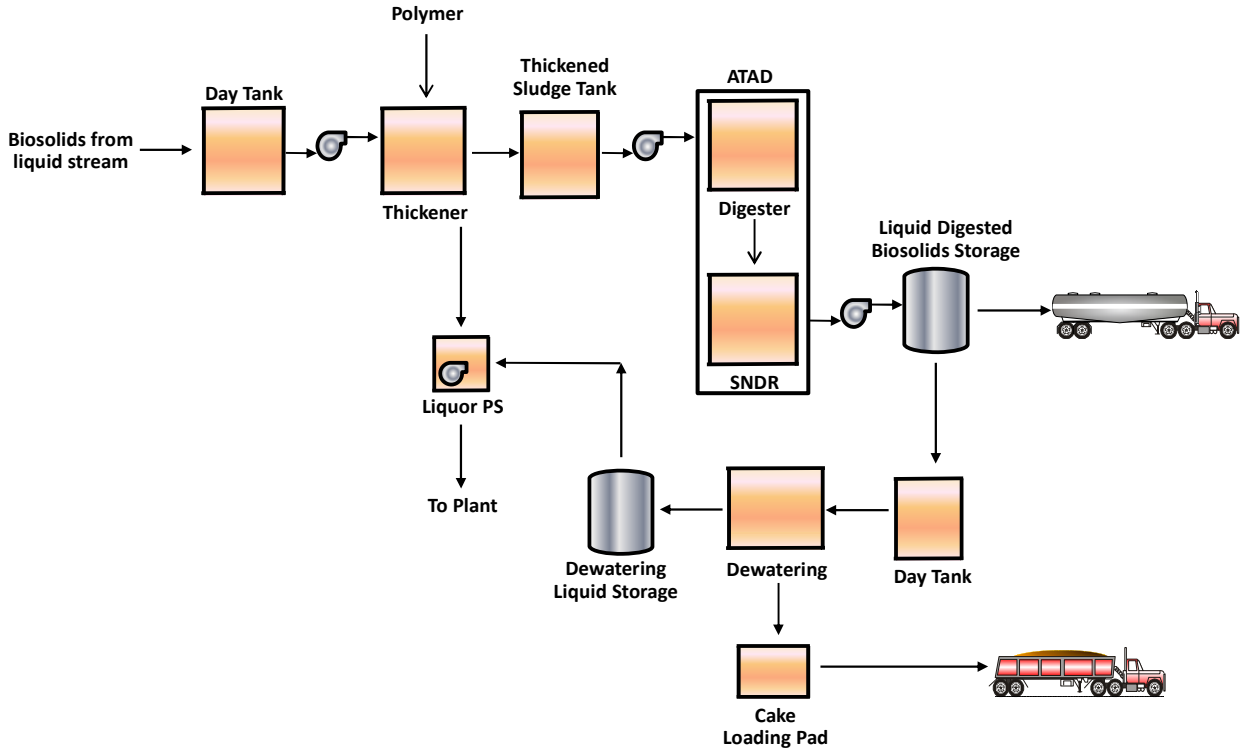


Figure 6-6 Process Flow Diagram for Cake for Beneficial Re-use

A flow diagram of this option is provided in Figure 6-6. This option is the same as liquid sludge for beneficial re-use with ATAD (Option 4) but with the addition of dewatering and an above ground liquid storage tank.

Options for cake storage were discussed in Option 4 and the conclusion to store the biosolids as liquid and dewater as required is the same for this option.

Advantages and disadvantages of this process are listed in Table 6-9. A general arrangement layout of this treatment train option is provided in Appendix 5.

Table 6-9 Advantages and Disadvantages of cake for beneficial re-use with ATAD

ADVANTAGES	DISADVANTAGES
• Sludge liquors can be batch pretreated to lower phosphorus load back to plant • Biosolids can be pasteurized in ATAD • Storage is safe and odour free • Produces two products – cake and liquid • Smaller digesters • Digestion is not weather dependant	• Moderate amount of truck traffic to haul cake • Phosphorus released in digester is sent back to the plant • Requires biofilter for odour control

6.5.7 Option No 6 - Solar Dried Pellets for Beneficial Re-use with ATAD

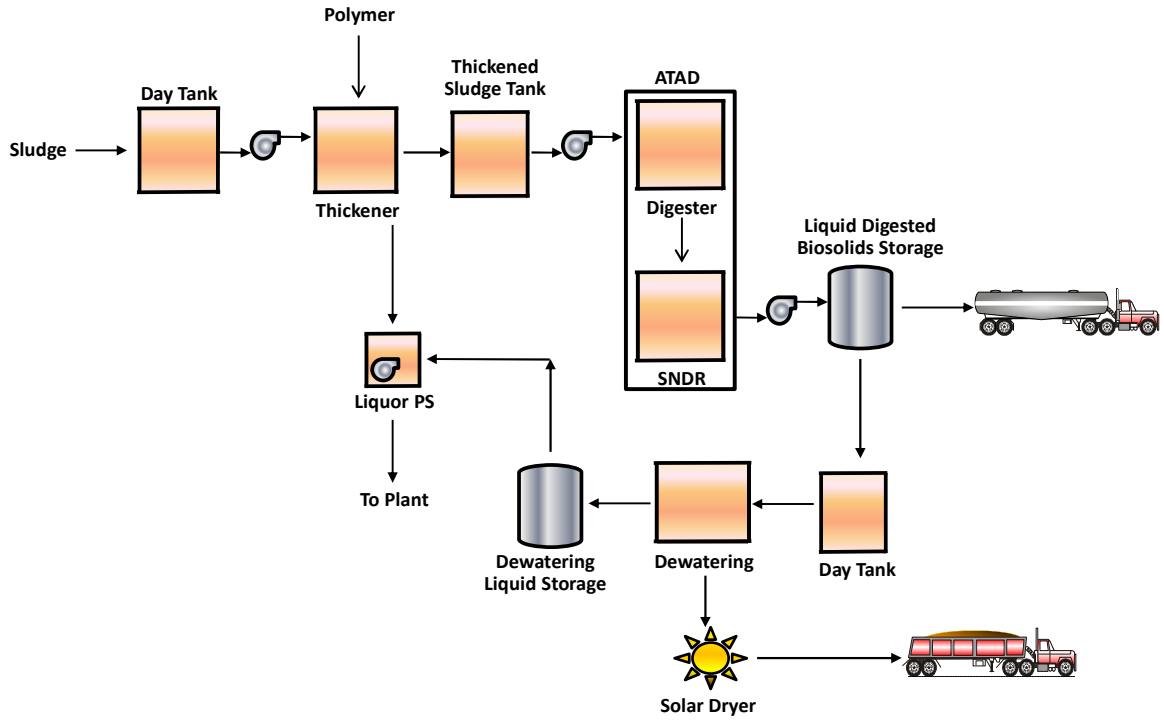


Figure 6-7 Process Flow Diagram for Solar Dried Pellets for Beneficial Re-use with ATAD

A flow diagram of this option is provided in Figure 6-7. This option follows the same process treatment steps as the cake for beneficial re-use with ATAD (Option 5); however, downstream of the dewatering units, the biosolids are conveyed to, and processed in, solar dyers as described in Option 3. The dryers produce a granular, finished product at >75% which is taken offsite and the plant can also send biosolids offsite as liquid or cake.

Advantages and disadvantages of this process are listed in Table 6-10. A general arrangement layout of this treatment train option is provided in Appendix 5.

Table 6-10 Advantages and Disadvantages of solar dried pellets for beneficial re-use with ATAD

ADVANTAGES	DISADVANTAGES
• Opportunity to create revenue from product • Least amount of truck traffic as product is driest • Biosolids can be pasteurized in ATAD • Sludge liquors can be batch pretreated to lower phosphorus load back to plant • Storage is safe and odour free • Produces three products – cake, liquid and pellets • Smaller digesters • Digestion is not weather dependant • Requires less liquid biosolids storage	• Most amount of treatment processes required • Phosphorus released in digester is sent back to the plant • Requires biofilter for odour control

6.5.8 Cost Comparison of Biosolids Treatment Technologies

Table 6-11 presents the life cycle cost estimates for the biosolids treatment technology alternatives.

Table 6-11 Cost Estimates for Biosolids Treatment Technologies

ITEM	OPTION NO 1 LIQUID SLUDGE WITH AEROBIC DIGESTION	OPTION NO 2 CAKE WITH AEROBIC DIGESTION	OPTION NO 3 PELLETS WITH AEROBIC DIGESTION	OPTION NO 4 LIQUID SLUDGE WITH ATAD	OPTION NO 5 CAKE WITH ATAD	OPTION NO 6 PELLETS WITH ATAD
Capital Cost	$19,273,000	$25,972,000	$25,990,000	$23,466,000	$31,849,000	$32,108,000
Operation and Maintenance Costs	$984,000	$2,481,000	$2,481,000	$1,583,000	$3,031,000	$3,031,000
Net Present Value	**$20,257,000**	**$28,453,000**	**$28,471,000**	**$25,049,000**	**$34,881,000**	**$35,139,000**

6.6 Detailed Evaluation of Short Listed Treatment Alternatives

The evaluation of the short list of treatment train options, using the criteria and weightings listed in Table 5-3 is provided in Table 6-12. The details of the scoring and rationale have been provided in Appendix 7.

Table 6-12 Weighted Scoring of Short Listed Biosolids Treatment Alternatives

SECONDARY CRITERIA	OPTION NO 1 – LIQUID SLUDGE WITH AEROBIC DIGESTION	OPTION NO 2 – CAKE WITH AEROBIC DIGESTION	OPTION NO 3 – PELLETS WITH AEROBIC DIGESTION	OPTION NO 4 – LIQUID SLUDGE WITH ATAD	OPTION NO 5 – CAKE WITH ATAD	OPTION NO 6 – PELLETS WITH ATAD
Social/ Culture						
Aesthetic impacts - Architectural Aesthetics (plant appearance)	5	1	3	6	2	4
Truck traffic (during construction and operation)	1	3	5	2	4	6
Noise Impact (during operation)	20	4	12	24	8	16
Odour (during operation)	20	4	12	24	8	16
Technical						
Ability to comply with the regulations or target objectives	12	4	8	24	16	20

SECONDARY CRITERIA	OPTION NO 1 – LIQUID SLUDGE WITH AEROBIC DIGESTION	OPTION NO 2 – CAKE WITH AEROBIC DIGESTION	OPTION NO 3 – PELLETS WITH AEROBIC DIGESTION	OPTION NO 4 – LIQUID SLUDGE WITH ATAD	OPTION NO 5 – CAKE WITH ATAD	OPTION NO 6 – PELLETS WITH ATAD
Process robustness	50	30	10	60	40	20
Energy Requirements	40	24	8	48	32	16
Suitability for Phasing	60	40	20	50	30	10
Time to Construct	20	12	4	24	16	8
Operation and Maintenance impacts (including staffing)	12	4	8	10	2	6
Site Requirement	8	6	2	12	10	4
Environment						
Sustainability	9	6	15	12	3	18
Health and Safety to the public	32	16	40	24	8	48
Minimize waste	6	12	18	24	30	36
Greenhouse Gas	9	3	12	18	6	15
Economic						
Capital Cost estimates	54	36	27	45	18	9
Operation and Maintenance costs	72	36	48	60	12	24
Life cycle analysis	54	36	27	45	18	9
Total Weighted	**484**	**277**	**279**	**512**	**263**	**285**

Based on detailed evaluation of the alternatives, Option No 4 – Liquid Sludge for Beneficial Re-use with ATAD offers the highest benefit over other alternatives. Figure 6-8 presents the breakdown between the main criteria.

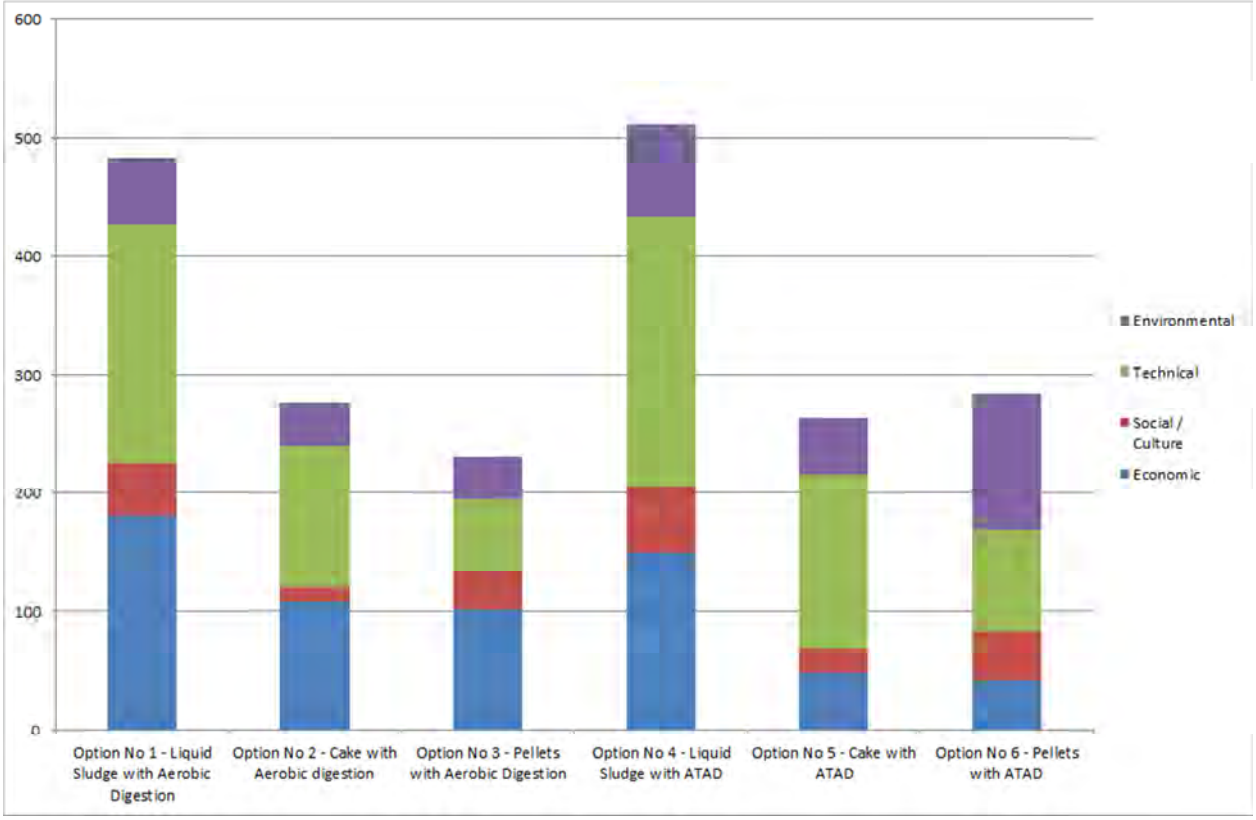


Figure 6-8 Summary of Evaluation of Biosolids Management Alternatives

6.7 Preliminary Preferred Solution for Biosolids Management

It is suggested that Option 4 – Liquid Sludge with ATAD is carried to the next stage of the project to further evaluate the benefits and costs.

7. PRELIMINARY PREFERRED ALTERNATIVE DESIGN CONCEPT

The preliminary preferred liquid treatment train Option No 1 Step Feed BNR, with all wastewater treatment stages indicated is shown in Figure 7-1. As indicated in Section 5.4.3.5, it is recommended that membrane filtration technology would be acceptable technology for the tertiary treatment. The preliminary preferred biosolids management strategy Option No 4 with ATAD is outlined in Figure 7-2.

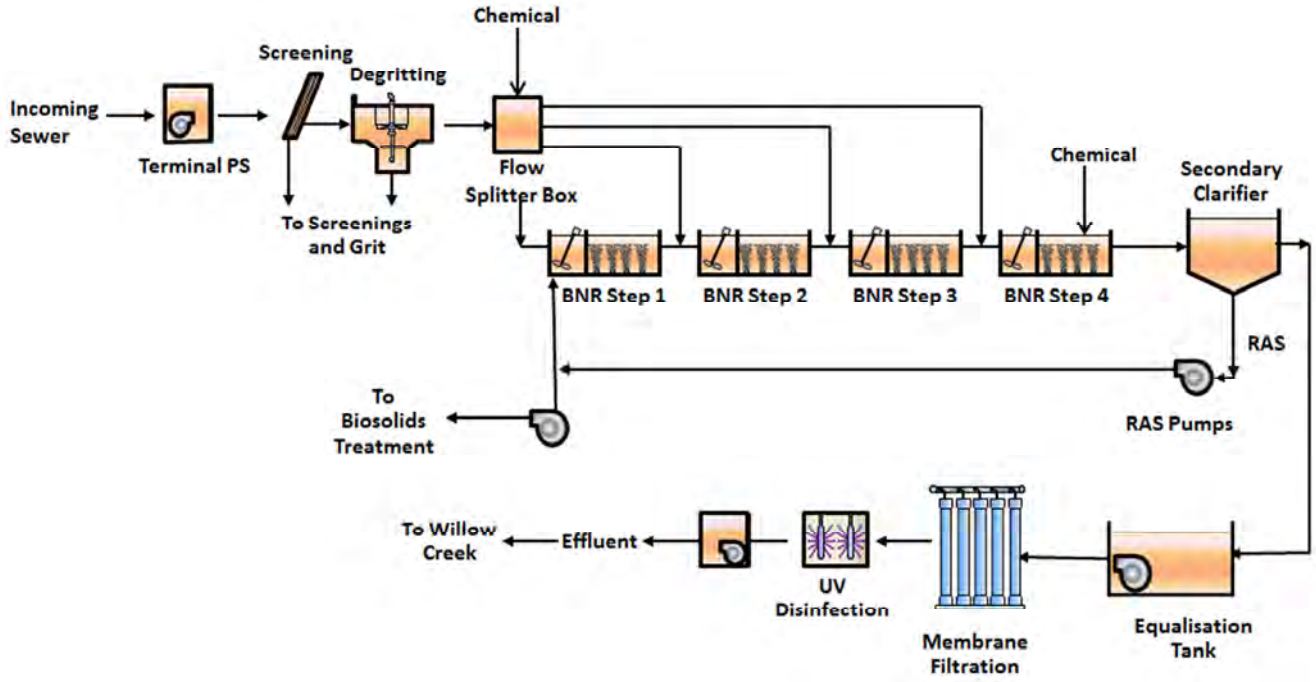


Figure 7-1 Preliminary Preferred Liquid Treatment Train

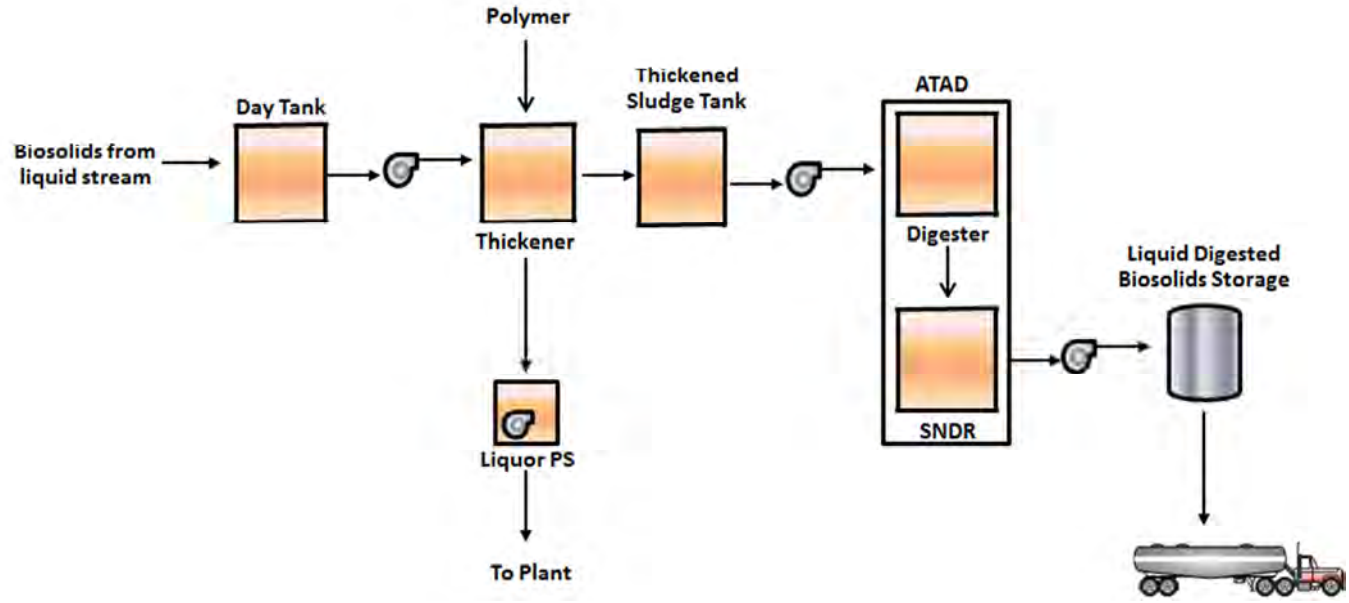


Figure 7-2 Preliminary Preferred Solids Treatment Train

The MWWTP is proposed to be placed on the Site at the intersection of Wilson Drive and Snow Valley Road. The proposed location for the MWWTP within this large parcel is in the north east area leaving sufficient space from the current and future land users as well as the current rail right of way. Approximately 100 m from the south and east side of the property lines are suggested to allow to mitigate any possible impact of noise and odour impacts. Figure 7-3 presents general layout of the plant within the allocated area. Appendix 8 shows the overall layout of the site. As shown, the headworks and tertiary treatment building will be located on the southern side whereas biosolids

treatment and storage tanks will be located on the north side of the site. The process air blower building is located in the center of the site between the two bioreactors to eliminate any noise impact on neighbours. The site will have sufficient space for future expansions and buffer areas for landscaping and other site features.

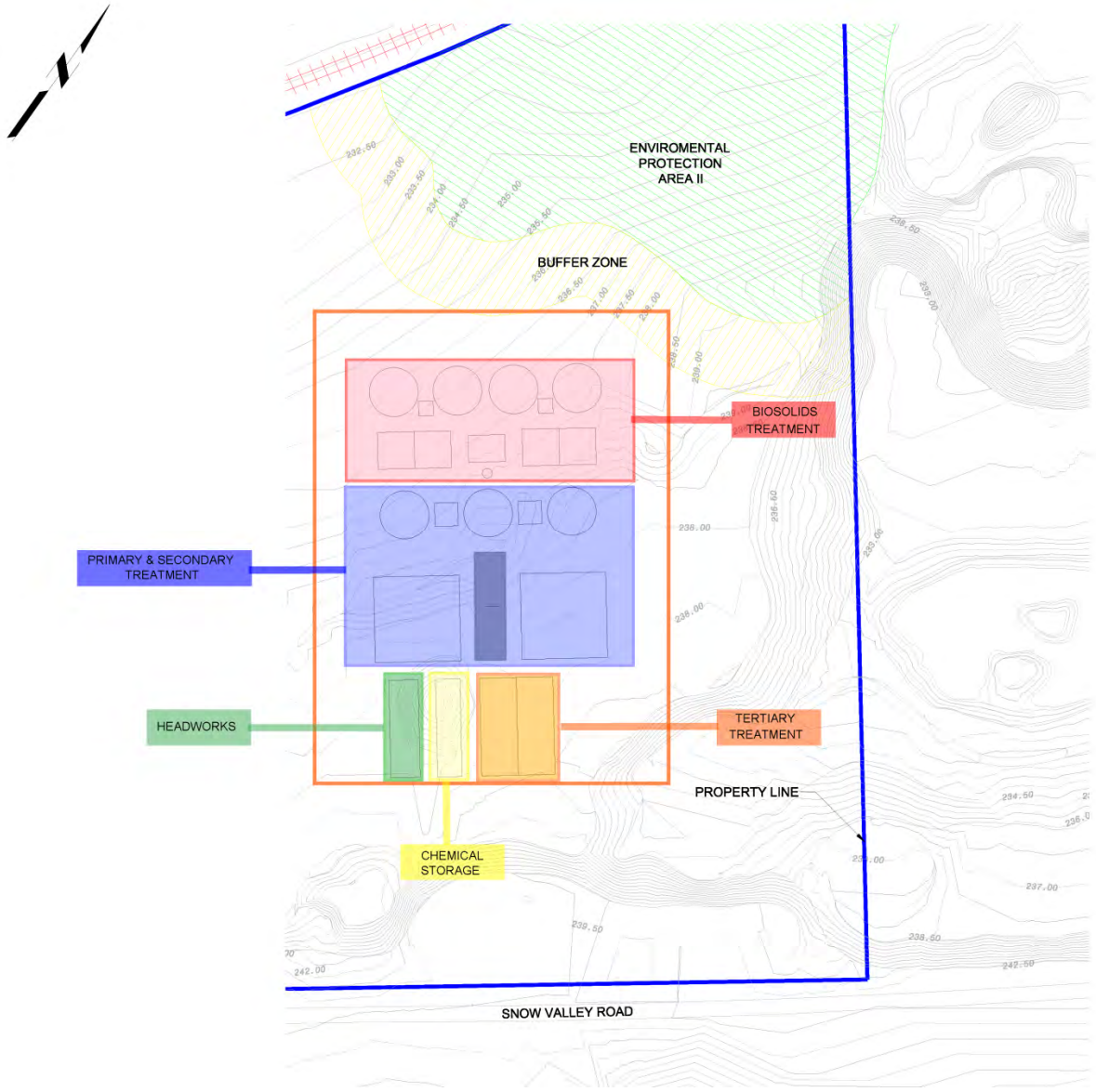


Figure 7-3 Site Plan for Preliminary Preferred Solution

As indicated previously, construction of the MWWTP will match to growth of the community. Phase 1 has been determined to serve 5000 units and opportunities are available at the site to allow for future growth in accordance the Midhurst Secondary Plan. Phase 1 will be built along the west side of the site while the expansion will be built on the east side of Phase 1. The site road that circles both phases will be built in Phase 1.

Table 7-1 presents the Class D capital cost estimate for the Phase 1 and the second expansion to reach to the Build out Capacity.

Table 7-1 Capital Cost Estimate for the MWWTP

	PHASE 1	BUILD OUT (Cost of Second Expansion in 2015 value)
Preliminary Treatment	$2,656,000	$1,993,000
Secondary Treatment	$12,585,000	$9,914,000
Tertiary Treatment	$6,037,000	$3,848,000
Disinfection	$1,025,000	$675,000
Effluent Pumping	$462,000	$387,000
Biosolids Treatment	$14,565,000	$12,605,000
Utilities, Site Preparation, Landscaping, Administration Building	$3,275,000	$1,250,000
Contingency (10%)	$4,060,500	$3,067,200
Engineering Fees, Permits etc. (17%)	$6,902,850	$5,214,240
Grand Total	**$51,568,350**	**$38,953,440**

It should be noted that the Step Feed BNR with membrane filtration complete with liquid sludge treatment with ATAD for beneficial re-use will continue to be considered preliminary preferred until is presented to public and review agencies and is confirmed as the preferred design concept based on any comments that may be received in the next stages of the Class EA Study. Upon confirmation of the preferred option design concept, a conceptual design will be developed.

Implementation of Preferred Solution In Stages

It is estimated that the growth in the Secondary Plan Area would occur at about 350 to 400 units per year. The preliminary preferred design concept includes a bioreactor for Phase 1 that has four passes (compartment). Each pass would serve approximately 1250 units which would take about 4 year to reach as per the estimated growth rate. Therefore, it is recommended to consider following approaches to deal with the low flows during the initial years of the development.

- Depending on the initial year's occupancy in the Secondary Plan Area trucking the sewage to another plant may be considered,
- Once there is sufficient flow that is feasible to covey the sewage via the sewers, the passes will operate in a fill and displace mode. The effluent from the bioreactor will be intercepted at the clarifier (or at the clarifier splitter box at the end of the bioreactor) and sent directly to tertiary treatment.
- When the load reaches the point where it makes sense to bring the clarifiers online, the bioreactor will start to operate as designed bringing extra passes online as they are needed.

- For Phase 2, once the Phase 1 bioreactor reaches capacity, then one of the passes can be dropped offline in the Phase 1 bioreactor and two passes can be commissioned in the Phase 2 bioreactor. Then the flow split can be adjusted according to the headworks building by blanking off parts of the flow splitter weirs. As additional capacity is required, more passes will be brought online.

EVALUATION OF TREATMENT ALTERNATIVES FOR MIDHURST WASTEWATER TREATMENT PLANT

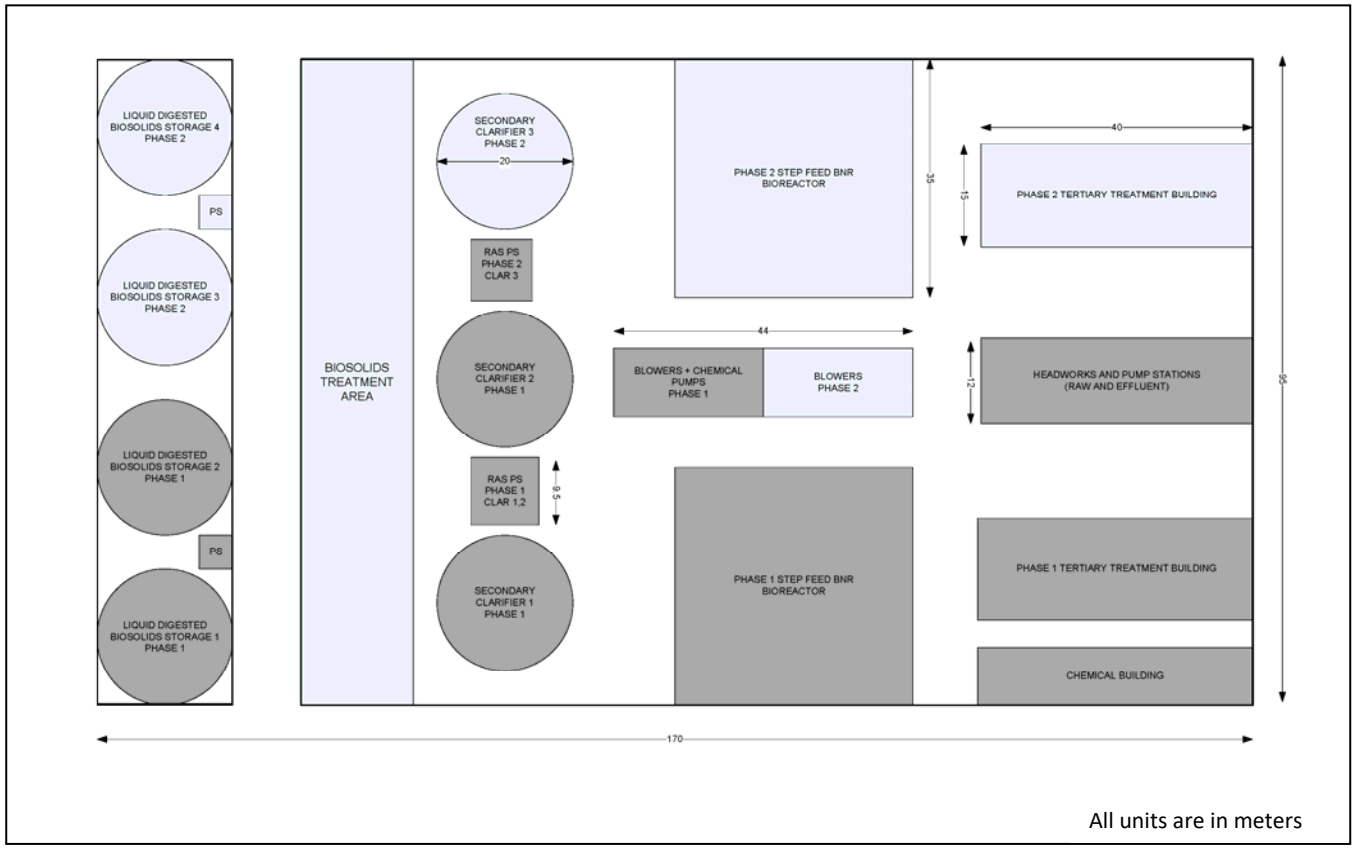
B&V PROJECT NO. 180261

APPENDIX 1

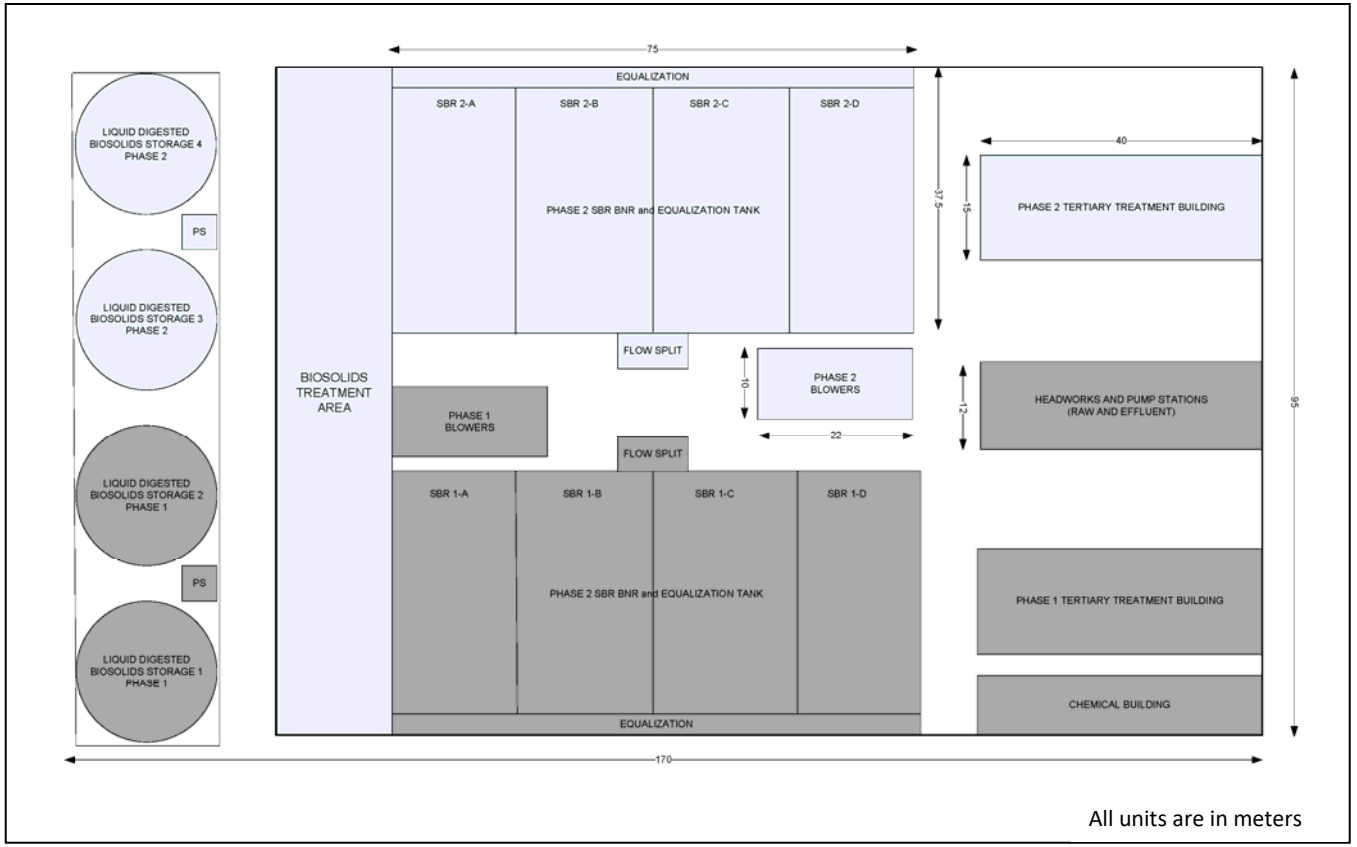
GENERAL ARRANGEMENTS FOR PRIMARY/SECONDARY TREATMENT ALTERNATIVES

BLACK & VEATCH
Building a world of difference.®

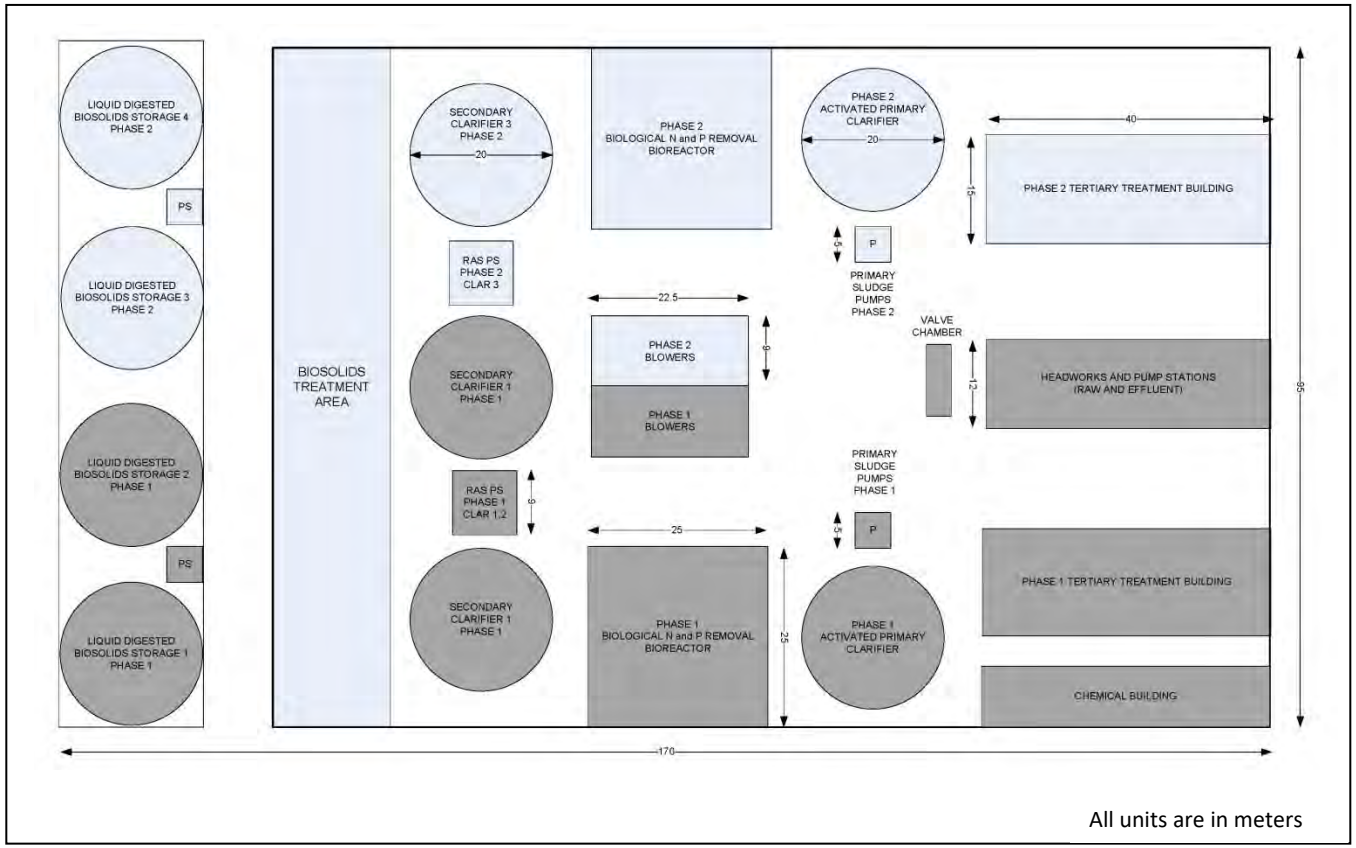
OPTION NO. 1 – STEP FEED BIOLOGICAL NITROGEN REMOVAL WITH TERTIARY TREATMENT



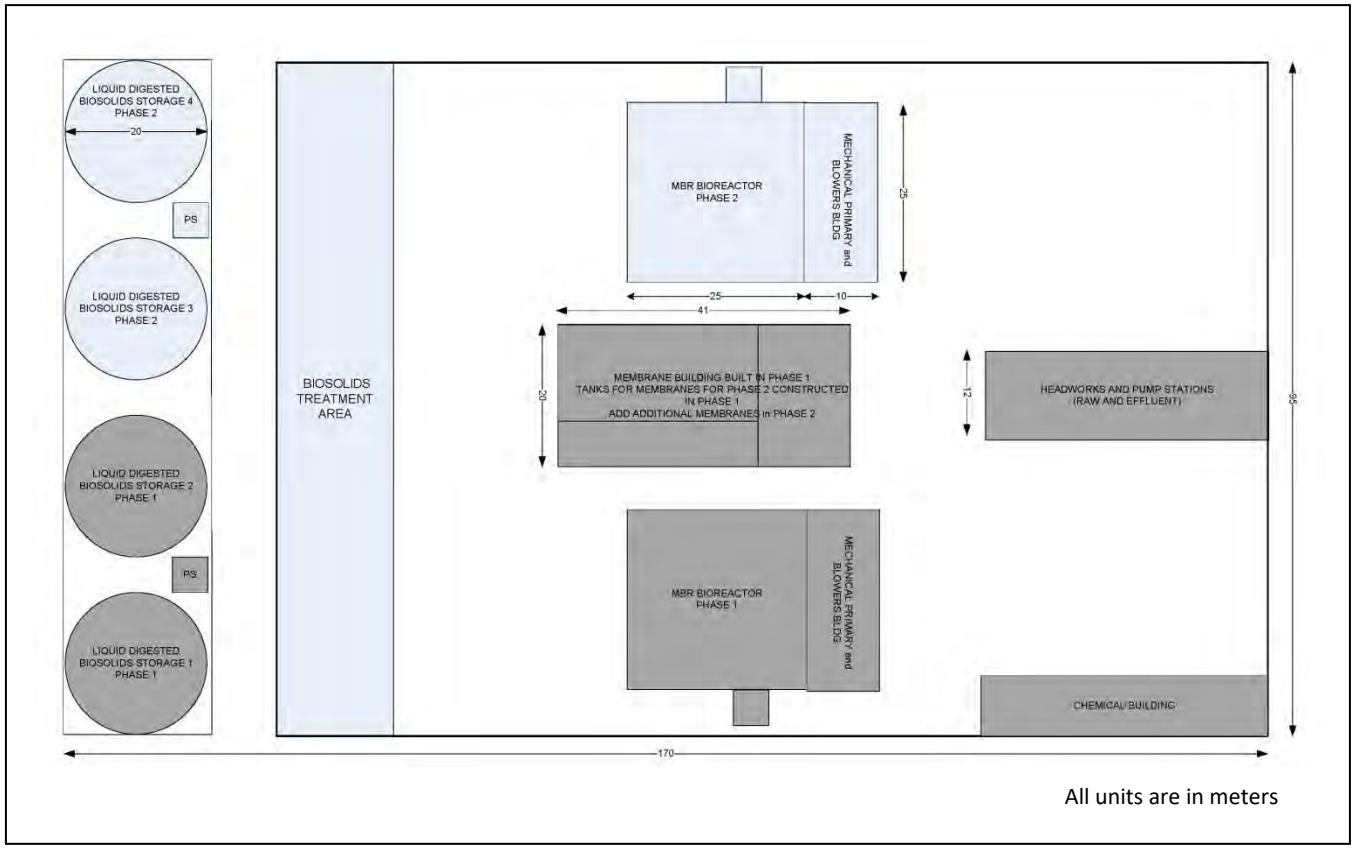
OPTION NO. 2 – SEQUENCING BATCH REACTOR BIOLOGICAL NITROGEN REMOVAL WITH TERTIARY TREATMENT



OPTION NO. 3 – BIOLOGICAL NITROGEN AND PHOSPHORUS REMOVAL WITH TERTIARY TREATMENT



OPTION NO. 4 – MEMBRANE BIOLOGICAL NITROGEN REMOVAL



EVALUATION OF TREATMENT ALTERNATIVES FOR MIDHURST WASTEWATER TREATMENT PLANT

B&V PROJECT NO. 180261

APPENDIX 2

NET PRESENT VALUE CALCULATIONS FOR PRIMARY/SECONDARY TREATMENT ALTERNATIVES

BLACK & VEATCH
Building a world of difference.®

NET PRESENT VALUE CALCULATIONS FOR OPTION NO. 1 – STEP FEED WITH BIOLOGICAL NITROGEN REMOVAL

Rev. No	Date	Prepared By	Contributors	Reviewed and Authorized By
1	9/17/2014	Monica Rivera	Cecil Stegman Pat Coleman	Oya Koc

General Factors	Phase 1	Build Out
Peak hourly dry weather flow (m^3/d)	15,519	26,891
Average dry weather flow (m^3/d)	8,450	12,314

Economic Factors	Phase 1	Build Out
Interest (%)	5	5
Inflation (%)	2	2
Contingency (%SUM Capital Costs)	25%	
Year to Begin	2014	
Duration of Construtions is 24 mo (time for mid point calculation)	1	1

CAPITAL COST

System + Equipment and Piping	Phase 1 Units	Phase 1 Unit Cost	Phase 1 Cost	Phase 1 Installation	Phase 1 Total Cost	Build Out Addition Units	Build Out Addition Unit Cost	Build Out Addition Total Cost	Build Out Addition Total Cost	Build Out Addition Total Cost
EQUIPMENT										
Step Feed BNR Bioreactor										
No. of Bioreactors	1					1				
Blowers (Aerzen lowe Package - GM 30L DN 150 - Pressure)	3	$ 42,640	$ 127,920	50%	$ 191,880	2	$ 42,640	$ 85,280	50%	$ 127,920
Mixers	8	$ 15,000	$ 120,000	50%	$ 180,000	8	$ 15,000	$ 120,000	50%	$ 180,000
Aeration Piping, valves and diffusers			$ 360,000	50%	$ 540,000			$ 720,000	50%	$ 1,080,000
Secondary Clarifiers										
No. of Clarifiers	2	$ 142,333	$ 284,667	50%	$ 427,000	1	$ 142,333	$ 142,333	50%	$ 213,500
FRP Effluent Weirs and Scum Baffles	2	$ 10,167	$ 20,333	50%	$ 30,500	1	$ 10,167	$ 10,167	50%	$ 15,250
Secondary Scum Pumps	2	$ 24,200	$ 48,400	50%	$ 72,600					
RAS Pumps Clarifier 1 & 3	2	$ 16,350	$ 32,700	50%	$ 49,050	2	$ 16,350	$ 32,700	50%	$ 49,050
RAS Pumps Clarifier 2	3	$ 13,300	$ 39,900	50%	$ 59,850					
WAS Pumps	2	$ 12,325	$ 24,650	50%	$ 36,975	2	$ 12,325	$ 24,650	50%	$ 36,975
Chemical Dosing										
Chemical Storage Tanks	2	$ 30,000	$ 60,000	50%	$ 90,000	2	$ 30,000	$ 60,000	50%	$ 90,000
Chemical Day Tanks	1	$ 5,000	$ 5,000	100%	$ 10,000	1	$ 5,000	$ 5,000	100%	$ 10,000
Primary Dose Pumps: Flow Splitter No. 2	2	$ 3,000	$ 6,000	100%	$ 12,000	2	$ 3,000	$ 6,000	100%	$ 12,000
Secondary Dose Pumps: MLSS splitter box	2	$ 2,500	$ 5,000	100%	$ 10,000	2	$ 2,500	$ 5,000	100%	$ 10,000
Chemical Transfer Pumps	2	$ 3,500	$ 7,000	100%	$ 14,000	3	$ 3,500	$ 10,500	100%	$ 21,000
Contingencies (25%)		25%			$ 430,964		25%	$ 305,407.50	25%	$ 461,424
Total Equipment Cost					**$2,154,819**					**$2,307,119**
CONSTRUCTION COSTS										
General Requirements		10%			$ 689,000		10%			$ 502,000
Sitework		8%			$ 510,000		3%			$ 146,000
Yard Piping					$ 92,000					$ 87,000
Step Feed BNR Bioreactor					$ 3,098,000					$ 3,098,000
Blower Building					$ 921,000					$ 921,000
Secondary Clarifier 1 & 2					$ 1,540,000					-
Secondary Clarifier 3					-					$ 770,000
RAS Pumping Station - Secondary Clarifier 1 & 2					$ 362,000					-
RAS Pumping Station - Secondary Clarifier 3					$ 362,000					-
Contingencies (25%)					$ 1,894,000					$ 1,381,000
Contractor Allowance		10%			$ 757,000		10%			$ 552,000
Mid-Point of Construction [S=P(1+i)n]					$ 205,000					$ 149,000
Total Probable Construction Cost					**$10,430,000**					**$7,606,000**

ANNUAL OPERATIONAL COST

Sytem	Phase 1 Value	Phase 1 Units	Phase 1 Unit Cost	Phase 1 Total Cost	Build Out Value	Build Out Units	Build Out Unit Cost	Build Out Total Cost
Chemical Consumption								
Alum	45	kg/d	3.95	$ 64,879	90	kg/d		
Total Chemical Consumption				**$ 64,879**				
Power Factors								
Bioreactor Process Air Blowers	875	kWh/d	0.1	$ 31,938	1750	kWh/d	0.1	$ 63,875
Bioreactor Mixers	144	kWh/d	0.1	$ 5,256	288	kWh/d	0.1	$ 10,512
Scum Pumps	1	kWh/d	0.1	$ 37	2	kWh/d	0.1	$ 73
RAS Pumps	115	kWh/d	0.1	$ 4,198	230	kWh/d	0.1	$ 8,395
WAS Pumps	11	kWh/d	0.1	$ 402	22	kWh/d	0.1	$ 803
Clarifier Mechanism	20.5	kWh/d	0.1	$ 748	41	kWh/d	0.1	$ 1,497
Total Average Power Consumption	**1166.5**	**kWh/d**	**0.1**	**$ 42,577**	**2333**	**kWh/d**	0.1	**$ 85,155**

Calculating NPV

Item			BUILD OUT																							
Capital Costs	**2014**	**2015**	**1 2016**	**2 2017**	**3 2018**	**4 2019**	**5 2020**	**6 2021**	**7 2022**	**8 2023**	**9 2024**	**10 2025**	**11 2026**	**12 2027**	**13 2028**	**14 2029**	**15 2030**	**16 2031**	**17 2032**	**18 2033**	**19 2034**	**20 2035**	**21 2036**	**22 2037**	**23 2038**	**24 2039**	**25 2040**	**TOTAL**
System + Equipment and Piping	$ 2,154,819												$ 2,307,119														
Yard Piping + Building + HVAC	$ 10,430,000												$ 7,606,000														
Capital Costs (2014)	**$ 12,584,819**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 9,913,119**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 22,497,938**
Capital Costs (Year n)	**$ 12,584,819**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 12,572,232**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 25,157,050**
Net Present Value (2014)	**$ 12,584,819**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 7,000,689**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 19,585,508**
Operating Costs																												
Chemical Consumption Cost (Pro-rated)			$ 5,190	$ 10,381	$ 15,571	$ 20,761	$ 25,952	$ 31,142	$ 36,332	$ 41,522	$ 46,713	$ 51,903	$ 57,093	$ 62,284	$ 67,474	$ 72,664	$ 77,855	$ 83,045	$ 88,235	$ 93,425	$ 98,616	$ 103,806	$ 108,996	$ 114,187	$ 119,377	$ 121,972	$ 123,867	
Power Consumption Cost			$ 42,577	$ 42,577	$ 42,577	$ 42,577	$ 42,577	$ 42,577	$ 42,577	$ 42,577	$ 42,577	$ 42,577	$ 85,155	$ 85,155	$ 85,155	$ 85,155	$ 85,155	$ 85,155	$ 85,155	$ 85,155	$ 85,155	$ 85,155	$ 85,155	$ 85,155	$ 85,155	$ 85,155	$ 85,155	
Operation Costs (2014)			**$ 47,768**	**$ 52,958**	**$ 58,148**	**$ 63,338**	**$ 68,529**	**$ 73,719**	**$ 78,909**	**$ 84,100**	**$ 89,290**	**$ 94,480**	**$ 142,248**	**$ 147,438**	**$ 152,628**	**$ 157,819**	**$ 163,009**	**$ 168,199**	**$ 173,390**	**$ 178,580**	**$ 183,770**	**$ 188,961**	**$ 194,151**	**$ 199,341**	**$ 204,531**	**$ 207,127**	**$ 209,021**	**$ 3,381,451**
Operation Costs (Year n)			**$ 49,697**	**$ 56,199**	**$ 62,941**	**$ 69,931**	**$ 77,175**	**$ 84,680**	**$ 92,455**	**$ 100,507**	**$ 108,844**	**$ 117,474**	**$ 180,405**	**$ 190,727**	**$ 201,390**	**$ 212,403**	**$ 223,776**	**$ 235,520**	**$ 247,643**	**$ 260,157**	**$ 273,073**	**$ 286,401**	**$ 300,153**	**$ 314,341**	**$ 328,976**	**$ 339,813**	**$ 349,780**	**$ 4,764,461**
Net Present Value (2014)			**$ 45,077**	**$ 48,547**	**$ 51,782**	**$ 54,793**	**$ 57,589**	**$ 60,181**	**$ 62,577**	**$ 64,788**	**$ 66,821**	**$ 68,685**	**$ 100,456**	**$ 101,147**	**$ 101,716**	**$ 102,170**	**$ 102,515**	**$ 102,756**	**$ 102,901**	**$ 102,953**	**$ 102,918**	**$ 102,801**	**$ 102,607**	**$ 102,340**	**$ 102,005**	**$ 100,348**	**$ 98,372**	**$ 2,108,843**
Net Present Value																												
Capital Costs (2014)	**$ 19,585,508**																											
Operation Costs (2014)	**$ 2,108,843**																											
Net Present Value (2014)	**$ 21,694,351**																											

Average Flow (m^3/d)	516	1,032	1,548	2,064	2,580	3,096	3,612	4,128	4,644	5,160	5,676	6,192	6,708	7,224	7,740	8,256	8,772	9,288	9,804	10,320	10,836	11,352	11,868	12,126	12,314

NET PRESENT VALUE CALCULATIONS FOR OPTION NO. 2 – SEQUENCING BATCH REACTOR WITH BIOLOGICAL NITROGEN REMOVAL

Rev. No	Date	Prepared By	Contributors	Reviewed and Authorized By
1	9/17/2014	Monica Rivera	Cecil Stegman Pat Coleman	Oya Koc

General Factors	Phase 1	Build Out
Peak hourly dry weather flow (m^3/d)	15,519	26,891
Average dry weather flow (m^3/d)	6,450	12,314

Economic Factors	Phase 1	Build Out
Interest (%)	5	5
Inflation (%)	2	2
Contingency (%SUM Capital Costs)	25%	
Year to Begin	2014	
Duration of Construtcion is 24 mo (time for	1	1

CAPITAL COST

System + Equipment and Piping	Phase 1 Units	Phase 1 Unit Cost	Phase 1 Cost	Phase 1 Installation	Phase 1 Total Cost	Build Out Addition Units	Build Out Addition Unit Cost	Build Out Addition Cost	Build Out Addition Installation	Build Out Addition Total Cost
EQUIPMENT										
SBR BNR Bioreactor & Equaliation Tank										
No. of Bioreactors	4					4				
Equalization Tanks	1					1				
Aeration Piping, valves and diffusers			$ 417,500	50%	$ 626,250			$ 835,000	50%	$ 1,252,500
SBR NMLR Pumps	4	$ 21,380	$ 85,520	50%	$ 128,280	4	$ 21,380	$ 85,520	50%	$ 128,280
Box Spare NMLR Pump	1	$ 21,380	$ 21,380	50%	$ 32,070				50%	$ -
WAS Pumps	4	$ 24,638	$ 98,552	50%	$ 147,828	4	$ 24,638	$ 98,552	50%	$ 147,828
Box Spare WAS Pump	1	$ 24,638	$ 24,638	50%	$ 36,957				50%	$ -
Secondary Scum Pumps	2	$ 24,200	$ 48,400	50%	$ 72,600				50%	$ -
Equalization Pumps	2	$ 40,710	$ 81,420	50%	$ 122,130	2	$ 40,710	$ 81,420	50%	$ 122,130
Box Spare Equalization Pump	1	$ 40,710	$ 40,710	50%	$ 61,065				50%	$ -
Blowers (Aerzen lowe Package - GM 30L DN 150 - Pressure)	4	$ 33,660	$ 134,640	50%	$ 201,960	4	$ 33,660	$ 134,640	50%	$ 201,960
Mixers	8	$ 15,000	$ 120,000	50%	$ 180,000	8	$ 15,000	$ 120,000	50%	$ 180,000
Chemical Dosing										
Chemical Storage Tanks	2	$ 30,000	$ 60,000	50%	$ 90,000	2	$ 30,000	$ 60,000	50%	$ 90,000
Chemical Day Tanks	1	$ 5,000	$ 5,000	100%	$ 10,000	1	$ 5,000	$ 5,000	100%	$ 10,000
Primary Dose Pumps: Flow Splitter No. 2	2	$ 3,000	$ 6,000	100%	$ 12,000	2	$ 3,000	$ 6,000	100%	$ 12,000
Chemical Transfer Pumps	2	$ 3,500	$ 7,000	100%	$ 14,000	2	$ 3,500	$ 7,000	100%	$ 14,000
Contingencies (25%)					$ 433,780					$ 539,875
Total Equipment Cost					**$2,168,925**					**$2,698,373**
CONSTRUCTION COSTS										
General Requirements		10%			$ 554,000		10%			$ 612,000
Sitework		10%			$ 595,000		3%			$ 178,000
SBR BNR Bioreactor & Equaliation Tank					$ 5,025,000					5,025,000
Blower Building					$ 921,000					921,000
Contingencies (25%)					$ 1,799,000					$ 1,684,000
Contractor Allowance		10%			$ 720,000		10%			$ 674,000
Mid-Point of Construction (%=P(1+i)n)%					$ 194,000					$ 183,000
Total Probable Construction Cost					**$9,908,000**					**$9,276,000**

ANNUAL OPERATIONAL COST

Sytem	Phase 1 Value	Phase 1 Units	Phase 1 Unit Cost	Phase 1 Total Cost	Build Out Value	Build Out Units	Build Out Unit Cost	Build Out Total Cost
Chemical Consumption								
Alum	44	kg/d	3.95	$ 63,437	88	kg/d		
Total Chemical Consumption				$ 63,437				
Power Factors								
Bioreactor Process Air Blowers	835	kWh/d	0.1	$ 30,478	1670	kWh/d	0.1	$ 60,955
Bioreactor Mixers	99	kWh/d	0.1	$ 3,504	192	kWh/d	0.1	$ 7,008
SBR NMLR Pumps	26	kWh/d	0.1	$ 949	52	kWh/d	0.1	$ 1,898
WAS Pumps	10	kWh/d	0.1	$ 365	20	kWh/d	0.1	$ 730
Total Average Power Consumption	1011	kWh/d	0.1	$ 36,902	2022	kWh/d	0.1	$ 73,803

Calculating NPV													BUILD OUT															
Item			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	TOTAL
Capital Costs	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
System + Equipment and Piping	$ 2,168,925												$ 2,698,373															
Yard Piping + Building + HVAC	$ 9,908,000												$ 9,276,000															
Capital Costs (2014)	**$ 12,076,925**	**0**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 11,974,373**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 24,051,298**
Capital Costs (Year n)	**$ 12,076,925**	**0**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 15,186,400**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 27,263,325**
Net Present Value (2014)	**$ 12,076,925**	**0**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 8,456,356**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 20,533,281**
Operating Costs																												
Chemical Consumption Costs (Pro-rated)			$ 5,075	$ 10,150	$ 15,225	$ 20,300	$ 25,375	$ 30,450	$ 35,525	$ 40,600	$ 45,675	$ 50,750	$ 55,825	$ 60,900	$ 65,974	$ 71,049	$ 76,124	$ 81,199	$ 86,274	$ 91,349	$ 96,424	$ 101,499	$ 106,574	$ 111,649	$ 116,724	$ 119,262	$ 121,114	
Power Consumption Cost			$ 36,902	$ 36,902	$ 36,902	$ 36,902	$ 36,902	$ 36,902	$ 36,902	$ 36,902	$ 36,902	$ 36,902	$ 73,803	$ 73,803	$ 73,803	$ 73,803	$ 73,803	$ 73,803	$ 73,803	$ 73,803	$ 73,803	$ 73,803	$ 73,803	$ 73,803	$ 73,803	$ 73,803	$ 73,803	
Operation Costs (2014)			**$ 41,976**	**$ 47,051**	**$ 52,126**	**$ 57,201**	**$ 62,276**	**$ 67,351**	**$ 72,426**	**$ 77,501**	**$ 82,576**	**$ 87,651**	**$ 129,628**	**$ 134,703**	**$ 139,777**	**$ 144,852**	**$ 149,927**	**$ 155,002**	**$ 160,077**	**$ 165,152**	**$ 170,227**	**$ 175,302**	**$ 180,377**	**$ 185,452**	**$ 190,527**	**$ 193,065**	**$ 194,917**	**$ 3,117,124**
Operation Costs (Year n)			**$ 43,672**	**$ 49,931**	**$ 56,423**	**$ 63,155**	**$ 70,133**	**$ 77,365**	**$ 84,859**	**$ 92,621**	**$ 100,660**	**$ 108,983**	**$ 164,399**	**$ 174,252**	**$ 184,433**	**$ 194,952**	**$ 205,818**	**$ 217,041**	**$ 228,630**	**$ 240,596**	**$ 252,949**	**$ 265,700**	**$ 278,859**	**$ 292,439**	**$ 306,451**	**$ 316,743**	**$ 326,178**	**$ 4,397,243**
Net Present Value (2014)			**$ 39,612**	**$ 43,133**	**$ 46,420**	**$ 49,484**	**$ 52,334**	**$ 54,982**	**$ 57,436**	**$ 59,704**	**$ 61,796**	**$ 63,720**	**$ 91,544**	**$ 92,410**	**$ 93,151**	**$ 93,775**	**$ 94,288**	**$ 94,694**	**$ 95,000**	**$ 95,212**	**$ 95,334**	**$ 95,371**	**$ 95,328**	**$ 95,210**	**$ 95,021**	**$ 93,535**	**$ 91,734**	**$ 1,940,228**
Net Present Value																												
Capital Costs (2014)	**$ 20,533,281**																											
Operation Costs (2014)	**$ 1,940,228**																											
Net Present Value (2014)	**$ 22,473,508**																											

Average Flow (m^3/d)	516	1,032	1,548	2,064	2,580	3,096	3,612	4,128	4,644	5,160	5,676	6,192	6,708	7,224	7,740	8,256	8,772	9,288	9,804	10,320	10,836	11,352	11,868	12,126	12,314

NET PRESENT VALUE CALCULATIONS FOR OPTION NO. 3 – BIOLOGICAL NITROGEN AND PHOSPHORUS REMOVAL

Rev No.	Date	Prepared By	Contributors	Reviewed and Authorized By
1	9/17/2014	Monica Rivera	Cecil Stegman Pat Coleman	Oya Koc

General Factors	Phase 1	Build Out
Peak hourly dry weather flow (m^3/d)	15,519	26,891
Average dry weather flow (m^3/d)	6,450	12,314

Economic Factors	Phase 1	Build Out
Interest (%)	5	5
Inflation (%)	2	2
Contingency (%SUM Capital Costs)	25%	
Year to Begin	2014	
Duration of Construction is 24 mo (time for	1	1

CAPITAL COST

System + Equipment and Piping	Phase 1					Build Out Addition				
	Units	Unit Cost	Cost	Installation	Total Cost	Units	Unit Cost	Cost	Installation	Total Cost
EQUIPMENT										
Activated Primary Clarifiers										
No. of Clarifiers	1	$ 157,500	$ 157,500	50%	$ 236,250	1	$ 157,500	$ 157,500	50%	$ 236,250
FRP Effluent Weirs and Scum Baffles	1	$ 9,250	$ 9,250	50%	$ 13,875	1	$ 9,250	$ 9,250	50%	$ 13,875
Aeration Piping, valves and diffusers			$ 325,000	50%	$ 487,500			$ 650,000	50%	$ 975,000
Dealudging Pumps	2	$ 12,235	$ 24,470	50%	$ 36,705	2	$ 12,235	$ 24,470	50%	$ 36,705
Elutriation Pumps	2	$ 12,740	$ 25,480	50%	$ 38,220	2	$ 12,740	$ 25,480	50%	$ 38,220
Primary Scum Pumps	2	$ 24,200	$ 48,400	50%	$ 72,600	2	$ 24,200	$ 48,400	50%	$ 72,600
Odour control Fan (/CFM)	2060	$ 5	$ 10,300	50%	$ 15,450	4120	$ 5	$ 20,600	50%	$ 30,900
Odour Control Biofilter (/CFM)	4120	$ 100	$ 412,000	50%	$ 618,000	8240	$ 100	$ 824,000	50%	$ 1,236,000
Odour Control Biofilter Fan (/CFM)	4120	$ 5	$ 41,200	50%	$ 61,800	8240	$ 5	$ 41,200	50%	$ 61,800
Biological N and P Bioreactor										
No. of Bioreactors	1					1				
NMLR Pumps	2	$ 37,160	$ 74,320	50%	$ 111,480	2	$ 37,160	$ 74,320	50%	$ 111,480
NMLR Pump Box Spare	1	$ 37,160	$ 37,160	50%	$ 55,740				50%	$ -
Blowers (Aerzen lowe Package - GM 30L DN 150 - Pressure)	3	$ 38,180	$ 114,540	50%	$ 171,810	2	$ 38,180	$ 76,360	50%	$ 114,540
Mixers	3	$ 20,000	$ 60,000	50%	$ 90,000	3	$ 20,000	$ 60,000	50%	$ 90,000
Secondary Clarifiers										
No. of Clarifiers	2	$ 142,333	$ 284,667	50%	$ 427,000	1	$ 142,333	$ 142,333	50%	$ 213,500
FRP Effluent Weirs and Scum Baffles	1	$ 10,167	$ 10,167	50%	$ 15,250	1	$ 10,167	$ 10,167	50%	$ 15,250
Secondary Clarifier Scum Pumps	2	$ 24,200	$ 48,400	50%	$ 72,600				50%	
RAS Pumps Clarifier 1 & 3	2	$ 16,350	$ 32,700	50%	$ 49,050	2	$ 16,350	$ 32,700	50%	$ 49,050
RAS Pumps Clarifier 2	3	$ 13,300	$ 39,900	50%	$ 59,850				50%	
WAS Pumps	2	$ 12,325	$ 24,650	50%	$ 36,975	2	$ 12,325	$ 24,650	50%	$ 36,975
Chemical Dosing										
Chemical Storage Tanks	2	$ 30,000	$ 60,000	50%	$ 90,000	1	$ 30,000			
Chemical Day Tanks	1	$ 5,000	$ 5,000	100%	$ 10,000	1	$ 5,000			
Primary Dose Pumps: MLSS Collection Channel	2	$ 3,000	$ 6,000	100%	$ 12,000	2	$ 3,000	$ 6,000		
Contingencies (25%)					$ 695,535					$ 833,036
Total Equipment Cost					$3,477,694					$4,165,181
CONSTRUCTION COSTS										
General Requirements		10%			$ 638,000		10%			$ 443,000
Sitework		10%			$ 580,000		3%			$ 129,000
Biological N and P Bioreactor					$ 1,810,000					$ 1,810,000
Blower Building					$ 777,000					$ 777,000
Secondary Clarifier 1 & 2					$ 1,540,000					-
Secondary Clarifier 3										$ 770,000
Primary Clarifier 1					$ 770,000					-
Primary Clarifier 2										$ 770,000
RAS Pumping Station - Secondary Clarifier 1 & 2					$ 362,000					-
RAS Pumping Station - Secondary Clarifier 3 (Add pumping system only)					$ 362,000					-
Primary Sludge Pumping Station					$ 175,000					$ 175,000
Contingencies (25%)					$ 1,754,000					$ 1,219,000
Contractor Allowance		10%			$ 701,000		10%			$ 487,000
Mid-Point of Construction ($=P(1+i)^n$)3					$ 189,000					$ 132,000
Total Probable Construction Cost					$9,658,000					$6,712,000

ANNUAL OPERATIONAL COST

Sytem	Phase 1				Build Out			
	Value	Units	Unit Cost	Total Cost	Value	Units	Unit Cost	Total Cost
Chemical Consumption								
Alum	5	kg/d	3.95	$ 7,209	10	kg/d		
Total Chemical Consumption				$ 7,209				
Power Factors								
Primary Clarifier Drives	18	kWh/d	0.1	$ 657	36	kWh/d	0.1	$ 1,314
Primary Clarifier Elutriation Pumps	35	kWh/d	0.1	$ 1,278	70	kWh/d	0.1	$ 2,555
Primary Clarifier Dewludging Pumps	4	kWh/d	0.1	$ 146	8	kWh/d	0.1	$ 292
Primary Clarifier Odour	228	kWh/d	0.1	$ 8,322	456	kWh/d	0.1	$ 16,644
Aeration	585.5	kWh/d	0.1	$ 21,371	1171	kWh/d	0.1	$ 42,742
NMLR Pumps	48	kWh/d	0.1	$ 1,752	96	kWh/d	0.1	$ 3,504
Mixers	96	kWh/d	0.1	$ 3,504	192	kWh/d	0.1	$ 7,008
RAS Pumps	115	kWh/d	0.1	$ 4,198	230	kWh/d	0.1	$ 8,395
WAS Pumps	5.5	kWh/d	0.1	$ 201	11	kWh/d	0.1	$ 402
Scum Pumps	1	kWh/d	0.1	$ 37	2	kWh/d	0.1	$ 73
Total Average Power Consumption	1136	kWh/d	0.1	$ 41,464	2272	kWh/d	0.1	$ 82,928

Calculating NPV													BUILD OUT															
Item			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	TOTAL
Capital Costs	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
System + Equipment and Piping	$ 3,477,694												$ 4,165,181															
Yard Piping + Building + HVAC	$ 9,658,000												$ 6,712,000															
Capital Costs (2014)	$ 13,135,694	0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 10,877,181	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 24,012,875
Capital Costs (Year n)	$ 13,135,694	0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 13,794,896	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 26,930,590
Net Present Value (2014)	$ 13,135,694	0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 7,681,514	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 20,817,208
Operating Costs																												
Chemical Consumption Costs (Pro-rated)			$ 577	$ 1,153	$ 1,730	$ 2,307	$ 2,884	$ 3,460	$ 4,037	$ 4,614	$ 5,190	$ 5,767	$ 6,344	$ 6,920	$ 7,497	$ 8,074	$ 8,651	$ 9,227	$ 9,804	$ 10,381	$ 10,957	$ 11,534	$ 12,111	$ 12,687	$ 13,264	$ 13,552	$ 13,763	
Power Consumption Cost			$ 41,464	$ 41,464	$ 41,464	$ 41,464	$ 41,464	$ 41,464	$ 41,464	$ 41,464	$ 41,464	$ 41,464	$ 82,928	$ 82,928	$ 82,928	$ 82,928	$ 82,928	$ 82,928	$ 82,928	$ 82,928	$ 82,928	$ 82,928	$ 82,928	$ 82,928	$ 82,928	$ 82,928	$ 82,928	
Operation Costs (2014)			$ 42,041	$ 42,617	$ 43,194	$ 43,771	$ 44,348	$ 44,924	$ 45,501	$ 46,078	$ 46,654	$ 47,231	$ 89,272	$ 89,848	$ 90,425	$ 91,002	$ 91,579	$ 92,155	$ 92,732	$ 93,309	$ 93,885	$ 94,462	$ 95,039	$ 95,615	$ 96,192	$ 96,480	$ 96,691	$ 1,845,045
Operation Costs (Year n)			$ 43,739	$ 45,226	$ 46,755	$ 48,327	$ 49,942	$ 51,604	$ 53,312	$ 55,067	$ 56,871	$ 58,726	$ 113,218	$ 116,228	$ 119,314	$ 122,476	$ 125,718	$ 129,040	$ 132,444	$ 135,933	$ 139,509	$ 143,173	$ 146,928	$ 150,776	$ 154,719	$ 158,286	$ 161,804	$ 2,559,134
Net Present Value (2014)			$ 39,673	$ 39,068	$ 38,465	$ 37,865	$ 37,268	$ 36,674	$ 36,083	$ 35,497	$ 34,914	$ 34,336	$ 63,044	$ 61,638	$ 60,262	$ 58,913	$ 57,593	$ 56,300	$ 55,033	$ 53,793	$ 52,579	$ 51,391	$ 50,227	$ 49,088	$ 47,973	$ 46,742	$ 45,506	$ 1,179,926
Net Present Value																												
Capital Costs (2014)	$ 20,817,208																											
Operation Costs (2014)	$ 1,179,926																											
Net Present Value (2014)	$ 21,997,134																											

Average Flow (m^3/d)	516	1,032	1,548	2,064	2,580	3,096	3,612	4,128	4,644	5,160	5,676	6,192	6,708	7,224	7,740	8,256	8,772	9,288	9,804	10,320	10,836	11,352	11,868	12,126	12,314

NET PRESENT VALUE CALCULATIONS FOR OPTION NO. 4 – MEMBRANE BIOREACTOR WITH NITROGEN REMOVAL

Rev. No	Date	Prepared By	Contributors	Reviewed and Authorized By
1	9/17/2014	Monica Rivera	Cecil Stegman Pat Coleman	Oya [illegible]

General Factors	Phase 1	Build Out
Peak hourly dry weather flow (m^3/d)	15,519	26,891
Average dry weather flow (m^3/d)	6,450	12,314

Economic Factors	Phase 1	Build Out
Interest (%)	5	5
Inflation (%)	2	2
Contingency (%SUM Capital Costs)	25%	
Year to Begin	2014	
Duration of Construction is 24 mo (time for mid	1	1

CAPITAL COST

System + Equipment and Piping	Phase 1 Units	Unit Cost	Cost	Installation	Total Cost	Build Out Addition Units	Unit Cost	Cost	Installation	Total Cost
EQUIPMENT										
Mechanical Primary Clarifiers										
No. of Clarifiers	3					3				
From Primary Sludge Holding	2	$ 24,850	$ 49,700	50%	$ 74,550	2	$ 24,850	$ 49,700	50%	
MBR Bioreactor										
No. of Bioreactors	1					1				
Aeration Piping, valves and diffusers			$ 325,000	50%	$ 487,500			$ 650,000	50%	$ 975,000
RAS Pumps	3	$ 43,910	$ 131,730	50%	$ 197,595	3	$ 43,910	$ 131,730	50%	$ 197,595
NMLR Pumps	3	$ 24,206	$ 72,618	50%	$ 108,927	3	$ 24,206	$ 72,618	50%	$ 108,927
WAS Pumps	2	$ 12,325	$ 24,650	50%	$ 36,975	2	$ 12,325	$ 24,650	50%	$ 36,975
Mixers	4	$ 15,000	$ 60,000	50%	$ 90,000	4	$ 15,000	$ 60,000	50%	$ 90,000
Blowers (Aerzen lowe Package - GM 30L DN 150 - Pressure)	4	$ 42,640	$ 170,560	50%	$ 255,840	4	$ 42,640	$ 170,560	50%	$ 255,840
Membrane Facility (No LEAP)										
Membrane Bioreactor System (without LEAP)			$ 2,699,000	25%	$ 3,373,750			$ 2,699,000	50%	$ 4,048,500
Chemical Dosing										
Chemical Storage Tanks	2	$ 30,000	$ 60,000	50%	$ 90,000	1	$ 30,000	$ 30,000	50%	$ 45,000
Chemical Day Tanks	1	$ 5,000	$ 5,000	100%	$ 10,000	1	$ 5,000	$ 5,000	100%	$ 10,000
Primary Dose Pumps: MLSS Collection Channel	2	$ 3,000	$ 6,000	100%	$ 12,000	2	$ 3,000	$ 6,000	100%	$ 12,000
Contingencies (25%)					$ 1,184,284					$ 1,444,959
Total Equipment Cost					**$5,921,421**					**$7,224,796**
CONSTRUCTION COSTS										
General Requirements		10%			$ 580,000		10%			$ 350,000
Sitework		10%			$ 528,000		3%			$ 102,000
MBR Bioractor					$ 2,280,000					$ 2,280,000
Mechanical Primary and Blower Building					$ 946,000					$ 946,000
Sludge Pump Station Chamber					$ 175,000					$ 175,000
MBR Building					$ 1,875,000					
Contingencies (25%)					$ 1,596,000					$ 963,000
Contractor Allowance		10%			$ 638,000		10%			$ 385,000
Mid-Point of Construction (S=P[1+i]n)?					$ 172,000					$ 104,000
Total Probable Construction Cost					**$8,790,000**					**$5,305,000**

ANNUAL OPERATIONAL COST

Sytem	Phase 1 Value	Units	Unit Cost	Total Cost	Build Out Value	Units	Unit Cost	Total Cost
Chemical Consumption								
NaOCL	28.26	kg/d	$0.60	$ 6,189	56.52	kg/d		$ -
Citric Acid	23.16	kg/d	$1.30	$ 10,990	46.32	kg/d	$1.30	$ 21,980
Alum	5	kg/d	$3.95	$ 7,209	10.00	kg/d		$ -
Total Chemical Consumption				**$ 24,388**				**$ 21,980**
Power Factors								
Mechanical Primary Clarifiers	326.5	kWh/d	0.1	$ 11,917	653	kWh/d	0.1	$ 23,835
Primary Clarifier Sludge Transfer Pumps	0.5	kWh/d	0.1	$ 18	1	kWh/d	0.1	$ 37
Bioreactor NMLR Pumps	75.5	kWh/d	0.1	$ 2,756	151	kWh/d	0.1	$ 5,512
Bioreactore RAS Pumps	753	kWh/d	0.1	$ 27,485	1506	kWh/d	0.1	$ 54,969
Bioreactor Blowers	741.5	kWh/d	0.1	$ 27,065	1483	kWh/d	0.1	$ 54,130
Bioreactor Mixers	48	kWh/d	0.1	$ 1,752	96	kWh/d	0.1	$ 3,504
Filtration Flocculators		kWh/d	0.1	$ -		kWh/d	0.1	$ -
Filtration Permeate Pumps	250	kWh/d	0.1	$ 9,125	500	kWh/d	0.1	$ 18,250
Filtration Air Scour	709	kWh/d	0.1	$ 25,879	1418	kWh/d	0.1	$ 51,757
Total Average Power Consumption	**2904**	**kWh/d**	**0.1**	**$ 105,996**	**5808**	**kWh/d**	**0.1**	**$ 211,992**

Chemical Consumption Conversion

USgal/yr	L/yr	L/d	SG	kg/d
2333	8,831	24	1.168	28.26
1801	6,818	19	1.24	23.16

Calculating NPV			BUILD OUT																								
Item			**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**TOTAL**
Capital Costs	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	
System + Equipment and Piping	$ 5,921,421												$ 7,224,796															
Yard Piping + Building + HVAC	$ 8,790,000												$ 5,305,000															
Capital Costs (2014)	**$ 14,711,421**	**0**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 12,529,796**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 27,241,218**
Capital Costs (Year n)	**$ 14,711,421**	**0**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 15,890,811**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 30,602,233**
Net Present Value (2014)	**$ 14,711,421**	**0**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 8,848,598**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 23,560,020**
Operating Costs																												
Diffuser Replacement Cost (10 year frequency)													$ 5,050										$ 10,100					
Membrane Replacement Cost (10 year frequency)													$ 457,800										$ 915,600					
Chemical Consumption Cost (Pro-rated)			$ 1,951	$ 3,902	$ 5,853	$ 7,804	$ 9,755	$ 11,706	$ 13,657	$ 15,608	$ 17,559	$ 19,510	$ 21,461	$ 23,412	$ 25,363	$ 27,314	$ 29,265	$ 31,216	$ 33,167	$ 35,118	$ 37,069	$ 39,020	$ 40,971	$ 42,922	$ 44,873	$ 45,849	$ 46,561	
Power Consumption Cost			$ 105,996	$ 105,996	$ 105,996	$ 105,996	$ 105,996	$ 105,996	$ 105,996	$ 105,996	$ 105,996	$ 105,996	$ 211,992	$ 211,992	$ 211,992	$ 211,992	$ 211,992	$ 211,992	$ 211,992	$ 211,992	$ 211,992	$ 211,992	$ 211,992	$ 211,992	$ 211,992	$ 211,992	$ 211,992	
Operation Costs (2014)			**$ 107,947**	**$ 109,898**	**$ 111,849**	**$ 113,800**	**$ 115,751**	**$ 117,702**	**$ 119,653**	**$ 121,604**	**$ 123,555**	**$ 125,506**	**$ 696,303**	**$ 235,404**	**$ 237,355**	**$ 239,306**	**$ 241,257**	**$ 243,208**	**$ 245,159**	**$ 247,110**	**$ 249,061**	**$ 251,012**	**$ 1,178,663**	**$ 254,914**	**$ 256,865**	**$ 257,841**	**$ 258,553**	**$ 6,259,277**
Operation Costs (Year n)			**$ 112,308**	**$ 116,625**	**$ 121,069**	**$ 125,644**	**$ 130,354**	**$ 135,203**	**$ 140,193**	**$ 145,328**	**$ 150,613**	**$ 156,051**	**$ 883,081**	**$ 304,520**	**$ 313,185**	**$ 322,074**	**$ 331,194**	**$ 340,550**	**$ 350,148**	**$ 359,993**	**$ 370,092**	**$ 380,451**	**$ 1,822,189**	**$ 401,974**	**$ 413,151**	**$ 423,015**	**$ 432,667**	**$ 8,781,671**
Net Present Value (2014)			**$ 101,867**	**$ 100,745**	**$ 99,604**	**$ 98,446**	**$ 97,273**	**$ 96,086**	**$ 94,888**	**$ 93,680**	**$ 92,463**	**$ 91,240**	**$ 491,732**	**$ 161,494**	**$ 158,180**	**$ 154,923**	**$ 151,724**	**$ 148,581**	**$ 145,494**	**$ 142,461**	**$ 139,484**	**$ 136,560**	**$ 622,915**	**$ 130,871**	**$ 128,105**	**$ 124,917**	**$ 121,684**	**$ 3,925,415**
Net Present Value																												
Capital Costs (2014)	**$ 23,560,020**																											
Operation Costs (2014)	**$ 3,925,415**																											
Net Present Value (2014)	**$ 27,485,434**																											

Average Flow (m3/d)	516	1,032	1,548	2,064	2,580	3,096	3,612	4,128	4,644	5,160	5,676	6,192	6,708	7,224	7,740	8,256	8,772	9,288	9,804	10,320	10,836	11,352	11,868	12,126	12,314

EVALUATION OF TREATMENT ALTERNATIVES FOR MIDHURST WASTEWATER TREATMENT PLANT

B&V PROJECT NO. 180261

APPENDIX 3

NET PRESENT VALUE CALCULATIONS FOR TERTIARY TREATMENT ALTERNATIVES

BLACK & VEATCH
Building a world of difference.®

NET PRESENT VALUE CALCULATIONS FOR OPTION NO. 1 – TERTIARY MEMBRANE FILTRATION

Rev. No	Date	Prepared By	Contributors	Reviewed and Authorized By
1	9/17/2014	Monica Rivera	Cecil Stegman Pat Coleman	Oya Koc
2	5/31/2016	Oya Koc		area of the building has been changed

OPTION 1: Tertiary Membrane Filtration

General Factors	Phase 1	Build Out
Peak hourly dry weather flow (m^3/d)	15,519	26,891
Average dry weather flow (m^3/d)	6,450	12,314

Economic Factors	Phase 1	Build Out
Interest (%)	5	5
Inflation (%)	2	2
Contingency (%SUM Capital Costs)	25%	
Year to Begin	2014	

CAPITAL COST OF TERTIARY MEMBRANE

Building Factors	Phase 1	Build Out Addition
Building Size (m^2)	600	600
Cost of building/m2^ ($)	2,000	2,000
TOTAL COST OF BUILDING	**1,200,000**	**1,200,000**

	GE filters sytem		Filter Room		Chemical room	Electrical room	TOTAL LENGTH		TOTAL AREA (m2)	
Footprint	Phase 1	Build Out	Phase 1	Build Out	Phase 1/BO	Phase 1/BO	Phase 1	Build Out	Phase 1	Build Out
Length	13.72	21.95	25	35	15	20	40	40	600	600
Width	14.68	14.68	25	25	15	10	15	15		

*Additional 3 trains for Build Out — 8.23 m

Equipment and Piping	Phase 1	Build Out Addition
UF System from GE Equipment Budget ($)	2,410,000	2,410,000
Instruments and Control	20,000	20,000
Replacement Cost (10 yr frequency, $/module)	1,450	
# of Modules total	288	288
MF Feed Tank Cost		
Process Valves and Piping	25,191	25,191
Structure	123,971	123,971
Total MF Feed Tank Cost	**149,162**	**149,162**
TOTAL COST OF EQUIPMENT	**2,579,162**	**2,579,162**

OPERATIONAL COST OF TERTIARY MEMBRANE

Chemical Use	Phase 1 Annual Cost ($)	Build Out Annual Cost ($)
Sodium Hypochlorite	3,515	7,030
Citric Acid	1,507	3,013
H2SO4	310	621
Sodium Bisulfite	2,178	4,355
Sodium Hydroxide	592	1,184
Ferric Chloride	104,879	48,541
TOTAL ANNUAL CHEMICAL COST	**112,981**	**64,743.31**

Chemical Consumption	SG	L/yr	kg/yr	Chemical Cost	
Sodium Hypochlorite	1.168	7,030	8,211	0.5	$/L
Citric Acid	1.24	810	1,004	1.5	$/kg
H2SO4	1.83	424	775	0.4	$/kg
Sodium Bisulfite	1.29	1,688	2,178	1.00	$/kg
Sodium Hydroxide	1.52	708	1,076	0.55	$/kg

Phase 1

Chemical	Specific gravity (s.g.) (g/mL)	Percentage solution (%)	Average Water flow for raw/water (m^3/d)	for primary disinfection (mg/L)	primary disinfection (L/h)	gal/hr	L/yr	$0.79/L
Ferric Chloride	1.33	33	6,450	24.75	95.2	4.001	132,758.46	104,879.18
	1.33	33	12,314	6.00	7.0	1.852	61,443.75	48,540.56

Power Factors	Phase 1	Build Out	
Power Cost	0.1	0.1	$/kWh
Annual Power Consumption	250,000	500,000	kWh/yr
TOTAL ANNUAL POWER COST	**25,000**	**50,000**	$/yr

Calculating NPV Costs													BUILD OUT													
Item			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	TOTAL
Capital Costs	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
System + Equipment and Piping	$ 2,579,162												$ 2,579,162															
Building + HVAC	$ 1,200,000												$ 1,200,000															
Contingency	$ 944,791												$ 944,791															
Capital Costs (2014)	**$ 4,723,953**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 4,723,953**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 9,447,905**
Capital Costs (Year n)	**$ 4,723,953**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 5,991,114**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 10,715,066**
Net Present Value (2014)	**$ 4,723,953**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 3,336,076**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 8,060,029**
Operating Costs																												
Power Consumption (from GE/ProAqua Budget)			$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	
Membrane Replacement Cost (10 year frequency)													$ 417,600										$ 417,600					
Chemical Consumption			$ 9,038	$ 18,077	$ 27,115	$ 36,154	$ 45,192	$ 54,231	$ 63,269	$ 72,308	$ 81,346	$ 90,384	$ 99,423	$ 108,461	$ 117,500	$ 126,538	$ 135,577	$ 144,615	$ 153,654	$ 162,692	$ 171,730	$ 180,769	$ 189,807	$ 198,846	$ 207,884	$ 212,403	$ 215,702	
Operation Costs (2014)			**$ 34,038**	**$ 43,077**	**$ 52,115**	**$ 61,154**	**$ 70,192**	**$ 79,231**	**$ 88,269**	**$ 97,308**	**$ 106,346**	**$ 115,384**	**$ 567,023**	**$ 158,461**	**$ 167,500**	**$ 176,538**	**$ 185,577**	**$ 194,615**	**$ 203,654**	**$ 212,692**	**$ 221,730**	**$ 230,769**	**$ 657,807**	**$ 248,846**	**$ 257,884**	**$ 262,403**	**$ 265,702**	**$ 4,757,917**
Operation Costs (Year n)			**$ 35,414**	**$ 45,714**	**$ 56,411**	**$ 67,519**	**$ 79,048**	**$ 91,011**	**$ 103,421**	**$ 116,292**	**$ 129,635**	**$ 143,466**	**$ 739,122**	**$ 204,987**	**$ 221,012**	**$ 237,597**	**$ 254,757**	**$ 272,508**	**$ 290,867**	**$ 309,852**	**$ 309,852**	**$ 349,769**	**$ 1,016,338**	**$ 392,405**	**$ 431,791**	**$ 439,501**	**$ 444,631**	**$ 6,736,920**
Net Present Value (2014)			**$ 32,121**	**$ 39,489**	**$ 46,410**	**$ 52,903**	**$ 58,987**	**$ 64,680**	**$ 70,000**	**$ 74,963**	**$ 79,585**	**$ 83,882**	**$ 400,434**	**$ 108,709**	**$ 111,626**	**$ 114,288**	**$ 116,707**	**$ 118,894**	**$ 120,861**	**$ 122,619**	**$ 116,780**	**$ 125,547**	**$ 347,435**	**$ 127,756**	**$ 128,613**	**$ 127,128**	**$ 125,048**	**$ 2,915,465**
Net Present Value																												
Capital Costs (2014)	**$ 8,060,029**																											
Operation Costs (2014)	**$ 2,915,465**																											
Net Present Value (2014)	**$ 10,975,494**																											

Average Flow (m3/d)	516	1,032	1,548	2,064	2,580	3,096	3,612	4,128	4,644	5,160	5,676	6,192	6,708	7,224	7,740	8,256	8,772	9,288	9,804	10,320	10,836	11,352	11,868	12,126	12,314

NET PRESENT VALUE CALCULATIONS FOR OPTION NO. 2 – TWO STAGE SAND FILTRATION

Rev. No	Date	Prepared By	Contributors	Reviewed and Authorized By
1	9/17/2014	Monica Rivera	Cecil Stegman Pat Coleman	Oye Koc

General Factors	Phase 1	Build Out
Peak hourly dry weather flow (m^3/d)	15,519	26,891
Average dry weather flow (m^3/d)	6,450	12,314

Economic Factors	Phase 1	Build Out
Interest (%)	5	5
Inflation (%)	2	2
Contingency (%SUM Capital Costs)	25%	
Year to Begin	2014	

CAPITAL COST OF SAND FILTERS

Building Factors	Phase 1	Build Out Addition
Buiding Size (m^3)	454	198
Cost of building/m2* ($)	2,000	2,000
Earthwork		
Excavation	$120,000	$120,000
Backfill	$102,000	$102,000
TOTAL COST OF BUILDING	**$1,129,800**	**$618,800**

	Phase 1			Biuld Out			TOTAL AREA	
Footprint	Stage 1	Stage 2	Total Phase 1	Stage 1	Stage 2	Total Build Out	Phase 1	Build Out Addition
Length	12.8	12.8	17.8	12.8	12.8	12.8	453.9	198.4
Width	7.75	7.75	25.5	7.75	7.75	15.5		

	Phase 1	Unit	Unit Cost
Excavation	2,400	M^3	50.00
Backfill	1,360	M^3	75.00

Equipment and Piping	Phase 1	Build Out Addition
Dynasand D2 Sand Filter	1,088,000	1,088,000
Instruments and Control	20,000	20,000
Replacement od airlift Pumps Cost (5 yr frequency,	750	
# of Modules total	15	15
TOTAL COST OF EQUIPMENT	**1,108,000**	**1,108,000**

OPERATIONAL COST OF SAND FILTERS

Chemical Use	Phase 1 Annual Cost ($)	Build Out Annual Cost ($)
Ferric Chloride	139,839	
TOTAL ANNUAL COST	**139,839**	**266,973**

Chemical	Specific gravity (s.g.) (g/mL)	Percentage solution (%)	Average water flow for raw water (m^3/d)	Maximum dosage for primary disinfection (mg/L)	Pump capacity for primary disinfection (L/h)	gal/hr	L/yr	$0.79/L
Ferric Chloride	1.33	33	6,450	**33.00**	20.2	5.335	177,011.28	139,838.91
Ferric Chloride	1.33	33	12,314	**33.00**	38.6	10.185	337,940.60	266,973.08

Power Factors	Phase 1	Build Out
Power Cost	0.1	0.1
Air Compressor	1	2
Horse Power	20	40
KW	15	30
Annual Power Cost	**13,065**	**26,129**

Calculating NPV Costs													BUILD OUT														
Item			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	TOTAL
Capital Costs	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
System + Equipment and Piping	$ 1,108,000												$ 1,108,000															
Building + HVAC	$ 1,129,800												$ 618,800															
Contingency	$ 559,450												$ 431,700															
Capital Costs (2014)	**$ 2,797,250**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 2,158,500**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 4,955,750**
Capital Costs (Year n)	**$ 2,797,250**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 2,737,500**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 5,534,750**
Net Present Value (2014)	**$ 2,797,250**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 1,524,342**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 4,321,592**
Operating Costs																												
Power Consumption (from Parkson/H2Flow)			$ 13,065	$ 13,065	$ 13,065	$ 13,065	$ 13,065	$ 13,065	$ 13,065	$ 13,065	$ 13,065	$ 13,065	$ 26,129	$ 26,129	$ 26,129	$ 26,129	$ 26,129	$ 26,129	$ 26,129	$ 26,129	$ 26,129	$ 26,129	$ 26,129	$ 26,129	$ 26,129	$ 26,129	$ 26,129	
Airlift Pump Replacement Cost (5 year freq)								$ 11,250					$ 11,250					$ 22,500					$ 22,500				
Chemical Consumption (Pro-rated)			$ 11,187	$ 22,374	$ 33,561	$ 44,748	$ 55,936	$ 67,123	$ 78,310	$ 89,497	$ 100,684	$ 111,871	$ 123,058	$ 134,245	$ 145,432	$ 156,620	$ 167,807	$ 178,994	$ 190,181	$ 201,368	$ 212,555	$ 223,742	$ 234,929	$ 246,116	$ 257,304	$ 262,897	$ 266,980	
Operation Costs (2014)			**$ 24,252**	**$ 35,439**	**$ 46,626**	**$ 57,813**	**$ 69,000**	**$ 91,437**	**$ 91,374**	**$ 102,562**	**$ 113,749**	**$ 124,936**	**$ 160,438**	**$ 160,375**	**$ 171,562**	**$ 182,749**	**$ 193,936**	**$ 227,623**	**$ 216,310**	**$ 227,497**	**$ 238,684**	**$ 249,872**	**$ 283,559**	**$ 272,246**	**$ 283,433**	**$ 289,026**	**$ 293,110**	**$ 4,207,607**
Operation Costs (Year n)			**$ 25,232**	**$ 37,608**	**$ 50,469**	**$ 63,830**	**$ 77,705**	**$ 105,033**	**$ 107,060**	**$ 122,571**	**$ 138,659**	**$ 155,342**	**$ 203,474**	**$ 207,462**	**$ 226,372**	**$ 245,956**	**$ 266,233**	**$ 318,727**	**$ 308,944**	**$ 331,421**	**$ 331,421**	**$ 378,722**	**$ 438,376**	**$ 429,304**	**$ 455,884**	**$ 474,179**	**$ 490,495**	**$ 5,990,478**
Net Present Value (2014)			**$ 22,886**	**$ 32,487**	**$ 41,521**	**$ 50,013**	**$ 57,985**	**$ 74,645**	**$ 72,462**	**$ 79,010**	**$ 85,125**	**$ 90,825**	**$ 113,302**	**$ 110,021**	**$ 114,333**	**$ 118,309**	**$ 121,964**	**$ 139,060**	**$ 128,373**	**$ 131,154**	**$ 124,909**	**$ 135,939**	**$ 149,859**	**$ 139,769**	**$ 141,355**	**$ 140,026**	**$ 137,947**	**$ 2,553,280**
Net Present Value																												
Capital Costs (2014)	**$ 4,321,592**																											
Operation Costs (2014)	**$ 2,553,280**																											
Net Present Value (2014)	**$ 6,874,873**																											

Average Flow (m3/d)	516	1,032	1,548	2,064	2,580	3,096	3,612	4,128	4,644	5,160	5,676	6,192	6,708	7,224	7,740	8,256	8,772	9,288	9,804	10,320	10,836	11,352	11,868	12,126	12,314

NET PRESENT VALUE CALCULATIONS FOR OPTION NO. 3 – BLUEPRO TECHNOLOGY

Rev. No	Date	Prepared By	Contributors	Reviewed and Authorized By
1	9/17/2014	Monica Rivera	Cecil Stegman Pat Coleman	Oya Koc

General Factors	Phase 1	Build Out
Peak hourly dry weather flow (m^3/d)	15,519	26,891
Average dry weather flow (m^3/d)	6,450	12,314

Economic Factors	Phase 1	Build Out
Interest (%)	5	5
Inflation (%)	2	2
Contingency (%SUM Capital Costs)	25%	
Year to Begin	2014	

CAPITAL COST OF TERTIARY MEMBRANE

Building Factors	Phase 1	Build Out Addition
Buiding Size (m^3)	1,000	1,000
Cost of building/m2* ($)	2,000	2,000
Earthwork:		
Excavation	$148,200	$148,200
Backfill	$88,320	$88,320
TOTAL COST OF BUILDING	**2,236,520**	**2,236,520**

Equipment and Piping	Phase 1	Build Out Addition
BluePro Filtration System	2,300,000	2,300,000
Instruments and Control	20,000	20,000
TOTAL COST OF EQUIPMENT	**2,320,000**	**2,320,000**

OPERATIONAL COST OF TERTIARY MEMBRANE

Chemical Consumption	Chemical Cost	Phase 1 Annual Cost ($)	Build Out Annual Cost ($)
Ferric Chloride, 8mg/L	0.79	42,375	-

Power Factors	Phase 1	Build Out
Power Cost ($/kWh)	0.1	0.1
No. of Compressors	1	2
HP	50	50
kW	37	37
Total Power Cost	**32,662**	**65,323**

BLUE WATER TECHNOLOGIES

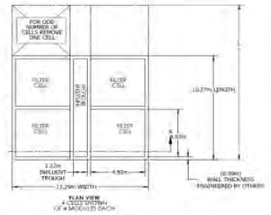
Blue Water Technologies, Inc.
10450 N. Airport Drive
Hayden, ID 83835-9742
www.bluewater-technologies.com

1 BASIS OF DESIGN

1.1 Water Quality

Parameter	Influent[1]		Effluent[1]	
Average Flow	12 (4)	MLD (MGD)		
Instantaneous Peak Flow	35 (9.3)	MLD (MGD)		
Total Suspended Solids (TSS)	< 45	mg/L	< 10	mg/L
BOD	< 45	mg/L	< 10	mg/L
Total Phosphorus (TP)	< 1	mg/L	< 0.03	mg/L
Non-Reactive Phosphorus (NRP)[2]	< 0.05	mg/L	< 0.05	mg/L

Notes:
1. Monthly Arithmetic average



FOOT PRINT LENGTH L	
NUMBER OF CELLS	OVERALL LENGTH
6	16.00m
8	21.23m
10	26.47m
12	31.70m
14	36.93m
16	42.16m
18	47.40m
20	52.63m

	Phase 1			Build Out			TOTAL AREA	
Footprint	Stage 1	Stage 2	Total Phase 1	Stage 1	Stage 2	Total Build Out	Phase 1	Build Out Addition
Length	20	20	25	20	20	30	1000	1000
Width	15	15	40	15	15	30		

	Phase 1	Unit	Unit Cost
Excavation	5,700	M^3	26.00
Backfill	2,760	M^3	32.00

Chemical	Specific gravity (s.g.) (g/mL)	Percentage solution (%)	Average water flow for raw water (m^3/d)	Maximum dosage for primary	Pump capacity for primary	gal/hr	L/yr	$0.78/L
Ferric Chloride	1.35	33	6,450	10.00	6.1	1.6	53639.8	42375.4

Calculating NPV Costs																											
Item			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	TOTAL
Capital Costs	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
System + Equipment and Piping	$ 2,320,000												$ 2,320,000															
Building + HVAC	$ 2,236,520												$ 2,236,520															
Contingency	$ 1,139,130												$ 1,139,130															
Capital Costs (2014)	**$ 5,695,650**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 5,695,650**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 11,391,300**
Capital Costs (Year n)	**$ 5,695,650**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 7,223,461**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 12,919,111**
Net Present Value (2014)	**$ 5,695,650**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 4,022,294**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 9,717,944**
Operating Costs																												
Power Consumption (from Blue Water Budgetary Quote)			$ 32,662	$ 32,662	$ 32,662	$ 32,662	$ 32,662	$ 32,662	$ 32,662	$ 32,662	$ 32,662	$ 32,662	$ 65,323	$ 65,323	$ 65,323	$ 65,323	$ 65,323	$ 65,323	$ 65,323	$ 65,323	$ 65,323	$ 65,323	$ 65,323	$ 65,323	$ 65,323	$ 65,323	$ 65,323	
Chemical Consumption (Pro-rated)			$ 3,390	$ 6,780	$ 10,170	$ 13,560	$ 16,950	$ 20,340	$ 23,730	$ 27,120	$ 30,510	$ 33,900	$ 37,290	$ 40,680	$ 44,070	$ 47,460	$ 50,851	$ 54,241	$ 57,631	$ 61,021	$ 64,411	$ 67,801	$ 71,191	$ 74,581	$ 77,971	$ 79,666	$ 80,903	
Operation Costs (2014)			**$ 36,052**	**$ 39,442**	**$ 42,832**	**$ 46,222**	**$ 49,612**	**$ 53,002**	**$ 56,392**	**$ 59,782**	**$ 63,172**	**$ 66,562**	**$ 102,614**	**$ 106,004**	**$ 109,394**	**$ 112,784**	**$ 116,174**	**$ 119,564**	**$ 122,954**	**$ 126,344**	**$ 129,734**	**$ 133,124**	**$ 136,514**	**$ 139,904**	**$ 143,294**	**$ 144,989**	**$ 146,226**	**$ 2,402,685**
Operation Costs (Year n)			**$ 37,508**	**$ 41,856**	**$ 44,562**	**$ 51,033**	**$ 55,871**	**$ 60,882**	**$ 66,072**	**$ 71,445**	**$ 77,006**	**$ 82,761**	**$ 130,139**	**$ 137,127**	**$ 144,343**	**$ 151,792**	**$ 159,482**	**$ 167,418**	**$ 175,608**	**$ 184,059**	**$ 187,780**	**$ 201,772**	**$ 211,048**	**$ 220,615**	**$ 230,480**	**$ 237,870**	**$ 244,698**	**$ 3,373,188**
Net Present Value (2014)			**$ 34,021**	**$ 36,157**	**$ 36,661**	**$ 39,985**	**$ 41,692**	**$ 43,268**	**$ 44,720**	**$ 46,054**	**$ 47,275**	**$ 48,389**	**$ 72,466**	**$ 72,721**	**$ 72,903**	**$ 73,015**	**$ 73,060**	**$ 73,044**	**$ 72,969**	**$ 72,838**	**$ 70,757**	**$ 72,424**	**$ 72,147**	**$ 71,826**	**$ 71,464**	**$ 70,264**	**$ 68,819**	**$ 1,498,921**
Net Present Value																												
Capital Costs (2014)	**$ 9,717,944**																											
Operation Costs (2014)	**$ 1,498,921**																											
Net Present Value (2014)	**$ 11,216,865**																											

Average Flow (m^3/d)	516	1,032	1,548	2,064	2,580	3,096	3,612	4,128	4,644	5,160	5,676	6,192	6,708	7,224	7,740	8,256	8,772	9,288	9,804	10,320	10,836	11,352	11,868	12,126	12,384

EVALUATION OF TREATMENT ALTERNATIVES FOR MIDHURST WASTEWATER TREATMENT PLANT

B&V PROJECT NO. 180261

APPENDIX 4

DETAILED EVALUATION MATRIX FOR LIQUID TREATMENT TRAINS

BLACK & VEATCH
Building a world of difference.®

EVALUATION MATRIX FOR SHORT LISTED LIQUID TREATMENT TRAINS

PRIMARY CRITERIA		SECONDARY CRITERIA		ABSOLUTE WEIGHT (WT)	Option No 1 - Step Feed BNR with two stage sand filtration		Option No 2 - SBR BNR with two stage sand filtration		Option No 3 – Bio P with two stage sand filtration		Option No 4 - MBR BNR		COMMENTS
CRITERIA	WEIGHT	CRITERIA	WEIGHT		SCORE	WT SCORE	SCORE	WT SCORE	SCORE	WT SCORE	SCORE	WT SCORE	
Social / Culture	10%	Aesthetic impacts - Architectural Aesthetics (plant appearance)	10	1	3	3	2	2	1	1	4	4	The MBR has the smallest footprint/building, whereas both the SBR and Bio P have a large amount of above ground concrete.
		Truck traffic (during construction and operation)	10	1	3	3	2	2	4	4	1	1	Most of the differential in truck traffic will be ongoing chemical delivery. The MBR will have the most chemicals and Bio P the least.
		Noise Impact (during operation)	40	4	3	12	1	4	2	8	4	16	Most un-attenuated noise will be generated by aeration pipework. The MBR has the shortest length of aeration pipework and SBR the longest.
		Odour (during operation)	40	4	4	16	3	12	1	4	2	8	Odour generated onsite will be treated. Any risk of odour will come from equipment failure. Failure of the Bio P unaerated passes containing fermenting wastewater has the greatest risk of odour impact, followed by failure of the MBR mechanical clarifier, then the SBR decanter system.
Technical	40%	Ability to comply with the regulations or target objectives	30	12	4	48	1	12	3	36	2	24	This criteria is measured by the risk that effluent does not meet TP and nitrogen (TN) objectives, accounting for potential for and mitigation of bypasses. The SBR has the greatest risk of failure and step feed the least risk.
		Process robustness	30	12	4	48	1	12	2	24	3	36	Based on the proven record of the technology to meet nitrogen and TP limits, the SBR has the least robust record and the step feed has the most robust.
		Energy Requirements	10	4	4	16	3	12	2	8	1	4	Based on the installed power required equipment and its impact to the grid
		Suitability for Phasing	10	4	3	12	4	16	1	4	2	8	Both step feed and SBR systems can operate at around 25% capacity allowing greater response to the speed of development that the Bio P and MBR systems which can only operate at around 50% capacity.
		Time to Construct	5	2	3	6	4	8	1	2	2	4	The SBR is simplest to construct with minimal structures and yard piping, the step feed also has fewer structures than the Bio P and MBR systems which both also have more expensive yard piping.
		Operation and Maintenance impacts (including staffing)	10	4	4	16	3	12	1	4	2	8	Bio P requires staff to have an understanding of the process and requires the most staff training, MBR requires staff training and operation of membranes, SBR requires staff training and operation of a batch system. The step feed system does not require any staff adjustments.
		Site Requirement	5	2	3	6	1	2	2	4	4	8	The MBR has the smallest footprint and the SBR has the largest.

PRIMARY CRITERIA		SECONDARY CRITERIA		ABSOLUTE WEIGHT (WT)	Option No 1 - Step Feed BNR with two stage sand filtration		Option No 2 - SBR BNR with two stage sand filtration		Option No 3 – Bio P with two stage sand filtration		Option No 4 - MBR BNR		COMMENTS
CRITERIA	WEIGHT	CRITERIA	WEIGHT		SCORE	WT SCORE	SCORE	WT SCORE	SCORE	WT SCORE	SCORE	WT SCORE	
Environmental	20%	Sustainability	15	3	3	9	4	12	2	6	1	3	MBR has the greatest risk potential as bypasses receive the least partial treatment.
		Health and Safety to the public	40	8	3	24	4	32	1	8	2	16	The greatest risk to the public is the potential for the Bio P to foul, followed by the potential for the MBR membranes to foul. Step feed and SBR are a lower risk to public health and safety.
		Minimize waste	30	6	3	18	4	24	1	6	2	12	SBR creates the least amount of waste and Bio P creates the greatest amount.
		Greenhouse Gas	15	3	1	3	3	9	2	6	4	12	The MBR has the greatest potential for implementation of greenhouse gas reduction technologies while step feed has the least potential due to the process simplicity.
Economic	30%	Capital Cost estimates	30	9	3	27	2	18	1	9	4	36	
		Operation and Maintenance costs	40	12	1	12	2	24	4	48	3	36	
		Life cycle analysis	**30**	**9**	**3**	27	1	9	2	18	4	36	
		TOTAL SCORE		100		306		213		197		284	

EVALUATION OF TREATMENT ALTERNATIVES FOR MIDHURST WASTEWATER TREATMENT PLANT

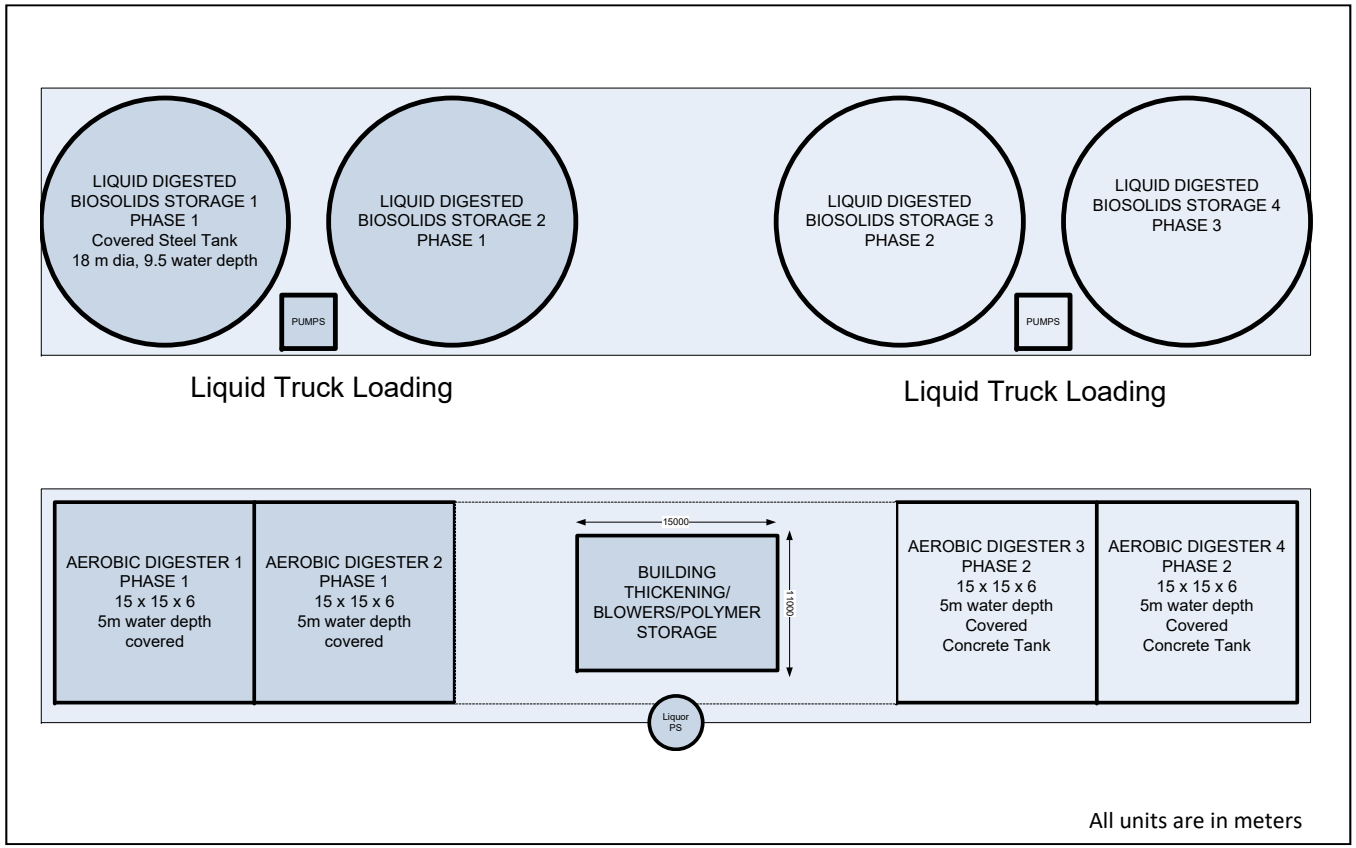
B&V PROJECT NO. 180261

APPENDIX 5

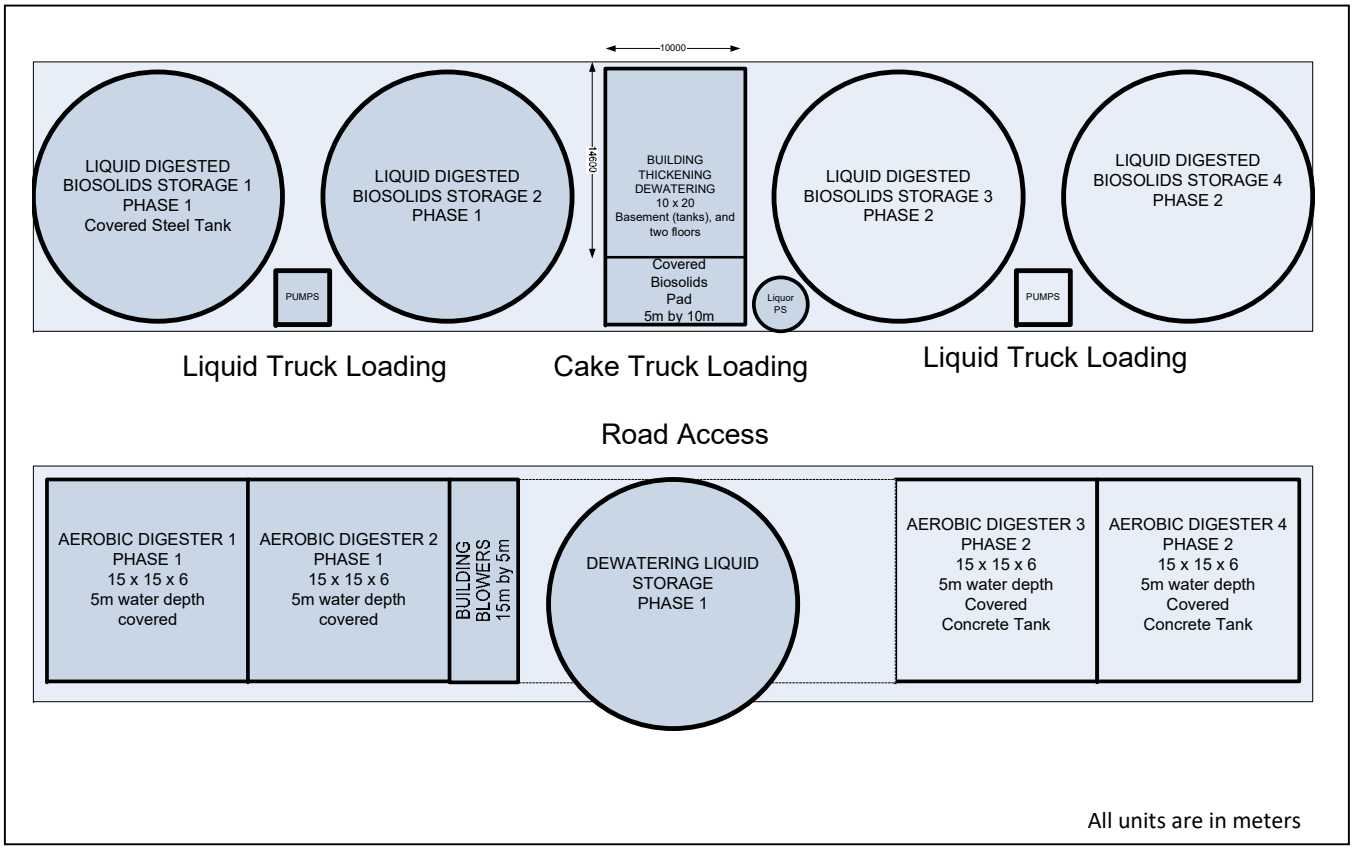
GENERAL ARRANGEMENTS FOR BIOSOLIDS ALTERNATIVES

BLACK & VEATCH
Building a world of difference.®

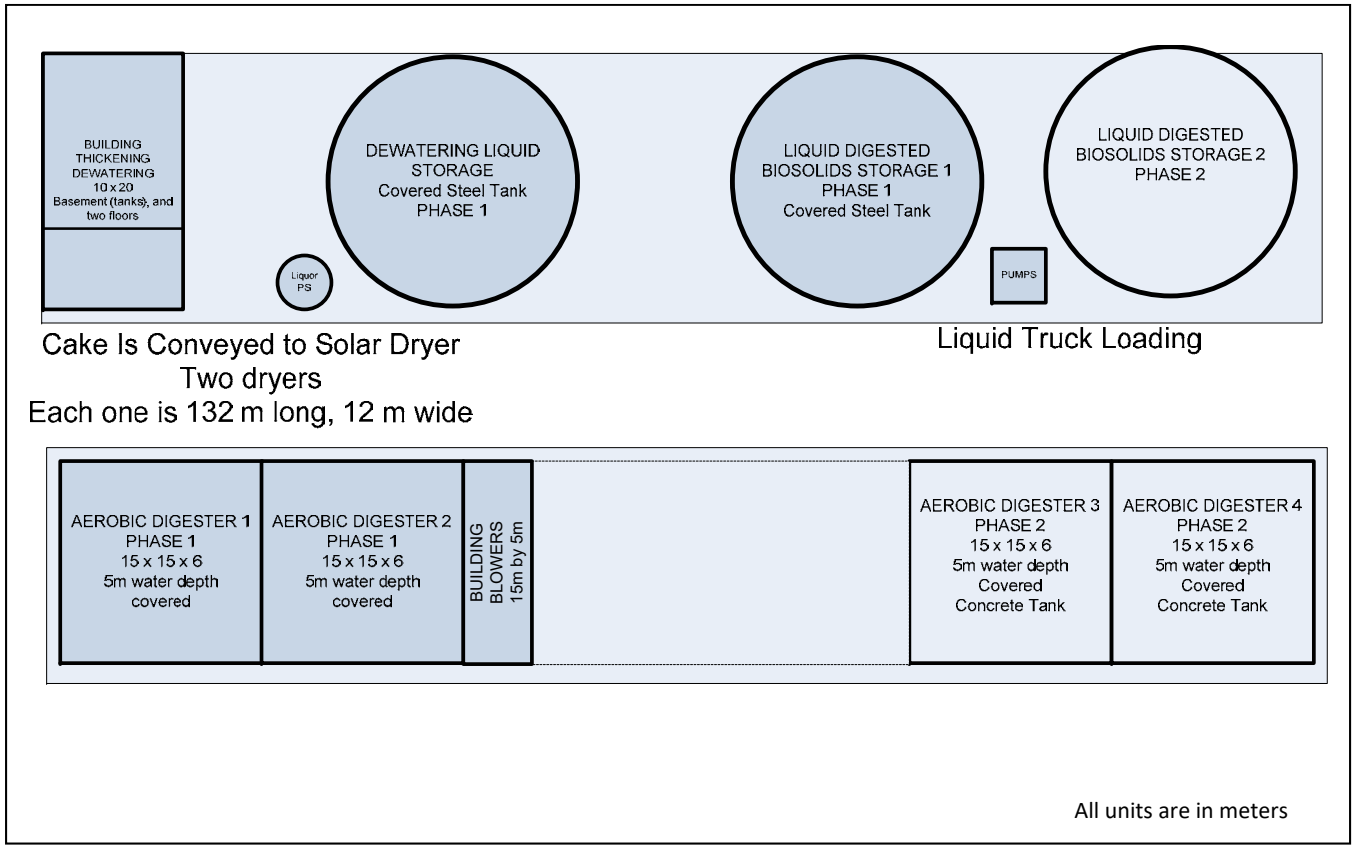
OPTION NO. 1 – STABILIZED LIQUID SLUDGE FOR BENEFICIAL RE-USE WITH CONVENTIONAL AEROBIC DIGESTION AND MECHANICAL THICKENING



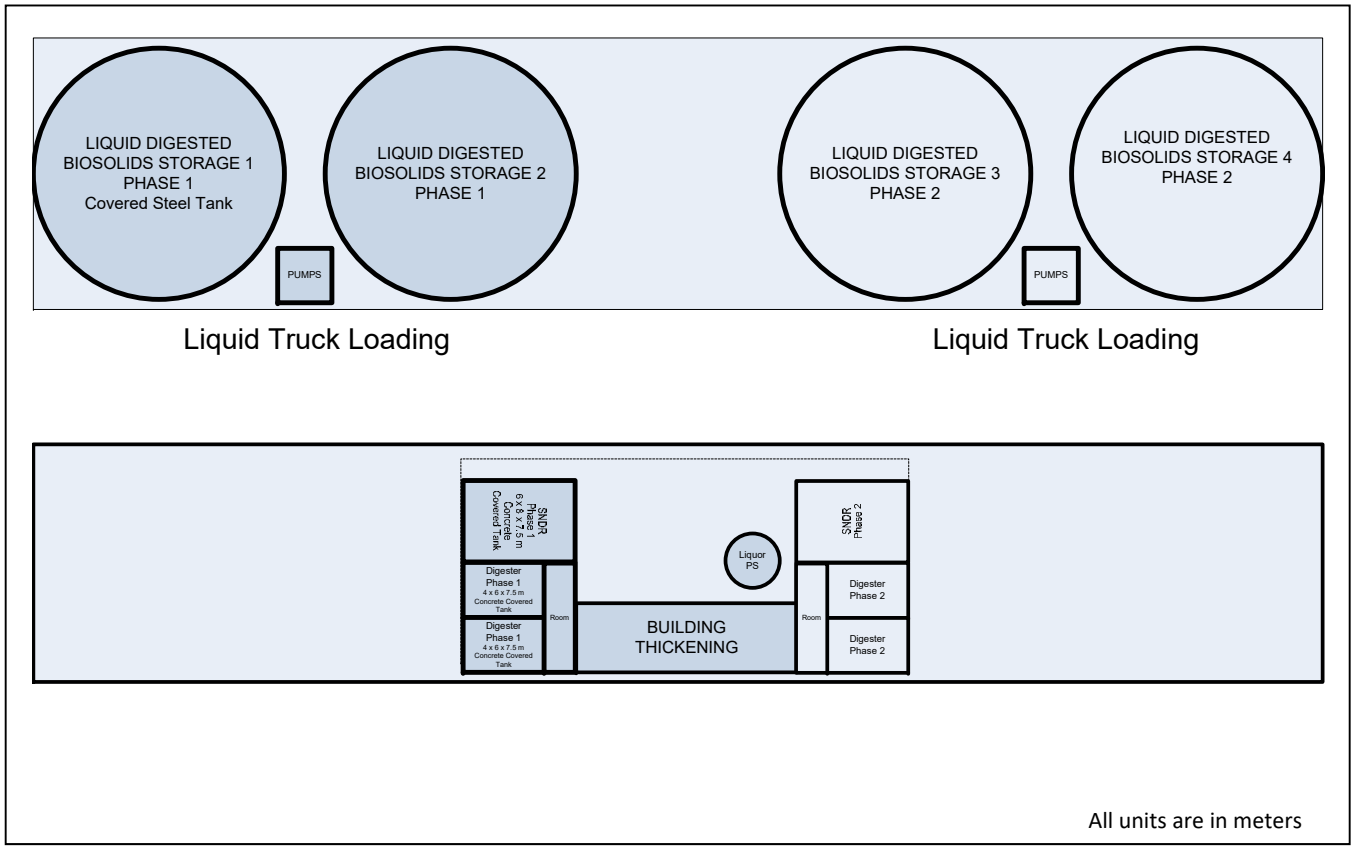
OPTION NO. 2 – STABILIZED CAKE FOR BENEFICIAL RE-USE WITH CONVENTIONAL AEROBIC DIGESTION AND MECHANICAL THICKENING



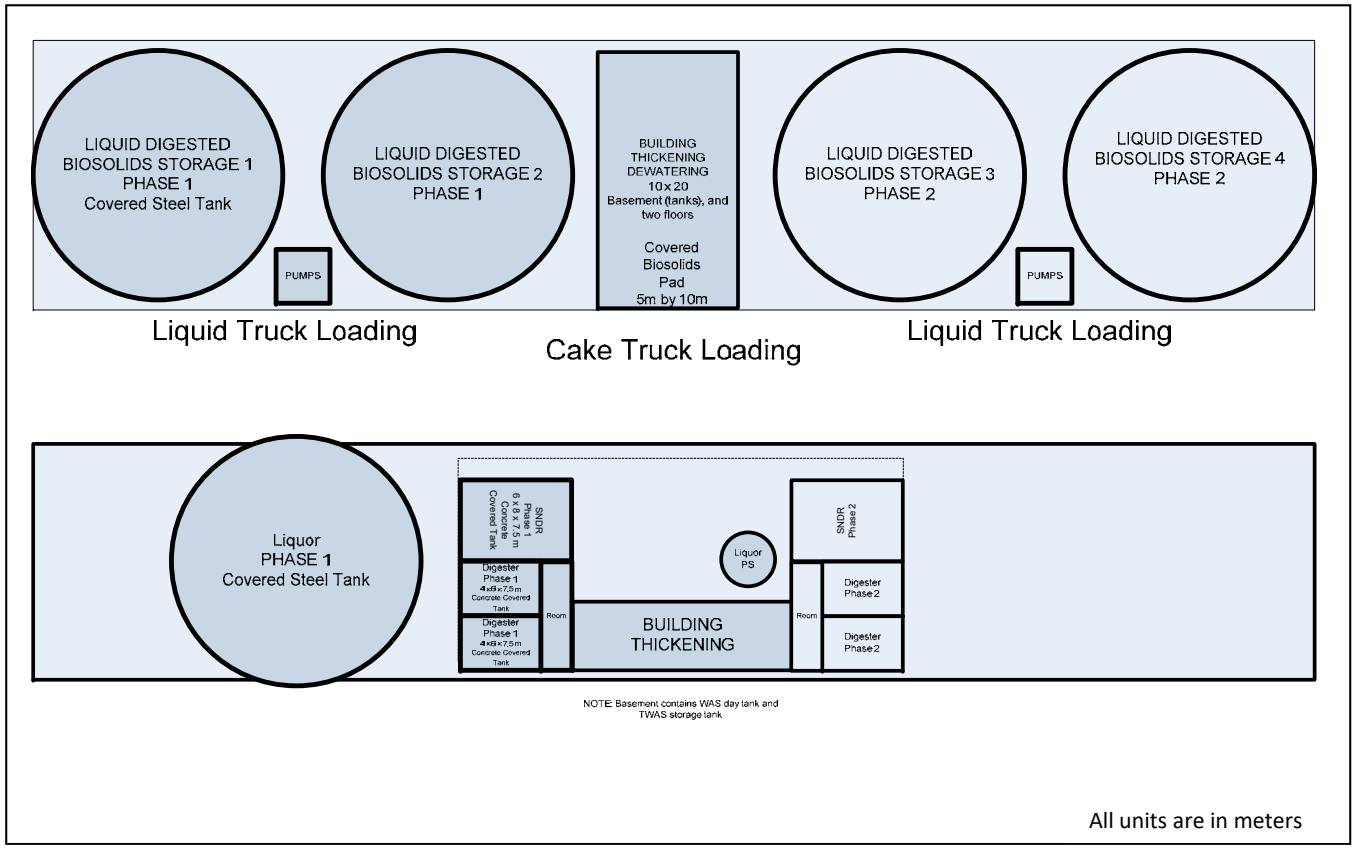
OPTION NO. 3 – SOLAR DRIED PELLETS FOR BENEFICIAL RE-USE WITH CONVENTIONAL AEROBIC DIGESTION AND MECHANICAL THICKENING



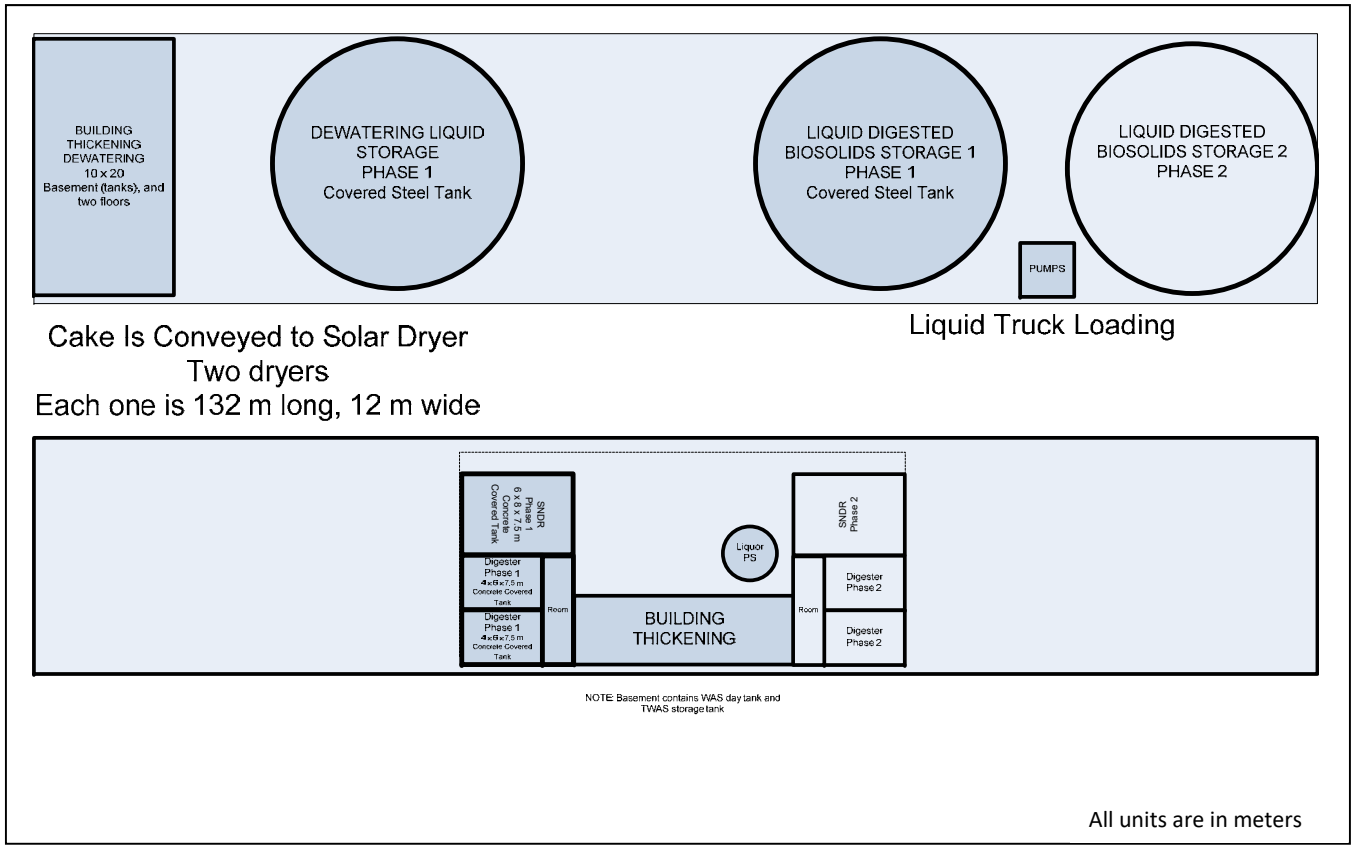
OPTION NO. 4 – STABILIZED LIQUID SLUDGE FOR BENEFICIAL RE-USE AUTOTHERMAL AEROBIC DIGESTION AND MECHANICAL THICKENING



OPTION NO. 5 – DRIED CAKE FOR BENEFICIAL RE-USE WITH ATAD AND MECHANICAL THICKENING



OPTION NO. 6 – SOLAR DRIED PELLETS FOR BENEFICIAL RE-USE AUTOTHERMAL AEROBIC DIGESTION AND MECHANICAL THICKENING



EVALUATION OF TREATMENT ALTERNATIVES FOR MIDHURST WASTEWATER TREATMENT PLANT

B&V PROJECT NO. 180261

APPENDIX 6

NET PRESENT VALUE CALCULATIONS FOR BIOSOLIDS ALTERNATIVES

BLACK & VEATCH
Building a world of difference.®

NET PRESENT VALUE CALCULATIONS FOR OPTION NO. 1 – STABILIZED LIQUID SLUDGE FOR BENEFICIAL RE-USE WITH CONVENTIONAL AEROBIC DIGESTION AND MECHANICAL THICKENING

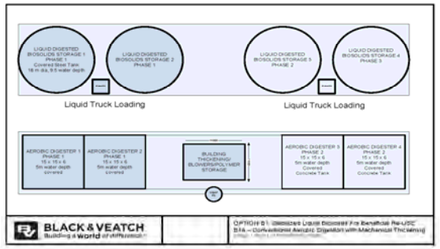
General Factors	Phase 1	Build Out
Peak hourly dry weather flow (m^3/d)	15,519	26,891
Average dry weather flow (m^3/d)	6,450	12,314

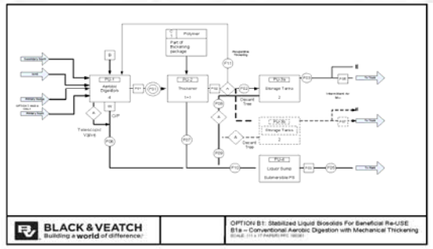
Economic Factors	Phase 1	Build Out
Interest (%)	5	5
Inflation (%)	2	2
Contingency (%SUM Capital Costs)	25%	
Year to Begin	2014	
Duration of Construtions is 24 mo (time for mid point	1	1

Date	Prepared By	Contributors	Reviewed and Authorized By
9/17/2014	Monica Rivera	Cecil Stegman Pat Coleman	Oya Koc

CAPITAL COST

System + Equipment and Piping	Phase 1 Units	Phase 1 Unit Cost	Phase 1 Cost	Phase 1 Installation	Phase 1 Total Cost	Build Out Addition Units	Build Out Addition Unit Cost	Build Out Addition Cost	Build Out Addition Installation	Build Out Addition Total Cost
EQUIPMENT										
Conventional Aerobic Digester										
No. of Digesters	2	-	-	-	-	2	-	-	-	-
Aeration System			$ 315,000	50%	$ 472,500			$ 315,000	50%	$ 472,500
Mixers	8	$ 15,000	$ 120,000	50%	$ 180,000	8	$ 15,000	$ 120,000	50%	$ 180,000
Building Blowers	**3**	**$ 35,000**	**$ 35,003**	**50%**	**$ 52,505**	**3**	**$ 35,000**	**$ 35,003**	**50%**	**$ 52,505**
Mechanical Thickeners										
No. of Thickeners	2	$ 250,000	$ 500,000	100%	$ 1,000,000	-	-	-	-	-
Liquid Digested Biosolids Storage										
No. of Liquid Digested Biosolids Storage Tanks	2	-	-	-	-	2	-	-	-	-
Liquid Truck Loading Pumps										
No. of Pumps	2		$ 100,000	50%	$ 150,000	2		$ 100,000	50%	$ 150,000
Liquor Sump Submersible Pump Station										
No. of Submersible Pumps	2	$ 205,000	$ 410,000	50%	$ 615,000	-	-	-	-	-
Contingencies		35%			$ 617,501		35%			$ 213,751.13
Total Equipment Cost					**$ 3,087,506**					**$ 1,068,756**
CONSTRUCTION COSTS										
General Requirements		10%	$ 645,000				10%	$ 554,000		
Sitework		8%	$ 478,000				3%	$ 161,000		
Yard Piping			$ 100,000					$ 80,000		
Aerobic Digetster 1 & 2/3 & 4			$ 1,501,000					$ 1,501,000		
Thickening/Blowers/Polymer Storage Building			$ 579,000							
Liquid Digested Biosolids Storage Tanks 1 & 2/3 & 4			$ 2,850,000					$ 2,950,000		
Liquid Truck Loading Pump Structure			$ 54,000					$ 54,000		
Liquor Sump Submersible Pump Station			$ 10,000							
Instrumentation (2%)		2%	$ 101,880				2%	$ 91,700		
Electrical (15%)		15%	$ 779,382				15%	$ 701,505		
Contingencies		25%	$ 1,775,000				25%	$ 1,523,000		
Contractor Allowance		10%	$ 710,000				10%	$ 609,000		
Mid-Point of Construction (S=P(1+i)n)1			$ 24,000					$ 21,000		
Total Probable Construction Cost			**$9,607,262**					**$8,246,205**		





ANNUAL OPERATIONAL COST

Sytem	Phase 1 Value	Units	Unit Cost	Total Cost	Build Out Value	Units	Unit Cost	Total Cost
Chemical Consumption								
Polymer (Thickening)	15	kg/d	$ 5.00	$ 27,375	15	kg/d		0
Total Chemical Consumption				**$ 27,375**				**0**
Power Factors								
Aerobic Digester Aeration	385	kWh/d	0.1	$ 14,053	770	kWh/d	0.1	$ 28,105
Aerobic Digester Mixers	185	kWh/d	0.1	$ 6,753	370	kWh/d	0.1	$ 13,505
Mechanical Thickeners (incl. feed and discharge pumps)	11	kWh/d	0.1	$ 402	22	kWh/d	0.1	$ 803
Liquor Submersible Pumps	11	kWh/d	0.1	$ 402	22	kWh/d	0.1	$ 803
Total Average Power Consumption	**592**	**kWh/d**	**0.1**	**$ 21,608**	**1184**	**kWh/d**	**0.1**	**$ 43,216**

Calculating NPV Costs			BUILD OUT																									
Item			**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**TOTAL**
Capital Costs	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	
System + Equipment and Piping	$ 3,087,506												$ 1,068,756															
Yard Piping + Building + HVAC	$ 9,607,262												$ 8,246,205															
Capital Costs (2014)	**$ 12,694,768**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 9,314,961**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 22,009,728**
Capital Costs (Year n)	**$ 12,694,768**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 11,813,622**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 24,508,390**
Net Present Value (2014)	**$ 12,694,768**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 6,578,267**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 19,273,035**
Operating Costs																												
Chemical Consumption Cost (Pro-rated)			$ 2,190	$ 4,380	$ 6,570	$ 8,760	$ 10,950	$ 13,140	$ 15,330	$ 17,520	$ 19,710	$ 21,900	$ 24,090	$ 26,280	$ 28,470	$ 30,660	$ 32,850	$ 35,040	$ 37,230	$ 39,420	$ 41,610	$ 43,800	$ 45,990	$ 48,180	$ 50,370	$ 51,465	$ 52,264	
Power Consumption Cost			$ 21,608	$ 21,608	$ 21,608	$ 21,608	$ 21,608	$ 21,608	$ 21,608	$ 21,608	$ 21,608	$ 21,608	$ 43,216	$ 43,216	$ 43,216	$ 43,216	$ 43,216	$ 43,216	$ 43,216	$ 43,216	$ 43,216	$ 43,216	$ 43,216	$ 43,216	$ 43,216	$ 43,216	$ 43,216	
Operation Costs (2014)			**$ 23,798**	**$ 25,988**	**$ 28,178**	**$ 30,368**	**$ 32,558**	**$ 34,748**	**$ 36,938**	**$ 39,128**	**$ 41,318**	**$ 43,508**	**$ 67,306**	**$ 69,496**	**$ 71,686**	**$ 73,876**	**$ 76,066**	**$ 78,256**	**$ 80,446**	**$ 82,636**	**$ 84,826**	**$ 87,016**	**$ 89,206**	**$ 91,396**	**$ 93,586**	**$ 94,681**	**$ 95,480**	**$ 1,572,489**
Operation Costs (Year n)			**$ 24,759**	**$ 27,579**	**$ 30,501**	**$ 33,529**	**$ 36,666**	**$ 39,915**	**$ 43,279**	**$ 46,762**	**$ 50,366**	**$ 54,097**	**$ 85,360**	**$ 89,900**	**$ 94,588**	**$ 99,427**	**$ 104,422**	**$ 109,577**	**$ 114,897**	**$ 120,385**	**$ 126,047**	**$ 131,887**	**$ 137,911**	**$ 144,122**	**$ 150,527**	**$ 155,334**	**$ 159,779**	**$ 2,211,616**
Net Present Value (2014)			**$ 22,458**	**$ 23,823**	**$ 25,093**	**$ 26,271**	**$ 27,360**	**$ 28,367**	**$ 29,293**	**$ 30,143**	**$ 30,921**	**$ 31,629**	**$ 47,532**	**$ 47,676**	**$ 47,773**	**$ 47,826**	**$ 47,837**	**$ 47,808**	**$ 47,742**	**$ 47,640**	**$ 47,506**	**$ 47,340**	**$ 47,145**	**$ 46,922**	**$ 46,674**	**$ 45,871**	**$ 44,936**	**$ 983,586**
Net Present Value																												
Capital Costs (2014)	**$ 19,273,035**																											
Operation Costs (2014)	**$ 983,586**																											
Net Present Value (2014)	**$ 20,256,620**																											

Average Flow (m3/d)	516	1,032	1,548	2,064	2,580	3,096	3,612	4,128	4,644	5,160	5,676	6,192	6,708	7,224	7,740	8,256	8,772	9,288	9,804	10,320	10,836	11,352	11,868	12,126	12,314

NET PRESENT VALUE CALCULATIONS FOR OPTION NO. 2 – STABILIZED CAKE FOR BENEFICIAL RE-USE WITH CONVENTIONAL AEROBIC DIGESTION AND MECHANICAL THICKENING

General Factors	Phase 1	Build Out
Peak hourly dry weather flow (m^3/d)	15,519	26,891
Average dry weather flow (m^3/d)	6,450	12,314

Economic Factors	Phase 1	Build Out
Interest (%)	5	5
Inflation (%)	2	2
Contingency (%SUM Capital Costs)	25%	
Year to Begin	2014	
Duration of Construction is 24 mo (time for mid point	1	1

CAPITAL COST

System + Equipment and Piping	Phase 1 Units	Unit Cost	Cost	Installation	Total Cost	Build Out Addition Units	Unit Cost	Cost	Installation	Total Cost
EQUIPMENT										
Conventional Aerobic Digester										
No. of Digesters	2	-	-	-	-	2	-	-	-	-
Aeration System			$ 315,000	50%	$ 472,500			$ 315,000	50%	$ 472,500
Mixers	8	$ 15,000	$ 120,000	50%	$ 180,000	8	$ 15,000	$ 120,000	50%	$ 180,000
Building Blowers	**3**	**$ 35,000**	**$ 35,003**	**50%**	**$ 52,505**	**3**	**$ 35,000**	**$ 35,003**	**50%**	**$ 52,505**
Mechanical Thickeners										
No. of Thickeners	2	$ 250,000	$ 500,000	100%	$ 1,000,000	-	-	-	-	-
Liquid Digested Biosolids Storage										
No. of Liquid Digested Biosolids Storage Tanks	2	-	-	-	-	2	-	-	-	-
Liquid Truck Loading Pumps										
No. of Pumps	2	-	$ 100,000	50%	$ 150,000	2	-	$ 100,000	50%	$ 150,000
Building Thickening/Dewatering & Cake Loading Pad										
No. of Thickening/Dewatering & Cake Loading Pad Buildings	1	-	-	-	-	-	-	-	-	-
Dewatering Feed Day Tank Mixers	2	$ 15,000	$ 30,000	50%	$ 45,000	-	-	-	-	-
Dewatering	4	$ 250,000	$ 1,000,000	100%	$ 2,000,000	-	-	-	-	-
Front End Loader										
Front End Loader	1	$ 30,000	$ 30,000	50%	$ 45,000	-	-	-	-	-
Dewatering Liquor Storage Tank										
No. of Storage Tanks	1	-	-	-	-	-	-	-	-	-
Liquor Sump Submersible Pump Station										
No. of Submersible Pumps	2	$ 205,000	$ 410,000	50%	$ 615,000	-	-	-	-	-
Contingencies		25%			$ 1,140,001		25%			$ 213,751
Total Equipment Cost					$ 5,700,006					$ 1,068,756
CONSTRUCTION COSTS										
General Requirements		10%	$ 920,000				10%	$ 554,000		
Sitework		8%	$ 681,000				3%	$ 161,000		
Yard Piping			$ 100,000					$ 80,000		
Aerobic Digetster 1 & 2/3 & 4			$ 1,501,000					$ 1,501,000		
Blower Building			$ 369,000							
Building Thickening/Dewatering & Cake Loading Pad			$ 952,000							
Liquid Digested Biosolids Storage Tanks 1 & 2/3 & 4			$ 2,850,000					$ 2,950,000		
Dewatering Liquor Storage Tank			$ 1,425,000							
Liquid Truck Loading Pump Structure			$ 54,000					$ 54,000		
Liquor Sump Submersible Pump Station			$ 10,000							
Instrumentation (2%)		2%	$ 145,220				2%	$ 91,700		
Electrical (15%)		15%	$ 1,110,933				15%	$ 701,505		
Contingencies		25%	$ 2,530,000				25%	$ 1,523,000		
Contractor Allowance		10%	$ 1,012,000				10%	$ 609,000		
Mid-Point of Construction (S=P(1+i)n)?			$ 34,000					$ 21,000		
Total Probable Construction Cost			$13,694,153					$8,246,205		

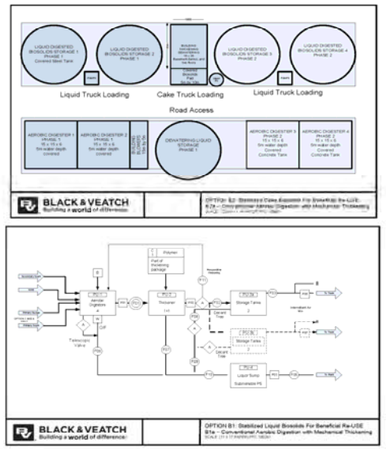
ANNUAL OPERATIONAL COST

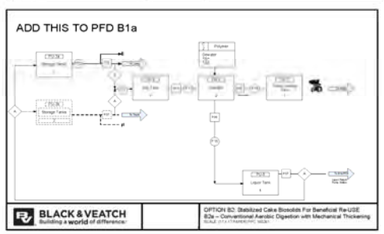
Sytem	Phase 1 Value	Units	Unit Cost	Total Cost	Value	Units	Unit Cost	Total Cost
Chemical Consumption								
Polymer (Thickening)	15	kg/d	$ 5.00	$ 27,375	15	kg/d	$ 5.00	$ 27,375
Polymer (Dewatering)	50	kg/d	$ 5.00	$ 91,250	100	kg/d	$ 5.00	$ 182,500
Total Chemical Consumption				$ 118,625				$ 209,875
Power Factors								
Aerobic Digester Aeration	385	kWh/d	0.1	$ 14,053	770	kWh/d	0.1	$ 28,105
Aerobic Digester Mixers	370	kWh/d	0.1	$ 13,505	370	kWh/d	0.1	$ 13,505
Mechanical Thickeners (incl. feed and discharge pumps)	22	kWh/d	0.1	$ 803	22	kWh/d	0.1	$ 803
Dewatering Feed Day Tank Mixers	18	kWh/d	0.1	$ 225	18	kWh/d	0.1	$ 225
Dewatering	30	kWh/d	0.1	$ 375	60	kWh/d	0.1	$ 750
Liquor Submersible Pumps	11	kWh/d	0.1	$ 402	22	kWh/d	0.1	$ 803
Total Average Power Consumption	836	kWh/d	0.1	$ 29,362	1262	kWh/d	0.1	$ 44,191

Calculating NPV Costs													BUILD OUT													
Item			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	TOTAL
Capital Costs	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
System + Equipment and Piping	$ 5,700,006												$ 1,068,756															
Yard Piping + Building + HVAC	$ 13,694,153												$ 8,246,205															
Capital Costs (2014)	**$ 19,394,159**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 9,314,961**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 28,709,119**
Capital Costs (Year n)	**$ 19,394,159**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 11,813,622**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 31,207,781**
Net Present Value (2014)	**$ 19,394,159**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 6,578,267**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 25,972,426**
Operating Costs																												
Chemical Consumption Cost (Pro-rated)			$ 9,490	$ 18,980	$ 28,470	$ 37,960	$ 47,450	$ 56,940	$ 66,430	$ 75,920	$ 85,410	$ 94,900	$ 104,390	$ 113,880	$ 123,370	$ 132,860	$ 142,350	$ 151,840	$ 161,330	$ 170,820	$ 180,310	$ 189,800	$ 199,290	$ 208,780	$ 218,270	$ 223,015	$ 226,479	
Power Consumption Cost			$ 29,362	$ 29,362	$ 29,362	$ 29,362	$ 29,362	$ 29,362	$ 29,362	$ 29,362	$ 29,362	$ 29,362	$ 44,191	$ 44,191	$ 44,191	$ 44,191	$ 44,191	$ 44,191	$ 44,191	$ 44,191	$ 44,191	$ 44,191	$ 44,191	$ 44,191	$ 44,191	$ 44,191	$ 44,191	
Operation Costs (2014)			**$ 38,852**	**$ 48,342**	**$ 57,832**	**$ 67,322**	**$ 76,812**	**$ 86,302**	**$ 95,792**	**$ 105,282**	**$ 114,772**	**$ 124,262**	**$ 148,581**	**$ 158,071**	**$ 167,561**	**$ 177,051**	**$ 186,541**	**$ 196,031**	**$ 205,521**	**$ 215,011**	**$ 224,501**	**$ 233,991**	**$ 243,481**	**$ 252,971**	**$ 262,461**	**$ 267,206**	**$ 270,670**	**$ 4,025,219**
Operation Costs (Year n)			**$ 40,422**	**$ 51,301**	**$ 62,599**	**$ 74,329**	**$ 86,503**	**$ 99,134**	**$ 112,236**	**$ 125,822**	**$ 139,906**	**$ 154,504**	**$ 188,437**	**$ 204,482**	**$ 221,093**	**$ 238,287**	**$ 256,081**	**$ 274,491**	**$ 293,535**	**$ 313,230**	**$ 333,597**	**$ 354,652**	**$ 376,417**	**$ 398,910**	**$ 422,152**	**$ 438,380**	**$ 452,944**	**$ 5,713,442**
Net Present Value (2014)			**$ 36,664**	**$ 44,316**	**$ 51,501**	**$ 58,239**	**$ 64,550**	**$ 70,453**	**$ 75,965**	**$ 81,106**	**$ 85,890**	**$ 90,335**	**$ 104,929**	**$ 108,441**	**$ 111,667**	**$ 114,620**	**$ 117,314**	**$ 119,759**	**$ 121,970**	**$ 123,956**	**$ 125,729**	**$ 127,300**	**$ 128,678**	**$ 129,874**	**$ 130,896**	**$ 129,455**	**$ 127,386**	**$ 2,480,991**
Net Present Value																												
Capital Costs (2014)	**$ 25,972,426**																											
Operation Costs (2014)	**$ 2,480,991**																											
Net Present Value (2014)	**$ 28,453,416**																											

Average Flow (m3/d)	516	1,032	1,548	2,064	2,580	3,096	3,612	4,128	4,644	5,160	5,676	6,192	6,708	7,224	7,740	8,256	8,772	9,288	9,804	10,320	10,836	11,352	11,868	12,126	12,314

Rev. No	Date	Prepared By	Contributors	Reviewed and Authorized By
1	9/17/2014	Monica Rivera	Cecil Stegman Pat Coleman	Oya Koc





NET PRESENT VALUE CALCULATIONS FOR OPTION NO. 3 - SOLAR DRIED PELLETS FOR BENEFICIAL RE-USE WITH CONVENTIONAL AEROBIC DIGESTION AND MECHANICAL THICKENING

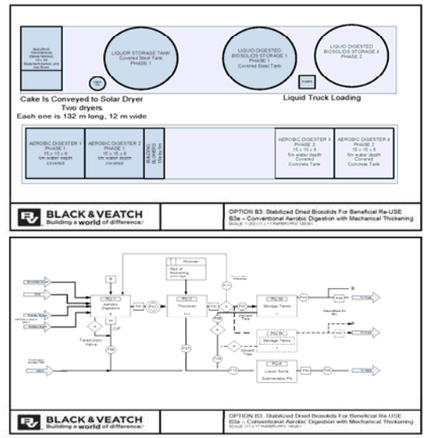
Rev. No	Date	Prepared By	Contributors	Reviewed and Authorized By
1	9/17/2014	Monica Rivera	Cecil Stegman Pat Coleman	Oya Koc

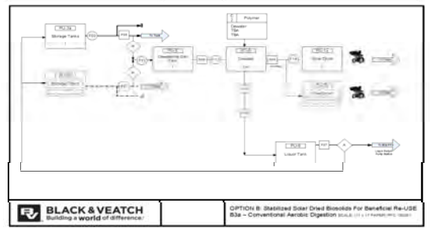
General Factors	Phase 1	Build Out
Peak hourly dry weather flow (m^3/d)	15,519	26,891
Average dry weather flow (m^3/d)	6,450	12,314

Economic Factors	Phase 1	Build Out
Interest (%)	5	5
Inflation (%)	2	2
Contingency (%SUM Capital Costs)	25%	
Year to Begin	2014	
Duration of Constrution is 24 mo (time for mid	1	1

CAPITAL COST

System + Equipment and Piping	Phase 1 Units	Phase 1 Unit Cost	Phase 1 Cost	Phase 1 Installation	Phase 1 Total Cost	Build Out Addition Units	Build Out Addition Unit Cost	Build Out Addition Cost	Build Out Addition Installation	Build Out Addition Total Cost
EQUIPMENT										
Conventional Aerobic Digester										
No. of Digesters	2	-	-	-	-	2	-	-	-	-
Aeration System			$ 315,000	50%	$ 472,500			$ 315,000	50%	$ 472,500
Mixers	8	$ 15,000	$ 120,000	50%	$ 180,000	8	$ 15,000	$ 120,000	50%	$ 180,000
Building Blowers	3	$ 35,000	$ 35,003	50%	$ 52,505	3	$ 35,000	$ 35,003	50%	$ 52,505
Mechanical Thickeners										
No. of Thickeners	2	$ 250,000	$ 500,000	100%	$ 1,000,000	-	-	-	-	-
Liquid Digested Biosolids Storage										
No. of Liquid Digested Biosolids Storage Tanks	1	-	-	-	-	1	-	-	-	-
Liquid Truck Loading Pumps										
No. of Pumps	2	-	$ 100,000	50%	$ 150,000	-	-	-	-	-
Liquor Sump Submersible Pump Station										
No. of Submersible Pumps	2	$ 205,000	$ 410,000	50%	$ 615,000	-	-	-	-	-
Building Thickening/Dewatering										
No. of Thickening/Dewatering Buildings	1	-	-	-	-	-	-	-	-	-
Dewatering Feed Day Tank Mixers	2	$ 15,000	$ 30,000	50%	$ 45,000	-	-	-	-	-
Dewatering	4	$ 250,000	$ 1,000,000	100%	$ 2,000,000	-	-	-	-	-
Solar Dryer										
Solar Dryer	1	$ 1,500,000	$ 1,500,000	50%	$ 2,250,000	1	$ 1,500,000	$ 1,500,000	50%	$ 2,250,000
Front End Loader										
Front End Loader	1	$ 30,000	$ 30,000		$ 30,000	1	$ 30,000	$ 30,000		$ -
Dewatering Liquor Storage Tank										
No. of Storage Tanks	1	-	-	-	-	-	-	-	-	-
Contingencies		25%			$ 1,698,751		25%			$ 738,751
Total Equipment Cost					**$ 8,493,756**					**$ 3,693,756**
CONSTRUCTION COSTS										
General Requirements		10%	$ 739,000				10%	$ 369,000		
Sitework		8%	$ 548,000				3%	$ 108,000		
Yard Piping			$ 100,000					$ 80,000		
Aerobic Digetster 1 & 2/3 & 4			$ 1,501,000					$ 1,501,000		
Blower Building			$ 369,000							
Building Thickening/Dewatering			$ 952,000							
Liquid Digested Biosolids Storage Tank 1 & 2			$ 1,425,000					$ 1,475,000		
Dewatering Liquor Storage Tank			$ 1,425,000							
Liquid Truck Loading Pump Structure			$ 54,000							
Liquor Sump Submersible Pump Station			$ 10,000							
Instrumentation (2%)		2%	$ 116,720				2%	$ 61,120		
Electrical (15%)		15%	$ 892,908				15%	$ 467,568		
Contingencies		25%	$ 2,033,000				25%	$ 1,015,000		
Contractor Allowance		10%	$ 813,000				10%	$ 406,000		
Mid-Point of Construction (S=P(1+i)n)^			$ 27,000					$ 14,000		
Total Probable Construction Cost			**$11,005,628**					**$5,496,688**		





ANNUAL OPERATIONAL COST

Sytem	Phase 1 Value	Phase 1 Units	Phase 1 Unit Cost	Phase 1 Total Cost	Build Out Value	Build Out Units	Build Out Unit Cost	Build Out Total Cost
Chemical Consumption								
Polymer (Thickening)	15	kg/d	$ 5.00	$ 27,375	15	kg/d	$ 5.00	$ 27,375
Polymer (Dewatering)	50	kg/d	$ 5.00	$ 91,250	100	kg/d	$ 5.00	$ 182,500
Total Chemical Consumption				**$ 118,625**				**$ 209,875**
Power Factors								
Aerobic Digester Aeration	385	kWh/d	0.1	$ 14,053	770	kWh/d	0.1	$ 28,105
Aerobic Digester Mixers	370	kWh/d	0.1	$ 13,505	370	kWh/d	0.1	$ 13,505
Mechanical Thickeners (incl. feed and discharge pumps)	22	kWh/d	0.1	$ 803	22	kWh/d	0.1	$ 803
Dewatering Feed Day Tank Mixers	1.8	kWh/d	0.1	$ 44	1.8	kWh/d	0.1	$ 44
Dewatering	20	kWh/d	0.1	$ 490	40	kWh/d	0.1	$ 980
	11	kWh/d	0.1	$ 402	22	kWh/d	0.1	$ 803
Total Average Power Consumption	**810**	**kWh/d**	**0.1**	**29,296**	**1226**	**kWh/d**	**0.1**	**44,240**

Calculating NPV Costs

BUILD OUT

Item / Capital Costs	2014	2015	1 2016	2 2017	3 2018	4 2019	5 2020	6 2021	7 2022	8 2023	9 2024	10 2025	11 2026	12 2027	13 2028	14 2029	15 2030	16 2031	17 2032	18 2033	19 2034	20 2035	21 2036	22 2037	23 2038	24 2039	25 2040	TOTAL
Bystem + Equipment and Piping	$ 8,493,756												$ 3,693,756															
Yard Piping + Building + HVAC	$ 11,005,628												$ 5,496,688															
Capital Costs (2014)	**$ 19,499,384**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 9,190,444**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 28,689,827**
Capital Costs (Year n)	**$ 19,499,384**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 11,655,705**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 31,155,088**
Net Present Value (2014)	**$ 19,499,384**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 6,490,333**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 25,989,716**
Operating Costs																												
Chemical Consumption Cost (Pro-rated)			$ 9,490	$ 18,980	$ 28,470	$ 37,960	$ 47,450	$ 56,940	$ 66,430	$ 75,920	$ 85,410	$ 94,900	$ 104,390	$ 113,880	$ 123,370	$ 132,860	$ 142,350	$ 151,840	$ 161,330	$ 170,820	$ 180,310	$ 189,800	$ 199,290	$ 208,780	$ 218,270	$ 223,015	$ 226,479	
Power Consumption Cost			$ 29,296	$ 29,296	$ 29,296	$ 29,296	$ 29,296	$ 29,296	$ 29,296	$ 29,296	$ 29,296	$ 29,296	$ 44,240	$ 44,240	$ 44,240	$ 44,240	$ 44,240	$ 44,240	$ 44,240	$ 44,240	$ 44,240	$ 44,240	$ 44,240	$ 44,240	$ 44,240	$ 44,240	$ 44,240	
Operation Costs (2014)			**$ 38,786**	**$ 48,276**	**$ 57,766**	**$ 67,256**	**$ 76,746**	**$ 86,236**	**$ 95,726**	**$ 105,216**	**$ 114,706**	**$ 124,196**	**$ 148,630**	**$ 158,120**	**$ 167,610**	**$ 177,100**	**$ 186,590**	**$ 196,080**	**$ 205,570**	**$ 215,060**	**$ 224,550**	**$ 234,040**	**$ 243,530**	**$ 253,020**	**$ 262,510**	**$ 267,255**	**$ 270,719**	**$ 4,025,296**
Operation Costs (Year n)			**$ 40,353**	**$ 51,231**	**$ 62,528**	**$ 74,256**	**$ 86,429**	**$ 99,058**	**$ 112,158**	**$ 125,743**	**$ 139,826**	**$ 154,422**	**$ 188,499**	**$ 204,545**	**$ 221,158**	**$ 238,353**	**$ 256,148**	**$ 274,559**	**$ 293,605**	**$ 313,302**	**$ 333,670**	**$ 354,727**	**$ 376,493**	**$ 398,987**	**$ 422,231**	**$ 438,460**	**$ 453,026**	**$ 5,713,768**
Net Present Value (2014)			**$ 36,601**	**$ 44,255**	**$ 51,442**	**$ 58,182**	**$ 64,494**	**$ 70,399**	**$ 75,913**	**$ 81,055**	**$ 85,841**	**$ 90,287**	**$ 104,963**	**$ 108,475**	**$ 111,700**	**$ 114,652**	**$ 117,344**	**$ 119,789**	**$ 121,999**	**$ 123,984**	**$ 125,757**	**$ 127,326**	**$ 128,704**	**$ 129,899**	**$ 130,920**	**$ 129,479**	**$ 127,409**	**$ 2,480,871**
Net Present Value																												
Capital Costs (2014)	**$ 25,989,716**																											
Operation Costs (2014)	**$ 2,480,871**																											
Net Present Value (2014)	**$ 28,470,587**																											

Average Flow (m3/d)	516	1,032	1,548	2,064	2,580	3,096	3,612	4,128	4,644	5,160	5,676	6,192	6,708	7,224	7,740	8,256	8,772	9,288	9,804	10,320	10,836	11,352	11,868	12,126	12,314

NET PRESENT VALUE CALCULATIONS FOR OPTION NO. 4 - STABILIZED LIQUID SLUDGE FOR BENEFICIAL RE-USE AUTOTHERMAL AEROBIC DIGESTION AND MECHANICAL THICKENING

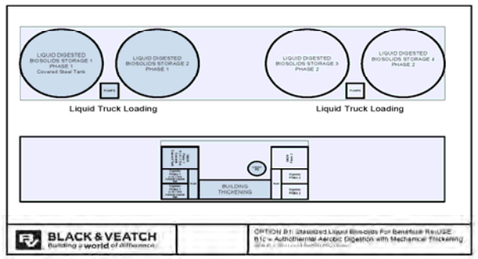
Rev. No	Date	Prepared By	Contributors	Reviewed and Authorized By
1	9/17/2014	Monica Rivera	Cecil Stegman Pat Coleman	Oya Koc

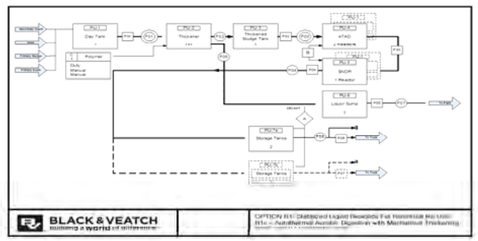
General Factors	Phase 1	Build Out
Peak hourly dry weather flow (m^3/d)	15,519	26,891
Average dry weather flow (m^3/d)	6,450	12,314

Economic Factors	Phase 1	Build Out
Interest (%)	5	5
Inflation (%)	2	2
Contingency (%SUM Capital Costs)	25%	
Year to Begin	2014	
Duration of Construtions is 24 mo (time for mid point	1	1

CAPITAL COST

System + Equipment and Piping	Phase 1 Units	Phase 1 Unit Cost	Phase 1 Cost	Phase 1 Installation	Phase 1 Total Cost	Build Out Addition Units	Build Out Addition Unit Cost	Build Out Addition Cost	Build Out Addition Installation	Build Out Addition Total Cost
EQUIPMENT										
Thickening Building										
No. of Thickening Buildings	1	-	-	-	-	-	-	-	-	-
Day Tank Mixers	2	$ 15,000	$ 30,000	50%	$ 45,000	-	-	-	-	-
No. of Thickeners	2	$ 250,000	$ 500,000	100%	$ 1,000,000	-	-	-	-	-
Autothermic Aerobic Digestion (ATAD)/SNDR										
No. of ATAD Digesters + SNDR	1	$ 2,200,000	$ 2,200,000	50%	$ 3,300,000	1	$ 2,200,000	$ 2,200,000	100%	$ 4,400,000
Liquor Sump Submersible Pump Station										
No. of Submersible Pumps	2	$ 205,000	$ 410,000	50%	$ 615,000	-	-	-	-	-
Liquid Truck Loading Pumps										
No. of Pumps	2		$ 100,000	50%	$ 150,000	2		$ 100,000	50%	$ 150,000
Liquid Digested Biosolids Storage										
No. of Liquid Digested Biosolids Storage Tanks	2	-	-	-	-	2	-	-	-	-
Contingencies		25%			$ 1,277,500		25%			$ 1,137,500
Total Equipment Cost					**$ 6,387,500**					**$ 5,687,500**
CONSTRUCTION COSTS										
General Requirements		10%	$ 549,000				10%	$ 465,000		
Sitework		8%	$ 407,000				3%	$ 135,000		
Yard Piping			$ 100,000					$ 80,000		
Autothermic Aerobic Digestion (ATAD)/SNDR			$ 862,000					$ 862,000		
Thickening Building			$ 460,000							
Liquid Digested Biosolids Storage Tanks 1 & 2/3 & 4			$ 2,850,000					$ 2,850,000		
Liquid Truck Loading Pumps			$ 54,000					$ 54,000		
Liquor Sump Submersible Pump Station			$ 10,000							
Instrumentation (2%)		2%	$ 86,720				2%	$ 76,920		
Electrical (15%)		15%	$ 663,408				15%	$ 588,438		
Contingencies		25%	$ 1,511,000				25%	$ 1,278,000		
Contractor Allowance		10%	$ 604,000				10%	$ 511,000		
Mid-Point of Construction (S=P(1+i)n)[3]			$ 20,000					$ 17,000		
Total Probable Construction Cost			**$8,177,128**					**$6,917,358**		





ANNUAL OPERATIONAL COST								
Sytem	**Phase 1 Value**	**Phase 1 Units**	**Phase 1 Unit Cost**	**Phase 1 Total Cost**	**Build Out Value**	**Build Out Units**	**Build Out Unit Cost**	**Build Out Total Cost**
Chemical Consumption								
Polymer (Thickening)	15	kg/d	$ 5.00	$ 27,375	15	kg/d		0
Total Chemical Consumption				**$ 27,375**				0
Power Factors								
Day Tank Mixers	9	kWh/d	0.1	$ 329	9	kWh/d	0.1	$ 329
Mechanical Thickeners (incl. feed and discharge pumps)	22	kWh/d	0.1	$ 803	22	kWh/d	0.1	$ 803
Autothermic Aerobic Digestion	1785	kWh/d	0.1	$ 43,733	3570	kWh/d	0.1	$ 87,465
Liquor Submersible Pumps	11	kWh/d	0.1	$ 402	22	kWh/d	0.1	$ 803
Total Average Power Consumption	**1827**	**kWh/d**	**0.1**	**$ 45,266**	**3623**	**kWh/d**	**0.1**	**$ 89,400**

Calculating NPV Costs													BUILD OUT															
Item			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	**TOTAL**
Capital Costs	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	
Sytem + Equipment and Piping	$ 6,387,500												$ 5,687,500															
Yard Piping + Building + HVAC	$ 8,177,128												$ 6,917,358															
Capital Costs (2014)	**$ 14,564,628**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 12,604,858**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 27,169,486**
Capital Costs (Year n)	**$ 14,564,628**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 15,986,008**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 30,550,636**
Net Present Value (2014)	**$ 14,564,628**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 8,901,607**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$ 23,466,235**
Operating Costs																												
Chemical Consumption Cost (Pro-rated)			$ 2,190	$ 4,380	$ 6,570	$ 8,760	$ 10,950	$ 13,140	$ 15,330	$ 17,520	$ 19,710	$ 21,900	$ 24,090	$ 26,280	$ 28,470	$ 30,660	$ 32,850	$ 35,040	$ 37,230	$ 39,420	$ 41,610	$ 43,800	$ 45,990	$ 48,180	$ 50,370	$ 51,465	$ 52,264	
Power Consumption Cost			$ 45,266	$ 45,266	$ 45,266	$ 45,266	$ 45,266	$ 45,266	$ 45,266	$ 45,266	$ 45,266	$ 45,266	$ 89,400	$ 89,400	$ 89,400	$ 89,400	$ 89,400	$ 89,400	$ 89,400	$ 89,400	$ 89,400	$ 89,400	$ 89,400	$ 89,400	$ 89,400	$ 89,400	$ 89,400	
Operation Costs (2014)			**$ 47,456**	**$ 49,646**	**$ 51,836**	**$ 54,026**	**$ 56,216**	**$ 58,406**	**$ 60,596**	**$ 62,786**	**$ 64,976**	**$ 67,166**	**$ 113,490**	**$ 115,680**	**$ 117,870**	**$ 120,060**	**$ 122,250**	**$ 124,440**	**$ 126,630**	**$ 128,820**	**$ 131,010**	**$ 133,200**	**$ 135,390**	**$ 137,580**	**$ 139,770**	**$ 140,865**	**$ 141,664**	**$ 2,501,817**
Operation Costs (Year n)			**$ 49,373**	**$ 52,684**	**$ 56,108**	**$ 59,649**	**$ 63,308**	**$ 67,090**	**$ 70,997**	**$ 75,034**	**$ 79,205**	**$ 83,512**	**$ 143,932**	**$ 149,644**	**$ 155,526**	**$ 161,584**	**$ 167,822**	**$ 174,245**	**$ 180,858**	**$ 187,666**	**$ 194,673**	**$ 201,886**	**$ 209,309**	**$ 216,949**	**$ 224,810**	**$ 231,103**	**$ 237,063**	**$ 3,494,032**
Net Present Value (2014)			**$ 44,782**	**$ 45,511**	**$ 46,161**	**$ 46,736**	**$ 47,241**	**$ 47,679**	**$ 48,054**	**$ 48,368**	**$ 48,625**	**$ 48,828**	**$ 80,147**	**$ 79,359**	**$ 78,551**	**$ 77,725**	**$ 76,881**	**$ 76,023**	**$ 75,150**	**$ 74,266**	**$ 73,370**	**$ 72,465**	**$ 71,552**	**$ 70,632**	**$ 69,707**	**$ 68,245**	**$ 66,672**	**$ 1,582,731**
Net Present Value																												
Capital Costs (2014)	**$ 23,466,235**																											
Operation Costs (2014)	**$ 1,582,731**																											
Net Present Value (2014)	**$ 25,048,966**																											

Average Flow (m3/d)	516	1,032	1,548	2,064	2,580	3,096	3,612	4,128	4,644	5,160	5,676	6,192	6,708	7,224	7,740	8,256	8,772	9,288	9,804	10,320	10,836	11,352	11,868	12,126	12,314

NET PRESENT VALUE CALCULATIONS FOR OPTION NO. 5 - DRIED CAKE FOR BENEFICIAL RE-USE WITH ATAD AND MECHANICAL THICKENING

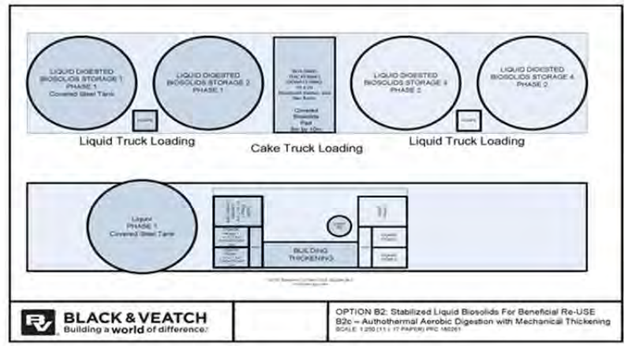
Rev. No.	Date	Prepared By	Concurrence	Reviewed and Authorized By
1	9/17/2014	Monica Rivera	Cecil Stegman Pat Colarusso	Oya Koc

General Factors	Phase 1	Build Out
Peak hourly dry weather flow (m^3/d)	15,519	26,891
Average dry weather flow (m^3/d)	6,450	12,314

Economic Factors	Phase 1	Build Out
Interest (%)	5	5
Inflation (%)	2	2
Contingency (%SUM Capital Costs)	25%	
Year to Begin	2014	
Duration of Construction is 24 mo (time for mid-point	1	1

CAPITAL COST

System + Equipment and Piping	Phase 1 Units	Phase 1 Unit Cost	Phase 1 Cost	Phase 1 Installation	Phase 1 Total Cost	Build Out Addition Units	Build Out Addition Unit Cost	Build Out Addition Cost	Build Out Addition Installation	Build Out Addition Total Cost
EQUIPMENT										
Thickening Building										
No. of Thickening Buildings	1	-	-	-	-	-	-	-	-	-
Day Tank Mixers	2	$ 15,000	$ 30,000	50%	$ 45,000	-	-	-	-	-
No. of Thickeners	2	$ 250,000	$ 500,000	100%	$ 1,000,000	-	-	-	-	-
Autothermic Aerobic Digestion (ATAD)/SNDR										
No. of ATAD Digesters + SNDR	1	$ 2,200,000	$ 2,200,000	100%	$ 4,400,000	1	$ 2,200,000	$ 2,200,000	100%	$ 4,400,000
Liquor Sump Submersible Pump Station										
No. of Submersible Pumps	2	$ 205,000	$ 410,000	50%	$ 615,000	-	-	-	-	-
Liquid Truck Loading Pumps										
No. of Pumps	2		$ 100,000	50%	$ 150,000	3		$ 100,000	50%	$ 150,000
Liquid Digested Biosolids Storage										
No. of Liquid Digested Biosolids Storage Tanks	2	-	-	-	-	2	-	-	-	-
Building Thickening/Dewatering & Pad										
No. of Thickening/Dewatering & Pad Buildings	1	-	-	-	-	-	-	-	-	-
Dewatering Feed Day Tank Mixers	2	$ 15,000	$ 30,000	50%	$ 45,000	-	-	-	-	-
Dewatering	4	$ 250,000	$ 1,000,000	100%	$ 2,000,000	-	-	-	-	-
Front End Loader										
Front End Loader	1	$ 30,000	$ 30,000		$ 30,000	-	-	-	-	-
Dewatering Liquor Storage Tank										
No. of Storage Tanks	1	-	-	-	-	-	-	-	-	-
Contingencies		25%			$ 2,071,250		25%			$ 1,137,500
Total Equipment Cost					**$ 10,956,250**					**$ 5,687,500**
CONSTRUCTION COSTS										
General Requirements		10%	$ 850,000				10%	$ 458,000		
Sitework		8%	$ 630,000				3%	$ 133,000		
Yard Piping			$ 100,000					$ 80,000		
Autothermic Aerobic Digestion (ATAD)/SNDR			$ 862,000					$ 862,000		
Building Thickening/Dewatering & Pad			$ 952,000							
Thickening Building			$ 460,000							
Liquid Digested Biosolids Storage Tanks 1 & 2/3 & 4			$ 2,850,000					$ 2,850,000		
Dewatering Liquor Storage Tank			$ 1,425,000							
Liquid Truck Loading Pumps			$ 54,000							
Liquor Sump Submersible Pump Station			$ 10,000							
Instrumentation (2%)		2%	$ 134,250				2%	$ 75,840		
Electrical (15%)		15%	$ 1,027,088				15%	$ 580,176		
Contingencies		25%	$ 2,339,000				25%	$ 1,260,000		
Contractor Allowance		10%	$ 915,000				10%	$ 504,000		
Mid-Point of Construction (S=P(1+i)n)3			$ 32,000					$ 17,000		
Total Probable Construction Cost			**$12,660,349**					**$6,820,016**		



ANNUAL OPERATIONAL COST

Sytem	Phase 1 Value	Phase 1 Units	Phase 1 Unit Cost	Phase 1 Total Cost	Build Out Value	Build Out Units	Build Out Unit Cost	Build Out Total Cost
Chemical Consumption								
Polymer (Thickening)	15	kg/d	$ 5.00	$ 27,375	15	kg/d	$ 5.00	$ 27,375
Polymer (Dewatering)	50	kg/d	$ 5.00	$ 91,250	100	kg/d	$ 5.00	$ 182,500
Total Chemical Consumption				$ 118,625				$ 209,875
Power Factors								
Day Tank Mixers	9	kWh/d	0.1	$ 329	9	kWh/d	0.1	$ 329
Mechanical Thickeners (incl. feed and discharge pumps)	22	kWh/d	0.1	$ 803	22	kWh/d	0.1	$ 803
Thickened Sludge Tank Mixers	17	kWh/d	0.1	$ 621	17	kWh/d	0.1	$ 621
Authothermic Aerobic Digestion	1785	kWh/d	0.1	$ 43,733	3570	kWh/d	0.1	$ 87,465
Dewatering Feed Day Tank Mixers	18	kWh/d	0.1	$ 225	18	kWh/d	0.1	$ 225
Dewatering	30	kWh/d	0.1	$ 375	60	kWh/d	0.1	$ 750
Liquor Submersible Pumps	11	kWh/d	0.1	$ 402	22	kWh/d	0.1	$ 803
Total Average Power Consumption	1,892	kWh/d	0.1	$ 46,486	3,718	kWh/d	0.1	$ 90,995

Calculating NPV Costs			BUILD OUT																									
Item			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	TOTAL
Capital Costs	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
System + Equipment and Piping	$ 10,358,250												$ 5,687,500															
Yard Piping + Building + HVAC	$ 12,660,349												$ 6,820,016															
Capital Costs (2014)	**$ 23,016,599**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 12,507,516**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 35,524,115**
Capital Costs (Year n)	**$ 23,016,599**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 15,862,555**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 38,879,154**
Net Present Value (2014)	**$ 23,016,599**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 8,832,864**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$ 31,849,463**
Operating Costs																												
Chemical Consumption Cost (Pro-rated)			$ 9,490	$ 18,980	$ 28,470	$ 37,960	$ 47,450	$ 56,940	$ 66,430	$ 75,920	$ 85,410	$ 94,900	$ 104,390	$ 113,880	$ 123,370	$ 132,860	$ 142,350	$ 151,840	$ 161,330	$ 170,820	$ 180,310	$ 189,800	$ 199,290	$ 208,780	$ 218,270	$ 227,015	$ 226,479	
Power Consumption Cost			$ 46,486	$ 46,486	$ 46,486	$ 46,486	$ 46,486	$ 46,486	$ 46,486	$ 46,486	$ 46,486	$ 46,486	$ 90,995	$ 90,995	$ 90,995	$ 90,995	$ 90,995	$ 90,995	$ 90,995	$ 90,995	$ 90,995	$ 90,995	$ 90,995	$ 90,995	$ 90,995	$ 90,995	$ 90,995	
Operation Costs (2014)			**$ 55,976**	**$ 65,466**	**$ 74,956**	**$ 84,446**	**$ 93,936**	**$ 103,426**	**$ 112,916**	**$ 122,406**	**$ 131,896**	**$ 141,386**	**$ 195,385**	**$ 204,875**	**$ 214,365**	**$ 223,855**	**$ 233,345**	**$ 242,835**	**$ 252,325**	**$ 261,815**	**$ 271,305**	**$ 280,795**	**$ 290,285**	**$ 299,775**	**$ 309,265**	**$ 314,010**	**$ 317,474**	**$ 4,898,519**
Operation Costs (Year n)			**$ 58,237**	**$ 69,473**	**$ 81,135**	**$ 93,235**	**$ 105,787**	**$ 118,804**	**$ 132,299**	**$ 146,287**	**$ 160,780**	**$ 175,796**	**$ 247,795**	**$ 265,028**	**$ 282,850**	**$ 301,279**	**$ 320,333**	**$ 340,028**	**$ 360,382**	**$ 381,415**	**$ 403,145**	**$ 425,592**	**$ 448,775**	**$ 472,715**	**$ 497,433**	**$ 515,167**	**$ 531,266**	**$ 6,935,036**
Net Present Value (2014)			**$ 52,823**	**$ 60,013**	**$ 66,750**	**$ 73,052**	**$ 78,940**	**$ 84,432**	**$ 89,545**	**$ 94,298**	**$ 98,705**	**$ 102,784**	**$ 137,982**	**$ 140,550**	**$ 142,859**	**$ 144,921**	**$ 146,748**	**$ 148,353**	**$ 149,746**	**$ 150,939**	**$ 151,941**	**$ 152,763**	**$ 153,414**	**$ 153,902**	**$ 154,238**	**$ 152,130**	**$ 149,414**	**$ 3,031,241**
Net Present Value																												
Capital Costs (2014)	**$ 31,849,463**																											
Operation Costs (2014)	**$ 3,031,241**																											
Net Present Value (2014)	**$ 34,880,704**																											

Average Flow (m3/d)	516	1,032	1,548	2,064	2,580	3,096	3,612	4,128	4,644	5,160	5,676	6,192	6,708	7,224	7,740	8,256	8,772	9,288	9,804	10,320	10,836	11,352	11,868	12,126	12,314

NET PRESENT VALUE CALCULATIONS FOR OPTION NO. 6 - SOLAR DRIED PELLETS FOR BENEFICIAL RE-USE AUTOTHERMAL AEROBIC DIGESTION AND MECHANICAL THICKENING

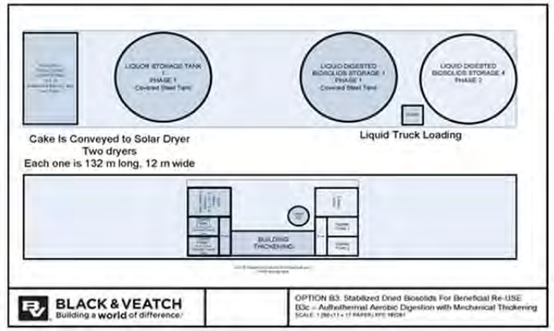
Rev. No	Date	Prepared By	Contributors	Reviewed and Authorized By
1	9/17/2014	Monica Rivera	Cecil Stegman Pat Coleman	Oya Kac

General Factors	Phase 1	Build Out
Peak hourly dry weather flow (m^3/d)	15,519	29,893
Average dry weather flow (m^3/d)	6,450	12,314

Economic Factors	Phase 1	Build Out
Interest (%)	5	5
Inflation (%)	2	2
Contingency (%SUM Capital Costs)	35%	
Year to Begin	2014	
Duration of Construction is 24 mo (time for mid point)	1	1

CAPITAL COST

System + Equipment and Piping	Phase 1 Units	Phase 1 Unit Cost	Phase 1 Cost	Phase 1 Installation	Phase 1 Total Cost	Build Out Addition Units	Build Out Addition Unit Cost	Build Out Addition Cost	Build Out Addition Installation	Build Out Addition Total Cost
EQUIPMENT										
Building Thickening/Dewatering										
No. of Thickening/Dewatering Buildings	1	-	-	-	-	-	-	-	-	-
Dewatering Feed Day Tank Mixers	2	$ 15,000	$ 30,000	50%	$ 45,000	-	-	-	-	-
Dewatering	4	$ 250,000	$ 1,000,000	100%	$ 2,000,000	-	-	-	-	-
Autothermic Aerobic Digestion (ATAD)/SNDR										
No. of ATAD Digesters + SNDR	1	$ 2,200,000	$ 2,200,000	100%	$ 4,400,000	1	$ 2,200,000	$ 2,200,000	100%	$ 4,400,000
Thickening Building										
No. of Thickening Buildings	1	-	-	-	-	-	-	-	-	-
Day Tank Mixers	2	$ 15,000	$ 30,000	50%	$ 45,000	-	-	-	-	-
No. of Thickeners	2	$ 250,000	$ 500,000	100%	$ 1,000,000	-	-	-	-	-
Liquid Digested Biosolids Storage										
No. of Liquid Digested Biosolids Storage Tanks	1	-	-	-	-	1	-	-	-	-
Liquid Truck Loading Pumps										
No. of Pumps	2		$ 100,000	50%	$ 150,000					
Liquor Sump Submersible Pump Station										
No. of Submersible Pumps	2	$ 205,000	$ 410,000	50%	$ 615,000					
Dewatering Liquor Storage Tank										
No. of Storage Tanks	1	-	-	-	-	-	-	-	-	-
Solar Dryer										
Solar Dryer	1	$ 1,500,000	$ 1,500,000	50%	$ 2,250,000	1	$ 1,500,000	$ 1,500,000	50%	$ 2,250,000
Front End Loader										
Front End Loader	1	$ 30,000	$ 30,000		$ 30,000	1	$ 30,000	$ 30,000		$ 30,000
Contingencies		25%			$ 2,633,750		25%			$ 1,670,000
Total Equipment Cost					$ 13,168,750					$ 8,350,000
CONSTRUCTION COSTS										
General Requirements		10%	$ 670,000				10%	$ 292,000		
Sitework		8%	$ 496,000				3%	$ 85,000		
Yard Piping			$ 100,000					$ 80,000		
Autothermic Aerobic Digestion (ATAD)/SNDR			$ 862,000					$ 862,000		
Building Thickening/Dewatering & Pad			$ 952,000							
Thickening Building			$ 460,000							
Liquid Digested Biosolids Storage Tank 1 & 2			$ 1,425,000					$ 1,475,000		
Dewatering Liquor Storage Tank			$ 1,425,000							
Liquid Truck Loading Pump Structure			$ 54,000							
Liquor Sump Submersible Pump Station			$ 10,000							
Instrumentation (2%)		2%	$ 105,760				2%	$ 48,340		
Electrical (15%)		15%	$ 809,064				15%	$ 369,801		
Contingencies		25%	$ 1,842,000				25%	$ 803,000		
Contractor Allowance		10%	$ 737,000				10%	$ 321,000		
Mid Point of Construction ($=P(1+i)n$)			$ 25,000					$ 11,000		
Total Probable Construction Cost			$9,972,824					$4,347,141		



ANNUAL OPERATIONAL COST								
Sytem	Phase 1 Value	Phase 1 Units	Phase 1 Unit Cost	Phase 1 Total Cost	Build Out Value	Build Out Units	Build Out Unit Cost	Build Out Total Cost
Chemical Consumption								
Polymer (Thickening)	15	kg/d	$ 5.00	$ 27,375	15	kg/d	$ 5.00	$ 27,375
Polymer (Dewatering)	50	kg/d	$ 5.00	$ 91,250	100	kg/d	$ 5.00	$ 182,500
Total Chemical Consumption				$ 118,625				$ 209,875
Power Factors								
Day Tank Mixers	9	kWh/d	0.1	$ 329	9	kWh/d	0.1	$ 329
Mechanical Thickeners (incl. feed and discharge pumps)	22	kWh/d	0.1	$ 803	22	kWh/d	0.1	$ 803
Thickened Sludge Tank Mixers	17	kWh/d	0.1	$ 621	17	kWh/d	0.1	$ 621
Autothermal Aerobic Digestion	1785	kWh/d	0.1	$ 43,733	3570	kWh/d	0.1	$ 87,465
Dewatering Feed Day Tank Mixers	1.8	kWh/d	0.1	$ 44	1.8	kWh/d	0.1	$ 44
Dewatering	20	kWh/d	0.1	$ 490	40	kWh/d	0.1	$ 980
Liquor Submersible Pumps	11	kWh/d	0.1	$ 402	22	kWh/d	0.1	$ 803
Total Average Power Consumption	1866	kWh/d	0.1	46,420	3682	kWh/d	0.1	91,044

Calculating NPV Costs													BUILD OUT															TOTAL
Item			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Capital Costs	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
System + Equipment and Piping	$ 13,168,750												$ 8,350,000															
Yard Piping + Building + HVAC	$ 9,972,824												$ 4,347,141															
Capital Costs (2014)	$ 23,141,574	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$ 12,697,141	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$ 35,838,715
Capital Costs (Year n)	$ 23,141,574	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$ 16,103,045	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$ 39,244,619
Net Present Value (2014)	$ 23,141,574	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$ 8,966,778	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$ 32,108,352
Operating Costs																												
Chemical Consumption Cost (Proration)			$ 9,490	$ 18,980	$ 28,470	$ 37,960	$ 47,450	$ 56,940	$ 66,430	$ 75,920	$ 85,410	$ 94,900	$ 104,390	$ 113,880	$ 123,370	$ 132,860	$ 142,350	$ 151,840	$ 161,330	$ 170,820	$ 180,310	$ 189,800	$ 199,290	$ 208,780	$ 218,270	$ 227,015	$ 236,479	
Power Consumption Cost			$ 46,420	$ 46,420	$ 46,420	$ 46,420	$ 46,420	$ 46,420	$ 46,420	$ 46,420	$ 46,420	$ 46,420	$ 91,044	$ 91,044	$ 91,044	$ 91,044	$ 91,044	$ 91,044	$ 91,044	$ 91,044	$ 91,044	$ 91,044	$ 91,044	$ 91,044	$ 91,044	$ 91,044	$ 91,044	
Operation Costs (2014)			$ 55,910	$ 65,400	$ 74,890	$ 84,380	$ 93,870	$ 103,360	$ 112,850	$ 122,340	$ 131,830	$ 141,320	$ 195,434	$ 204,924	$ 214,414	$ 223,904	$ 233,394	$ 242,884	$ 252,374	$ 261,864	$ 271,354	$ 280,844	$ 290,334	$ 299,824	$ 309,314	$ 314,059	$ 317,523	$ 4,898,596
Operation Costs (Year n)			$ 58,169	$ 69,403	$ 81,063	$ 93,162	$ 105,713	$ 118,728	$ 132,222	$ 146,208	$ 160,700	$ 175,714	$ 247,858	$ 265,091	$ 282,915	$ 301,345	$ 320,400	$ 340,096	$ 360,452	$ 381,487	$ 403,218	$ 425,666	$ 448,851	$ 472,792	$ 497,512	$ 515,247	$ 531,149	$ 6,935,362
Net Present Value (2014)			$ 52,761	$ 59,953	$ 66,691	$ 72,995	$ 78,885	$ 84,378	$ 89,493	$ 94,247	$ 98,656	$ 102,736	$ 134,016	$ 140,584	$ 142,891	$ 144,952	$ 146,779	$ 148,383	$ 149,775	$ 150,967	$ 151,969	$ 152,790	$ 153,440	$ 153,928	$ 154,263	$ 152,154	$ 149,437	$ 3,031,121
Net Present Value																												
Capital Costs (2014)	$ 32,108,352																											
Operation Costs (2014)	$ 3,031,121																											
Net Present Value (2014)	$ 35,139,473																											

Average Flow (m3/d)	516	1,032	1,548	2,064	2,580	3,096	3,612	4,128	4,644	5,160	5,676	6,192	6,708	7,224	7,740	8,256	8,772	9,288	9,804	10,320	10,836	11,352	11,868	12,126	12,314

EVALUATION OF TREATMENT ALTERNATIVES FOR MIDHURST WASTEWATER TREATMENT PLANT

B&V PROJECT NO. 180261

APPENDIX 7

DETAILED EVALUATION MATRIX FOR BIOSOLIDS TREATMENT ALTERNATIVES

BLACK & VEATCH
Building a world of difference.®

EVALUATION MATRIX FOR SHORT LISTED BIOSOLIDS MANAGEMENT TREATMENT ALTERNATIVE

PRIMARY CRITERIA		SECONDARY CRITERIA		ABSOLUTE WEIGHT (WT)	OPTION NO 1 – LIQUID SLUDGE WITH AEROBIC DIGESTION		OPTION NO 2 – CAKE WITH AEROBIC DIGESTION		OPTION NO 3 – PELLETS WITH AEROBIC DIGESTION		OPTION NO 4 – LIQUID SLUDGE WITH ATAD		OPTION NO 5 – CAKE WITH ATAD		OPTION NO 6 – PELLETS WITH ATAD		COMMENTS
CRITERIA	WEIGHT	CRITERIA	WEIGHT		SCORE	WT SCORE	SCORE	WT SCORE	SCORE	WT SCORE	SCORE	WT SCORE	SCORE	WT SCORE	SCORE	WT SCORE	
Social / Culture	10%	**Aesthetic impacts - Architectural Aesthetics (plant appearance)**	10	1	5	**5**	1	**1**	3	**3**	6	**6**	2	**2**	4	**4**	Liquid storage alone has less visual impact than solar dryer and cake pad options. The cake pad and associated shoveling to truck have the highest visual impact. ATAD takes less space and is easier to control for odours than conventional aerobic digestion.
		Truck traffic (during construction and operation)	10	1	1	**1**	3	**3**	5	**5**	2	**2**	4	**4**	6	**6**	The drier the product the less is removed by truck from site. ATAD destroys more sludge than conventional aerobic digestion so less biosolids product is created. Traffic during construction comparable.
		Noise Impact (during operation)	40	4	5	**20**	1	**4**	3	**12**	6	**24**	2	**8**	4	**16**	There is less sludge process equipment, and therefore less associated noise risk, with liquid storage and the most with cake production. ATAD is located further from the property boundary than conventional aerobic digesters.
		Odour (during operation)	40	4	5	**20**	1	**4**	3	**12**	6	**24**	2	**8**	4	**16**	There is less biosolids handling, and therefore less odour risk, with liquid storage and the most with cake production. Fewer biosolids are produced with ATAD thereby further reducing odour risk.
Technical	40%	**Ability to comply with the regulations or target objectives**	10	4	3	**12**	1	**4**	2	**8**	6	**24**	4	**16**	5	**20**	ATAD is a more controlled digestion environment that pasteurizes the biosolids minimizing risk of not meeting objectives. The ease of dewatering the biosolids increases ability to meet objectives.
		Process robustness	25	10	5	**50**	3	**30**	1	**10**	6	**60**	4	**40**	2	**20**	ATAD has proven robustness especially during winter months. Liquid storage is less complex than cake production and finally pellet production, thereby increasing process robustness.
		Energy Requirements	20	8	5	**40**	3	**24**	1	**8**	6	**48**	4	**32**	2	**16**	The options are ranged based on the installed power for installed equipment.
		Suitability for Phasing	25	10	6	**60**	4	**40**	2	**20**	5	**50**	3	**30**	1	**10**	Liquid storage is the easiest to phase as less process equipment (dewatering, dryers) is required. Conventional aerobic digestion is easier to operate at low loading rates than ATAD.
		Time to Construct	10	4	5	**20**	3	**12**	1	**4**	6	**24**	4	**16**	2	**8**	Less equipment is required for liquid storage construction and most for pellets. Conventional aerobic digestion has a longer construction time than ATAD due to the ground preparation and concrete work required.

PRIMARY CRITERIA		SECONDARY CRITERIA		ABSOLUTE WEIGHT (WT)	OPTION NO 1 – LIQUID SLUDGE WITH AEROBIC DIGESTION		OPTION NO 2 – CAKE WITH AEROBIC DIGESTION		OPTION NO 3 – PELLETS WITH AEROBIC DIGESTION		OPTION NO 4 – LIQUID SLUDGE WITH ATAD		OPTION NO 5 – CAKE WITH ATAD		OPTION NO 6 – PELLETS WITH ATAD		COMMENTS
CRITERIA	WEIGHT	CRITERIA	WEIGHT		SCORE	WT SCORE	SCORE	WT SCORE	SCORE	WT SCORE	SCORE	WT SCORE	SCORE	WT SCORE	SCORE	WT SCORE	
		Operation and Maintenance impacts (including staffing)	5	2	6	**12**	2	**4**	4	**8**	5	**10**	1	**2**	3	**6**	Liquid storage has the least O&M requirements, pellets can be produced most of the year, while cake can only be produced over a few months and must all be trucked off-site at this time. Conventional aerobic digestion is easier to operate and maintain than ATAD.
		Site Requirement	5	2	4	**8**	3	**6**	1	**2**	6	**12**	5	**10**	2	**4**	Solar dryers take the largest land area, while conventional aerobic digestion takes more space than ATAD for liquid and cake storage. Liquid storage takes less land area than cake.
Environmental	20%	**Sustainability**	15	3	3	**9**	2	**6**	5	**15**	4	**12**	1	**3**	6	**18**	Pellets with ATAD has the greatest sustainability as 3 stable products are produced, followed by pellets with conventional aerobic digestion for the 3 products. Less maintenance is required for liquid over cake. The benefits of a stable product from ATAD outweigh those from conventional aerobic digestion but for cake the benefits from the greater ease of operating conventional aerobic digestion outweigh the use of ATAD.
		Health and Safety to the public	40	8	4	**32**	2	**16**	5	**40**	3	**24**	1	**8**	6	**48**	Fewer trucks are required to move pellet product. Cake has more risk than liquid storage due to the use of the cake pad. There is more risk of fugitive emissions from ATAD than conventional aerobic digestion.
		Minimize waste	30	6	1	**6**	2	**12**	3	**18**	4	**24**	5	**30**	6	**36**	Fewer biosolids are produced from ATAD than conventional aerobic digestion. The dryer the product, the less is produced.
		Greenhouse Gas	15	3	3	**9**	1	**3**	4	**12**	6	**18**	2	**6**	5	**15**	Liquid via ATAD is the best as ammonia does not need to be oxidized. Following this the use of solar energy in the dryers saves energy and the requirement to add nitrogen to the process.
Economic	30%	**Capital Cost estimates**	30	9	6	**54**	4	**36**	3	**27**	5	**45**	2	**18**	1	**9**	
		Operation and Maintenance costs	40	12	6	**72**	3	**36**	4	**48**	5	**60**	1	**12**	2	**24**	
		Life cycle analysis	**30**	**9**	**6**	**54**	4	**36**	**3**	**27**	**5**	**45**	**2**	**18**	**1**	**9**	
		TOTAL SCORE		**100**		**484**		**277**		**279**		**512**		**263**		**285**	

EVALUATION OF TREATMENT ALTERNATIVES FOR MIDHURST WASTEWATER TREATMENT PLANT

B&V PROJECT NO. 180261

APPENDIX 8

PRELIMINARY PREFERRED TREATMENT SOLUTION SITE LAYOUTS

BLACK & VEATCH
Building a world of difference.®

ENVIRONMENTAL PROTECTION AREA II

BUFFER ZONE TO ENVIRONMENTAL PROTECTION AREA II

PROPERTY LINE

ACCESS GATE FOR WELL FIELD

WELL FIELD GRAVEL AREA

TW22

OW19-3

OW19-4

OW19-2

ACCESS GATE

ACCESS ROAD

WATER TREATMENT PLANT SITE

UNDERGROUND RESERVOIR

WASTEWATER TREATMENT PLANT SITE

CARSON WATER TREATMENT PLANT

STORM OUTLET PIPE TO DETENTION POND

STORM WATER MANAGEMENT POND AREA

WILSON DRIVE

SNOW VALLEY ROAD

100m

LEGEND

- ENVIRONMENTAL PROTECTION AREA II
- BUFFER ZONE TO ENVIRONMENTAL PROTECTION AREA II
- WATER TREATMENT PLANT SITE BOUNDARY
- WELL FIELD GRAVEL AREA
- PROPERTY LINE
- FENCE
- 238.00 EXISTING CONTOUR
- 235.00 PROPOSED CONTOUR MAJOR
- 238.00 PROPOSED CONTOUR MINOR
- STORM SEWER
- PROPOSED MUNICIPAL WELL SITE
- BUILDING
- TANK
- ROAD

0 10 20 30m

1:1000

OVERALL SITE PLAN

SCALE 1 : 1000

BLACK & VEATCH
Building a world of difference.

DESIGN	AP
DRAWN	AVK
QA/QC	

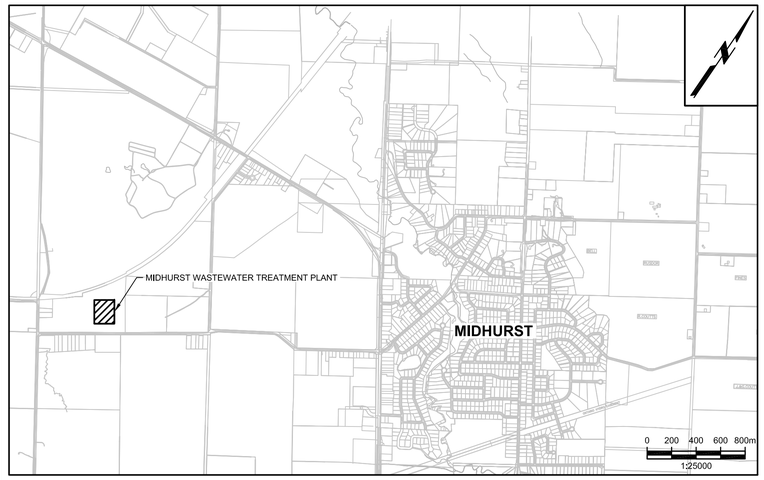
TOWNSHIP OF SPRINGWATER
MIDHURST WASTEWATER TREATMENT PLANT
OVERALL SITE PLAN

DWG. NO. G-101

CONT. NO.

SERIES NO.

C:\pw_working\engpw\d0882580\G-101.dwg BY MAY 10, 2016



KEY-PLAN
SCALE 1 : 25000

SITE PLAN
SCALE 1 : 500

LIQUID DIGESTED BIOSOLIDS STORAGE 1 PHASE 1
LIQUID DIGESTED BIOSOLIDS STORAGE 2 PHASE 1
LIQUID DIGESTED BIOSOLIDS STORAGE 3 PHASE 2
LIQUID DIGESTED BIOSOLIDS STORAGE 4 PHASE 2
PUMPS
FF 238.30
ENVIRONMENTAL PROTECTION AREA II
BUFFER ZONE TO ENVIRONMENTAL PROTECTION AREA II
DIGESTER PHASE 1
DIGESTER PHASE 2
ROOM PHASE 2
FF 238.70
THICKENING BUILDING PHASE 1
SECONDARY CLARIFIER 1 PHASE 1
SECONDARY CLARIFIER 2 PHASE 1
SECONDARY CLARIFIER 3 PHASE 2
RAS PUMPING STATION BUILDING PHASE 1
RAS PUMPING STATION BUILDING PHASE 1
STAND BY POWER GENERATOR
STORM SEWER
ACCESS GATE FOR WELL FIELD
WELL FIELD GRAVEL AREA
BLOWERS AND CHEMICAL PUMPS BUILDING PHASE 1
STEP FEED BNR BIO-REACTOR PHASE 1
STEP FEED BNR BIO-REACTOR PHASE 2
FG 238.00
PROPERTY LINE
TW22
OW19-3
OW19-2
OW19-1
ACCESS GATE
UNDERGROUND RESERVOIR
CHEMICAL STORAGE TANKS
BLOWERS BUILDING PHASE 2
STAFF PARKING
FF 238,30
FF 238,50
FF 238,80
FF 237,85
CARSON WATER TREATMENT PLANT
ADMINISTRATION BUILDING
STORM SEWER OUTLET TO STORM DETENTION POND
CONCRETE CURB
WATER TREATMENT PLANT SITE
TERTIARY TREATMENT BUILDING PHASE 1
HEADWORKS AND PUMPING STATION BUILDING PHASE 1 & 2
TERTIARY TREATMENT BUILDING PHASE 2
SNOW VALLEY ROAD
8,66m
R10.67m
45.25m
0.5%
2.0%
2.6%
6%

KEY

FF FINISHED FLOOR
FG FINISHED GROUND

LEGEND

- ENVIRONMENTAL PROTECTION AREA II
- BUFFER ZONE TO ENVIRONMENTAL PROTECTION AREA II
- WATER TREATMENT PLANT SITE BOUNDARY
- WELL FIELD GRAVEL AREA
- PROPERTY LINE
- FENCE
- EXISTING CONTOUR
- PROPOSED CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- STORM SEWER
- STORM MH
- STORM CB
- PROPOSED MUNICIPAL WELL SITE
- BUILDING
- TANK
- ROAD

0 5 10 15m
1:500

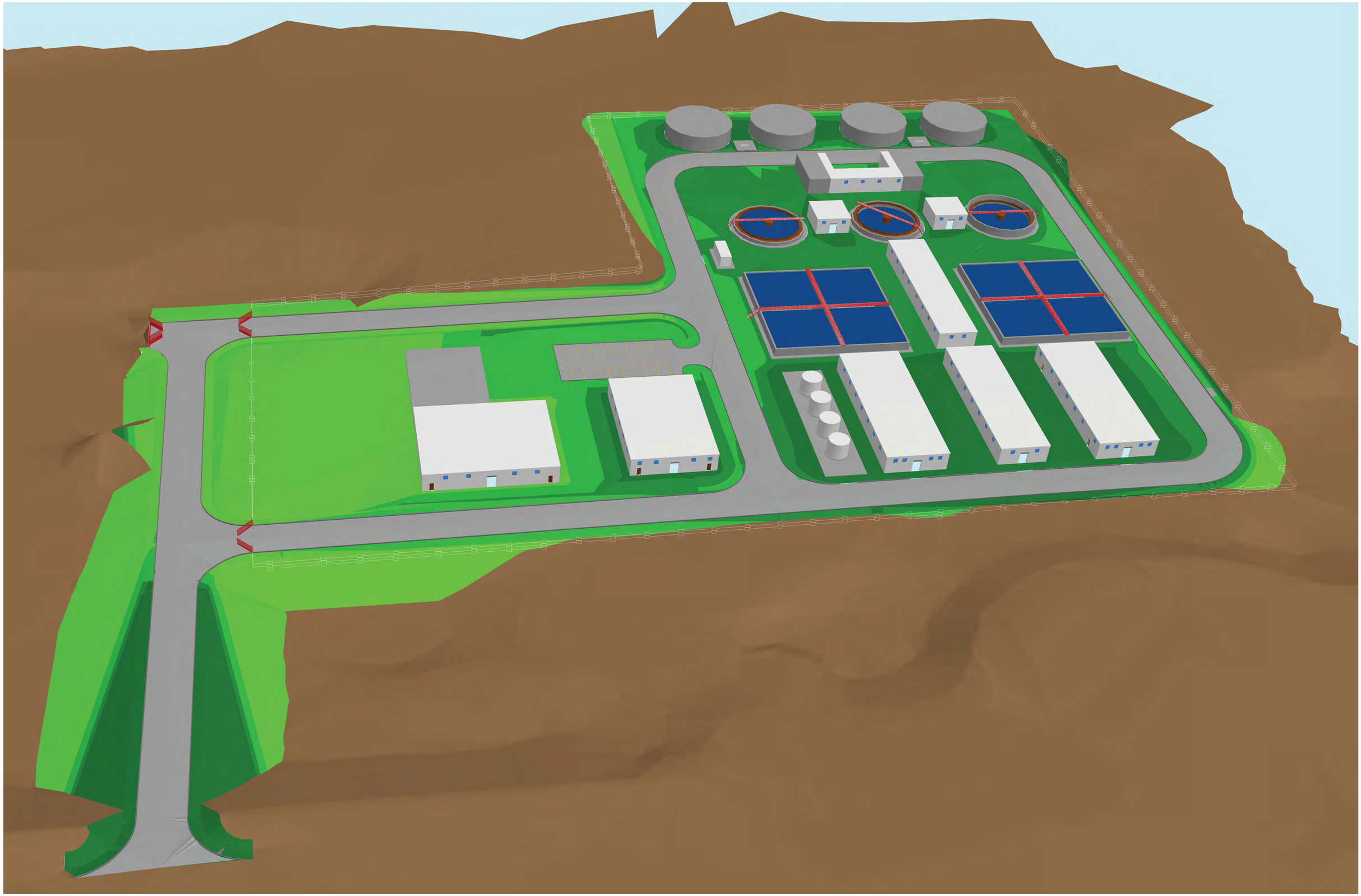
BLACK & VEATCH
Building a world of difference.

DESIGN	AP
DRAWN	AVK
QA/QC	

TOWNSHIP OF SPRINGWATER
MIDHURST WASTEWATER TREATMENT PLANT
SITE PLAN

DWG. NO. G-102
CONT. NO.
SERIES NO.

C:\pw_working\cngpw\d0882580\G-102.dwg BV MAY 10, 2016



BLACK & VEATCH
Building a world of difference.®

DESIGN	TOWNSHIP OF SPRINGWATER MIDHURST WASTEWATER TREATMENT PLANT	DWG. NO.
DRAWN AVK	CONCEPTUAL SITE 3D MODEL	CONT. NO.
QA/QC		SERIES NO.

C:\pw_working\cngpw\d0882580\G-104.dwg BV FEB 19, 2016

BLACK & VEATCH
Building a world of difference.

DESIGN	
DRAWN	AVK
QA/QC	

TOWNSHIP OF SPRINGWATER
MIDHURST WASTEWATER TREATMENT PLANT

CONCEPTUAL
SITE 3D MODEL

DWG. NO.

CONT. NO.

SERIES NO.

C:\pw_working\cngpw\d0882580\G-104.dwg BV FEB 19, 2016

EVALUATION OF TREATMENT ALTERNATIVES FOR MIDHURST WASTEWATER TREATMENT PLANT

B&V PROJECT NO. 180261

APPENDIX 9

TECHNICAL MEMORANDUM: DESIGN BASIS FOR MIDHURST WASTEWATER TREATMENT PLANT

BLACK & VEATCH
Building a world of difference.®

TECHNICAL MEMORANDUM:

DESIGN BASIS FOR MIDHURST WASTEWATER TREATMENT PLANT

Class EA Phase 3 & 4 for the Midhurst Secondary Plan

B&V PROJECT NO. 180261

PREPARED FOR

The Township of Springwater

C/O AINLEY & ASSOCIATES LIMITED

MAY 2018

BLACK & VEATCH
Building a world of difference.®

Table of Contents

LIST OF TABLES

LIST OF FIGURES

1.0 Background

Infrastructure requirements to accommodate future growth planned within the Midhurst Secondary Plan were considered in accordance with Phases 1 and 2 of the Municipal Class EA (2000, as amended in 2007 and 2011) and documented in the "Midhurst Master Plan – Phase 1 & 2 - Water, Wastewater & Transportation, Ainley, July 2009" ("Master Plan"). The Master Plan determined that the Township of Springwater would construct a new sewage system to service growth within the Midhurst Secondary Plan area with the provision for expansion to service the currently developed area in Midhurst, including sanitary collection system, pump stations, treatment plant and outfall to a receiving water body.

The Master Plan concluded that a Class EA Study will be required since the new sewage system is a Schedule C activity. Phases 3 and 4 of the Municipal Class EA planning process is currently being carried out by Ainley & Associates Limited on behalf of the Township of Springwater.

2.0 Objective

The objective of this memorandum is to present the design basis for the proposed Midhurst Wastewater Treatment Plant (MWWTP). This design basis will be used to develop and evaluate alternative design concepts as part of the Phase 3 & 4 of the Midhurst Class EA Study. In accordance with the Master Plan, a new municipal wastewater treatment plant will be constructed to serve existing and proposed residential, commercial and light industrial development in the Midhurst Secondary Plan Area.

3.0 Units and Population

3.1 UNITS

The design basis is approximately 9,546 units of which 350 are Allowance for Existing and Future Public and Government Employment Lands and 1,338 units account for existing serviced and unserviced residential units in the existing Midhurst system (Equivalent Units) (Ainley Group, 2009).

3.2 PHASING

For purposes of this assessment, we have divided the building out of the Midhurst Secondary Plan into a Phase 1 and full Build Out (described below). However, even within Phase 1, it is anticipated that construction will occur in sub-phases, with not all of Phase 1 being built at one time. The same is true of Full Build Out where sub-phasing is anticipated. While actual timing of construction is market dependent, for purposes of this assessment, it has been assumed that absorption will be between 350 to 400 units per year. There will be opportunity to phase the construction of the MWWTP, including the potential to construct a series of wastewater treatment plant modules for each sub-phase of construction within Phase 1 and Full Build Out to serve that sub-phase of development (i.e the plant will be constructed in phases to match the Build Out).

In accordance with the Master Plan, 2009, one unit is equivalent to 3 persons (Ainley Group, 2009).

Table 3-1 presents the summary of design basis for units and population.

Table 3-1 Units and Population

	PHASE 1	BUILD OUT
Units	5,000	9,546
Person Equivalents	15,000	28,638

Figure 1 illustrates the average annual flow from the start of Phase 1 until the completion of full Build Out. The Rated Capacity is increased by the addition of process units at least two years before it is required.

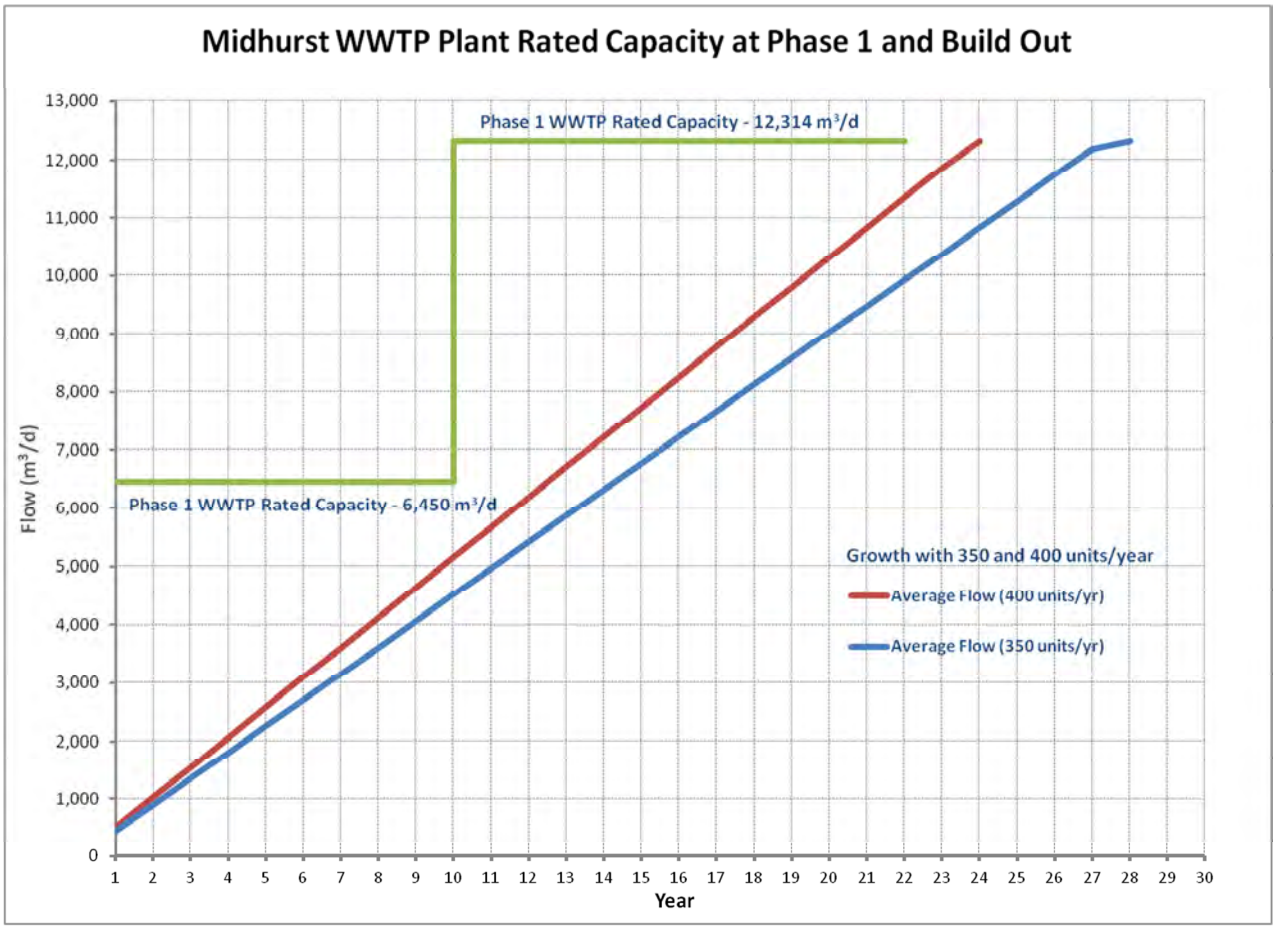


Figure 1 - WWTP Rated Capacity Expansions at Phase 1 and Build Out

4.0 Flows

4.1 FLOW GENERATION RATE

One unit is equivalent to 1.02 m^3/day of dry weather flow and 0.27 m^3/day of extraneous flow (Ainley Group, 2009). At three persons per unit, this equals to 0.34 m^3 plus 0.09 m^3 per person per

day. This is equal to 430 L per person per day. Table 4-1 summarizes the flow generation per person.

Table 4-1 Flow Generation per Person

	VALUE	UNITS
Dry weather flow (G_{dwf})	340	L/d per person
Extraneous flow (G_{ext})	90	L/d per person
Average flow	430	L/d per person

4.2 PEAK HOURLY FLOW PEAKING FACTOR

The ratio of the peak day dry weather flow to the dry weather flow is given by the Harmon Formula (Ministry of the Environment (Ontario), 2008)(Page 5-11):

$$PF = 1 + \frac{14}{4 + P^{0.5}}$$

Where P is population in 1,000's.

Therefore, the peaking factor for Phase 1 is 2.78 and for the full Build Out 2.50.

4.3 PEAK HOURLY FLOW

The peak day flow is the average dry weather flow multiplied by the peaking factor plus the extraneous flow (Ministry of the Environment (Ontario), 2008).

$$Q_{PD=}\left(\left(G_{dwf} * PF\right) + G_{ext}\right) * Population$$

The peak hourly flow for Phase 1 is 15,519 m3/d and full Build Out is 26,891 m3/d.

4.4 PEAK INSTANTANEOUS FLOWS

The peak instantaneous flow to the plant will be the sum of the pumped flows from the terminal pump stations. It is recommended that a receiving chamber accept these flows and provide some balancing if there is no balancing at the pump stations.

4.5 SUMMARY

The design basis is that the peak flow to treatment will be the peak hourly flow. Table 4-2 presents the design basis for flows for various conditions.

Table 4-2 Flow Design Basis

	PHASE 1	BUILD OUT
Average dry weather flow (m^3/d)	6, 450	12,314
Peak hourly dry weather flow (m^3/d)	15,519	26,891

The Average Dry Weather Flow Rates are consistent with the flows used in the modeling to establish effluent limits (Hutchinson & Nesbitt, 2013).

5.0 Loads

5.1 GENERATION RATES

The generation rates and concentrations presented in Table 5-1 are obtained from the MOE Design Guidelines for Sewage Works (Ministry of the Environment (Ontario), 2008) : pages 8-9 and 8-17.

Table 5-1 Load Generation Rates

	g/(person*d)	mg/L
cBOD5	75	175
TSS	90	209
TKN	13	30
Total Phosphorus (TP)	3	7

5.2 PEAKING FACTORS

The maximum month loads are typically 1.25 times the average load.

5.3 DESIGN LOADS

Table 5-2 presents the summary of load for Phase 1 and Build Out conditions.

Table 5-2 Summary of Loads

LOAD IN KG/D	PHASE 1	BUILD OUT
cBOD5	1,125	2,148
TSS	1,350	2,577
TKN	195	372
Total Phosphorus (TP)	45	86

6.0 Characteristics

Table 6-1 presents characteristics of raw wastewater.

Table 6-1 Characteristics

	VALUE	UNITS
Inert to total suspended solids	15%	w/w
Which is at average flow	31	mg/L
COD to $cBOD_5$	2.1	w/w
Alkalinity	200	As mg/L $CaCO_3$

6.1 TEMPERATURE

Table 6-2 presents the air temperature data is from the 1981-2010 Climate Normals for the Barrie WPCC (Environment Canada).

Table 6-2 Design Basis for Temperature

	AIR (RH)	AIR (°C)	WASTEWATER
Peak day	100%	36.5	-
Peak over one SRT	80%	20	20
Average	TBA	7	14

	AIR (RH)	AIR (°C)	WASTEWATER
Minimum over one SRT	0%	-12	10
Minimum day	0%	-35	-

There are only 10.4 days over 30°C and less than one day less than -30°C.

6.2 FRACTIONATION

The design is based on default wastewater characteristics for raw sewage.

6.3 SLUDGE MANAGEMENT

The biosolids will not be anaerobically digested therefore return liquor nutrient loading will not be a significant issue.

7.0 Effluent Quality

7.1 EFFLUENT LIMITS

Table 7-1 summarizes the effluent limits for Phase 1 of this project.

Table 7-1 Phase 1 Effluent Limits

DESCRIPTION	SAMPLE TYPE	CONCENTRATION	
		VALUE	UNITS
Carbonaceous Biochemical Oxygen Demand ($cBOD_5$)	Composite	15	mg/L Annual Average
Total Suspended Solids (TSS)*	Composite	15	mg/L Annual Average
Ammonia-N June 1 to Oct 31 Nov 1 to May 31	Composite	 1.5 3.0	mg-N/L Monthly Average
Total Inorganic Nitrogen (TIN) Ammonia-N + Oxidized-N	Composite	15.4	mg-N/L
Total Phosphorus (TP)	Daily Composite	0.05	mg/L
Disinfection (*e. coli*)*	Monthly Geometric Mean Density	100	/100 mL

*The objective will be set by the MOECC at the time the ECA is issued.

Table 7-2 lists the proposed build-out limits for the wastewater treatment plant.

Table 7-2 Build Out Limits

DESCRIPTION	SAMPLE TYPE	CONCENTRATION	
		VALUE	UNITS
Carbonaceous Biochemical Oxygen Demand ($cBOD_5$)	Composite	15	mg/L Annual Average
Total Suspended Solids (TSS)*	Composite	15	mg/L Annual Average
Ammonia-N June 1 to Oct 31 Nov 1 to May 31	Composite	 1.0 2.0	mg-N/L Monthly Average
Total Inorganic Nitrogen (TIN) Ammonia-N + Oxidized-N	Composite	15.4	mg-N/L
Total Phosphorus (TP)	Daily Composite	0.03	mg/L
Disinfection (*e. coli*)*	Monthly Geometric Mean Density	100	/100 mL
*The objective will be set by the MOECC at the time the ECA is issued.			

7.2 OBJECTIVES

In addition to the effluent limits, it is suggested to establish operational objectives for the design evaluation as listed in Table 7-3.

Table 7-3 Phase 1 Operational Objectives

DESCRIPTION	SAMPLE TYPE	CONCENTRATION	
		VALUE	UNITS
Carbonaceous Biochemical Oxygen Demand ($cBOD_5$)	Composite	10	mg/L Annual Average
Total Suspended Solids (TSS)*	Composite	10	mg/L Annual Average
Ammonia-N June 1 to Oct 31 Nov 1 to May 31	Composite	 1.0 2.0	mg-N/L Daily Average
Oxidized Nitrogen	Composite	15	mg-N/L
Total Phosphorus (TP)	Daily Composite	0.03	mg/L
Disinfection (*e. coli*)*	Monthly Geometric	100	/100mL

DESCRIPTION	SAMPLE TYPE	CONCENTRATION	
	Mean Density		

*The objective will be set by the MOECC at the time the ECA is issued.

8.0 Works Cited

Ainley Group. (2009, July). *Town of Springwater. Class Environmental Assessment Study for Midhurst Water, Wastewater and Transportation Master Plan. Phase 1 and 2 Report* . Ainley Group, Consulting Engineers and Planners.

Environment Canada. (n.d.). *Canadian Climate Normals 1971-2000 Station Data. Barrie WPCC, Climate ID 6110557.* Retrieved August 18, 2013

Hutchinson, N., & Nesbitt, R. (2013). *MEMO Dated December 11, 2013 RE: J130030 - Willow Creek Effluent Limits - Phase 3 EA Input.* Bracebridge: Hutchinson Environmental Sciences Ltd.

Ministry of the Environment (Ontario). (2008). *Design Guidelines for Sewage Works.* Retrieved August 15, 2013, from Ministry of the Environment (Ontario): http://www.ene.gov.on.ca/stdprodconsume/groups/lr/@ene/@resources/documents/resource/std01_079496.pdf

APPENDIX 'S'

Midhurst WWTP and WTP Facilities – RWDI Air Inc., May 2018 Odour Mitigation Assessment for Midhurst Wastewater Treatment Plant and Sewage Pumping Stations - Black & Veatch, May 2018

REPORT

MIDHURST WWTP AND WTP FACILITIES

MIDHURST, ONTARIO

ENVIRONMENTAL IMPACT ASSESSMENT: ODOUR AND AIR QUALITY

RWDI #1302274

May 28, 2018

SUBMITTED TO

Oya Koc, P.Eng.
Project Manager
KocO@bv.com

Black & Veatch
50 Minthorn Blvd. | Suite 501
Markham, Ontario L3T 7X8

T: 905.370.1256

SUBMITTED BY

Alain Carriere
Senior Project Manager | Associate
Alain.Carriere@rwdi.com

RWDI AIR Inc.
Consulting Engineers & Scientists
600 Southgate Drive
Guelph, Ontario N1G 4P6

T: 519.823.1311 | ext. 2398
F: 519.823.1316

EXECUTIVE SUMMARY

Black & Veatch retained RWDI AIR Inc. on behalf of Ainley Group as part of the Township of Springwater Class Environmental Assessment (Class EA) for the Midhurst Water, Wastewater and Transportation Master Plan. RWDI was retained to conduct preliminary dispersion modelling to predict the potential impacts for odour and air quality associated with the operations of the eventual full build-out of the proposed Midhurst Wastewater Treatment Plant (WWTP) and Water Treatment Plant (WTP), to assess the air quality impacts from a worst-case pumping station and to qualitatively assess the air quality impacts of a lane widening of a nearby road. This assessment investigates odour and air quality impacts from equipment and operations associated with the water and wastewater facilities at two locations. The "Snow Valley/Wilson Road Site" located north of Snow Valley Road and east of Wilson Drive, includes a wastewater treatment plant and a water treatment facility with a pumping station located to the south of the WWTP and WTP across Snow Valley Road. The "Doran Site", along Gill Road north of Doran Road, includes a water treatment facility and sewage pumping station. This assessment is based on Ministry of the Environment and Climate Change (MOECC) guidelines as provided in the Ontario Regulation 419/05 and addresses MOECC comments dated April 30, 2018.

Air emissions were modelled from all significant sources at the WWTP, WTP and nearest sewage pumping station. Model results show that the maximum predicted concentrations of hydrogen sulphide, total reduced sulphur, ammonia, sulphur dioxide and nitrogen oxide were less than their respective MOECC POI Limits. The maximum modelled odour concentration at one nearby sensitive receptor was 4.16 odour units (OU). This exceeds the typical MOECC limit of 1 OU, however, the MOECC allows exceedances of this limit where the frequency of exceedance is not more than 0.5%. In this case the frequency of exceedance was 0.4%, and is therefore acceptable. The frequency of exceedance is equivalent to 35 hours per year.

Predicted concentrations for all individual contaminants of significance were found to be less than their respective Standards or guidelines under O. Reg. 419/05 at all receptors in the area for both the Snow Valley/Wilson Road Site and the Doran Site. For odour, modelling of a conservative scenario predicted concentrations somewhat above the recommended limit of 1 OU at a nearby receptor, however the frequency of occurrence of this exceedance was less than 0.5%, which is considered acceptable by the MOECC.

Potential air quality impacts from traffic associated with the WWTP and for traffic on Wilson Drive and Snow Valley Drive were also considered, notably on a section of Wilson Road that will be widened from 2 lanes to 4 lanes. Based on studies with similar traffic levels the potential air quality impacts were considered minor, and a setback distance of 20 m from the edges of the roadway to nearby receptors would be adequate to mitigate any impacts.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1 INTRODUCTION

Black & Veatch retained RWDI AIR Inc. as part of the Township of Springwater Class Environmental Assessment (Class EA) for the Midhurst Water, Wastewater and Transportation Master Plan. RWDI was retained to conduct dispersion modelling to predict the potential impacts for odour and air quality associated with the operations of the eventual full build-out of the proposed Midhurst Wastewater Treatment Plant (WWTP) and Water Treatment Plant (WTP), to assess the air quality impacts from a worst-case pumping station and to qualitatively assess the proposed changes a nearby road (lane widening of a section of Wilson Road). This assessment investigates odour and air quality impacts from equipment and operations associated with the water and wastewater facilities at two locations. The "Snow Valley/Wilson Road Site", located north of Snow Valley Road and east of Wilson Drive, includes a wastewater treatment plant and a water treatment facility with a pumping station located to the south of the WWTP and WTP across Snow Valley Road. The "Doran Site" along Gill Road north of Doran Road, includes a water treatment facility and sewage pumping station. This assessment is based on Ministry of the Environment and Climate Change (MOECC) guidelines as provided in the Ontario Regulation 419/05 and addresses MOECC comments dated April 30, 2018.

2 FACILITY DESCRIPTION

The proposed Midhurst WWTP and WTP are to provide primary water supply and wastewater treatment for increased future development in the surrounding area.

2.1 Snow Valley/Wilson Road Site

The Snow Valley/Wilson Road, illustrated in **Figure 1**, will consist of the wastewater treatment plant, a water treatment plant, a well field, a storm management pond and a pumping station to the south, located across South Valley Road. Process units in the wastewater treatment plant (situated to the northeast of the property) will include a headworks and pumping station, buildings primarily used for blowers, pumping and tertiary treatment, aeration tanks, clarifiers, a thickening building with digesters, biofilters, storage tanks for chemicals and biosolids, and standby generators. The biosolids produced at the WWTP will be transferred off-site for beneficial reuse. The main odour mitigation control at the WWTP consists of the biofilter at the headworks building and two biofilters servicing the ATADs, Sludge Storage Tanks, Truck Loading Area and Thickening Building. Proper capture of odorous air from these sources and proper operation of the biofilters will adequately mitigate odours from these sources. It is assumed that a control efficiency of 80% for TRS species and odour will be achieved by the biofilters, and that all manufacturer recommendations for proper operation and maintenance of the biofilters will be followed. A preventative maintenance plan will be put in place to ensure the units remain functioning efficiently.

A facility layout for the Snow Valley/Wilson RoadSite was obtained from CAD drawings supplied by B&V and are illustrated in **Figure 1**. The building heights for the Snow Valley/Wilson RoadSite were provided by B&V. The sensitive receptors included in the dispersion model are illustrated in **Figure 2**.

2.2 Doran Site

The Doran Site, illustrated in **Figure 3**, will consist of a sewage pumping station, a water treatment plant, a reservoir, and an enclosed stand by generator.

The building heights associated with the Doran Site were approximated from similar process units within the Snow Valley/Wilson RoadSite.

2.3 Pumping Stations

It is anticipated that ten (10) pumping stations will be required to service the existing and proposed development in the study area. For this assessment one worst case pumping station was chosen to be evaluated to provide an indication of the maximum potential impacts. The pumping station to the south of the Snow Valley/Wilson RoadSite was chosen because of its close proximity to a residential neighbourhood. Each of the pumping stations will consist of a pumping station and an enclosed stand by generator.

3 REGULATORY OVERVIEW

Section 14 of Ontario's *Environmental Protection Act* (EPA) prohibits discharges of contaminants that cause or may cause an adverse effect. Odours are included in the definition of contaminants. The EPA has several definitions of adverse effect which include the following two (2) most common and applicable examples:

- "(g) loss of enjoyment of normal use of property, and
- (h) interference with the normal conduct of business".

Section 9 of the Act requires that any facility that may discharge a contaminant into the natural environment must be done in accordance with an Environmental Compliance Approval. Both the Snow Valley/Wilson Road Site and the Doran site are in the stages of designing the facility and do not have an Environmental Compliance Approval. Once the design has been finalized, an Emission Summary and Dispersion Modelling Report will be completed in accordance with O. Reg. 419/05 to show compliance with all contaminants outlined with its operations prior to construction.

In March 2005, the MOECC published a position paper in which it proposed to develop an odour policy framework. As part of this position paper, the Ministry recognized the need to review odour-based limits. The Ministry now recognizes that the potential for an objectionable effect depends on several other factors besides the intensity of the odour. These other factors are the frequency, duration, offensiveness and location of the odour.

In June 2006, the Ministry released another position paper that outlines a Proposed Approach for the Implementation of Odour-Based Standards and Guidelines. In this paper, the Ministry recommended that odour detection thresholds for specific chemicals be applied for the development of odour-based standards and guidelines.

The most recent MOECC guidance regarding odour impacts indicates that odour impacts above 1 odour unit (OU) at a sensitive receptor location are acceptable as long as the frequency of occurrence is less than 0.5% of the time, based on a 5-year modelling period, as indicated in the MOECC's Technical Bulletin; Methodology for Modelling Assessments of Contaminants with 10-Minute Average Standards and Guidelines under O.Reg. 419, September 2016. Based on the most recent guidance provided by the MOECC, a reasonable assessment of whether or not a facility has a potential to cause an adverse effect would be to compare the dispersion modelling results to the odour threshold value of 1 OU as well as assess the frequency of occurrence at sensitive receptors to determine if the predicted results above 1 OU occur less than 0.5% of the time.

4 METHODOLOGY

4.1 Emissions

The following sections identify the sources considered in this assessment, the contaminants modeled and how the emissions were determined.

4.1.1 Identified Sources

Odour and air quality sources from the proposed facilities were identified from information provided by B&V. The main sources of emissions from the WWTP equipment at the Snow Valley/Wilson RoadSite include:

- One (1) Headworks Building Biofilter Exhaust;
- Two (2) Aeration Tanks;
- Three (3) Secondary Clarifiers;
- Two (2) Biofilters, each exhausting:
    - One (1) Autothermal Thermophilic Aerobic Digester (ATAD) Facility;
    - Two (2) Sludge Tanks (2,454 m^3 each);
    - One (1) Sludge Truck Loading Area;
    - Thickening Building Exhaust;
- Four (4) Emergency Diesel Fired Generators:
    - Two (2) at the WWTP rated at 500 kW;
    - One (1) at the WTP rated at 250 kW; and
    - One (1) at the pumping station rated at 70 kW.

An emergency diesel fired generator is the only source identified for the Doran Site. A power rating was unavailable at the time of this assessment, so it was assumed to be equivalent to the emergency diesel generator at the Snow Valley/Wilson RoadSite WTP (250 kW).

It is anticipated that ten (10) pumping stations will be required to service the existing and proposed development in the study area. For this assessment, the worst-case pumping station was evaluated.

4.1.2 Contaminants of Interest

The WWTP produces a variety of air contaminants as a result of physical, chemical and biological processes. As per discussion with the MOECC and B&V (July 2017), the contaminants of concern are listed below:

- Odour;
- Total Reduced Sulphur (TRS);
- Hydrogen Sulphide (H_2S);
- Sulphur Dioxide (SO_2); and
- Ammonia (NH_3).

From the Water Treatment Plant and the Pumping Station, nitrogen oxides and sulphur dioxide were the only contaminants evaluated. As agreed with the MOECC, the Water Treatment Plant and the Pumping Station (and associated sewers) will not be expected to have any odorous emissions based on proper design, which will also be evaluated as part of the approval process for the ECA to meet all regulatory requirements. The design will include odour mitigation measures such as the use of chemicals 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.

The only emissions modelled from these sources were the emergency diesel generators, which were assessed for emissions of nitrogen dioxide and sulphur dioxide. The MOECC emergency generator guideline, Information for Proponents Applying for a Certificate of Approval (Air) for an Emergency Generator, August 2008, states that the significant contaminants emitted to the atmosphere from an emergency generator are nitrogen oxides (NO_X). Other contaminants, for these types of sources, are generally emitted in negligible amounts. Therefore, carbon monoxide and total suspended particulate matter from the generators were considered insignificant for this assessment. Sulphur dioxide emissions were considered in this assessment to demonstrate compliance with the more stringent SO2 standards recently adopted by the MOECC.

Local air quality was assessed by comparing the maximum predicted contaminant concentrations to the latest approved Ministry of Environment and Climate Change (MOECC) Air Contaminants Benchmarks (ACB) List: Standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants", Version 1.0 - December 13, 2016.

The vehicle emissions portion of the report is separate from the assessment of stationary sources at the Snow Valley/Wilson RoadSite and the Doran Site. Vehicular traffic produces a variety of air contaminants as a result of fuel combustion inside the engine, evaporation of fuel from the tank, brake and tire wear, and re-suspension

(also known as re-entrainment) of loose particles on the road surface (silt) as the vehicle travels over the road surface. For the vehicle emissions the selected contaminants of concern are outlined in the Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects (MTO Guide) [1]. The key contaminants to be assessed include:

- Criteria Air Contaminants (nitrogen dioxide, carbon monoxide, sulphur dioxide and particulate matter), and
- Volatile Organic Compounds (benzene, 1,3-butadiene, formaldehyde, acetaldehyde and acrolein).

4.1.3 Odour Impact Assessment

The odour impact assessment only applies to the WWTP at the Snow Valley/Wilson RoadSite. Odour, hydrogen sulphide, total reduced sulphur, and ammonia concentrations used in the assessment were supplied by B&V and are based on surrogate WWTP concentrations. B&V provided a memo (dated August 23, 2017) outlining the concentrations, flow rates and control efficiencies to be used for each source (Headworks Building, Aeration Tanks and the Biofilters servicing the ATADs, Sludge Storage Tanks, Truck Loading Area and Thickening Building). The supporting documents used as inputs to the model are provided in **Appendix A**.

4.1.3.1 Snow Valley/Wilson Road Site Wastewater Treatment Plant

Headworks Building

Concentrations, flow rate and the biofilter control efficiency used to calculate emissions were provided in the memo by B&V. The concentrations provided for the Headworks Building were based on measured values from a report completed by B&V entitled Odour Study for Lakeshore WPCP Expansion, dated March 2010 (Appendix A). Concentrations were determined from a weighting between 80% grit tanks and 20% screens with a biofilter control efficiency of 80%. All emissions within the Headworks Building are emitted through the biofilter.

Aeration Tanks

Emissions from the Aeration Tanks were based on the concentration from aeration tank # 3 inlet from the Odour Study for Lakeshore WPCP Expansion, prepared by B&V, dated March 2010. The value used in this assessment is at least twice as high compared to other well run WWTPs, and are therefore conservative. The emission rates were calculated as flux emission rates using the concentrations as provided in the above-mentioned study, the air flow rate to the aeration tank and the nominal surface area of the tanks. The air flow rate to the aeration tank and the nominal surface area of the tanks was provided in the memo.

Clarifiers

Hydrogen sulphide, total reduced sulphur and ammonia concentrations were taken from the B&V report entitled Odour Study for Lakeshore WPCP Expansion, dated March 2010 (Appendix A) for Clarifier #3. The radius of the clarifiers was provided by B&V and a surrogate flow rate from in-house data was used to calculate the flux rate for the dispersion model.

At the time of this assessment odour data was unavailable, thus in-house odour concentrations were used. An average odour concentration was taken from three in-house studies with secondary clarifiers. The radius of the clarifiers provided by B&V and the surrogate flow rate from in-house data were used to calculate the flux rate for the dispersion model.

Biofilters

The two emission sources at the Thickening building are the biofilters. One biofilter is located on each of the east and west sides of the Thickening building. Each biofilter services the thickening building, two ATADS, one Storage Nitrification Denitrification Reactor (SNDR), two sludge storage tanks and the loading of sludge from the tanks to the tanker trucks.

Odour and H_2S concentrations from the ATAD Biofilters were provided by B&V in the memo. The odour and H_2S concentrations are based on measurements conducted at the biofilter at the Eagle River Water & Sanitation District plant.

The ammonia concentration from the ATAD Biofilters was provided by B&V in the memo. According to the memo, the vendor estimated the ammonia concentration based on the first stage of odour control (SNDR), a removal rate of 70%.

Pumping Stations

A preventative maintenance plan will be put in place and adhered to, to ensure the pumping stations remain functioning efficiently. If the pumping stations remain functioning properly and efficiently, then there will be minimal odour emissions. The only significant source of emission from the pumping stations will be from the emergency diesel generator when it is operating. Please refer to Section 4.1.4 of this report on how emission rates were estimated for the emergency diesel generator.

4.1.4 Emergency Diesel Generators

There are three emergency diesel generators located at the Snow Valley/Wilson Road Site. Two of the emergency diesel fired generators have an engine power rating of 500 kW and are located at the WWTP. The WTP has an emergency diesel fired generator with an engine power rating of 250 kW and the PS has an emergency diesel generator with an engine power rating of 70 kW. The only air quality source at the Doran Site is an emergency diesel generator. The power rating of the Doran Site emergency diesel generator was not available at the time of this assessment so it was assumed to be equivalent to the emergency diesel generator at the Snow Valley/Wilson RoadSite WTP (250 kW).

Emissions from the emergency diesel fired generators that are less than 447 kW (600 hp), were estimated using the engine power rating and the emission factors from US EPA AP-42 Chapter 3.3 Gasoline and Diesel Industrial Engines. A sulfur content of 0.5% was used in the assessment.

Emissions from the emergency diesel fired generators that are greater than 447 kW (600 hp) were estimated using the engine power rating and the emission factors from US EPA AP-42 Chapter 3.4 Large Stationary Diesel and All Stationary Dual-fuel Engines. A sulfur content of 0.5% was used in the assessment.

Emission rate calculations can be found in **Appendix C**.

4.1.5 Vehicle Emissions

With the proposed Snow Valley/Wilson RoadSite, there are proposed transportation improvements to the surrounding road network. For example, Wilson Road from Snow Valley Road to Barrie city limits will be widened from 2 lanes to 4 lanes. At the time of this assessment, the horizon year of the roadway improvements was not available. RWDI has substantial experience with roadway assessments and relied on our expertise from those studies to provide a qualitative assessment on the impacts the proposed roadway improvements may have on the surrounding area.

The standard approach for estimating vehicular emissions is to use computer simulation techniques that are based on extensive previous testing of a wide range of vehicles. Motor Vehicle Emission Simulator (MOVES) is such a model that has been developed for this purpose by the U.S. Environmental Protection Agency. Since the contribution from vehicle emissions for this assessment is evaluated qualitatively, MOVES was not specifically run. However, in-house studies used in the qualitative analysis were based on the horizon year of 2021. Typically, emissions from vehicular traffic tend to improve as the years pass, therefore the emissions from the surrogate study are considered conservative in comparison with projects that will become operational at a later date.

4.2 Dispersion Modelling

Dispersion modelling was conducted to assess impacts from the Snow Valley/Wilson RoadSite and the Doran Site on the surrounding area. Dispersion modelling was conducted for various contaminants, including hydrogen sulphide, total reduced sulphur, ammonia, nitrogen oxide, sulphur dioxide and odour. The emission rates used for each source were described in the preceding sections of this report. The location of each source is shown in **Figure 1**.

The U.S. EPA's AERMOD dispersion model was used to predict maximum concentrations resulting from emissions from the Snow Valley/Wilson RoadSite and the Doran Site operations. AERMOD is a steady-state Gaussian model that is capable of handling multiple emission sources. Within the model, receptor grids as well as sensitive receptor locations of interest were considered.

4.2.1 Operating Schedule

Operations of most sources at the facility may occur up to 24 hours per day, 7 days per week. The only variance in operation over the course of a day is the testing of emergency generators. The emergency equipment testing scenario considers only the generators and assumes testing only occurs between 0700 and 1900h. The sludge loading area will not operate on a daily basis, it will depend when the sludge is ready to be unloaded from the tanks. For this assessment, a conservative approach was used and it was assumed to operate all the time.

4.2.2 Description of Operating Conditions

For this assessment, all on-site sources were assumed to be operating simultaneously at maximum capacity. This is a very conservative approach as it assumes all sources will be operating during the worst case meteorological conditions, which is an unlikely event.

For the Snow Valley/Wilson Road Site, the operating conditions include the Headworks Building biofilter, aeration tanks, secondary clarifiers, the ATADs, sludge tanks, sludge loading area, thickening building exhaust and all four emergency diesel generators operating simultaneously at maximum capacity.

For the Doran Site, the operating conditions include the emergency diesel generator operating at maximum capacity.

4.2.3 Source Parameters

Tables 2, **3** and **4** in the Tables Section provide the source parameters used for the facility in this assessment.

4.2.4 Meteorological Conditions

Site specific meteorological data was requested from the MOECC to determine the impacts from odour on the nearby sensitive receptors. A fully-processed 5-year (2012 to 2016) site-specific meteorological data was prepared by the MOECC with wind-sector dependent land use specific to the applicant's facility, upper air data from the Buffalo station and surface data from the Borden AWOS station, with missing data filled with those from the Toronto International Airport station.

4.2.5 Area of Modelling Coverage

The area of modelling coverage was designed to meet the requirements outlined in O.Reg. 419/05, s 14. A multi-tiered grid was designed to extend a minimum of 5 km from all sources located on-site. The tiers in the grid were as follows:

- 20 m spacing up to 200 m distance from the on-site sources;
- 50 m spacing up to 500 m distance from the on-site sources;
- 100 m spacing up to 1,000 m distance from the on-site sources;
- 200 m spacing up to 2,000 m distance from the on-site sources; and
- 500 m spacing up to 5,000 m distance from the on-site sources.

The property line of the overall facility was defined in the AERMOD dispersion model. In addition to the gridded receptors, receptors were placed along the property line at 10-metre intervals. Those receptors in the aforementioned grid that fell within the property line were eliminated from consideration in the modelling.

The modelling for all contaminants considered ground level receptors, where all receptor locations were positioned at grade level, with the exception of contaminants with 10 minute standards. For contaminants with 10 minute standards, all receptors were positioned at a height of 1.5 m above grade, representing typical "nose height" for an average person. This approach is consistent with MOECC guidance.

Typically, when modelling contaminants with 10 minute standards, impacts are assessed only at sensitive receptor locations, not at the property line. In the MOECC guidance, sensitive receptors are defined as "any locations where and when human activities regularly occur". Nearby sensitive receptors, within 2 km of the facility were included in the model, including potential future sensitive receptors. These sensitive receptors were each modelled at flagpole heights of 1.5 m above grade. These flagpole heights were chosen to represent typical first story window locations. The nearby sensitive receptors are summarized in **Table 1** and locations are shown on **Figure 2**.

4.2.6 Terrain Data

Terrain information for the area surrounding the facility was obtained from the MOECC Regional Meteorological and Terrain Data for Air Dispersion Modelling web site. The terrain data is based on the North American Datum 1983 (NAD83) horizontal reference datum. These data were run through the AERMAP terrain pre-processor by the MOECC to estimate base elevations for receptors and to help the model account for changes in elevation of the surrounding terrain

4.2.7 Averaging Periods Used

10-minute, ½-hour, 1-hour and 24-hour averaging times were used with the AERMOD model to compare to Schedule 3 Standards, Upper Risk Thresholds, and other guidelines listed in the MOECC Workbook "Air Contaminants Benchmarks (ACB) List: Standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants", Version 1.0 - December 13, 2016. 10-minute average values were calculated from the 1-hour predicted concentrations using a factor of 1.65 and ½-hour average values were calculated from the 1-hour predicted concentrations using a factor of 1.2, as given in Table 4.1 of the Ministry document "Guideline A11: Air Dispersion Modelling Guideline for Ontario" dated February 2017. Note that modelled concentrations of SO_2 were compared to the more stringent standard recently adopted by the MOECC, as mentioned in the MOECC comments dated April 30, 2018, and were found to be compliant with this new standard.

4.2.8 Dispersion Modelling Input and Output Files

Modelling input and output files have been provided on a compact disc included in **Appendix B**.

5 FINDINGS

This section describes predictions of odour, hydrogen sulphide, total reduced sulphur, sulphur dioxide, ammonia and nitrogen oxides in the study area. As discussed in Section 4.1.2, there are ambient air quality objectives for these contaminants. The maximum concentrations predicted by the AERMOD model with all equipment

operating based on a worst-case scenario are summarized in **Table 5** for the Snow Valley/Wilson Road WWTP Site and **Table 6** for the Doran WTP Site. **Figure 4** provides a visual of the 10-minute odour contour plot for the Snow Valley/Wilson Road Site. Background values have not been added to these concentrations, as this is not required by O. Reg. 419/05.

5.1 Odour Impact Assessment

For odour, the Snow Valley/Wilson Road Site is in compliance with the most recent MOECC Guidelines regarding odour impacts at sensitive receptor locations. The maximum predicted 10-minute odour concentration was 4.16 OU at one sensitive receptor, which is greater than the recommended 1 OU at sensitive receptors. The location of the maximum odour concentration was predicted to occur at receptor R63, a residence located to the south of the facility. For the odour modelling, where odour impacts were greater than 1 odour unit per cubic meter (OU/m^3) at a sensitive receptor location, a frequency analysis was conducted to determine the percentage of time that predicted odour impacts would exceed 1 OU/m^3 at each location.

The most recent MOECC guidance regarding odour impacts indicates that odour impacts above 1 OU at a sensitive receptor location are acceptable, as long as the frequency of occurrence is less than 0.5% of the time, based on a 5-year modelling period, as indicated in the MOECC's Technical Bulletin: Methodology for Modelling Assessments of Contaminants with 10-minute Averaging Standards and Guidelines for Odour under O. Reg. 419/05, dated September 2016 (MOECC Odour Guidance).

For the Snow Valley/Wilson Road Site, frequency analysis of model results determined that the frequency of exceedance of the MOECC limit of 1 OU was 0.4%, and is therefore acceptable. The frequency of exceedance is equivalent to 35 hours per year. Refer to **Table 7** for the Frequency of Exceedance results.

Guidelines

The guideline of 1 OU is often used by MOECC as a target, and it is quite conservative. It is not a regulatory standard, and there are exceptions. The value of 1 OU is defined as the level of odour that 50% of an odour panel (i.e., a group of people whose sensitivity to odour has been tested to be within an average range), can just detect that there is an odour in a diluted sample. At 3 OU, there would likely still be some people who would not be aware of an odour at all. Generally, only higher levels would lead to potential odour complaints.

The maximum predicted 10-minute hydrogen sulphide and total reduced sulphur concentration was 4.89 $\mu g/m^3$, which is 37.6% of limit. The maximum predicted 24-hour hydrogen sulphide and total reduced sulphur concentration was 1.53 $\mu g/m^3$, which is 21.9% of limit. The location of the maximum 10-minute and 24-hour concentration was predicted to occur at receptor R10, a residence located west of the proposed facility.

The maximum predicted 24-hour ammonia concentration was 33.7 $\mu g/m^3$, which is 33.7% of limit. The location of the maximum 24-hour concentration was predicted to occur to the north of the proposed facility.

5.2 Emergency Diesel Generators

At the Snow Valley/Wilson Road WWTP, the maximum predicted ½-hour nitrogen oxide concentration was 1189 µg/m^3, which is 63% of limit. The maximum predicted 1-hour and annual sulphur dioxide concentrations were 64 µg/m^3 and 4 µg/m^3, respectively. The locations of the maxima were predicted to occur to the east of the facility

At the Doran site, the maximum predicted ½-hour nitrogen oxide concentration was 586 µg/m^3, which is 31.2% of limit. The maximum predicted 1-hour and annual sulphur dioxide concentrations were 32 µg/m^3 and 2 µg/m^3, respectively. The locations of the maxima were predicted to occur to the west of the proposed facility

5.3 Vehicle Emissions

Dispersion models predict the dispersal of air pollutants as they drift away from an emission source. The U.S. EPA dispersion model, known as CAL3QHCR, which is intended specifically to predict air contaminant levels downwind of roadways is used to predict concentrations from vehicles only. The model takes vehicle emission factors and combines them with hourly meteorological data, information on traffic volumes, and the configuration of the roadway. It uses this information to predict concentrations from roadways only to air quality levels at selected locations (receptors) adjacent to the highway under a variety of meteorological conditions.

The Ontario Ministry of Transportation's (MTO) *Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects* (June 2012) defines a sensitive receptor as a residential dwelling; a critical receptor is defined as retirement homes, hospitals, childcare centres, schools and similar institutional buildings.

There are several contributing factors that determine the appropriate setback distance from the roadway to the nearest sensitive receptor. One of the contributing factors is traffic volumes. Depending on the Annual Average Daily Traffic (AADT) volumes depends on what the setback distance from the roadway will be. The higher the AADT, the greater the setback distance from the roadway. Another contributing factor to determining the setback distance is the background concentration. Background concentrations can be the dominant contributor to the predicted concentration. Speed limit is also a contributing factor to the predicted setback distance. Emission factors generated using MOVES is dependent on the speed and generally as speed increases, emission factors decrease. The last contributor is the Horizon year in which the roadway is being assessed for. Emissions tend to decrease as the Horizon year is further out.

Information to conduct a detailed roadway assessment was not available at the time of the assessment, therefore an in-house roadway study was used as a surrogate to provide a general guideline as to what the impacts and the setback distance from the edge of the roadway to the nearest receptor might be. Traffic volumes were provided after the assessment was complete and a comparison of the traffic volumes from the surrogate roadway study and the 2041 traffic volumes provided on Wilson Drive and Snow Valley Road was conducted to ensure the surrogate roadway study is still applicable. It should be noted that additional trucking activity associated with the Midhurst WWTP 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 surrogate 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. As with similar studies, however, it concluded that the contribution of predicted traffic emissions to these ambient levels of these contaminants will be very small.

The surrogate study was based on the following information:

- AADT ranging from 5,000 on the side roads to 30,000 on the main arterial road, which aligns with the Wilson Drive AADT of 15,000 and the Snow Valley Road AADT of 13,600
- Speed limits of 80km/hour and 60km/hour, which coincides with Snow Valley Road and Wilson Drive.
- Horizon Year of 2031.

The analysis from the in-house roadway study concluded that where roads are to be widened, modified or developed that a setback distance of 20 m from the edges of the roadway to the sensitive/critical receptor would be adequate within the study are. This setback distance only applies to traffic emissions to ensure impacts are minimal. The 2041 traffic volumes for Wilson Drive and Snow Valley Drive fall within the AADTs from the surrogate study, therefore the setback distance of 20m from the edge of the roadway to the receptor is still applicable.

5.4 Construction Emissions

Emissions generated from construction activities may include:

- Combustion emissions from fossil-fuelled vehicles, equipment and generators;
- Fugitive dust emissions from vehicles, equipment, material handling and demolition/construction activities; and
- Wind erosion of exposed surfaces.

To minimize and limit fugitive dust emissions, the measures below should be adopted:

- Waste dumping heights - the heights from which materials are dropped in handling operations will be kept as low as practical to minimize fugitive dust emissions.
- Truck loading - operators will load material in a manner that reduces the potential for overloading of trucks and, hence, reduces the potential for spillage on the haul routes. Where practical, operators will leave a freeboard along the box edges when loading trucks.
- Truck haulage - haul trucks will be covered with tarps for the duration of the trips to and from the construction site.
- Watering - during dry conditions and for periods of high winds, fugitive dust emissions may attain levels that require additional temporary mitigation measures for material handling. Working areas will be watered during dry conditions to reduce dust arising from machinery movements. Haul roads will also be watered as needed to control dust.

Besides the above specific actions, it is generally recommended to apply best management practices to mitigate any air quality impacts caused by construction dust. Note that the ministry recommends that non-chloride dust suppressants be applied. More comprehensive measures for the control of fugitive dust emissions can be found at the following link:

http://www.bieapfremp.org/Toolbox%20pdfs/EC%20-%20Final%20Code%20of%20Practice%20-%20Construction%20%20Demolition.pdf

6 CONCLUSIONS AND RECOMMENDATIONS

Predicted concentrations for all individual contaminants of significance were found to be less than their respective Standards or guidelines under O. Reg. 419/05 at all receptors in the area for both the Snow Valley/Wilson Road Site and the Doran Site. For odour, modelling of a conservative scenario predicted concentrations somewhat above the recommended limit of 1 OU at a nearby receptor, however the frequency of occurrence of this exceedance was less than 0.5%, which is considered acceptable by the MOECC.

Therefore, both the Snow Valley/Wilson Road Site and the Doran Site will be compliant with the requirements of O. Reg. 419/05.

Based on the above analysis, the following are recommended:

- Odour testing once the plant is in operation to confirm compliance.
- A setback distance of at least 20 m from the edges of the roadway to the receptor within the study area. This setback distance only applies to traffic emissions to ensure impacts are minimal.
- Implementing the suggested fugitive dust mitigation measures during construction to ensure off-site dust impacts at sensitive receptors will be minimal.
- A Best Management Practices Plan for controlling dust as well as an odour mitigation and management plan should be included in the future ECA submission.

TABLES

Table 1: Odour Sensitive Receptor Summary Table

Sand and Gravel Site WWTP and WTP

Receptor ID	Description	Location		
		X	Y	Z
R1	Residence	599704	4919366	1.50
R2	Residence	599727	4919272	1.50
R3	Residence	599792	4919228	1.50
R4	Residence	599413	4919174	1.50
R5	Residence	599177	4918564	1.50
R6	Residence	598970	4919215	1.50
R7	Golf Course	598783	4919342	1.50
R8	Golf Course	598674	4919518	1.50
R9	Golf Course	598575	4919660	1.50
R10	Residence	598459	4920036	1.50
R11	Residence	598451	4920072	1.50
R12	Residence	598433	4920105	1.50
R13	Residence	599347	4920399	1.50
R14	Residence	599513	4920557	1.50
R15	Residence	599585	4920605	1.50
R16	Residence	600484	4921051	1.50
R17	Residence	600536	4921086	1.50
R18	Simcoe County Museum	599786	4921617	1.50
R19	Simcoe County Museum	599798	4922007	1.50
R20	Simcoe County District School Board	599590	4922061	1.50
R21	Barrie North Winter Tennis and Baseball Diamond	600434	4922003	1.50
R22	Forest Hill Public School	600289	4922495	1.50
R23	Residence	600648	4921670	1.50
R24	Residence	599206	4921838	1.50
R25	Springwater Provincial Park	598496	4921154	1.50
R26	Springwater Provincial Park	598198	4921227	1.50
R27	Springwater Provincial Park	598788	4921364	1.50
R28	Residence	599135	4921912	1.50
R29	Residence	599476	4921970	1.50
R30	Residence	599289	4921951	1.50
R31	Residence	598987	4921929	1.50
R32	Residence	598889	4921865	1.50
R33	Residence	598850	4922026	1.50
R34	Tree Nursery Sports Park	598755	4922160	1.50
R35	Barrie Community Sports Complex	598347	4921977	1.50
R36	Barrie Community Sports Complex	598174	4922127	1.50
R37	Barrie Community Sports Complex	598025	4921947	1.50
R38	Barrie Community Sports Complex	597629	4921913	1.50
R39	Barrie Community Sports Complex	597331	4921895	1.50
R40	Barrie Community Sports Complex	597455	4922139	1.50
R41	Barrie Community Sports Complex	598156	4922391	1.50
R42	Tree Nursery Sports Park	599020	4922330	1.50
R43	Tree Nursery Sports Park	598792	4922495	1.50
R44	Golf Course	598276	4919598	1.50
R45	Golf Course	597872	4919575	1.50
R46	Residence	598158	4920143	1.50
R47	Residence	598079	4920252	1.50
R48	Residence	597944	4920388	1.50
R49	Residence	597950	4919999	1.50
R50	Residence	597728	4920169	1.50
R51	Residence	597567	4919873	1.50
R52	Residence	597417	4919712	1.50
R53	Residence	597293	4920027	1.50

Table 1: Odour Sensitive Receptor Summary Table

Sand and Gravel Site WWTP and WTP

Receptor ID	Description	Location		
		X	Y	Z
R54	Residence	597194	4919842	1.50
R55	Residence	596964	4919737	1.50
R56	Residence	597143	4919451	1.50
R57	Residence	600485	4919999	1.50
R58	Residence	600494	4919719	1.50
R59	Residence	600614	4919829	1.50
R60	Residence	599350	4920163	1.50
R61	Residence	599270	4920062	1.50
R62	Residence	599144	4920017	1.50
R63	Residence	599030	4919928	1.50
R64	Residence	598913	4919981	1.50
R65	Residence	598823	4919906	1.50
R66	Residence	598727	4919841	1.50
R67	Residence	598653	4919774	1.50
R68	Residence	598794	4919684	1.50
R69	Residence	598823	4919790	1.50
R70	Residence	598940	4919869	1.50
R71	Residence	598964	4919718	1.50
R72	Residence	599143	4919816	1.50
R73	Residence	599408	4919949	1.50
R74	Residence	599697	4919933	1.50
R75	Residence	599950	4920082	1.50
R76	Residence	598817	4919473	1.50
R77	Residence	599014	4919433	1.50
R78	Residence	599122	4919516	1.50
R79	Residence	599344	4919609	1.50
R80	Residence	599612	4919744	1.50
R81	Residence	599990	4919673	1.50
R82	Residence	600243	4919590	1.50
R83	Residence	599892	4919381	1.50
R84	Residence	599202	4919104	1.50
R85	Residence	599171	4918956	1.50
R86	Residence	599266	4918782	1.50
R87	Residence	599577	4918762	1.50
R88	Residence	599472	4918506	1.50
R89	Residence	600264	4919263	1.50
R90	Residence	600189	4919022	1.50
R91	Residence	600600	4919534	1.50

Table 2 Source Summary Table

Sand and Gravel Site (Wastewater Treatment Plant, Water Treatment Plant and Pumping Station)

RWDI Project #1302274

Source ID [1]	Source Type [1]	Source Description	Notes	Source Data									Emission Data							
				Source Area [2] (m^2)	Stack Volumetric Flow Rate (Am^3/s)	Stack Exit Gas Temp. (°C)	Stack Inner Diameter (m)	Stack Exit Velocity (m/s)	Stack Height Above Grade (m)	Stack Height Above Roof (m)	Source Coordinates X (m)	Source Coordinates Y (m)	Contaminant	CAS Number	Concentration (ug/m^3)	Maximum Emission Rate (g/s)	Maximum Flux Rate ($g/m^2/s$)	Averaging Period (hours)	Emission Estimating Technique [3]	Emissions Data Quality [4]	% of Overall Emissions (%)
HEAD	POINT	Headworks Building Exhaust (Biofilter)	[5]	n/a	12.8	23.0	0.6	43.8	10.0	2.0	598,866	4,920,276	Hydrogen Sulphide	7783-06-4	9.16E-02	1.17E-06	n/a	1	V-ST	Above-Average	2%
													Total Reduced Sulphur	n/a	9.16E-02	1.17E-06	n/a	1	V-ST	Above-Average	2%
													Ammonia	7664-41-7	2.00E-03	2.56E-08	n/a	1	V-ST	Above-Average	<1%
DIGEST_1	POINT	ATADS (West Biofilter) [Includes two ATADS, one SNDR and two sludge storage tanks and truck loading area)	[6]	90	3.3	35.0	0.5	20.1	5.0	1.0	598,797	4,920,350	Hydrogen Sulphide	7783-06-4	7.46E+00	2.46E-05	n/a	1	V-ST	Above-Average	49%
													Total Reduced Sulphur	n/a	7.46E+00	2.46E-05	n/a	1	V-ST	Above-Average	49%
													Ammonia	7664-41-7	2.15E+04	7.10E-02	n/a	1	V-ST	Above-Average	50%
DIGEST_2	POINT	ATADS (East Biofilter) [Includes two ATADS, one SNDR and two sludge storage tanks and truck loading Area)	[6]	90	3.3	35.0	0.5	20.1	5.0	1.0	598,820	4,920,364	Hydrogen Sulphide	7783-06-4	7.46E+00	2.46E-05	n/a	1	V-ST	Above-Average	49%
													Total Reduced Sulphur	n/a	7.46E+00	2.46E-05	n/a	1	V-ST	Above-Average	49%
													Ammonia	7664-41-7	2.15E+04	7.10E-02	n/a	1	V-ST	Above-Average	50%
AERATE_1	AREA	Aeration Tank (West)	[7]	900	0.5	35.0	33.9	0.00056	0.6	n/a	598,822	4,820,261	Hydrogen Sulphide	7783-06-4	1.00E-03	4.89E-10	5.43E-07	1	V-ST	Above-Average	<1%
													Total Reduced Sulphur	n/a	1.00E-03	4.89E-10	5.43E-07	1	V-ST	Above-Average	<1%
													Ammonia	7664-41-7	1.00E-02	4.89E-09	5.43E-06	1	V-ST	Above-Average	<1%
AERATE_2	AREA	Aeration Tank (East)	[7]	900	0.5	35.0	33.9	0.00056	0.6	n/a	598,871	4,920,295	Hydrogen Sulphide	7783-06-4	1.00E-03	4.89E-10	5.43E-07	1	V-ST	Above-Average	<1%
													Total Reduced Sulphur	n/a	1.00E-03	4.89E-10	5.43E-07	1	V-ST	Above-Average	<1%
													Ammonia	7664-41-7	1.00E-02	4.89E-09	5.43E-06	1	V-ST	Above-Average	<1%
CLARI_1	AREA	Secondary Clarifier (West)	[8]	283.5	0.00008	12.0	19.0	n/a	0.6	n/a	598,798	4,920,316	Hydrogen Sulphide	7783-06-4	1.00E-03	8.33E-14	2.94E-16	1	V-ST	Above-Average	<1%
													Total Reduced Sulphur	n/a	1.00E-03	8.33E-14	2.94E-16	1	V-ST	Above-Average	<1%
													Ammonia	7664-41-7	1.00E-02	8.33E-13	2.94E-15	1	V-ST	Above-Average	<1%
CLARI_2	AREA	Secondary Clarifier (Middle)	[8]	283.5	0.00008	12.0	19.0	n/a	0.6	n/a	598,826	4,920,335	Hydrogen Sulphide	7783-06-4	1.00E-03	8.33E-14	2.94E-16	1	V-ST	Above-Average	<1%
													Total Reduced Sulphur	n/a	1.00E-03	8.33E-14	2.94E-16	1	V-ST	Above-Average	<1%
													Ammonia	7664-41-7	1.00E-02	8.33E-13	2.94E-15	1	V-ST	Above-Average	<1%
CLARI_3	AREA	Secondary Clarifier (East)	[8]	283.5	0.00008	12.0	19.0	n/a	0.6	n/a	598,854	4,920,354	Hydrogen Sulphide	7783-06-4	1.00E-03	8.33E-14	2.94E-16	1	V-ST	Above-Average	<1%
													Total Reduced Sulphur	n/a	1.00E-03	8.33E-14	2.94E-16	1	V-ST	Above-Average	<1%
													Ammonia	7664-41-7	1.00E-02	8.33E-13	2.94E-15	1	V-ST	Above-Average	<1%
GENSET_1	POINT	WWTP Emergency Generator 1 - 500 kW	[9]	n/a	1.81	506	0.3	25.6	6.5	3.5	598,792	4,920,295	Nitrogen Oxides	10102-44-0	n/a	2.03E+00	n/a	1	V-ST	Above-Average	35%
													Sulphur dioxide	9/5/7446	n/a	1.02E-01	n/a	1	V-ST	Above-Average	32%
GENSET_2	POINT	WWTP Emergency Generator 2 - 500 kW	[9]	n/a	1.81	506	0.3	25.6	6.5	3.5	598,794	4,920,292	Nitrogen Oxides	10102-44-0	n/a	2.03E+00	n/a	1	V-ST	Above-Average	35%
													Sulphur dioxide	9/5/7446	n/a	1.02E-01	n/a	1	V-ST	Above-Average	32%
GENSET_3	POINT	WTP Emergency Generator - 250 kW	[9]	n/a	1.06	457	0.3	15.0	6.5	3.5	598,780	4,920,186	Nitrogen Oxides	10102-44-0	n/a	1.31E+00	n/a	1	V-ST	Above-Average	23%
													Sulphur dioxide	9/5/7446	n/a	8.65E-02	n/a	1	V-ST	Above-Average	27%
GEN_PUMP	POINT	Pumping Station Emergency Generator - 70kW	[9] [10]	n/a	0.26	540	0.2	14.7	3.5	0.5	599,001	4,920,003	Nitrogen Oxides	10102-44-0	n/a	3.66E-01	n/a	1	V-ST	Above-Average	6%
													Sulphur dioxide	9/5/7446	n/a	2.42E-02	n/a	1	V-ST	Above-Average	8%
Total	n/a	Total of all listed sources		- -	- -	- -	- -	- -	- -	- -	- -	- -	Hydrogen Sulphide	7783-06-4	- -	5.04E-05	n/a	1	- -	- -	100%
													Total Reduced Sulphur	n/a		5.04E-05	n/a	1	- -	- -	100%
													Ammonia	7664-41-7		1.42E-01	n/a	1	- -	- -	100%
													Nitrogen Oxides	10102-44-0		5.73E+00	n/a	1	- -	- -	100%
													Sulphur dioxide	9/5/7446		3.16E-01	n/a	1	- -	- -	100%

Notes:

[1] Source ID, Source Type: should provide information on the modelling source type (e.g., Point, Area or Volume Source); the process source or sources within the modelling source (e.g., Process Line #1); and the stack or stacks within each process source.

[2] Source Area as used in the dispersion model. These areas were estimated based on aerial photographs of the facility.

[3] Emission Estimating Technique Short-Forms are V-ST (Validated Source Test), "ST" (Source Test), EF (Emission Factor), MB (Mass Balance), and EC (Engineering Calculation).

[4] Data Quality Categories: Highest; Above-Average; Average; and Marginal.

[5] Flow rate and concentrations for the Headworks Building were provided by B&V, the stack exit temperature was based on a similar study conducted by RWDI, and the stack diameter, stack height above roof were based on reasonable assumptions.

[6] Flow rate and concentrations for the ATADS Biofilter were provided by B&V, the stack exit temperature, stack diameter, stack height above roof were based on reasonable assumptions.

[7] Source area, exit velocity and concentrations for the Aeration tanks were provided by B&V, the source height above roof and above grade were based on reasonable assumptions.

[8] Source area for the Secondary Clairifiers were estimated based on information provided by B&V. Concentrations were based on the Innisfill WWTP study conducted by B&V. The stack flow rate was based on similar studies conducted by RWDI. The stack exit temperature and the source height above roof and above grade were based on reasonable assumptions.

[9] Power ratings were provided by B&V. Flow rates and stack exit temperatures were based on similar sized generator engine specification sheets. Stack diameter, stack height above grade and stack height above roof were based on reasonable assumptions.

[10] The location and size of the pumping station building was estimated based on information provided by B&V.

Revision Date:	2018-05-23
Prepared by:	ZH
Checked by:	MG

Table 3 Source Summary Table - Odour

Sand and Gravel Site (Wastewater Treatment Plant, Water Treatment Plant and Pumping Station)

RWDI Project #1302274

Source ID [1]	Source Type [1]	Source Description	Notes	Source Area [2] (m^2)	Source Data						Source Coordinates		Emission Data							
					Stack Volumetric Flow Rate (Am^3/s)	Stack Exit Gas Temp. (°C)	Stack Inner Diameter (m)	Stack Exit Velocity (m/s)	Stack Height Above Grade (m)	Stack Height Above Roof (m)	X (m)	Y (m)	Contaminant	CAS Number	Concentration (OU)	Maximum Emission Rate (OU/s)	Maximum Flux Rate ($OU/m^2/s$)	Averaging Period (hours)	Emission Estimating Technique [3]	Emissions Data Quality [4]	% of Overall Emissions [5] (%)
HEAD	POINT	Headworks Building Exhaust (Biofilter)	[5]	n/a	12.8	23.0	0.6	43.8	10.0	2.0	598,866	4,920,276	Odour	n/a	4.36E+02	5.58E+03	n/a	1	V-ST	Above-Average	80.2%
DIGEST_1	POINT	ATADS (West Biofilter) [Includes two ATADS, one SNDR and two sludge storage tanks and truck loading area)	[6]	90.0	3.3	35.0	0.5	20.1	5.0	1.0	n/a	n/a	Odour	n/a	1.20E+02	3.96E+02	n/a	1	V-ST	Above-Average	5.7%
DIGEST_2	POINT	ATADS (East Biofilter) [Includes two ATADS, one SNDR and two sludge storage tanks and truck loading Area)	[6]	90.0	3.3	35.0	0.5	20.1	5.0	1.0	n/a	n/a	Odour	n/a	1.20E+02	3.96E+02	n/a	1	V-ST	Above-Average	5.7%
AERATE_1	AREA	Aeration Tank (West)	[7]	900	0.5	35.0	33.9	0.0	0.6	n/a	598,822	4,820,261	Odour	n/a	6.00E+02	2.93E+02	3.30E-01	1	V-ST	Above-Average	4.2%
AERATE_2	AREA	Aeration Tank (East)	[7]	900	0.5	35.0	33.9	0.0	0.6	n/a	598,871	4,920,295	Odour	n/a	6.00E+02	2.93E+02	3.30E-01	1	V-ST	Above-Average	4.2%
CLARI_1	AREA	Secondary Clarifier (West)	[8]	283.5	0.00008	12.0	19.0	n/a	0.6	n/a	598,798	4,920,316	Odour	n/a	4.25E+02	3.54E-02	1.25E-04	1	V-ST	Above-Average	<1%
CLARI_2	AREA	Secondary Clarifier (Middle)	[8]	283.5	0.00008	12.0	19.0	n/a	0.6	n/a	598,826	4,920,335	Odour	n/a	4.25E+02	3.54E-02	1.25E-04	1	V-ST	Above-Average	<1%
CLARI_3	AREA	Secondary Clarifier (East)	[8]	283.5	0.00008	12.0	19.0	n/a	0.6	n/a	598,854	4,920,354	Odour	n/a	4.25E+02	3.54E-02	1.25E-04	1	V-ST	Above-Average	<1%
Total	n/a	Total of all listed sources		- -							- -	- -	Odour	n/a		6.96E+03	n/a	1	- -	- -	100%

Notes:

[1] Source ID, Source Type: should provide information on the modelling source type (e.g., Point, Area or Volume Source); the process source or sources within the modelling source (e.g., Process Line #1); and the stack or stacks within each process source.

[2] Source Area as used in the dispersion model. These areas were estimated based on aerial photographs of the facility.

[3] Emission Estimating Technique Short-Forms are V-ST (Validated Source Test), "ST" (Source Test), EF (Emission Factor), MB (Mass Balance), and EC (Engineering Calculation).

[4] Data Quality Categories: Highest; Above-Average; Average; and Marginal.

[5] Flow rate and concentrations for the Headworks Building were provided by B&V, the stack exit temperature was based on a similar study conducted by RWDI, and the stack diameter, stack height above roof were based on reasonable assumptions.

[6] Flow rate and concentrations for the ATADS Biofilter were provided by B&V, the stack exit temperature, stack diameter, stack height above roof were based on reasonable assumptions.

[7] Source area, exit velocity and concentrations for the Aeration tanks were provided by B&V, the source height above roof and above grade were based on reasonable assumptions.

[8] Source area for the Secondary Clairifiers were estimated based on information provided by B&V. Concentrations were based on the Innisfill WWTP study conducted by B&V. The stack flow rate was based on similar studies conducted by RWDI. The stack exit temperature and the source height above roof and above grade were based on reasonable assumptions.

[9] Flow rates and stack exit temperatures were based on similar sized generator engine specification sheets. Stack diameter, stack height above grade and stack height above roof were based on reasonable assumptions.

Revision Date:	2017-09-22
Prepared by:	TR
Checked by:	ODS

Table 4 Source Summary Table

RWDI Project #1302274

Doran Site (Water Treatment Plant)

Source ID [1]	Source Type [1]	Source Description	Notes	Stack Volumetric Flow Rate (Am^3/s)	Stack Exit Gas Temp. (°C)	Stack Inner Diameter (m)	Stack Exit Velocity (m/s)	Stack Height Above Grade (m)	Stack Height Above Roof (m)	Source Coordinates X (m)	Source Coordinates Y (m)	Emission Data: Contaminant	CAS Number	Concentration (ug/m^3)	Maximum Emission Rate (g/s)	Maximum Flux Rate ($g/m^2/s$)	Averaging Period (hours)	Emission Estimating Technique [3]	Emissions Data Quality [4]	% of Overall Emissions (%)
DORAN_GEN	POINT	WTP Emergency Generator - 250 kW	[5]	1.06	457	0.3	15.0	3.5	0.5	600,892	4,923,456	Nitrogen Oxides	10102-44-0	n/a	3.66E-01	n/a	1	V-ST	Above-Average	100%
												Sulphur dioxide	9/5/7446	n/a	2.42E-02	n/a	1	V-ST	Above-Average	100%
Total												Nitrogen Oxides	10102-44-0	- -	3.66E-01	n/a	1	- -	- -	100%
												Sulphur dioxide	9/5/7446		2.42E-02	n/a	1			100%

Notes:

[1] Source ID, Source Type: should provide information on the modelling source type (e.g., Point, Area or Volume Source); the process source or sources within the modelling source (e.g., Process Line #1); and the stack or stacks within each process source.

[2] Source Area as used in the dispersion model. These areas were estimated based on aerial photographs of the facility.

[3] Emission Estimating Technique Short-Forms are V-ST (Validated Source Test), "ST" (Source Test), EF (Emission Factor), MB (Mass Balance), and EC (Engineering Calculation).

[4] Data Quality Categories: Highest; Above-Average; Average; and Marginal.

[5] Power rating for the emergency generator was not available at the time of this study, so it was assumed to be equivalent to the emergency diesel generator at the WTP located at the Sand and Gravel Site. Flow rates and stack exit temperatures were based on similar sized generator engine specification sheets. Stack diameter, stack height above grade and stack height above roof were based on reasonable assumptions.

Revision Date:	2018-05-23
Prepared by:	ZH
Checked by:	MG

Table 5 Emission Summary Table

RWDI Project #1302274

Sand and Gravel Site (Wastewater Treatment Plant, Water Treatment Plant and Pumping Station)

Receptor	Sensitive Receptor ID	Contaminant	CAS Number	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Maximum POI Concentration (µg/m³)	Averaging Period (hours)	MOECC POI Limit [1] (µg/m³)	Limiting Effect	Regulation Schedule #	Percentage of MOECC POI Limit (%)
Sensitive Receptor	R10	Hydrogen Sulphide	7783-06-4	5.04E-05	AERMOD	4.89	10 min	13	Odour	3	37.6%
Property Line	n/a	Hydrogen Sulphide	7783-06-4	5.04E-05	AERMOD	1.53	24	7	Health	3	21.9%
Sensitive Receptor	R10	Total Reduced Sulphur	n/a	5.04E-05	AERMOD	4.89	10 min	13	Odour	3	37.6%
Property Line	n/a	Total Reduced Sulphur	n/a	5.04E-05	AERMOD	1.53	24	7	Health	3	21.9%
Property Line	n/a	Ammonia	7664-41-7	0.14	AERMOD	33.7	24	100	Health	3	33.7%
Property Line	n/a	Nitrogen Oxides [2]	10102-44-0	5.73	AERMOD	1189	0.5	1880	Health	MOECC Guideline	63%
Sensitive Receptor	R63	Odour	n/a	6961	AERMOD	4.16	10 min	1	Odour	N/A	N/A
Property Line	n/a	Sulphur dioxide	9/5/7446	0.32	AERMOD	63.59	1	100	Health	MOECC Guideline	63.6%
Property Line	n/a	Sulphur dioxide	9/5/7446	0.32	AERMOD	4.02	Annual	10	Health	MOECC Guideline	40.2%

Notes:

[1] The term “MOECC POI Limit” refers to the following (there may be more than one relevant MOECC POI Limit for each contaminant):
- Air quality standards in Schedules 2 and 3 of O. Reg. 419/05;
- The Upper Risk Thresholds (URTs) in Schedule 6 of O. Reg. 419/05;
- The guidelines for contaminants set out in the MOECC Workbook: Air Contaminants Benchmarks (ACB) List";
- The Daily Assessment Values (DAV) from the MOECC Workbook: Air Contaminants Benchmarks (ACB) List";
- The Annual Assessment Values (AAV) from the MOECC Workbook: Air Contaminants Benchmarks (ACB) List";
- JSL values set out in the MOECC Workbook: Air Contaminants Benchmarks (ACB) List";
- An Acceptable Point of Impingement Concentration for a facility with Limited Operational Flexibility; or,
- An acceptable concentration for contaminants with no standards or guidelines.

[2] Maximum concentration for NOX is based on all four generators operating simultaneously.

Revision Date:	2018-05-23
Prepared by:	ZH
Checked by:	MG

Table 6 Emission Summary Table

RWDI Project #1302274

Doran Site (Water Treatment Plant)

Receptor	Contaminant	CAS Number	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Maximum POI Concentration (µg/m³)	Averaging Period (hours)	MOECC POI Limit [1] (µg/m³)	Limiting Effect	Regulation Schedule #	Percentage of MOECC POI Limit (%)
Property Line	Nitrogen Oxides	10102-44-0	3.66E-01	AERMOD	586	0.5	1880	Health	MOECC Guideline	31.2%
Property Line	Sulphur dioxide	9/5/7446	2.42E-02	AERMOD	32	1	100	Health	MOECC Guideline	32.3%
Property Line	Sulphur dioxide	9/5/7446	2.42E-02	AERMOD	2	Annual	10	Health	MOECC Guideline	15.9%

Notes:

[1] The term “MOECC POI Limit” refers to the following (there may be more than one relevant MOECC POI Limit for each contaminant):
- Air quality standards in Schedules 2 and 3 of O. Reg. 419/05;
- The Upper Risk Thresholds (URTs) in Schedule 6 of O. Reg. 419/05;
- The guidelines for contaminants set out in the MOECC Workbook: Air Contaminants Benchmarks (ACB) List";
- The Daily Assessment Values (DAV) from the MOECC Workbook: Air Contaminants Benchmarks (ACB) List";
- The Annual Assessment Values (AAV) from the MOECC Workbook: Air Contaminants Benchmarks (ACB) List";
- JSL values set out in the MOECC Workbook: Air Contaminants Benchmarks (ACB) List";
- An Acceptable Point of Impingement Concentration for a facility with Limited Operational Flexibility; or,
- An acceptable concentration for contaminants with no standards or guidelines.

Revision Date:	2018-05-23
Prepared by:	ZH
Checked by:	MG

Table 7: Odour Frequency Analysis

RWDI Project #1302274

Midhurst WWTP and WTP

Receptor Information					Maximum Predicted 10-Minute Concentration (OU/m³)	Predcited Excusrions Above Specified 10-Minute Values					
						Events > 1 OU		Events > 3 OU		Events > 5 OU	
ID#	Description	X	Y	Z		Count	Frequency	Count	Frequency	Count	Frequency
R1	Residence	599704	4919366	1.50	0.6	0	0.0%	0	0.0%	0	0.0%
R2	Residence	599727	4919272	1.50	0.6	0	0.0%	0	0.0%	0	0.0%
R3	Residence	599792	4919228	1.50	0.6	0	0.00%	0	0.0%	0	0.0%
R4	Residence	599413	4919174	1.50	1.2	2	0.0%	0	0.0%	0	0.0%
R5	Residence	599177	4918564	1.50	0.4	0	0.0%	0	0.0%	0	0.0%
R6	Residence	598970	4919215	1.50	0.9	0	0.0%	0	0.0%	0	0.0%
R7	Golf Course	598783	4919342	1.50	1.1	1	0.0%	0	0.0%	0	0.0%
R8	Golf Course	598674	4919518	1.50	1.5	3	0.0%	0	0.0%	0	0.0%
R9	Golf Course	598575	4919660	1.50	0.8	0	0.0%	0	0.0%	0	0.0%
R10	Residence	598459	4920036	1.50	1.8	43	0.1%	0	0.0%	0	0.0%
R11	Residence	598451	4920072	1.50	1.9	26	0.1%	0	0.0%	0	0.0%
R12	Residence	598433	4920105	1.50	1.9	30	0.1%	0	0.0%	0	0.0%
R13	Residence	599347	4920399	1.50	2.1	132	0.3%	0	0.0%	0	0.0%
R14	Residence	599513	4920557	1.50	2.2	22	0.1%	0	0.0%	0	0.0%
R15	Residence	599585	4920605	1.50	2.1	11	0.0%	0	0.0%	0	0.0%
R16	Residence	600484	4921051	1.50	0.8	0	0.0%	0	0.0%	0	0.0%
R17	Residence	600536	4921086	1.50	0.7	0	0.0%	0	0.0%	0	0.0%
R18	Simcoe County Museum	599786	4921617	1.50	1.2	2	0.0%	0	0.0%	0	0.0%
R19	Simcoe County Museum	599798	4922007	1.50	1.0	0	0.0%	0	0.0%	0	0.0%
R20	Simcoe County District School Board	599590	4922061	1.50	0.8	0	0.0%	0	0.0%	0	0.0%
R21	Barrie North Winter Tennis and Baseball Diamond	600434	4922003	1.50	0.6	0	0.0%	0	0.0%	0	0.0%
R22	Forest Hill Public School	600289	4922495	1.50	0.8	0	0.0%	0	0.0%	0	0.0%
R23	Residence	600648	4921670	1.50	0.7	0	0.0%	0	0.0%	0	0.0%
R24	Residence	599206	4921838	1.50	1.2	3	0.0%	0	0.0%	0	0.0%
R25	Springwater Provincial Park	598496	4921154	1.50	1.4	16	0.0%	0	0.0%	0	0.0%
R26	Springwater Provincial Park	598198	4921227	1.50	0.9	0	0.0%	0	0.0%	0	0.0%
R27	Springwater Provincial Park	598788	4921364	1.50	1.8	4	0.0%	0	0.0%	0	0.0%
R28	Residence	599135	4921912	1.50	0.9	0	0.0%	0	0.0%	0	0.0%
R29	Residence	599476	4921970	1.50	1.0	2	0.0%	0	0.0%	0	0.0%
R30	Residence	599289	4921951	1.50	1.3	2	0.0%	0	0.0%	0	0.0%
R31	Residence	598987	4921929	1.50	0.9	0	0.0%	0	0.0%	0	0.0%
R32	Residence	598889	4921865	1.50	0.9	0	0.0%	0	0.0%	0	0.0%
R33	Residence	598850	4922026	1.50	0.9	0	0.0%	0	0.0%	0	0.0%
R34	Tree Nursery Sports Park	598755	4922160	1.50	1.0	2	0.0%	0	0.0%	0	0.0%
R35	Barrie Community Sports Complex	598347	4921977	1.50	0.7	0	0.0%	0	0.0%	0	0.0%
R36	Barrie Community Sports Complex	598174	4922127	1.50	0.6	0	0.0%	0	0.0%	0	0.0%
R37	Barrie Community Sports Complex	598025	4921947	1.50	0.7	0	0.0%	0	0.0%	0	0.0%
R38	Barrie Community Sports Complex	597629	4921913	1.50	0.5	0	0.0%	0	0.0%	0	0.0%
R39	Barrie Community Sports Complex	597331	4921895	1.50	0.5	0	0.0%	0	0.0%	0	0.0%
R40	Barrie Community Sports Complex	597455	4922139	1.50	0.4	0	0.0%	0	0.0%	0	0.0%
R41	Barrie Community Sports Complex	598156	4922391	1.50	0.5	0	0.0%	0	0.0%	0	0.0%
R42	Tree Nursery Sports Park	599020	4922330	1.50	0.7	0	0.0%	0	0.0%	0	0.0%
R43	Tree Nursery Sports Park	598792	4922495	1.50	0.8	0	0.0%	0	0.0%	0	0.0%
R44	Golf Course	598276	4919598	1.50	0.8	0	0.0%	0	0.0%	0	0.0%
R45	Golf Course	597872	4919575	1.50	0.8	0	0.0%	0	0.0%	0	0.0%
R46	Residence	598158	4920143	1.50	0.7	0	0.0%	0	0.0%	0	0.0%
R47	Residence	598079	4920252	1.50	0.6	0	0.0%	0	0.0%	0	0.0%
R48	Residence	597944	4920388	1.50	0.8	0	0.0%	0	0.0%	0	0.0%
R49	Residence	597950	4919999	1.50	0.6	0	0.0%	0	0.0%	0	0.0%
R50	Residence	597728	4920169	1.50	0.4	0	0.0%	0	0.0%	0	0.0%
R51	Residence	597567	4919873	1.50	0.4	0	0.0%	0	0.0%	0	0.0%
R52	Residence	597417	4919712	1.50	0.5	0	0.0%	0	0.0%	0	0.0%
R53	Residence	597293	4920027	1.50	0.3	0	0.0%	0	0.0%	0	0.0%
R54	Residence	597194	4919842	1.50	0.5	0	0.0%	0	0.0%	0	0.0%
R55	Residence	596964	4919737	1.50	0.4	0	0.0%	0	0.0%	0	0.0%
R56	Residence	597143	4919451	1.50	0.4	0	0.0%	0	0.0%	0	0.0%
R57	Residence	600485	4919999	1.50	0.4	0	0.0%	0	0.0%	0	0.0%
R58	Residence	600494	4919719	1.50	0.4	0	0.0%	0	0.0%	0	0.0%
R59	Residence	600614	4919829	1.50	0.4	0	0.0%	0	0.0%	0	0.0%
R60	Residence	599350	4920163	1.50	1.2	57	0.1%	0	0.0%	0	0.0%
R61	Residence	599270	4920062	1.50	1.6	95	0.2%	0	0.0%	0	0.0%
R62	Residence	599144	4920017	1.50	2.3	101	0.2%	0	0.0%	0	0.0%
R63	Residence	599030	4919928	1.50	4.2	51	0.1%	2	0.0%	0	0.0%
R64	Residence	598913	4919981	1.50	2.5	172	0.4%	0	0.0%	0	0.0%
R65	Residence	598823	4919906	1.50	1.7	51	0.1%	0	0.0%	0	0.0%
R66	Residence	598727	4919841	1.50	2.1	6	0.0%	0	0.0%	0	0.0%
R67	Residence	598653	4919774	1.50	1.3	3	0.0%	0	0.0%	0	0.0%
R68	Residence	598794	4919684	1.50	2.0	2	0.0%	0	0.0%	0	0.0%
R69	Residence	598823	4919790	1.50	1.9	6	0.0%	0	0.0%	0	0.0%
R70	Residence	598940	4919869	1.50	2.4	52	0.1%	0	0.0%	0	0.0%
R71	Residence	598964	4919718	1.50	2.5	6	0.0%	0	0.0%	0	0.0%
R72	Residence	599143	4919816	1.50	2.8	22	0.1%	0	0.0%	0	0.0%
R73	Residence	599408	4919949	1.50	1.1	8	0.0%	0	0.0%	0	0.0%
R74	Residence	599697	4919933	1.50	0.6	0	0.0%	0	0.0%	0	0.0%
R75	Residence	599950	4920082	1.50	0.5	0	0.0%	0	0.0%	0	0.0%
R76	Residence	598817	4919473	1.50	1.3	1	0.0%	0	0.0%	0	0.0%
R77	Residence	599014	4919433	1.50	1.7	1	0.0%	0	0.0%	0	0.0%
R78	Residence	599122	4919516	1.50	1.7	6	0.0%	0	0.0%	0	0.0%
R79	Residence	599344	4919609	1.50	1.2	5	0.0%	0	0.0%	0	0.0%
R80	Residence	599612	4919744	1.50	0.7	0	0.0%	0	0.0%	0	0.0%
R81	Residence	599990	4919673	1.50	0.5	0	0.0%	0	0.0%	0	0.0%
R82	Residence	600243	4919590	1.50	0.4	0	0.0%	0	0.0%	0	0.0%
R83	Residence	599892	4919381	1.50	0.6	0	0.0%	0	0.0%	0	0.0%
R84	Residence	599202	4919104	1.50	0.7	0	0.0%	0	0.0%	0	0.0%
R85	Residence	599171	4918956	1.50	0.6	0	0.0%	0	0.0%	0	0.0%
R86	Residence	599266	4918782	1.50	0.5	0	0.0%	0	0.0%	0	0.0%
R87	Residence	599577	4918762	1.50	0.5	0	0.0%	0	0.0%	0	0.0%
R88	Residence	599472	4918506	1.50	0.4	0	0.0%	0	0.0%	0	0.0%
R89	Residence	600264	4919263	1.50	0.4	0	0.0%	0	0.0%	0	0.0%
R90	Residence	600189	4919022	1.50	0.4	0	0.0%	0	0.0%	0	0.0%
R91	Residence	600600	4919534	1.50	0.3	0	0.0%	0	0.0%	0	0.0%

43848 Hours of valid Meterological Data (enter number of VALID hours in met data file)

FIGURES

Site Plan Showing Property Line, Building Heights and Location of Sources

Sand & Gravel Site Wastewater Treatment Plant

Map Projection: NAD 1983 UTM Zone 17N

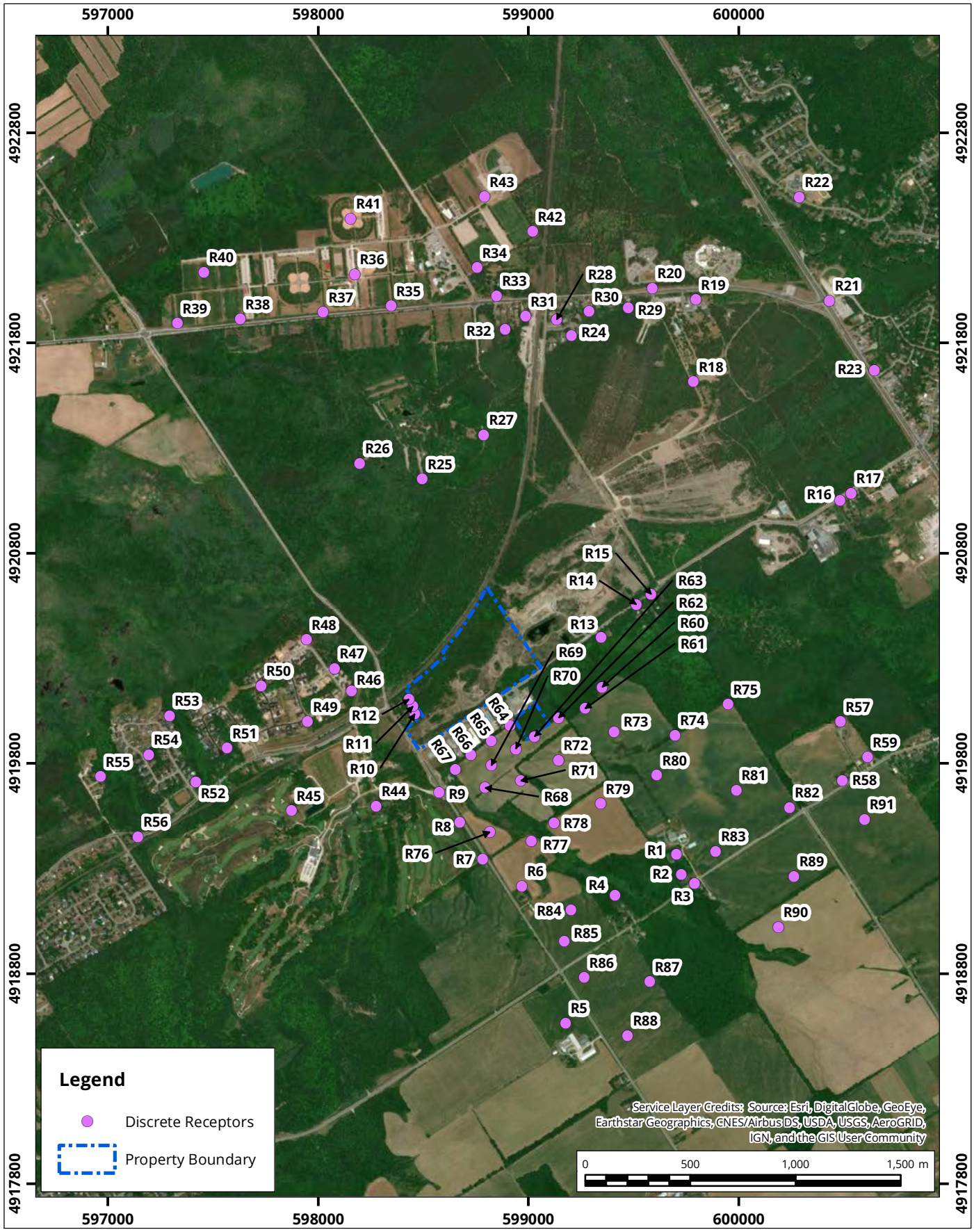
Midhurst WWTP and WTP Facilities - Midhurst, Ontario

True North

Project #: 1302274

Drawn by: DJH	Figure: 1
Approx. Scale:	1:4,500
Date Revised:	Sep 25, 2017

Map Document: C:\Users\djh\Desktop\GIS Temp\1302274\1302274 - Midhurst - Figure 1.mxd



Site Plan Showing Locations of Sensitive Receptors

Sand & Gravel Site Wastewater Treatment Plant

True North

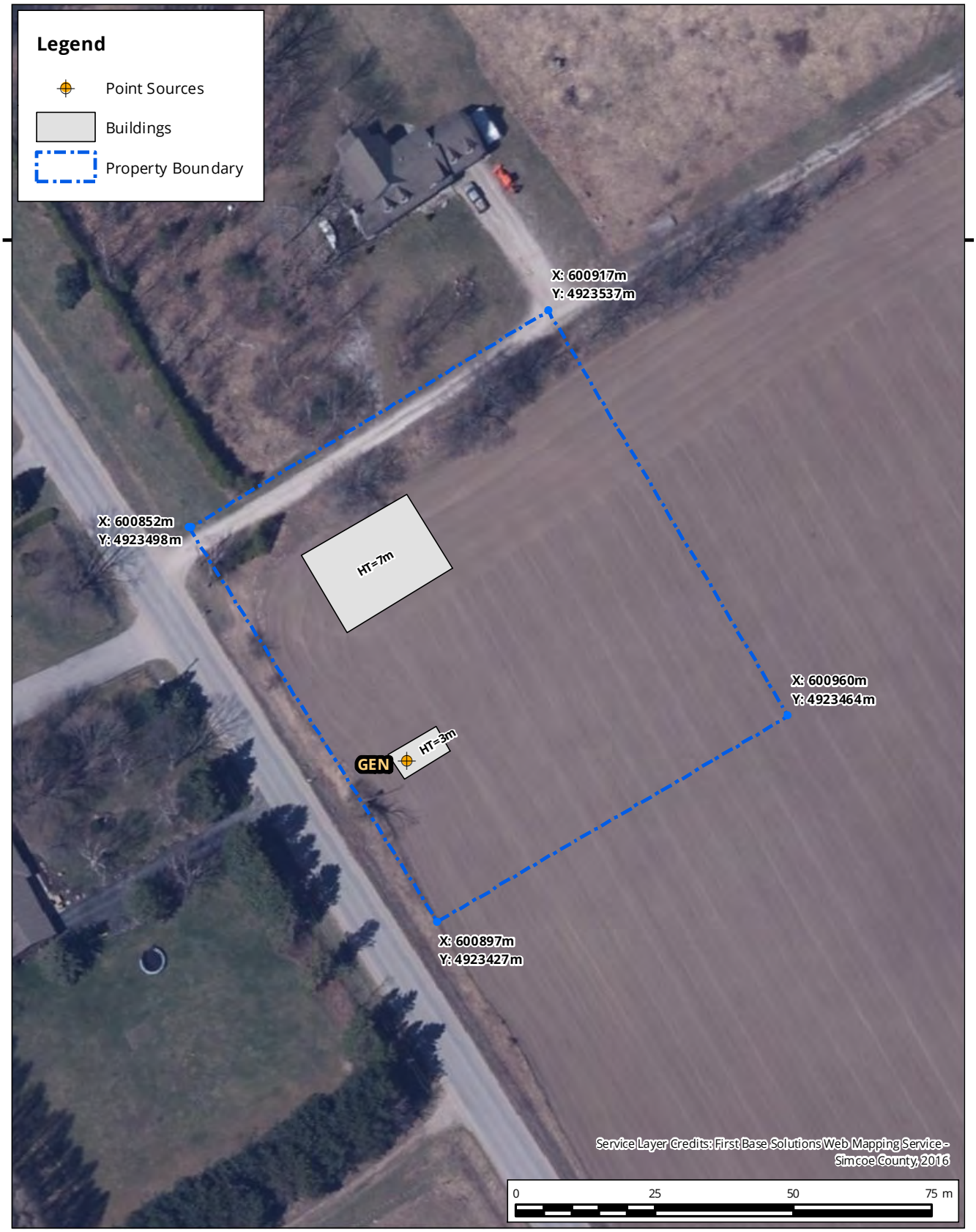
Drawn by:	DJH	Figure:	2
Approx. Scale:	1:25,000		
Date Revised:	Sep 26, 2017		

Map Projection: NAD 1983 UTM Zone 17N

Midhurst WWTP and WTP Facilities - Midhurst, Ontario

Project #: 1302274

Map Document: C:\Users\djh\Desktop\GIS Temp\1302274\1302274 - Midhurst - Figure 2.mxd



Site Plan Showing Property Line, Building Heights and Location of Sources

Doran Site Water Treatment Plant

Map Projection: NAD 1983 UTM Zone 17N

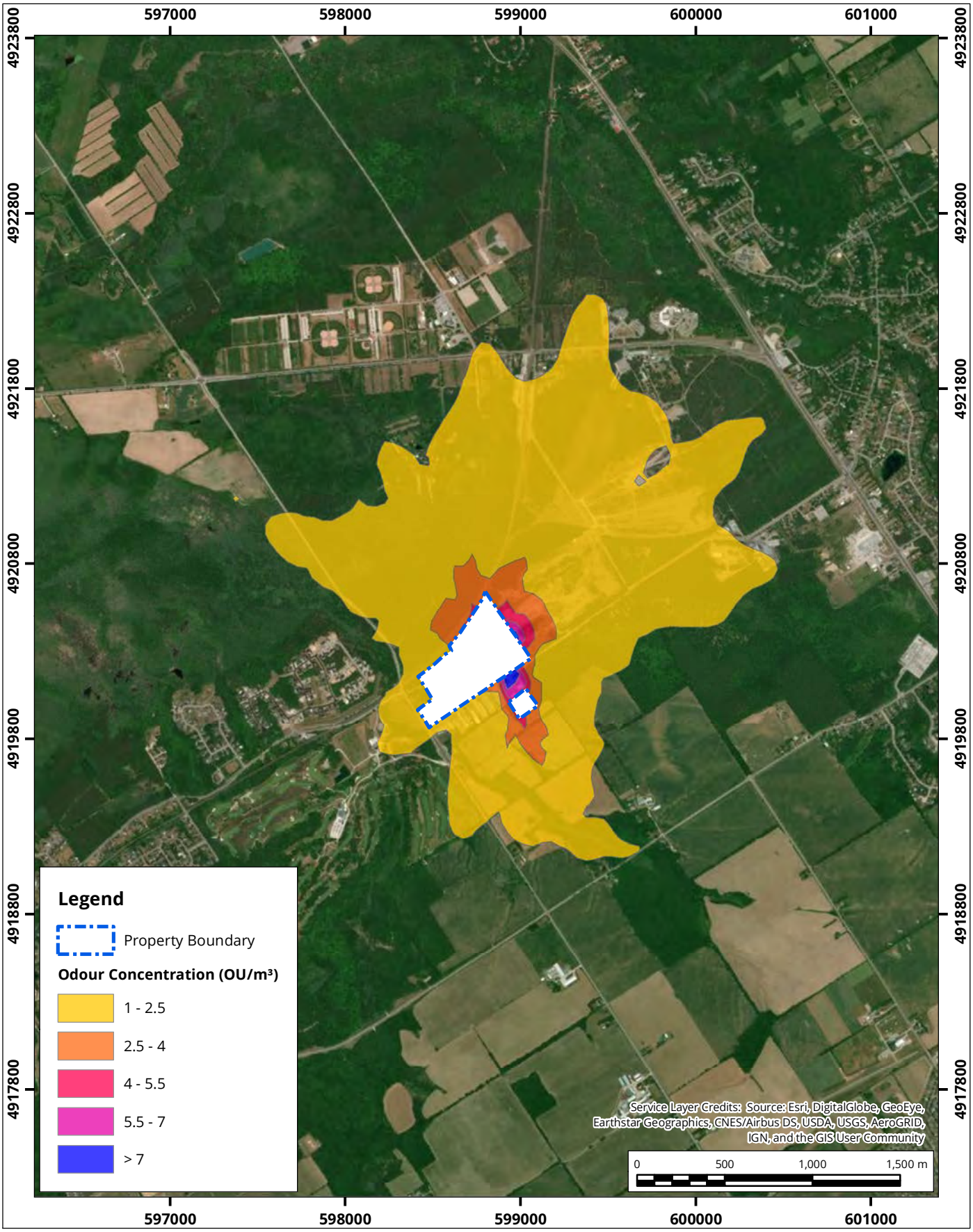
Midhurst WWTP and WTP Facilities - Midhurst, Ontario

True North

Project #: 1302274

Drawn by: DJH	Figure:	3
Approx. Scale:	1:1,000	
Date Revised:	Sep 25, 2017	

Map Document: C:\Users\djh\Desktop\GIS Temp\1302274\1302274 - Midhurst - Figure 3.mxd



Predicted Maximum 10-Minute Odour Concentrations
Sand & Gravel Site Wastewater Treatment Plant

MOECC 10-Minute Odour Standard = 1 OU/m³

Map Projection: NAD 1983 UTM Zone 17N

Midhurst WWTP and WTP Facilities - Midhurst, Ontario

Project #: 1302274

True North

Drawn by: DJH	Figure: 4
Approx. Scale:	1:30,000
Date Revised:	May 23, 2018

Map Document: C:\Users\djh\Desktop\GIS Temp\1302274\1302274 - Midhurst - Figure 4_1hr Odour.mxd

APPENDIX A

BLACK & VEATCH
Building a world of difference.

BLACK & VEATCH
50 MINTHORN BLVD, SUITE 501, MARKHAM, ON, L3T 7X8
905-370-1246 | www.bv.com

MEMORANDUM

Client Name : Geranium
Project Name : Midhurst –Secondary Plan Class Environmental Assessment

B&V Project Number 180261
B&V File Number
Date 2017 08 23

Subject : Odour Emissions Data for Midhurst WWTP

To: Alain Carriere, RWDI

From: Pat Coleman

CC: Oya Koc, Lynne Moss

1.0 Introduction

The purpose of this note is to provide odour emission information for odour modelling.

2.0 Headworks Building

2.1 Suggestion

Model biofilter as point source located at the building end closest to the blower building. It would fit in the existing footprint of the building allowance

2.2 Air Flow Rate

Based on 12 air changes per hour and a wet well/building envelope of 3,840 m^3, the air flow discharge would be 12.8 m^3/s.

2.3 Emission

The values used for the headworks are based on measured values from the Innisfil WWTP. The weighting between the grit tanks and the screens is 20% screens and 80% grit tanks, giving an odour unit value of 2,180 OU. The biofilter efficiency is assumed to be 80%.

Description	Odour	H_2S	NH_3	RSC	VOCs
m^3/s	OU	ug/m^3	ug/m^3	ug/m^3	ug/m^3
12.8	436.04	0.0916	0.002	0.0176	0.1452

3.0 Aeration Tanks

3.1 Suggestion

The suggestion was to model the aeration tanks using a flux rate based on the Innisfil values. The value used is based on the aeration tank #3 inlet. This value is at least twice as high as seen at other well run WWTPs.

3.2 Air Flow Rate

The air flow rate to the aeration tanks at average conditions is 1,760 m^3/h per tank. The nominal surface area of the tanks is 30 m x 30 m = 900 m^2. The flux rate is about 2 m/h or 0.00056 m/s.

3.3 Emission

Description	Odour	H_2S	NH_3	RSC	VOCs
Units	**OU/m^3**	**ug/m^3**	**ug/m^3**	**ug/m^3**	**ug/m^3**
Aeration Tanks	600	0.001	0.01	0.001	0.1

Description	Odour	H_2S	NH_3	RSC	VOCs
Units	**$OU/(s*m^2)$**	**$ug/(s*m^2)$**	**$ug/(s*m^2)$**	**$ug/(s*m^2)$**	**$ug/(s*m^2)$**
Flux	0.33	5.43E-07	5.43E-06	5.43E-07	5.43E-05

4.0 ATAD, Sludge Storage Tanks and Thickening Building

4.1 Sludge Thickening Building

The thickener would be vented to the ATAD biofilter. The sludge building is vented at 6 ac/hr and dispersed because the air would not contain any odours.

4.2 ATAD

The first stage of the odour control system includes the Storage Nitrification Denitrification Reactor (SNDR) headspace, the air is cooled and the scrubbed (removing ammonia). The second stage is a biofilter with organic media.

The vendor provided odour unit and hydrogen sulfide concentrations measured at their biofilter at the Eagle River Water & Sanitation District plant. The RSC is assumed to be equal to the H_2S concentration because the ATAD and SNDR are aerobic processes.

The vendor estimates that the ammonia concentration entering the first stage of odour control (SNDR) is 100 ppmv. The removal rate is 70%. The density of ammonia in air is 0.717 kg/m^3 at 20 C.

4.3 Sludge Storage Tanks

The sludge tanks foul air will be fed into the SND reactor.

There are four storage tanks at 2,454 m^3 each. The tanks are only mixed prior to being emptied. One tank will be emptied at a time. Once empty, the tank will be flushed and not odour controlled. The sludge will be pumped from the tank to the truck.

The tanks will only emit odours when being filled, mixed and being emptied. The plan is to connect the tanks to the ATAD biofilter.

We propose that we increase the emission rate that ThermAer provides from their biofilter by 1.38 times to capture the extra air from the sludge tanks (i.e., ThermAer would provide a larger biofilter for this purpose). This is equivalent to one air change per hour on three full tanks and on one a quarter full tank.

4.4 Emission Rate from Biofilters

There are two biofilters, one on either side of the ATAD building. One biofilter will service two ATADs, one SNDR and two sludge storage tanks. The VOC value is from the Innisfil aerobic digester data as there is no information available on the ATAD biofilter VOCs.

Air Flow/Filter	Odour	H_2S	NH_3	RSC	VOCs
m^3/s	OU	ug/m^3	ug/m^3	ug/m^3	ug/m^3
3.3	120	7.46	21,510	7.46	0.1

5.0 Sources

- Black & Veatch 2010. Innisfil Lakeshore WPCP Expansion Environmental Study Report. Appendix T. Odour Study for Lakeshore WPCP Expansion.
- Data provided by ThermAer collected at the Eagle River Eagle River Water & Sanitation District plant.

Innisfil Lakeshore WPCP Expansion
Environmental Study Report

Appendix T

Odour Study for Lakeshore WPCP Expansion

prepared by Black & Veatch dated March 2010

File: 108128
September 2011

Ministry of the Environment

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'Environnement

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

Via Email only

October 04, 2010

Grant W. Shellswell
Acting Manager of Engineering
Town of Innisfil
Infrastructure and Engineering Services
2101 Innisfil Beach Road
Innisfil, Ontario L9S 1A1

Dear Mr. Shellswell,

RE: Lakeshore Water Pollution Control Plant
Town of Innisfil
Class Environmental Assessment
Appendix T of the Draft Environmental Study Report

The Ministry of the Environment (Ministry) has received the draft Environmental Study Report (ESR) dated September 2010 for the Lakeshore Water Pollution Control Plant (WPCP) in the Town of Innisfil (Town).

The Ministry held a meeting with the Town and its consultant Ainley Group on September 29, 2010 to discuss concerns with the air quality assessment for the above noted project during the Class Environmental Assessment (Class EA) study. The air quality impact assessment requirements were specified in the Ministry's August 11, 2009 letter to the Town. Further to the September 29, 2010 meeting, it is recommended that additional information be provided.

Air Quality Impact Assessment- General Comments

The draft ESR focuses on odour emissions but does not include other potential air contaminant releases from the Lakeshore WPCP processes. An air quality impact assessment should include contaminants such as but not limiting to – Hydrogen Sulfide (H_2S), ammonia (NH_3), Total Reduced Sulphur (TRS), Mercaptans, etc. The following information is required:

- The emission estimates for the above noted parameters for the existing and future operations,
- The maximum predicted concentration at the point of impingement and at the nearest sensitive receptor for both existing and future scenarios,

- The maximum predicted concentrations should be compared against O. Reg. 419/05 standards including 10-minute odour standards
- If required, mitigation measures should also be addressed

Appendix T- Odour Study Report

Odour Emission Estimates

For the new aeration basin under the expansion scenario, the primary clarifiers and the new biosolids, it was estimated to have an ODTV of 750 OU, 3 000 OU and 20 000 OU respectively. Please provide clarification in the final ESR for the basis of these estimates.

Odour Dispersion Modelling

The final ESR should include a summary of the land uses for a 3 km radius surrounding the facility as outlined in the Air Dispersion Modeling for Ontario Guideline (ADMGO).

Discrete receptors were not included in the odour assessment. At a minimum, the maximum predicted odour concentration at the nearest sensitive receptor(s) should be included in the final ESR as outlined in the ADMGO.

The electronic input and output AERMOD files should also be included in the Final ESR.

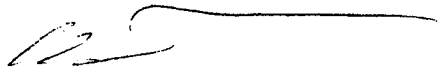
Model Results

In Section 2.7, the modelling results do not summarize the maximum predicted odour concentration for the existing scenario versus the future scenario. It is recommended that the final ESR include a discussion on the maximum odour predicted concentrations and the impacts at the nearest sensitive receptor(s) under the two scenarios.

It is not clear whether the odour dispersion modelling results followed the methodology stipulated under the Technical Bulletin entitled "*Methodology for modeling assessments of contaminants with 10-minute average standards and guidelines under O. Reg. 419/05*" (April 2008). Please clarify in the final ESR if this methodology was used to conduct the odour dispersion modelling analysis. The Technical Bulletin is available at http://www.ene.gov.on.ca/publications/6700e.pdf.

Thank you for the opportunity commenting on the draft ESR for this undertaking. Please feel free to contact me directly at (416) 326-4886 or via email: Chunmei.Liu@ontario.ca if you have any questions about these comments.

Yours truly,



Chunmei Liu
Environmental Assessment and Planning Coordinator
Air, Pesticides and Environmental Planning

c. C. Hood, Manager, Barrie District Office, MOE
J. Mullan, Ainley Group
D. Lyons, Ministry of Municipal Affairs and Housing
M. Antunes, Central Region, MOE
Central Region EA File
A & P File

BLACK & VEATCH
Building a world of difference®

ADDENDUM # 1
ODOUR STUDY FOR LAKESHORE WPCP EXPANSION
TOWN OF INNISFIL

In a letter dated October 4, 2010, the Ministry of the Environment provided comments on the March 2010 Odour Study. On behalf of the Town of Innisfil, this Addendum # 1 responds to the Ministry's letter. Each of the MOE's comments have been reprinted in bold for ease of reference. Responses are presented following each comment. This Addendum should be read in conjunction with the Odour Study.

Air Quality Impact Assessment – General Comments

The draft ESR focuses on odour emissions but does not include other potential air contaminant releases from the Lakeshore WPCP processes. An air quality impact assessment should include contaminants such as but not limiting to – Hydrogen Sulphide (H_2S), Ammonia (NH_3), Total Reduced Sulphur (TRS), Mercaptans, etc. The following information is required:

- **The emissions estimates for the above noted parameters for the existing and future operations**

In addition to collecting odour emission data we also measured H_2S concentrations at the same process locations. H_2S data is provided in the draft ESR in Table 3 of the Ortech Report, but it is also shown in Table 1 below for reference. The H_2S accounted for most of the odour at the Headworks Bar Screens and North Aerated Grit Tank sources but accounted for very little of the odour at the other sources. H_2S concentrations were measured with a Jerome Analyzer and may include other reduced sulfur compounds.

Table 1 – Existing Odour, H_2S, and Other Specific Contaminant Emissions

Source	Measured Odour (OU)	Measured Avg H_2S ($\mu g/m^3$)	Estimated NH_3 ($\mu g/m^3$)	Estimated RSC[(1)] ($\mu g/m^3$)	Estimated VOCs ($\mu g/m^3$)
Headworks Bar Screens	1229	0.21	0.01	0.04[(2)]	1.23
N. Aerated Grit Tank	2418	0.52	0.01	0.10[(2)]	0.6
Screw Sump #1/2	542	0.003	0.01	0.003	0.1
Aeration Tank #2 Inlet	1748	0.011	0.01	0.011	0.1
Aeration Tank #2 Outlet	1461	0.003	0.01	0.003	0.1
Screw Sump #3/4	499	0.001	0.01	0.001	0.1
Aeration Tank #3 Inlet	588	0.001	0.01	0.001	0.1
Aeration Tank #3 Outlet	500	0.004	0.01	0.004	0.1
Clarifier #3	1466	0.001	0.01	0.001	0.1
Small Digester	2491	0.017	0.01	0.017	0.1
North Storage tank	1060	0.001	0.01	0.001	0.1
Filter Building	1476	0.002	0.01	0.002	0.1
[(1)]Assumed to be same as H_2S unless noted, [(2)]Assumed to be 20% of H_2S					

The estimates of other contaminants were not included in the draft ERS because they are expected to be very low with overall odour being the primary concern. However, estimates for contaminants are provided in Table 1 based on previous testing conducted at other wastewater facilities.

Detector tubes were used to check for ammonia, but none was detected. Previous sampling at other wastewater facilities shows that ammonia occurs at very low concentrations at the types of processes being used at the Lakeshore WPCP. As a conservative estimate, an existing ammonia concentration of 0.01 mg/L could be assumed for all processes as shown in Table 1.

Reduced sulphur compound (RSC) testing has been previously performed at another similar wastewater facility. In general, the overall RSC concentration is about 20 percent of the H_2S concentration. For the headworks and grit tank the existing overall RSC concentration was assumed to be 20 percent of H_2S, but for the other processes which had very low H_2S, the existing RSC was conservatively assumed to be equal to the H_2S, Supporting data is provided as an attachment.

VOC testing has also been previously performed at another similar wastewater facility. The VOC concentrations are also low and the total of all 75 VOCs tested was only 1.23 $\mu g/m^3$. Note that d-limonene was not included because it was added as an odour masking agent. As a conservative estimate, the existing overall VOC emissions were assumed to be 1.23 $\mu g/m^3$ at the headworks with a diminished value of 0.6 $\mu g/m^3$ grit tank. The bulk of the VOCs in the wastewater are emitted in those initial processes, so downstream processes would have significantly less VOC emissions. A conservative estimate of 0.1 $\mu g/m^3$ was assumed for all other processes as shown on Table 1.

For the future scenario, mitigation measures are installed at the headworks, grit tanks, and solids thickening. The odour modeling indicated that the net overall odour emissions from the plant in the future are less than the present. Therefore, it can be assumed that the overall emissions of other contaminants will also be slightly less.

- **The maximum predicted concentration at the point of impingement and at the nearest sensitive receptor for both existing and future scenarios.**

The maximum predicted concentration was not determined for specific compounds because they do not occur in significant concentrations and overall odour is the main concern. In general, previous research at municipal wastewater facilities throughout North America has shown a wide range of VOC compounds at very low concentrations. It is cost prohibitive to attempt specific compound identification and even when this has been attempted, not all the compounds are identified. When the total VOCs are considered, the conglomerate concentration remains low. As shown in Table 1 in the previous discussion, the total VOCs measured at another similar wastewater facility are very low.
In contrast to the VOCs, odour is a concern at wastewater treatment plants, so our focus was on odour.

The issue of "nearest sensitive receptor" is discussed in the model results.

- **The maximum predicted concentrations should be compared against the O. Reg. 419/05 standards including 10-minute odour standards**

See subsequent discussion under model results.

- **If required, mitigation measures should also be addressed**

As noted in the draft ESR, mitigation measures are installed at the headworks, grit tanks, and solids thickening. After the plant expansion is completed, the odour modeling indicates that future odour emissions are less than at present.

Appendix T- Odour Study Report

Odour Emission Estimates

For the new aeration basin under the expansion scenario, the primary clarifiers and new biosolids, it was estimated to have an ODTV of 750 OU, 3 000 OU and 20 000 OU respectively. Please provide clarification in the final ESR for the basis of these estimates.

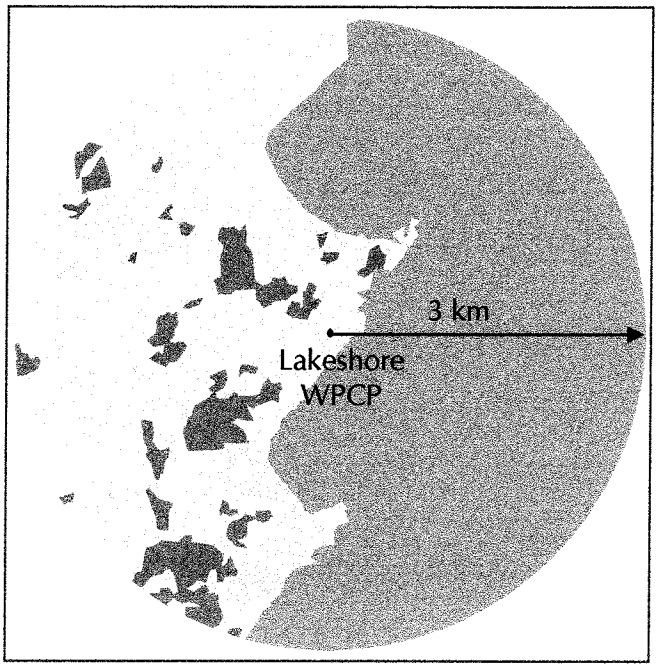
The total future 40 mld flow will proceed through the new primary clarifiers prior to being re-channelled to the existing and new aeration tanks, the odour emanating from the aeration tanks will be reduced. For the existing aeration tanks, it was assumed that the new odour emissions would be half of the existing scenario resulting in an ODTV of 874 OU. The basis for this assumption is that the sulphide laden influent wastewater will no longer flow directly to the aeration basins, but would first pass into the primary clarifiers and be emitted at the overflow weirs. Therefore, emissions from the aeration basins would be reduced. For the new aeration basin, it was estimated to have an ODTV of 750 OU. The existing and new aeration tanks were assumed to have slightly different magnitudes of odour emission because the existing aeration basins are plug flow and the new aeration basins will be completely mixed. Completely mixed basins maintain more aerobic conditions, so it is assumed that slightly less odour is emitted.

For the new primary clarifiers a conservative value of 3,000 OU was assumed. The basis of this value is an assumed H_2S emission of 1.5 ppm, which represents the peak summer value typically seen at primary clarifiers in previous plant surveys.
For the biosolids facilities, a very conservative value of 20,000 OU was assumed for this intermittent and very small volume air flow. The basis of this assumption is previous testing at similar biosolids storage facilities, which has shown a range of odour values from 5,000 to 20,000 OU depending on the length of storage time.

Odour Dispersion Modelling

The final ESR should include a summary of the land uses for a 3 km radius surrounding the facility as outlined in the Air Dispersion Modeling for Ontario Guideline (ADMGO).

As noted in Section 2.3.1 of the Odour Modeling Analysis report (dated February 2010), a visual inspection of the topographic map (illustrated in Figure 2-1 of the odour report), *"conservatively"* [emphasis added] concluded that over 50 percent of the area surrounding the proposed project is rural. Additionally, from the figure below, it can be seen that approximately 75 percent of the area within a 3 km radius of the site is considered rural.



Discrete receptors were not included in the odour assessment. At a minimum, the maximum predicted odour concentration at the nearest sensitive receptor(s) should be included in the final ESR as outlined in the ADMGO.

As noted in Section 2.4 of the Odour Modeling Analysis report (dated February 2010), a nested rectangular grid network consistent with the requirements outlined in the ADMGO was utilized in the modeling analysis. Modeling receptors were also placed along the facility fence line as outlined in the ADMGO. Since fence line receptors were included in the analysis, it was conservatively assumed that no "sensitive" receptor could possibly be closer than a fence line receptor; therefore, no individual "sensitive" receptors were added. The nearest residence is approximately 50 meters from the facility's property near the intersection of St Johns Road and 6th Line.

The electronic input and output AERMOD files should also be included in the Final ESR.

The electronic input and output modeling files are included on the enclosed DVD.

Model Results

In Section 2.7, the modeling results do not summarize the maximum predicted odour concentration for the existing scenario versus the future scenario. It is recommended that the final ESR include a discussion on the maximum odour predicted concentrations and the impacts at the nearest sensitive receptor(s) under the two scenarios.

It is not clear whether the odour dispersion modeling results followed the methodology stipulated under the Technical Bulletin entitle "Methodology for modeling assessments of contaminants with 10-minute average standards and guidelines under O. Reg. 419/05 (April 2008). Please clarify in the final ESR if this methodology was used to conduct the odour dispersion modeling analysis.

The 0.30 percent decrease, as mentioned in Section 2.7 of the odour report, was based on the maximum impact to give the owner of the project an indication of the percent reduction in the odour impact. Per guidance outlined in the Technical Bulletin mentioned above, the percent reduction is 2.2 percent based on a base case impact of 722 odour units (OU) versus a post-project impact of 706 OU. These values were derived from the modeling analysis after eliminating the meteorological anomalies, i.e., the top 8 hours per year for a one-hour averaging period. It should be noted here that the facility currently has few odour complaints.

Please see the following attachments, which are provided in support of the Model results:

1) Reduced Sulphur Compound Analyses – ASTM D 5504-01 (20 compounds)
2) VOC Compound Analyses - EPA TO-15 (75 Compounds)

S:\108128\Reports\Addendum 1 to Odour Study.doc

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS
Page 1 of 1

Client: **St Croix Sensory, Inc.**
Client Sample ID: Bord Na Mona In
Client Project ID: Black & Veatch / Orlando

CAS Project ID: P0903888
CAS Sample ID: P0903888-001

Test Code: ASTM D 5504-01
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Zheng Wang
Sampling Media: 10 L Tedlar Bag
Test Notes:

Date Collected: 11/11/09
Time Collected: 11:30
Date Received: 11/12/09
Date Analyzed: 11/12/09
Time Analyzed: 11:07, 11:50
Volume(s) Analyzed: 1.0 ml(s)
0.20 ml(s)

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV
7783-06-4	Hydrogen Sulfide	**47,000**	35	**34,000**	25
463-58-1	Carbonyl Sulfide	**110**	12	**45**	5.0
74-93-1	Methyl Mercaptan	**6,600**	9.8	**3,300**	5.0
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0
75-18-3	Dimethyl Sulfide	**360**	13	**140**	5.0
75-15-0	Carbon Disulfide	**22**	7.8	**7.2**	2.5
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0
75-66-1	tert-Butyl Mercaptan	**85**	18	**23**	5.0
107-03-9	n-Propyl Mercaptan	**59**	16	**19**	5.0
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0
110-02-1	Thiophene	ND	17	ND	5.0
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0
352-93-2	Diethyl Sulfide	ND	18	ND	5.0
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0
624-92-0	Dimethyl Disulfide	**100**	9.6	**26**	2.5
616-44-4	3-Methylthiophene	ND	20	ND	5.0
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0
872-55-9	2-Ethylthiophene	ND	23	ND	5.0
110-81-6	Diethyl Disulfide	ND	12	ND	2.5

1) VOC Analyses – EPA TO-15 (75 Compounds)

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: **St Croix Sensory, Inc.**
Client Sample ID: **Bord Na Mona In**
Client Project ID: **Black & Veatch / Orlando**

CAS Project ID: P0903888
CAS Sample ID: P0903888-001

Test Code: EPA TO-15 Modified
Instrument ID: Tekmar AUTOCAN/HP5973/HP6890/MS3
Analyst: Li Li
Sampling Media: 10 L Tedlar Bag
Test Notes:

Date Collected: 11/11/09
Date Received: 11/12/09
Date Analyzed: 11/12/09
Volume(s) Analyzed: 0.020 Liter(s)

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV
115-07-1	Propene	ND	25	ND	15
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	25	ND	5.1
74-87-3	Chloromethane	ND	25	ND	12
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	25	ND	3.6
75-01-4	Vinyl Chloride	ND	25	ND	9.8
106-99-0	1,3-Butadiene	ND	25	ND	11
74-83-9	Bromomethane	ND	25	ND	6.4
75-00-3	Chloroethane	ND	25	ND	9.5
64-17-5	Ethanol	ND	250	ND	130
75-05-8	Acetonitrile	ND	25	ND	15
107-02-8	Acrolein	ND	25	ND	11
67-64-1	Acetone	ND	250	ND	110
75-69-4	Trichlorofluoromethane	ND	25	ND	4.5
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	50	ND	20
107-13-1	Acrylonitrile	ND	25	ND	12
75-35-4	1,1-Dichloroethene	ND	25	ND	6.3
75-09-2	Methylene Chloride	ND	25	ND	7.2
107-05-1	3-Chloro-1-propene (Allyl Chloride	ND	25	ND	8.0
76-13-1	Trichlorotrifluoroethane	ND	25	ND	3.3
75-15-0	Carbon Disulfide	**310**	50	**100**	16
156-60-5	trans-1,2-Dichloroethene	ND	25	ND	6.3
75-34-3	1,1-Dichloroethane	ND	25	ND	6.2
1634-04-4	Methyl tert-Butyl Ether	ND	25	ND	6.9
108-05-4	Vinyl Acetate	ND	250	ND	71
78-93-3	2-Butanone (MEK)	ND	25	ND	8.5

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: **St Croix Sensory, Inc.**
Client Sample ID: **Bord Na Mona In**
Client Project ID: **Black & Veatch / Orlando**

CAS Project ID: P0903888
CAS Sample ID: P0903888-001

Test Code: EPA TO-15 Modified
Instrument ID: Tekmar AUTOCAN/HP5973/HP6890/MS3
Analyst: Li Li
Sampling Media: 10 L Tedlar Bag

Date Collected: 11/11/09
Date Received: 11/12/09
Date Analyzed: 11/12/09
Volume(s) Analyzed: 0.020 Liter(s)

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV
156-59-2	cis-1,2-Dichloroethene	ND	25	ND	6.3
141-78-6	Ethyl Acetate	ND	50	ND	14
110-54-3	n-Hexane	ND	25	ND	7.1
67-66-3	Chloroform	**140**	25	**29**	5.1
109-99-9	Tetrahydrofuran (THF)	ND	25	ND	8.5
107-06-2	1,2-Dichloroethane	ND	25	ND	6.2
71-55-6	1,1,1-Trichloroethane	ND	25	ND	4.6
71-43-2	Benzene	ND	25	ND	7.8
56-23-5	Carbon Tetrachloride	ND	25	ND	4.0
110-82-7	Cyclohexane	ND	50	ND	15
78-87-5	1,2-Dichloropropane	ND	25	ND	5.4
75-27-4	Bromodichloromethane	ND	25	ND	3.7
79-01-6	Trichloroethene	ND	25	ND	4.7
123-91-1	1,4-Dioxane	ND	25	ND	6.9
80-62-6	Methyl Methacrylate	ND	50	ND	12
142-82-5	n-Heptane	ND	25	ND	6.1
10061-01-5	cis-1,3-Dichloropropene	ND	25	ND	5.5
108-10-1	4-Methyl-2-pentanone	ND	25	ND	6.1
10061-02-6	trans-1,3-Dichloropropene	ND	25	ND	5.5
79-00-5	1,1,2-Trichloroethane	ND	25	ND	4.6
108-88-3	Toluene	**450**	25	**120**	6.6
591-78-6	2-Hexanone	ND	25	ND	6.1
124-48-1	Dibromochloromethane	ND	25	ND	2.9
106-93-4	1,2-Dibromoethane	ND	25	ND	3.3
123-86-4	n-Butyl Acetate	ND	25	ND	5.3

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: **St Croix Sensory, Inc.**
Client Sample ID: Bord Na Mona In
Client Project ID: Black & Veatch / Orlando

CAS Project ID: P0903888
CAS Sample ID: P0903888-001

Test Code: EPA TO-15 Modified
Instrument ID: Tekmar AUTOCAN/HP5973/HP6890/MS3
Analyst: Li Li
Sampling Media: 10 L Tedlar Bag
Test Notes:

Date Collected: 11/11/09
Date Received: 11/12/09
Date Analyzed: 11/12/09
Volume(s) Analyzed: 0.020 Liter(s)

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	25	ND	5.4	
127-18-4	Tetrachloroethene	ND	25	ND	3.7	
108-90-7	Chlorobenzene	ND	25	ND	5.4	
100-41-4	Ethylbenzene	ND	25	ND	5.8	
179601-23-1	m,p-Xylenes	ND	50	ND	12	
75-25-2	Bromoform	ND	25	ND	2.4	
100-42-5	Styrene	ND	25	ND	5.9	
95-47-6	o-Xylene	ND	25	ND	5.8	
111-84-2	n-Nonane	ND	25	ND	4.8	
79-34-5	1,1,2,2-Tetrachloroethane	ND	25	ND	3.6	
98-82-8	Cumene	ND	25	ND	5.1	
80-56-8	alpha-Pinene	**330**	25	**59**	4.5	
103-65-1	n-Propylbenzene	ND	25	ND	5.1	
622-96-8	4-Ethyltoluene	ND	25	ND	5.1	
108-67-8	1,3,5-Trimethylbenzene	ND	25	ND	5.1	
95-63-6	1,2,4-Trimethylbenzene	ND	25	ND	5.1	
100-44-7	Benzyl Chloride	ND	25	ND	4.8	
541-73-1	1,3-Dichlorobenzene	ND	25	ND	4.2	
106-46-7	1,4-Dichlorobenzene	ND	25	ND	4.2	
95-50-1	1,2-Dichlorobenzene	ND	25	ND	4.2	
5989-27-5	d-Limonene	**1,900**	25	**340**	4.5	
96-12-8	1,2-Dibromo-3-chloropropane	ND	25	ND	2.6	
120-82-1	1,2,4-Trichlorobenzene	ND	25	ND	3.4	
91-20-3	Naphthalene	ND	25	ND	4.8	
87-68-3	Hexachlorobutadiene	ND	25	ND	2.3	

Note: d-Limonene applied as odour masking agent.

BUILDING A WORLD OF DIFFERENCE®



Odour Study for Lakeshore WPCP Expansion

Prepared for

Town of Innisfil

Black & Veatch Project No. 163808

Submittal Date March 2010

BLACK & VEATCH
Building a world of difference®

Table of Contents

List of Figures

Appendices

Section 1. Introduction

The Town of Innisfil owns and operates the Lakeshore Water Pollution Control Plant (Lakeshore WPCP). The current plant capacity is 14,370 m^3/d on an annual average daily flow basis, and the plant treated approximately 9,000 m^3/d (9 MLD) on average in 2009. Plant facilities consist of headworks (influent pumping, screening and grit removal), extended aeration activated sludge system, secondary clarifiers, effluent filters and UV disinfection. Solids handling processes include aerobic digestion with decanting, aerated liquid sludge storage and liquid land application. In order to accommodate the full build out of the Town of Innisfil's 2008 Official Plan, an expansion/upgrade of the existing Lakeshore WPCP is planned and will soon be necessary.

The Plant Upgrade/Expansion Project (hereinafter referred to as the Project) will increase the plant's capacity to 40 MLD. Proposed new facilities include a significant expansion or new influent pumping and headworks facility, the addition of primary clarifiers, new aeration basins configured for biological nutrient removal, new secondary clarifiers, and new tertiary phosphorus removal facilities. New solids handling processes include gravity thickening and fermentation of primary sludge, mechanical thickening of waste activated sludge, new anaerobic digesters, and new digested biosolids storage tanks. At this time, it is anticipated the Town will continue biosolids disposal by land applying liquid biosolids. The existing aerobic digesters and biosolids storage tanks will be decommissioned. The project will also control the odour associated with the operation within the headworks area and filter building.

1.1 Project Location

The Lakeshore WPCP is located in the southern part of the Town of Innisfil, in southern Ontario, Canada. The facility is situated approximately at the intersection of 6th Line and St John's Road near Lake Simcoe, as depicted on the map in Figure 1-1.

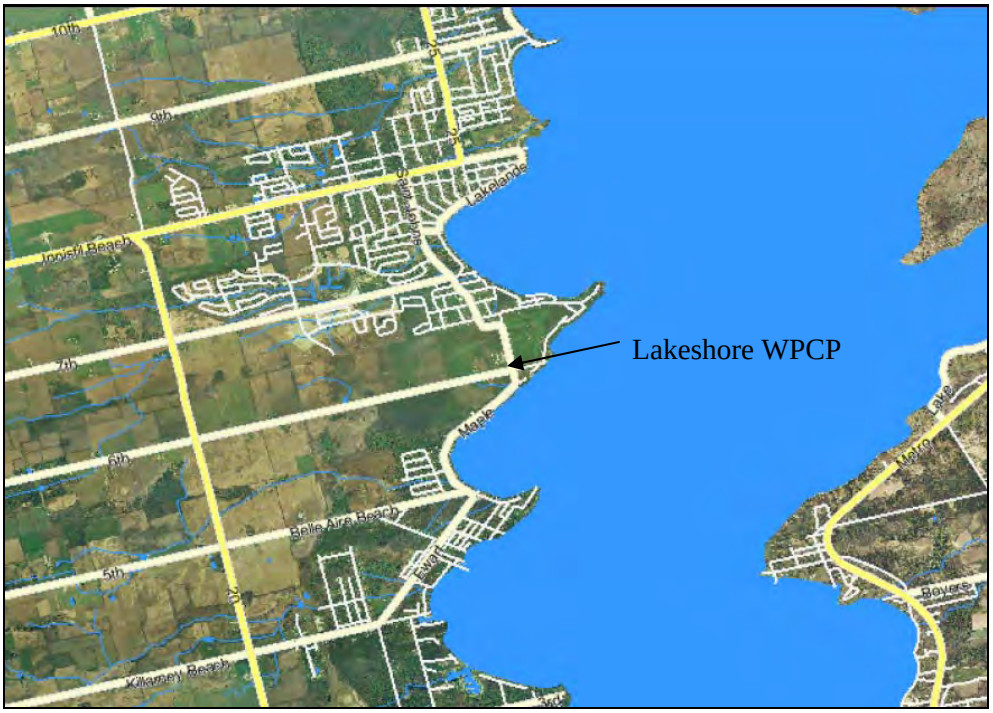


Figure 1-1 Facility Location

Section 2. Air Dispersion Modeling

The following sections discuss the air dispersion modeling methodology and the modeling results from the odour modeling analysis for the proposed Project. This odour analysis has been performed in accordance with the Ministry of the Environment (MOE) document *Air Dispersion Modelling Guideline for Ontario*.

2.1 Emission Source Parameters

As part of the expansion project, an odour testing program was initiated to determine odour emission rates at significant sources in the plant. ORTECH Environmental conducted this odour testing program in October, 2009. The ORTECH testing results and a report are included as Appendix A for reference. The odour emission rates for the significant sources as determined by ORTECH Environmental are summarized below along with a discussion on the odour emission rate for the expansion project.

2.1.1 Headworks Bar Screens

Existing Facility

During the odour testing, the geometric mean odour detection threshold value (ODTV) for the Headworks Building was 1,229 OU. However, it is expected that the Headworks Building would have a higher odour emission rate during warmer weather conditions, as such; it was assumed that the maximum odour emission rate for this type of source would be a factor of three times the sampled value. This results in an ODTV of 3,687 OU for the exhaust fans on the Screen roof.

Expansion Project

The existing Headworks Building is expected to be upgraded with odour control facilities; therefore, for the expanded plant, the odour emissions from the existing exhaust fans were eliminated. Likewise, any new screening operations associated with a new headworks facility would also be controlled, so no new odour sources were added.

2.1.2 Aerated Grit Tank

Existing Facility

During the odour testing, only the north aerated grit tank was in operation. The geometric mean ODTV for the north aerated grit tank was 2,418 OU. However, it is expected that the aerated grit tank would have a higher odour emission rate during warmer weather conditions, as such; it was assumed that the maximum odour emission rate for this type of source would be a factor of three times the sampled value. This results in an ODTV of 7,254 OU for the north aerated grit tank. To be conservative, it was assumed the south aerated grit tank had the same ODTV.

Expansion Project

The existing aerated grit tanks are expected to be controlled; therefore, for the expansion scenario, the odour emissions from both the north and south aerated grit tanks were eliminated. Likewise, any new aerated grit tanks associated with a new headworks facility would also be controlled, so no new odour sources were added.

2.1.3 Screw Sump

Existing Facility

During the odour testing, both the screw sump #1/2 area and the screw sump #3/4 area were tested. However, to be conservative, the higher of the two samples (542 OU) was used for both sump areas in the modeling analysis.

Expansion Project

The expansion project currently does not have the screw sump areas getting controlled for odour emissions. Since the amount of residual sulfides in the water would remain the same entering these areas and subsequently stripped out at the sumps, the ODTV from the existing operations were assumed for these sources in the expansion scenario.

2.1.4 Aeration Tanks

Existing Facility

During the odour testing, the inlet and outlet of both aeration tanks #2 and #3 were tested. However, to be conservative, the highest of the four samples (1,748 OU) was used for the entire aeration area for all four aeration tanks in the modeling analysis.

Expansion Project

The expansion project currently does not have the existing aeration tanks getting controlled for odour emissions. However, since the total 40 MLD flow will proceed through the new primary clarifiers prior to being re-channelled to the existing and new aeration tanks, the odour emanating from the aeration tanks will be reduced. For the existing aeration tanks, it was assumed that the new odour emissions would be half of the existing scenario resulting in an ODTV of 874 OU. For the new aeration basin, it was estimated to have an ODTV of 750 OU. During the expansion project, the existing basins will be modified to allow for operation in a biological nutrient removal configuration (including denitrification, biological phosphorus removal, or both). To increase the capacity new BNR basins also will be constructed.

2.1.5 Clarifiers

Existing Facility

The existing facility does not have any primary clarifiers but has four secondary clarifiers. During the odour testing, only clarifier #3 was tested and resulted in an ODTV of 1,466 OU. It was assumed that the remaining clarifiers had the same ODTV as clarifier #3.

Expansion Project

The expansion project will add primary clarifiers for the entire plant and additional secondary clarifiers to expand the existing capacity. For the odour modeling analysis, it was assumed the primary clarifiers would have an ODTV of 3,000 OU and the secondary clarifiers would have the same ODTV as the existing clarifiers, namely 1,466 OU. The existing secondary clarifiers will remain unchanged.

2.1.6 Digesters

Existing Facility

During the odour testing, only the small digester was tested. The ODTV for the small digester was 2,491 OU. It was assumed the large digester tank had the same ODTV.

Expansion Project

The expansion project includes decommissioning the existing aerobic digesters. New anaerobic digesters will be constructed. The anaerobic digester tanks will have a digester gas flare which will effectively control odour emissions; therefore, for the expansion scenario, the odour emissions from both existing small and large aerobic digester tanks were eliminated.

2.1.7 Storage Tanks

Existing Facility

During the odour testing, only the north storage tank was tested. The ODTV for the north storage tank was 1,060 OU. To be conservative, it was assumed the south storage tank had the same ODTV.

Expansion Project

The existing storage tanks are expected to be decommissioned when the plant is expanded; therefore, for the expansion scenario, the odour emissions from both the north and south tanks were eliminated. New biosolids storage tanks will be constructed are addressed as an expansion project source.

2.1.8 Filter Building

Existing Facility

During the odour testing, the ODTV for the Filter Building was 1,476 OU. It was assumed that this ODTV was the same for all four exhaust fans on the Filter Building roof.

Expansion Project

The existing Filter Building is expected to be decommissioned; therefore, for the expansion scenario, the odour emissions from the exhaust fans were eliminated.

2.1.9 New Expansion Sources

Primary Clarifiers

New primary clarifiers will be constructed in the expansion project, between the headworks and the activated sludge process.

Tertiary Phosphorous Removal Facility

A new tertiary phosphorous removal building will be constructed in the expansion project. This facility will replace the existing Filter Building. Odours emanating from this facility were assumed to be equivalent to the existing filter building; as such, an ODTV of 1,476 OU was used.

Solids Thickening

New gravity thickeners will be constructed in the expansion project for thickening of primary sludge. When operating for biological phosphorus removal, these gravity thickeners will also be capable of being operated for sludge fermentation. New mechanical facilities will be installed for thickening of waste activated sludge. The odours associated with the processes will be controlled; therefore, only the sources discussed above were added to modeling analysis.

Solids Digestion

The existing aerobic digesters will be decommissioned during the expansion project. New anaerobic digesters will be constructed.

Biosolids Storage

A new biosolids storage area will be constructed in the expansion project. The storage tanks will be covered, but vented to the atmosphere without treatment. The ODTV for this process was assumed to be 20,000 OU, which will be emitted intermittently from the exhaust vent during filling operations. For purposes of the modeling a constant exhaust rate of 1,000 cfm was assumed.

2.2 Model Selection and Description

Consistent with the MOE document *Air Dispersion Modelling Guideline for Ontario*, the American Meteorological Society/Environmental Protection Agency (AMS/EPA) Regulatory Model (AERMOD, Version 09292) air dispersion model was used to predict maximum ground-level concentrations associated with the proposed Project's emissions. The AERMOD model was specifically designed to support the USEPA's regulatory modeling programs. AERMOD is the product of AMS/EPA Regulatory Model Improvement Committee (AERMIC), formed to introduce state-of-the-art modeling concepts into USEPA's air quality models. AERMOD incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. The AERMOD model includes a wide range of options for modeling air quality impacts of pollution sources.

2.3 Model Options

Since the AERMOD model is designed to support the MOE's modeling programs, the regulatory modeling options are considered the default mode of operation for the model. Regulatory default consists of entering the appropriate input source characteristics, selecting the appropriate regulatory options, and then using the recommended model defaults. Regulatory default options were utilized in the modeling analysis.

2.3.1 Dispersion Coefficients

With the introduction of AERMOD, the choice of the use of the simple rural or urban dispersion coefficient is no longer available. The AERMOD model has the option of assigning specific sources to have an urban effect, thus enabling AERMOD to employ enhanced turbulent dispersion associated with anthropogenic heat flux, parameterized by population size of the urban area.

The USEPA document *Guideline on Air Quality Models* (Appendix W of 40 CFR 51) provides the basis for determining the urban/rural status of a source based on a land use classification procedure or a population based procedure. The MOE document *Air Dispersion Modelling Guideline for Ontario* states that the land use procedures are considered a more definitive criterion, and as such, the land use procedure was utilized in this modeling analysis. The land use procedure is as follows:

- Classify the land use within the total area, A_o, circumscribed by a 3 km radius circle about the source using the meteorological land use typing scheme proposed by Auer.
- If land use Types I1 (heavy industrial), I2 (light-moderate industrial), C1 (commercial), R2 (single-family compact residential), and R3 (multi-family compact residential) account for 50 percent or more of A_o, use urban dispersion coefficients; otherwise, use appropriate rural dispersion coefficients.

Based on a visual inspection of the USGS 7.5-minute topographic map of the proposed site location, illustrated in Figure 2-1, it was conservatively concluded that over 50 percent of the area surrounding the proposed Project is rural. Since the proposed Project is not located in an urbanized area, urban boundary layer option was not invoked.

Source: http://www.digital-topo-maps.com/

Figure 2-1 Site Location

2.3.2 Good Engineering Practice and Building Downwash Evaluation

The dispersion of a plume can be affected by nearby structures when the stack is short enough to allow the plume to be significantly influenced by surrounding building turbulence. This phenomenon, known as structure-induced downwash, generally results in higher model predicted ground-level concentrations in the vicinity of the influencing structure. According to Section 15 of Ontario Regulation 419/05, the stack height to be used in modeling must be the lower of the following heights:

1. The actual height above ground level at which the contaminants are discharged into the air from the source of contaminant.
2. The higher of the following heights:
   a. 65 meters,
   b. the height established by applying the formula:

$$Hg = A + 1.5\,B$$

where:

Hg = GEP stack height
A = height of nearby structure(s)
B = lesser dimension (height or projected width) of nearby structure(s)

The term *nearby* is defined as a distance up to five times the lesser of the height or width dimension of a structure or terrain feature.

For these analyses, the buildings and structures of the existing facility and proposed expansion project were analyzed to determine the potential to influence the plume dispersion from the odour-producing sources' stacks. Structure dimensions and relative locations were entered into the USEPA's Plume Rise Model Enhancement (PRIME) version of Building Profile Input Program Prime (BPIP-PRIME, Version 04274) to produce an AERMOD input file with direction specific building downwash parameters. Since the stacks' heights are less than respective GEP heights, direction-specific downwash parameters from the BPIPPRM program were included in the AERMOD air dispersion modeling analysis.

2.3.3 Model Default Options

Since the AERMOD model is especially designed to support the MOE's regulatory modeling programs, the regulatory modeling options are considered the default mode of operation for the model. These options include, but are not limited to, the use of stack-tip downwash and a routine for processing averages when calm winds or missing meteorological data occur.

2.4 Receptor Grid

The air dispersion modeling receptor locations were established at appropriate distances to ensure sufficient density and aerial extent to adequately characterize the pattern of pollutant impacts in the area. Specifically, a nested rectangular grid network that extends out 10 km from the center of the proposed location was used. As specified in the MOE document *Air Dispersion Modelling Guideline for Ontario*, the nested rectangular grid network will consists of the following five tiers:

a) 10 meters along the facility fence line
b) 20 meters or less, in an area that is bounded by a rectangle, where every point on the boundary of the rectangle is at least 200 meters from every source of contaminant;
c) 50 meters or less, in an area that surrounds the area described in clause (b) and that is bounded by a rectangle, where every point on the rectangle is at least 300 meters from the area described in clause (b);
d) 100 meters or less, in an area that surrounds the area described in clause (c) and that is bounded by a rectangle, where every point on the rectangle is at least 800 meters from the area described in clause (b);
e) 200 meters or less, in an area that surrounds the area described in clause (d) and that is bounded by a rectangle, where every point on the rectangle is at least 1,800 meters from the area described in clause (b);
f) 500 meters or less, in an area that surrounds the area described in clause (e) and that is bounded by a rectangle, where every point on the rectangle is at least 4,800 meters from the area described in clause (b);

Figure 2-2 illustrates the five tier grid.

2.5 Terrain Considerations

Terrain elevations at receptors were obtained from 7.5-minute format (resolution 1:25,000) Digital Elevation Model (DEM) files and incorporated into the AERMOD model. These files were obtained through the MOE

website[1]. There is no distinction in AERMOD between elevated terrain below release height and terrain above release height, as with earlier regulatory models that distinguished between simple terrain and complex terrain. For applications involving elevated terrain, the user must now also input a hill height scale along with the receptor elevation. To facilitate the generation of hill height scales for AERMOD, a terrain preprocessor, called AERMAP, has been developed by USEPA. For each receptor AERMAP searches for the terrain height and location that has the greatest influence on dispersion. Using AERMAP (Version 09040), terrain elevations were determined using a method that locates interpolated terrain elevation near each receptor. This method ensures that the most representative elevation of the surrounding nearby terrain points in the DEM files are used for each receptor.

[1] www.ene.gov.on.ca/envision/air/regulations/demdata.html

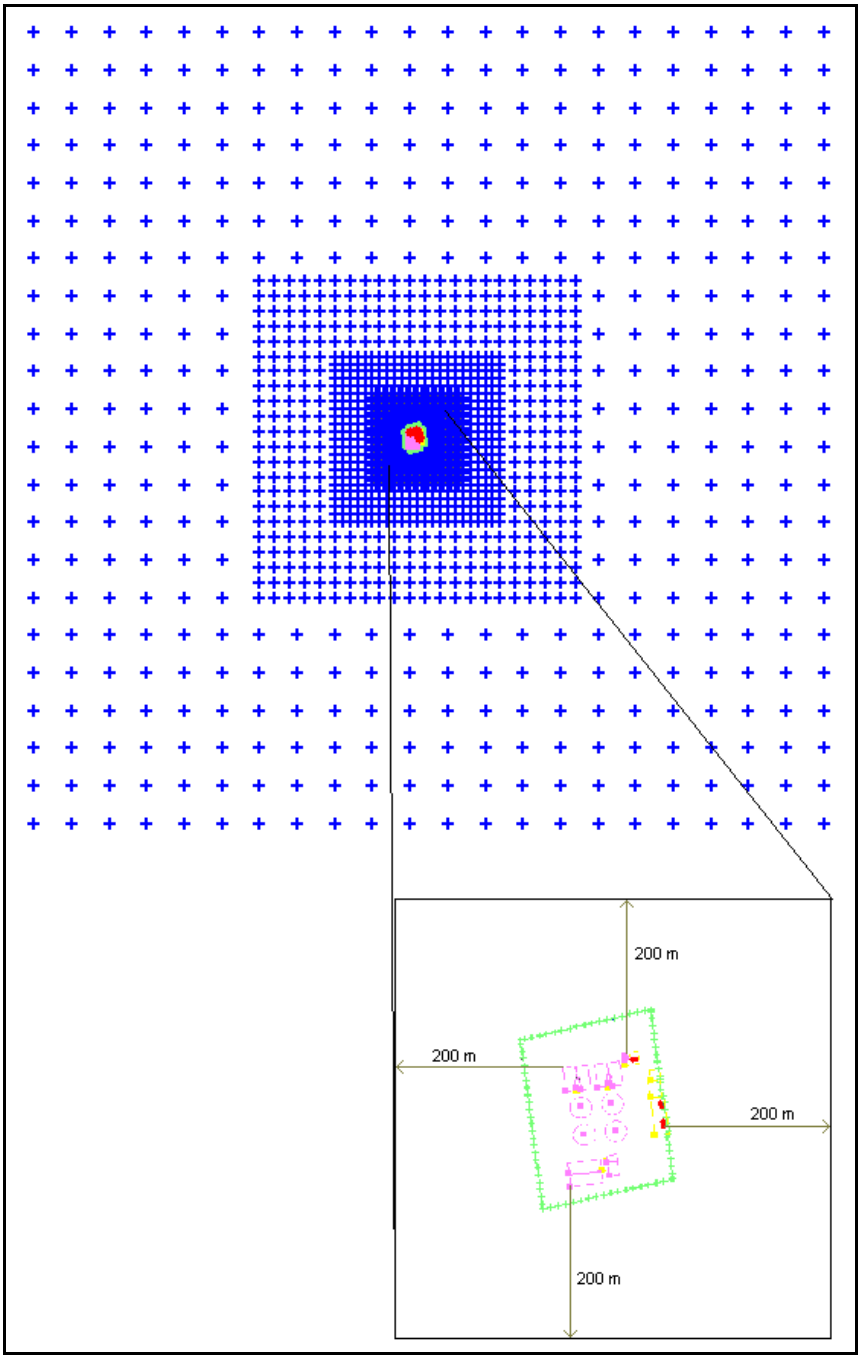


Figure 2-2 Multi-Tier Receptor Grid

2.6 Meteorological Data

The AERMOD model utilizes a file of surface boundary layer parameters and a file of profile variables including wind speed, wind direction, and turbulence parameters. These two types of meteorological inputs are generated by the meteorological preprocessor for AERMOD, which is called AERMET. AERMET requires hourly input of specific surface and upper air meteorological data. These data at a minimum include the wind flow vector, wind speed, ambient temperature, cloud cover, and morning radiosonde observation, including height, pressure, and

temperature. AERMET includes three stages of preprocessing of the meteorological data. The first two stages extract, quality check, and merge the available meteorological data. The third stage requires input of certain surface characteristics (surface roughness, Bowen ratio, and Albedo) representative of the area.

MOE has provided five years (1996-2000) of pre-processed (AERMOD ready) surface and upper air meteorological data for specific geographical areas throughout Ontario. As illustrated in Figure 2-3, the proposed Project is located in the Southwestern (Barrie, Owen Sound) Region. This Southwestern Region has three meteorological datasets based on various land use characteristics, namely crop, forest, or urban. Based on a visual inspection of the surrounding area near the facility, it was assumed that the crop dataset best represents the land use surrounding the facility.

As such, surface and upper air meteorological data from Toronto and Buffalo meteorological stations, respectively, were used in the AERMOD model. MOE has already confirmed that the provided data files are appropriate for use in and meet the percent complete requirements of the AERMOD model. Additionally, since the meteorological files provided by MOE are AERMOD-ready, Stage 3 of the AERMET process, inputting site characteristics (Bowen, Albedo, surface roughness), will not need to be performed.

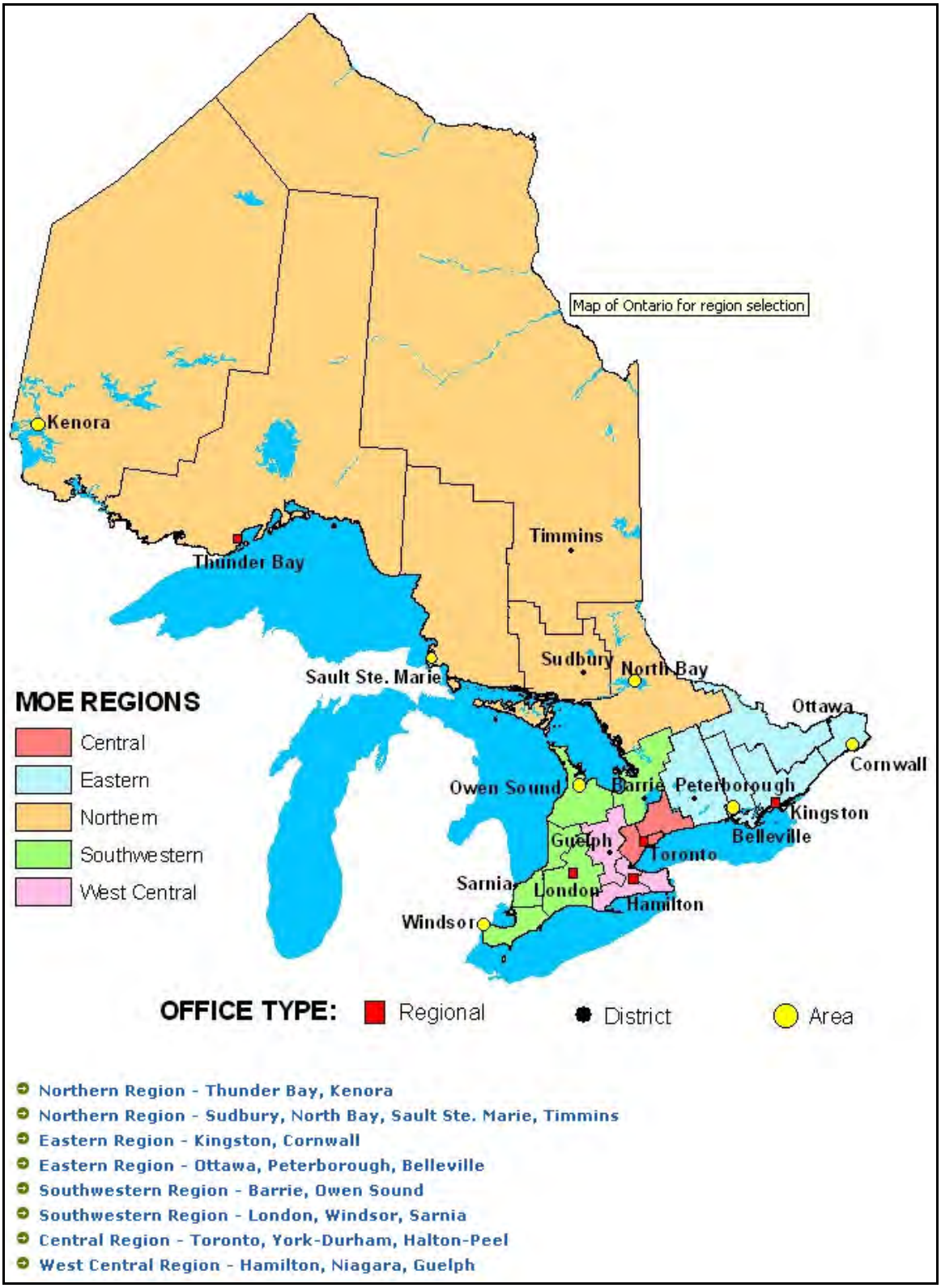


Figure 2-3 Regional Meteorological Datasets

2.7 Model Results

The dispersion modeling analysis was performed using the current sources and measured emissions to establish a base case for purposes of comparison. The dispersion model was then rerun with the future conditions for the expansion project.

The dispersion modeling analysis for the expansion project showed a 0.30 percent decrease in the maximum model-predicted odour impact once the new facilities are completed. Although some new sources such as the primary clarifiers and aeration basins are not covered and treated, other sources such as the existing and new headworks are completely contained and treated with activated carbon. The net result is that the model predicts that the expansion project will not result in an increase in off-site odour in the neighbourhoods near the plant.

The dispersion model for the expansion project shows that the process with the highest off-site impact would be the existing screw pump source group. The two screw pump sump areas could be considered for treatment as they have a relatively small surface area and could be covered with a flat aluminum covers and treated with activated carbon. If the screw pump sump areas were covered and treated the model predicts a 71 percent decrease in the maximum odour impact compare to the current base case conditions.

The odour control improvements required for the expansion project to maintain the current magnitude of off-site impact include the following:

- Cover and treat existing headworks
- Cover and treat existing grit tanks
- Cover and treat new headworks
- Cover and treat new grit tanks
- Anaerobic digester gas treated in flare
- Cover and treat fermenters
- Contain and treat TWAS facility

Each of these sources has relatively low annual average H_2S concentrations, so effective treatment can be obtained with activated carbon systems located adjacent to the sources. The activated systems will provide 98 percent odour reduction and effectively remove these processes as sources of concern for off-site odour.

Appendix A
ORTECH Environmental Odour Sampling Report

Report

ORTECH Environmental
a division of ORTECH Consulting Inc.

Odour Testing Program at the Town of Innisfil Water Pollution Control Plant, Ontario, Canada

A Report to:

Black & Veatch Corporation
8400 Ward Parkway
Kansas City
Missouri, USA
64114

Attention:

Mr. Gayle Van Durme, P.E.
Tel: (913) 458-3205
Fax: (913) 458-3730
Email: vandurmegp@bv.com

Submitted by:

Mr. Stephen Thorndyke, M.Eng., P.Eng.
Principal, Odour Assessment/Analytical Services
Tel: (905) 822-4120, Ext. 345
Fax: (905) 855-0406
E-mail: sthorndyke@ortech.ca

Report No.:

25716
20 pages, 4 Appendices

Date:

December 8, 2009

TABLE OF CONTENTS

1. INTRODUCTION

At the request of Black & Veatch Corporation, ORTECH Environmental (ORTECH) carried out an odour testing program at the municipal Water Pollution Control Plant in the Town of Innisfil near Barrie, Ontario, Canada.

The primary purpose of the program was to determine odour emission rates at the significant sources of odour emissions in the plant in preparation for a plant upgrade and expansion.

A total of twelve sources were selected by Black & Veatch for testing. The field work, which included the collection of odour samples and the measurement or estimation of volumetric flow rates at these sources, was carried out on October 14 and 15, 2009.

At the ORTECH laboratories in Mississauga, Ontario, the odour samples were evaluated by an odour panel to obtain the odour concentrations as the odour threshold detection values (ODTV) which were multiplied by the respective volumetric flow rates to determine the odour emission rates. These emission rates will be used by Black & Veatch in conjunction with dispersion modelling to predict off-site odour concentrations.

Additional aspects of the program included the determination of reduced sulphur compound concentrations in the odour samples and further evaluation of the odour samples by the odour panel.

2. TEST PROGRAM

After a brief tour of the plant on October 14, 2009 by Black & Veatch and ORTECH personnel, it was decided that testing would be carried out at the following twelve representative sources:

1. Headworks Bar Screens
2. North Aerated Grit Tank
3. Screw Sump #1/2
4. Aeration Tank #2 Inlet
5. Aeration Tank #2 Outlet
6. Screw Sump #3/4
7. Aeration Tank #3 Inlet
8. Aeration Tank #3 Outlet
9. Clarifier #3
10. Small Digester
11. North Storage Tank
12. Filter Building

Photographs of these sources are shown in Appendix 1.

Another source of odour emissions is the area where trucks empty septage into the Headworks Building. The septage trucks have a vent discharge, but the discharges are intermittent and vary with each truck, so a vent sample was not collected.

Other potential sources of odour emissions were not tested either because they were very similar to some of the sources above which were tested, they were not operating during the two test days or they were considered to be insignificant.

The similar sources were:

1. Aeration Tank #1
2. Aeration Tank #4
3. Clarifier #1
4. Clarifier #2
5. Clarifier #4

Sources not operating were:

1. South Aerated Grit Tank
2. Large Digester
3. South Storage Tank

3. SAMPLING LOCATIONS

Odour samples for the Headworks Bar Screens were collected as fugitive emissions within the Screens Room of the Headworks Building where the screens are located. Volumetric flow rates were measured at the exhaust fans on the Screen Room roof. The Screen Room door and windows were closed during sampling.

A sampling probe was lowered into the North Aerated Grit Tank to a short distance above the liquid surface to collect odour samples. The volumetric flow rate for the tank was based on the aeration rate which was obtained from the plant.

Screw Sump #1/2 and Screw Sump #3/4 are identical. At each sump a sampling probe made from 6 mm outside diameter Teflon tubing was lowered into the Screw Sump to a few meters above the inclined screw conveyor to collect odour samples. The volumetric flow rate was measured around the perimeter of each Screw Sump.

At Aeration Tank #2 and Aeration Tank #3 a flux chamber was used to collect odour samples on the liquid surface close to the inlet and outlet of each Aeration Tank. The volumetric flow rate for each Aeration Tank was based on the aeration rate which was obtained from the plant.

A flux chamber was used to collect odour samples on the liquid surface of Clarifier #3 close to the outer perimeter of the tank. The flow of nitrogen through the flux chamber was used to calculate a volumetric flow rate for the Clarifier.

At the Small Digester and North Storage Tank, a flux chamber was used to collect odour samples on the liquid surface close to the edge of each tank. The volumetric flow rate for each tank was based on the aeration rate which was obtained from the plant.

Odour samples for the Filter Building were collected as fugitive emissions within the building where the filters are located. Volumetric flow rates were measured at the exhaust fans on the Filter Building roof. The Filter Building doors and windows were closed during sampling.

4. TEST PROCEDURES

4.1 Odour Sampling

Odour samples at the Headworks Bar Screens Room, North Aerated Grit Tank, the Screw Sumps and Filter Building were collected using a lung sampling method, whereby the odour samples are undiluted as they are extracted from the emission source.

Figure 1 shows a schematic of the lung sampling system. A Teflon sampling probe was held about 1.5 m above floor level at the Filter Building, about 1 m above the liquid surface at the North Aerated Grit Tank and about 3 m below the walkway at the two Screw Sumps. The probe was attached to a Tedlar gas sample bag enclosed in an air-tight container. During sampling, a pump evacuated air from the container, thereby drawing gas sample into the Tedlar bag.

All odour samples were collected in 40 litre Tedlar (polyvinyl fluoride) bags, which were covered with dark colour garbage bags immediately after sampling in order to minimize potential photochemical reactions. Each sample bag was purged with diluted gas sample and then refilled. Each odour sample was collected over an approximately 10 minute period. Duplicate odour samples were collected in succession at each source.

The odour concentration in the above sources were expected to be low enough that predilution with nitrogen during odour sample collection was considered to be unnecessary to avoid condensation in the Tedlar bags.

All other sources were tested using a flux chamber following the United States Environmental Protection Agency (US EPA) method. With this method, odorous emissions at Clarifier #3 liquid surface were swept through an exit port on the chamber with nitrogen where the samples were collected in 40 litre Tedlar bags as shown in Figure 2. A lung odour sampling method was used in conjunction with the flux chamber to collect the odour samples in the Tedlar bags.

The flux chamber system was designed so that the nitrogen was distributed evenly over the sampling surface. Dimensions of the flux chamber were recorded as well as conditioning time, sampling time, nitrogen and sample flow rates for each test.

The nitrogen was passed through a flux chamber at a flow rate of approximately 5 L/min for a conditioning period of 25 min before any odour samples were collected. The sampling time per sample was about 10 minutes to give a total sample volume of about 50 L. About 40 L of sample was collected in the Tedlar bag and the remaining 10 L was vented to the atmosphere from the flux chamber.

At the other sampling locations where the flux chamber was used, including the Aeration Tanks, Small Digester and North Storage Tank, the aeration air in these tanks replaced the nitrogen to sweep odorous air sample from the liquid surface. Otherwise, sampling was the same as sampling at Clarifier #3.

4.2 Odour Evaluation

The odour samples were evaluated within 24 hours after collection by the dynamic dilution olfactometer at ORTECH's odour test facility shown in Figure 3. This facility is a specialized room, designed to provide an odour-free environment for accurate evaluations.

The olfactometer is a binary port system operated in a non-forced choice mode. The sample bag is pressurized in a pressure vessel, and the resulting flow metered through an electronic mass flow controller at a predetermined rate. The sample is diluted with flow-controlled odorless air, and is passed to the panel members through one of two sample ports. A three-way valve allows the operator to direct the sample through either of the two ports (Port A or Port B).

Each evaluation begins at a high dilution level, which is lowered in a step-wise sequence by a factor of 1.41 at each step. At each dilution level, the panelists register their responses by entering the letter of the port at which they detect the odour. The range of dilution ratios of the ORTECH odour test facility is from 5,793 times to 8 times.

The panelist responses are processed to determine the odour threshold value for the sample. This is done by a regression analysis of the log of the dilution level versus the probit value of the percent of the panel responding. The point at which statistically 50% of the panel can just detect the odour is recorded as the odour detection threshold value (ODTV). The ODTV is a dilution factor and therefore has no units. For convenience, however, the ODTV may be expressed in odour units (ou).

In addition to the ODTV, the panelists were also asked to determine the odour recognition threshold value (ODTV) which is the dilution step at which a panellist recognizes an odour instead of detecting an odour. The ORTV is either the same as or lower than the ODTV. Panellists were also asked to describe the character of the odour in there own words. Because of potential health effects, the panellists only evaluated selected samples for the ORTV and odour character, whereas all the samples were evaluated for the ODTV.

A seven or eight member odour panel was used for all evaluations. They are drawn from a pool of people who routinely participate in this type of work. They have all been tested at least annually for odour sensitivity and are considered to be within the normal range.

4.3 Hydrogen Sulphide Testing

Concentrations of hydrogen sulphide in each Tedlar bag used for odour sample collection were measured using a Jerome Model 631-X hand-held analyzer. This analyzer measures concentrations of hydrogen sulphide by volume as parts per million (ppm) but also partially responds to other reduced sulphur compounds, such as mercaptans and organic sulphides, which may be present in the gases.

A Teflon sampling line was placed in the Tedlar bag and an internal pump drew sample into the analyzer where concentrations of hydrogen sulphide were measured and recorded at approximately 1-minute intervals. The detection limit was 0.003 ppm hydrogen sulphide.

Analyzer specifications are shown in Appendix 2.

4.4 Volumetric Flow Rate Determinations

Volumetric flow rate measurements were taken once at each operating exhaust fan vent on the roof of the Headworks Building and the Filter Building using a hot wire anemometer method. A hot wire anemometer was also used to measure the volumetric flow rate at Screw Sump #1/2 and Screw Sump #3/4.

At all the other emission sources, volumetric flow rates were assumed to be equal to the aeration rates which were obtained for the plant. These aeration rates are constant for each group of emission sources such as the Aerated Grit Tanks, Aeration Tanks, Digesters and Storage Tanks. Therefore, the number of tanks in each area and the number of operating tanks in each area at the time of odour sampling were accounted for during calculation of the aeration rate for each operating tank.

For example, the total aeration rate for the North Storage Tank and South Storage Tank is 506 L/s when both tanks are operating or 253 L/s per tank. During odour sampling, the South Storage Tank was not operating so that the aeration rate at the North Storage Tank was increased to 506 L/s.

5. RESULTS

5.1 Odour Detection Threshold Values

Odour detection threshold values (ODTV) determined by the odour panelists are detailed in Appendix 3 and summarized in Table 1 for the individual samples evaluated.

Aeration Tank #3 Inlet was initially sampled in duplicate on October 14, 2009 but one of the sample bags leaked and there was insufficient sample remaining before it could be evaluated for the ODTV, although the hydrogen sulphide concentration was measured for both samples. The remaining sample was evaluated for ODTV but two more samples were collected and evaluated on October 15, 2009 at this source.

Duplicate samples were collected and evaluated on both October 14 and October 15, 2009 at the filter building after closing the windows and doors of the building before sampling commenced.

The following table summarizes the average results from Table 1 for each source based on the geometric mean ODTV for the duplicate tests at each source:

Summary of ODTV:

Source	ODTV Sample 1 (ou)	ODTV Sample 2 (ou)	Geometric Mean ODTV (ou)
Headworks Bar Screens	1380	1095	1229
North Aerated Grit Tank	2978	1964	2418
Screw Sump #1/2	512	574	542
Aeration Tank #2 Inlet	1688	1811	1748
Aeration Tank #2 Outlet	1408	1517	1461
Screw Sump #3/4	599	416	499
Aeration Tank #3 Inlet	-	588	588
Aeration tank #3 Outlet	512	488	500
Clarifier #3	1274	1687	1466
Small Digester	2483	2499	2491
North Storage tank	1012	1111	1060
Filter Building	1460	1492	1476

These results are based on the initial testing only for Aeration Tank #3 Inlet and on the repeat testing only for the Filter Building which gave the higher ODTV.

The geometric mean ODTV measured at the Aeration Tank #3 on October 15 (1483 ou) was much higher than the geometric mean ODTV measured on October 14 (588 ou) at this source and was similar to the geometric mean ODTV measured at the Aeration Tank #3 Inlet (1748 ou) on October 14. The higher geometric mean ODTV measured at the filter building on October 15 (1476 ou) compared with October 14 (516 ou) may be partially due to the building doors and windows being closed earlier before odour sampling commenced on October 15 but, more likely, the odour emissions from the filter building vary from day to day.

Generally, the duplicate ODTV measured at each source on each test day were consistent.

5.2 Measured Volumetric Flow Rates

Volumetric flow rate measurements for each operating exhaust fan vent on the roof of the Headworks Building, Filter Building, Screw Sump #1/2 and Screw Sump #3/4 using a hot wire anemometer method are shown in Appendix 4 and Table 2.

At the Headworks Building only one of the exhaust fans was operating. This fan was a "mushroom" fan with the exhaust gases directed downwards to the building roof from an annular space. This space had an outer diameter of 0.79 m and an inner diameter of 0.51 m to give an area of 0.279 m^2. The average gas velocity measured at 12 points in the annular space was 1.613 m/s to give a volumetric flow rate of 0.450 m^3/s.

At the Filter Building three of the four exhaust fans were operating. A diagram in Appendix 4 indicates which of the three fans were operating. The fan which was not operating was the second fan from the north end of the Filter building. All of these fans were "mushroom" fans with the exhaust gases directed downwards to the building roof from an annular space. One of the fans had the same dimensions as the operating fan at the Headworks Building with an outer diameter of 0.79 m and an inner diameter of 0.51 m to give an area of 0.279 m^2. The average gas velocity measured at 12 points in the annular space was 4.650 m/s to give a volumetric flow rate of 1.297 m^3/s. The other two operating fans had an outer diameter of 0.81 m and an inner diameter of 0.58 m to give an area of 0.251 m^2. The average gas velocity measured at 12 points in the annular space was 6.585 m/s to give a volumetric flow rate of 1.653 m^3/s per fan. Therefore, the total volumetric flow rate for the three operating fans was 4.603 m^3/s.

For the Screw Sump #1/2 and Screw Sump #3/4, velocity measurements were made at 18 or 20 points around the perimeter of each Screw Sump, respectively and average to determine the average velocities, which were 0.396 m/s for Screw Sump #1/2 and 0.295 m/s for Screw Sump #3/4. These velocities were caused by warm air ascending up the Screw Sumps. The open area of the Screw Sumps were measured to be 39.0 m^2 to give volumetric flow rates of 15.44 m^3/s for Screw Sump #1/2 and 11.51 m^3/s for Screw Sump #3/4.

5.3 Estimated Volumetric Flow Rates

Volumetric flow rates were estimated for the North Aerated Grit Tank, Aeration Tank #2, Aeration Tank #3, Small Digester and North Storage Tank based on the aeration rate at these sources. These aeration rates were supplied to ORTECH by Black & Veatch based on process data obtained at the time of sampling.

The total aeration rate for the two Aerated Grit Tanks was 69 L/s equivalent to 69 L/s for the North Aerated Grit Tank since this was the only Aerated Grit Tank operating on the sampling day. The total liquid surface area for this tank was 16.7 m^2 to give an aeration rate of 4.14 $L/s/m^2$.

For the four combined Aeration Tanks the aeration rate was 700 L/s or 175 L/s per tank since all four Aeration Tanks were in operation on the two sampling days. The total liquid surface area for the four combined Aeration Tanks is 680 m^2 to give an aeration rate of 1.03 $L/s/m^2$.

The total aeration rate for the two Digesters was 427 L/s or 427 L/s for the Small Digester since this was the only Digester operating on the test day. The total liquid surface area for this digester was 65 m^2 to give an aeration rate of 6.57 $L/s/m^2$.

The total aeration rate for the two Storage Tanks was 506 L/s or 506 L/s for the North Storage Tank since this was the only Storage Tank operating on the test day. The total liquid surface area for this tank was 208 m^2 to give an aeration rate of 2.43 $L/s/m^2$.

5.4 Odour Emission Rates

The odour concentrations, expressed as the ODTV in Table 1, were combined with the volumetric flow rates to calculate the odor emission rates for each source, as shown in Table 2. Odour emission rates are given as ou/s (m^3 basis).

The following table summarizes the average results from Table 2 for each source based on the geometric mean ODTV for the duplicate tests at each source:

Summary of Measured Odour Emission Rates:

Source	Geometric Mean ODTV (ou)	Volumetric Flow Rate (m^3/s)	Odour Emission Rate (ou/s)
Headworks Bar Screens	1229	0.459	563
North Aerated Grit Tank	22418	0.069	167
Screw Sump #1/2	542	15.05	8158
Aeration Tank #2 Inlet	1748	0.175	306
Aeration Tank #2 Outlet	1461	0.175	256
Screw Sump #3/4	499	11.21	5596
Aeration Tank #3 Inlet	588	0.175	103
Aeration Tank #3 Outlet	500	0.175	87
Clarifier #3	1466	0.071	104
Small Digester	2491	0.427	1064
North Storage tank	1060	0.506	537
Filter Building	1476	4.627	6829

These odour emission rates do not include Aeration Tank #1, Aeration Tank #4, Clarifier #1, Clarifier #2 and Clarifier #4 which were operating while sampling was conducted at the other sources.

Therefore, the overall odour emission rates for all the sources are:

Summary of Overall Odour Emission Rates:

Source	Geometric Mean ODTV (ou)	Volumetric Flow Rate (m^3/s)	Odour Emission Rate (ou/s)
Headworks Bar Screens	1229	0.459	563
North Aerated Grit Tank	22418	0.069	167
Screw Sump #1/2	542	15.05	8158
Aeration Tank #1	1598	0.175	280
Aeration Tank #2	1598	0.175	280
Screw Sump #3/4	499	11.21	5596
Aeration Tank #3	542	0.175	95
Aeration Tank #4	542	0.175	95
Clarifier #1	1466	0.071	104
Clarifier #2	1466	0.071	104
Clarifier #3	1466	0.071	104
Clarifier #4	1466	0.071	104
Small Digester	2491	0.427	1064
North Storage tank	1060	0.506	537
Filter Building	1476	4.627	6829
		Total	24080

These odour emission rates assume that the overall ODTV for each Aeration Tank is the geometric mean of the inlet and outlet measurements and that the odour emission rates for the four Clarifiers are all the same.

Other significant sources of odour emissions in the plant are not included in this table, which is based on the plant processes which were operating during the two day sampling period. The odour emission rates for the Small Digester and the North Storage Tank were measured shortly after aeration commenced at these tanks. Previous to that there was no tank aeration.

5.5 Hydrogen Sulphide Concentrations

Hydrogen sulphide concentrations determined in the Tedlar bag samples for the duplicate tests at each source are shown in Table 3 and summarized in the table below, along with the ODTV:

Summary of Hydrogen Sulphide Concentrations:

Source	Geometric Mean ODTV (ou)	Hydrogen Sulphide Concentration (ppm)	Hydrogen Sulphide Concentration (mg/m^3)
Headworks Bar Screens	1229	0.15	0.21
North Aerated Grit Tank	2418	0.37	0.52
Screw Sump #1/2	542	0.002	0.003
Aeration Tank #2 Inlet	1748	0.008	0.011
Aeration Tank #2 Outlet	1461	0.002	0.003
Screw Sump #3/4	499	<0.001	0.001
Aeration Tank #3 Inlet	588	<0.001	0.001
Aeration Tank #3 Outlet	500	0.003	0.004
Clarifier #3	1466	<0.001	0.001
Small Digester	2491	0.013	0.017
North Storage tank	1060	<0.001	0.001
Filter Building	1476	0.001	0.002

These results show that hydrogen sulphide is a very large contributor to the ODTV at the Headworks Bar Screens and North Aerated Grit Tank but a very minor contributor to the ODTV at the other sources. The hydrogen sulphide concentrations may include other reduced sulfur compounds but it is likely that hydrogen sulphide predominates.

5.6 Other Odour Properties

For a selected sample for each type of emission source in the plant, the odour recognition threshold value (ORTV) and odour character were evaluated by the odour panelists in addition to the ODTV.

Where the ORTV was determined, the ODTV was either the same as or up to a factor of 2 times higher than the ORTV. Sometimes, a panelist could not recognize the odour and did not give an ORTV.

The panelists described the odour character in the Headworks Bar Screens and North Aerated Grit Tank samples as "rotten eggs" which would normally correspond to a hydrogen sulphide odour. Odour character descriptions for samples from the other sources were inconsistent amongst the panelists and included "rotten grass", "rotten eggs", "decomposing grass", decomposing leaves", decomposing garden waste", grass clippings", "algae", "chemical", "rotten food", "compost" and "sewage".

6. CONCLUSIONS

ORTECH collected duplicate odour samples at twelve emission sources in the Town of Innisfil Water Pollution Control Plant on October 14 and October 15, 2009, and evaluated these samples by an odour panel for the odour detection threshold value (ODTV). Additional samples were collected and evaluated at two of these sources.

The twelve sources were selected for testing by Black & Veatch and are considered to be the most significant sources of odour emissions in the plant. The Septage Truck Unloading Facility has high odour emissions from some of the truck vents, but the discharges are intermittent and vary from truck to truck, so the vents were not sampled.

Volumetric flow rates were measured at some of the sources and were estimated from aeration rates at other sources. The aeration rates were provided to ORTECH by the plant.

In addition, to the ODTV, hydrogen sulphide concentrations were measured in all of the odour samples using a Jerome Analyzer. Odour recognition threshold values (ORTV) and descriptions of the odour character were determined for selected odour samples from the sources.

The geometric mean ODTV for the twelve sources varied from 500 ou to 2491 ou at the Aeration #2 tank Outlet and Small Digester, respectively. The highest odour emission rates were 8,158 ou/s and 5,596 ou/s at Screw Sump #1/2 and Screw Sump #3/4, respectively. The combined odour emission rate for all of the sources tested and for similar sources which were not tested was 24,080 ou/s, although this emission rate does not include Septage Truck Unloading and minor sources of odour emissions.

Hydrogen sulphide concentrations in the odour samples varied from less than 0.001 ppm to 0.37 ppm. The hydrogen sulphide accounted for most of the odour at the Headworks Bar Screens and North Aerated Grit Tank sources but accounted for very little of the odour at the other sources. Hydrogen sulphide concentrations were measured with a Jerome Analyzer may include other reduced sulfur compounds.

Except for the "rotten egg" descriptor used to describe the odour character of the Headworks Bar Screens and North Aerated Grit Tank samples, the odour panel gave inconsistent descriptors for the character of the samples from the remaining sources.

Stephen Thorndyke, M.Eng., P.Eng.
Principal, Odour Assessment/Analytical Services

ST:or

Figure 1
Odour Lung Sampler

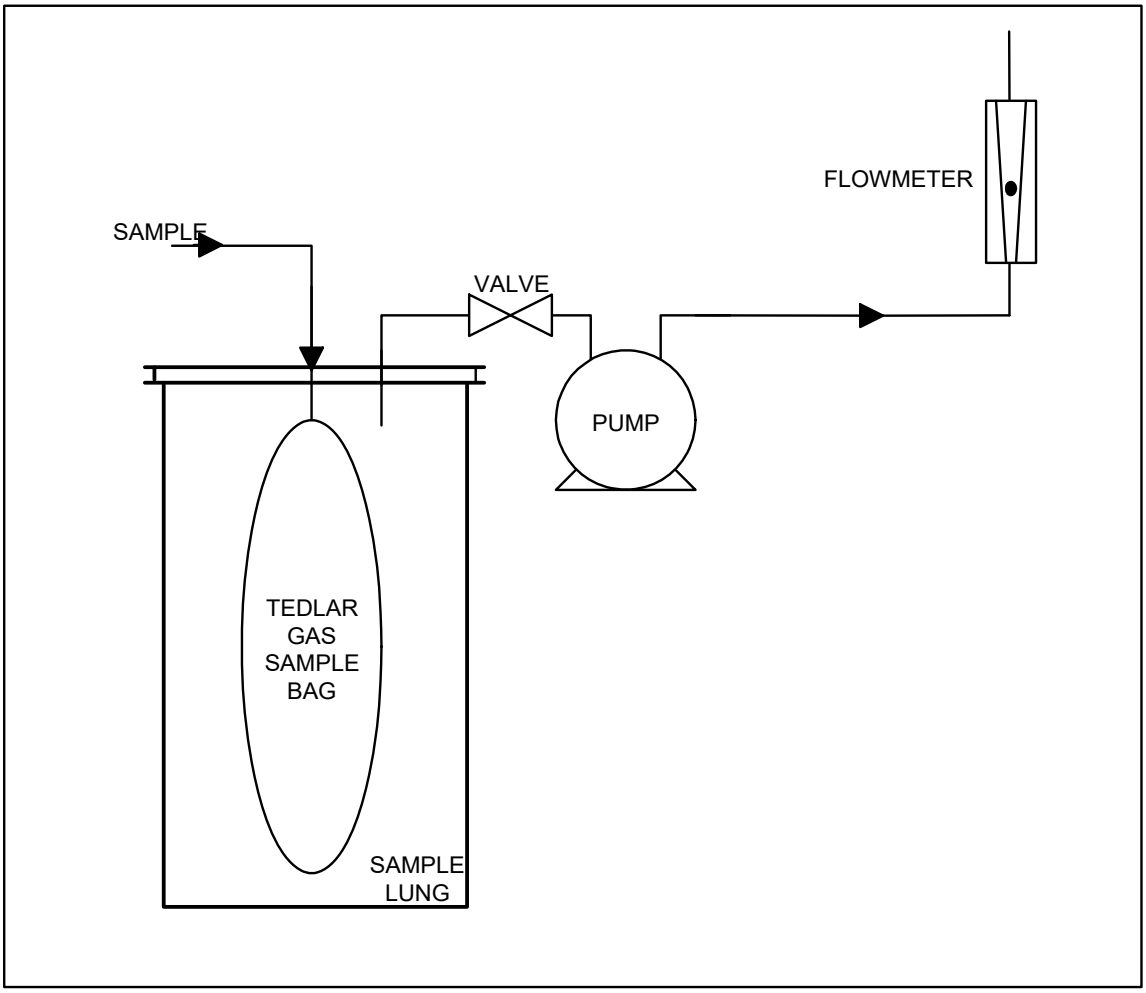


Figure 2
Odour Flux Chamber Sampler

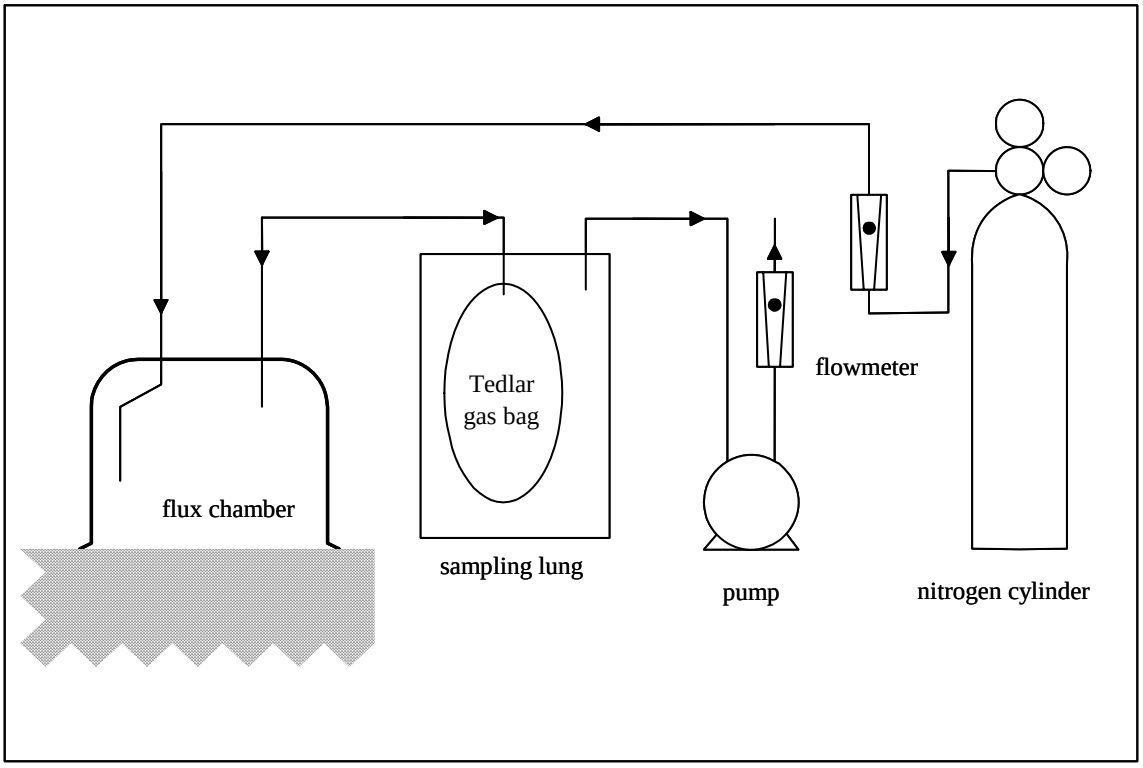


Figure 3
Olfactometer

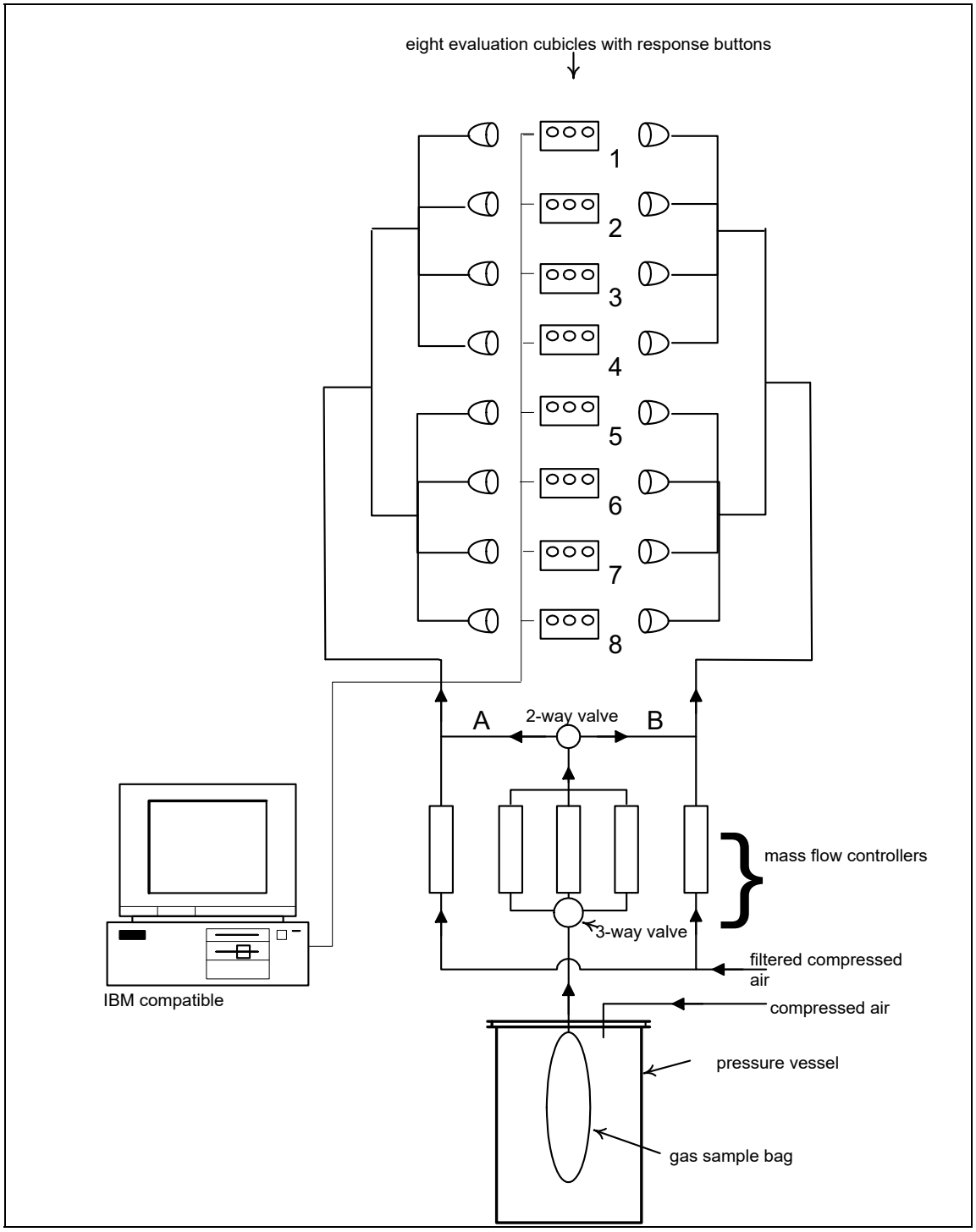


Table 1: Odour Detection Threshold Values (ODTV)

Source No.	Emission Source Description	Sampling Date (2009)	ODTV Sample No. 1 ou	ODTV Sample No. 2 ou	Mean ODTV ou	Comments
1	Headworks Bar Screens	October 14	1380	1095	1229	
2	North Aerated Grit Tank	October 14	2978	1964	2418	
3	Screw Sump #1/2	October 14	512	574	542	
4	Aeration Tank #2 Inlet	October 14	1688	1811	1748	
5	Aeration Tank #2 Outlet	October 14	1408	1517	1461	
6	Screw Sump #3/4	October 14	599	416	499	
7	Aeration Tank #3 Inlet	October 14	-	588	588	Sample No.1 Bag Leaked
	Aeration Tank #3 Inlet	October 15	1460	1506	1483	Repeat Testing
8	Aeration Tank #3 Outlet	October 14	512	488	500	
9	Clarifier #3	October 15	1274	1687	1466	
10	Small Digester	October 15	2483	2499	2491	
11	North Storage Tank	October 15	1012	1111	1060	
12	Filter Building	October 14	481	553	516	
	Filter Building	October 15	1460	1492	1476	Repeat Testing

Table 2: Odour Emission Rates

Source No.	Emission Source Description	Mean ODTV ou	Velocity m/s	Area m^2	Volumetric Flow Rate m^3/s	Odour Emission Rate ou/s (m^3 basis)	Comments
1	Headworks Bar Screens	1229	1.613	0.279	0.450	553	1 of 2 Fans operating
2	North Aerated Grit Tank	2418	-	-	0.069	167	1 of 2 Tanks operating
3	Screw Sump #1/2	542	0.396	39.0	15.44	8372	Operating
4	Aeration Tank #2 Inlet	1748	-	-	0.175	306	4 Tanks 700 L/s total
5	Aeration Tank #2 Outlet	1461	-	-	0.175	256	4 Tanks 700 L/s total
6	Screw Sump #3/4	499	0.295	39.0	11.51	5743	Operating
7	Aeration Tank #3 Inlet	588	-	-	0.175	103	4 Tanks 700 L/s total
	Aeration Tank #3 Inlet (repeat)	1483	-	-	0.175	259	4 Tanks 700 L/s total
8	Aeration Tank #3 Outlet	500	-	-	0.175	87	4 Tanks 700 L/s total
9	Clarifier #3	1466	0.00064	111	0.071	104	4 Clarifiers operating
10	Small Digester	2491	-	-	0.427	1064	1 of 2 Tanks operating, 427 L/s
11	North Storage Tank	1060	-	-	0.506	537	1 of 2 Tanks operating, 506 L/s
12	Filter Building	516	-	-	4.603	2374	3 of 4 Fans operating
	Filter Building (repeat)	1476	4.650 6.585	0.279 0.251	4.603	6794	1 of 2 Fans operating 2 of 2 Fans operating

Table 3: Hydrogen Sulphide Concentrations

Source No.	Emission Source Description	Mean ODTV	Hydrogen Sulfide Concentrations ** Sample No. 1			Sample No. 2			Hydrogen Sulfide Average Concentration		Comments
		ou	ppm	ppm	ppm	ppm	ppm	ppm	ppm	mg/m^3 *	
1	Headworks Bar Screens	1229	0.17	0.17	0.17	0.14	0.13	0.14	0.15	0.21	
2	North Aerated Grit Tank	2418	0.43	0.44	0.44	0.31	0.31	0.31	0.37	0.52	
3	Screw Sump #1/2	542	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	
4	Aeration Tank #2 Inlet	1748	0.005	0.004	0.004	0.012	0.012	0.012	0.008	0.011	
5	Aeration Tank #2 Outlet	1461	<0.001	0.002	0.002	0.002	<0.001	<0.001	0.002	0.002	
6	Screw Sump #3/4	499	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	
7	Aeration Tank #3 Inlet	588	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	
	Aeration Tank #3 Inlet	1483	<0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.002	Repeat Testing
8	Aeration Tank #3 Outlet	500	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004	
9	Clarifier #3	1466	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	
10	Small Digester	2491	0.017	0.020	0.016	0.007	0.007	0.008	0.013	0.017	
11	North Storage Tank	1060	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	
12	Filter Building	516	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	
	Filter Building	1476	0.001	0.001	0.001	0.002	0.002	0.001	0.001	0.002	Repeat Testing

***** At 25°C and 1 atmosphere
****** May include other reduced sulfur compounds

APPENDIX 1

Photographs of the Sampling and Measurement Locations (5 pages)

Headworks Bar Screens

North Aerated Grit Tank

Screw Sump #1/2

Aeration Tank #2

Clarifier #3

Small Digester

North Storage Tank

Filter Building

Screw Sumps, Aeration Tanks and Clarifiers

Headworks Building Roof Fans

APPENDIX 2

Hydrogen Sulphide Analyzer Specifications
(4 pages)

JEROME® 631-X™

HYDROGEN SULFIDE ANALYZER

Operation Manual

July 2004

Arizona Instrument LLC
1912 W 4th Street
Tempe, AZ 85281

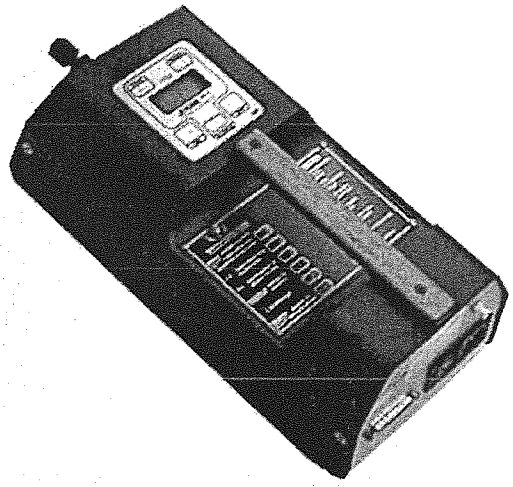
(800) 528-7411
(602) 470-1414
Fax (480) 804-0656
http://www.azic.com
email:
azi@azic.com - General
intl@azic.com - International
support@azic.com - Customer Support

700-0037-B

JEROME 631-X

Hydrogen Sulfide Analyzer

Operation Manual



PROPRIETARY RIGHTS NOTICE

This manual contains valuable information and material developed by Arizona Instrument LLC for use with the Jerome 631-X Hydrogen Sulfide Analyzer. No part of this manual can be reproduced or transmitted in any form or by any means, electronic, mechanical or otherwise. This includes photocopying and recording or in connection with any information storage or retrieval system without the express written permission of Arizona Instrument LLC.

ALL RIGHTS RESERVED

Resisorb™ is a registered trademark of J.T. Baker Chemical Company.
Tygon™ is a registered trademark of Norton.

Applications

- Ambient air analysis
- Odor nuisance monitoring
- Regulatory compliance
- Control room corrosion monitoring
- Quality control
- Scrubber efficiency testing
- Accuracy check for other hydrogen sulfide monitors and control systems
- Hydrogen sulfide source detection
- Leak detection
- The Jerome 631-X can be operated from 100-120 or 200-240 VAC. To change the default voltage range, refer to "Setting the Input Voltage" on page 21.

3. PRINCIPLE OF OPERATION

A thin gold film, in the presence of hydrogen sulfide, undergoes an increase in electrical resistance proportional to the mass of hydrogen sulfide in the sample.

When the SAMPLE button is pressed, an internal pump pulls ambient air over the gold film sensor for a precise period. The sensor absorbs the hydrogen sulfide. The instrument determines the amount absorbed and displays the measured concentration of hydrogen sulfide in ppm. During normal sampling, the ambient air sample is diluted in the flow system at a ratio of 100:1. When sampling in Range 0, (where low levels of hydrogen sulfide are expected) undiluted air samples are drawn across the gold film sensor.

The instrument's microprocessor automatically re-zeroes the digital meter at the start of each sample cycle and freezes the meter reading until the next sample cycle is activated, thus eliminating drift between samples.

During the sample mode cycle, bars on the LCD represent the percentage of sensor saturation. Depending on the concentrations, 50 to 500 samples may be taken before the sensor reaches saturation. At that point, a 10-minute heat cycle must be initiated to remove the accumulated hydrogen sulfide from the sensor. During the sensor regeneration cycle, both solenoids are closed to cause air to pass through a scrubber filter and provide clean air for the regeneration process. The flow system's final scrubber filter prevents contamination of the environment.

The heat generated during the regeneration may cause some low level thermal drift. To ensure maximum sample accuracy, wait 30 minutes after regeneration before zeroing and using the instrument.

8. JEROME 631-X TECHNICAL SPECIFICATIONS

Range	0.003ppm (3ppb) to 50ppm H_2S in four graduated ranges
Sensitivity	0.003ppm H_2S
Precision	5% relative standard deviation
Accuracy	Range 0: ± 0.003ppm at 0.050ppm H_2S Range 1: ± 0.03ppm at 0.50ppm H_2S Range 2: ± 0.3ppm at 5.0ppm H_2S Range 3: ± 2ppm at 25ppm H_2S
Response time-sample mode	
10 to 50 ppm	13 seconds
1.0 to 10.0 ppm	16 seconds
0.10 to 1.00 ppm	25 seconds
0.001 to 0.100 ppm	30 seconds
Response time-survey mode	
0 to 50 ppm	3 seconds
1.0 to 9.9 ppm	6 seconds
0.10 to 0.99 ppm	15 seconds
0.001 to 0.099 ppm	20 seconds
Flow rate	150cc/min (0.15 liters/min)
Power requirements	100-120 V~, 50/60 Hz, 1 A or 220-240 V~, 50/60 Hz, 1 A
Fuse	F1A T250V, 5mm X 20mm
Internal battery pack	Rechargeable Nickel Cadmium
Operating environment	0° to 40°C, non-condensing, non-explosive
Case construction	Aluminum alloy
Dimensions	15 cm x 33 cm x 10 cm (6" w x 13" l x 4" h)
Weight	3.18 kilos (7 pounds)
Digital meter display	Liquid crystal display (LCD)
Certification	CE mark on 220-240 V~, 631-XE model only.

APPENDIX 3

Odour Panel ODTV Results
(15 pages)

Source No.	Emission Source Description	Sampling Date (2009)	Sample No. 1 Start	Sample No. 1 Finish	Sample No. 2 Start	Sample No. 2 Finish	Comments
1	Headworks Bar Screens	October 14	12:08	12:18	12:22	12:32	
2	North Aerated Grit Tank	October 14	11:34	11:44	11:47	11:57	
3	Screw Sump #1/2	October 14	09:57	10:07	10:12	10:22	
4	Aeration Tank #2 Inlet	October 14	12:12	12:22	12:42	12:58	
5	Aeration Tank #2 Outlet	October 14	11:05	11:15	11:20	11:30	
6	Screw Sump #3/4	October 14	09:46	09:56	10:01	10:11	
7	Aeration Tank #3 Inlet	October 14	14:13	14:26	14:29	14:39	Sample No.1 Bag Leaked
	Aeration Tank #3 Inlet	October 15	11:42	11:52	11:56	12:06	Repeat Testing
8	Aeration Tank #3 Outlet	October 14	13:25	13:35	13:42	13:52	
9	Clarifier #3	October 15	09:21	09:31	09:33	09:41	
10	Small Digester	October 15	10:36	10:42	10:45	10:52	
11	North Storage Tank	October 15	14:36	14:48	14:51	15:01	
12	Filter Building	October 14	13:44	13:54	14:03	14:13	
	Filter Building	October 15	10:39	10:49	10:52	11:02	Repeat Testing

Innisfil WPCP
Black & Veatch
North Aerated Grit Tank
Date of Evaluation: October 14, 2009

Sample No. : **25716-B1** **Undiluted**
Predilution: **1**
Panellist No. **8**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*00000000*	0	0.0
2	5793	*00000000*	0	0.0
3	4096	*0000BB00*	2	25.0
4	2896	*0000AAAA*	4	50.0
5	2048	*AAA0AAAA*	7	87.5
6	1448	*AAAAAAAA*	8	100.0
-	1024	-	-	-
-	724	-	-	-
-	512	-	-	-
-	362	-	-	-
-	256	-	-	-

Raw ODTV 2978
Net ODTV 2978

Sample No. : **25716-B2** **Undiluted**
Predilution: **1**
Panellist No. **8**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*00000000*	0	0.0
2	5793	*00000000*	0	0.0
3	4096	*000000AA0*	2	25.0
4	2896	*0000AAAA*	4	50.0
5	2048	*0000BBBB*	4	50.0
6	1448	*0000BBBB*	4	50.0
7	1024	*0000BBBB*	4	50.0
8	724	*AAAAAAAA*	8	100.0
-	512	-	-	-
-	362	-	-	-
-	256	-	-	-

Raw ODTV 1964
Net ODTV 1964

Innisfil WPCP
Black & Veatch
Screw Sump #3/4
Date of Evaluation: October 14, 2009

Sample No. : **25716-B3** **Undiluted**
Predilution: **1**
Panellist No. **8**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*00000000*	0	0.0
-	5793	-	-	-
-	4096	-	-	-
-	2896	-	-	-
-	2048	-	-	-
2	1448	*00000000*	0	0.0
3	1024	*00000000*	0	0.0
4	724	*00000AAA*	3	37.5
5	512	*0000AAAA*	4	50.0
6	362	*BBBBBBBB*	8	100.0
-	256	-	-	-

Raw ODTV 599
Net ODTV 599

Sample No. : **25716-B4** **Undiluted**
Predilution: **1**
Panellist No. **8**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*00000000*	0	0.0
-	5793	-	-	-
-	4096	-	-	-
-	2896	-	-	-
-	2048	-	-	-
1	1448	*00000000*	0	0.0
2	1024	*00000000*	0	0.0
3	724	*00000000*	0	0.0
4	512	*BB000000*	2	25.0
5	362	*BBBB0000*	4	50.0
6	256	*BBBBBBBB*	8	100.0

Raw ODTV 416
Net ODTV 416

Innisfil WPCP
Black & Veatch
Screw Sump #1/2
Date of Evaluation: October 14, 2009

Sample No. : **25716-B5** **Undiluted**
Predilution: **1**
Panellist No. **8**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*00000000*	0	0.0
-	5793	-	-	-
-	4096	-	-	-
-	2896	-	-	-
-	2048	-	-	-
-	1448	-	-	-
2	1024	*00000000*	0	0.0
3	724	*00000AA0*	2	25.0
4	512	*0000AAAA*	4	50.0
5	362	*BB00BBBB*	6	75.0
6	256	*BBBBBBBB*	8	100.0

Raw ODTV 512
Net ODTV 512

Sample No. : **25716-B6** **Undiluted**
Predilution: **1**
Panellist No. **8**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*00000000*	0	0.0
-	5793	-	-	-
-	4096	-	-	-
-	2896	-	-	-
-	2048	-	-	-
-	1448	-	-	-
2	1024	*00000000*	0	0.0
3	724	*00000B00*	1	12.5
4	512	*0000BBBB*	4	50.0
5	362	*BBBBBBBB*	8	100.0
-	256	-	-	-

Raw ODTV 574
Net ODTV 574

Innisfil WPCP
Black & Veatch
Aeration Tank #2 Outlet
Date of Evaluation: October 14, 2009

Sample No. : **25716-B7** **Undiluted**
Predilution: **1**
Panellist No. **8**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*00000000*	0	0.0
2	5793	*00000000*	0	0.0
3	4096	*00000000*	0	0.0
4	2896	*00000000*	0	0.0
5	2048	*00000A00*	1	12.5
6	1448	*A0000AAA*	4	50.0
7	1024	*AA00AAAA*	6	75.0
8	724	*AAAAAAAA*	8	100.0
-	512	-	-	-
-	362	-	-	-
-	256	-	-	-

Raw ODTV 1408
Net ODTV 1408

Sample No. : **25716-B8** **Undiluted**
Predilution: **1**
Panellist No. **8**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*00000000*	0	0.0
-	5793	-	-	-
-	4096	-	-	-
2	2896	*00000000*	0	0.0
3	2048	*00000AA0*	2	25.0
4	1448	*A000AAAA*	5	62.5
5	1024	*BBB0BBBB*	7	87.5
6	724	*BBBBBBBB*	8	100.0
-	512	-	-	-
-	362	-	-	-
-	256	-	-	-

Raw ODTV 1517
Net ODTV 1517

Innisfil WPCP
Black & Veatch
Filter Building
Date of Evaluation: October 14, 2009

Sample No. : 25716-B9 Undiluted
Predilution: 1
Panellist No. 8

Test No.	Dilution	Responses	No.	Percent
1	Blank	*00000000*	0	0.0
2	5793	*00000000*	0	0.0
3	4096	*00000000*	0	0.0
4	2896	*00000000*	0	0.0
5	2048	*00000000*	0	0.0
6	1448	*00000000*	0	0.0
7	1024	*00000000*	0	0.0
8	724	*00000B00*	1	12.5
9	512	*00000BB0*	2	25.0
10	362	*B000BBBB*	5	62.5
11	256	*BBBBBBBB*	8	100.0

Raw ODTV 481
Net ODTV 481

Sample No. : 25716-B10 Undiluted
Predilution: 1
Panellist No. 8

Test No.	Dilution	Responses	No.	Percent
1	Blank	*00000000*	0	0.0
-	5793	-	-	-
-	4096	-	-	-
-	2896	-	-	-
-	2048	-	-	-
2	1448	*00000000*	0	0.0
3	1024	*00000000*	0	0.0
4	724	*00000B00*	1	12.5
5	512	*B000BBB0*	4	50.0
6	362	*BBB0BBBB*	7	87.5
7	256	*BBBBBBBB*	8	100.0

Raw ODTV 553
Net ODTV 553

Innisfil WPCP
Black & Veatch
Headworks Bar Screens
Date of Evaluation: October 14, 2009

Sample No. : **25716-B11** **Undiluted**
Predilution: **1**
Panellist No. **8**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*00000000*	0	0.0
-	5793	-	-	-
-	4096	-	-	-
2	2896	*00000000*	0	0.0
3	2048	*00000B00*	1	12.5
4	1448	*0000BBBB*	4	50.0
5	1024	*A000AAAA*	5	62.5
6	724	*AAAAAAAA*	8	100.0
-	512	-	-	-
-	362	-	-	-
-	256	-	-	-

Raw ODTV 1380
Net ODTV 1380

Sample No. : **25716-B12** **Undiluted**
Predilution: **1**
Panellist No. **8**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*00000000*	0	0.0
-	5793	-	-	-
-	4096	-	-	-
2	2896	*00000000*	0	0.0
3	2048	*00000000*	0	0.0
4	1448	*0000AAA0*	3	37.5
5	1024	*B000BBBB*	5	62.5
6	724	*BB0BBBBB*	7	87.5
7	512	*BBBBBBBB*	8	100.0
-	362	-	-	-
-	256	-	-	-

Raw ODTV 1095
Net ODTV 1095

Innisfil WPCP
Black & Veatch
Aeration Tank #3 Outlet
Date of Evaluation: October 14, 2009

Sample No. : **25716-B13** **Undiluted**
Predilution: **1**
Panellist No. **8**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*00000000*	0	0.0
2	5793	*00000000*	0	0.0
3	4096	*00000000*	0	0.0
4	2896	*00000000*	0	0.0
5	2048	*00000000*	0	0.0
6	1448	*00000000*	0	0.0
7	1024	*00000000*	0	0.0
8	724	*BB000000*	2	25.0
9	512	*BB0B0B0B*	5	62.5
10	362	*BB0B0BBB*	6	75.0
11	256	*BBBBBBBB*	8	100.0

Raw ODTV 512
Net ODTV 512

Sample No. : **25716-B14** **Undiluted**
Predilution: **1**
Panellist No. **8**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*00000000*	0	0.0
-	5793	-	-	-
-	4096	-	-	-
-	2896	-	-	-
-	2048	-	-	-
2	1448	*00000000*	0	0.0
3	1024	*00000000*	0	0.0
4	724	*00000B00*	1	12.5
5	512	*B0000BBB*	4	50.0
6	362	*AA000AAA*	5	62.5
7	256	*AAAAAAAA*	8	100.0

Raw ODTV 488
Net ODTV 488

Innisfil WPCP
Black & Veatch
AerationTank #2 Inlet
Date of Evaluation: October 14, 2009

Sample No. : **25716-B15** **Undiluted**
Predilution: **1**
Panellist No. **8**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*00000000*	0	0.0
-	5793	-		-
2	4096	*00000000*	0	0.0
3	2896	*0000AA00*	2	25.0
4	2048	*0000BBB0*	3	37.5
5	1448	*0000BBBB*	4	50.0
6	1024	*BB00BBBB*	6	75.0
7	724	*BBBBBBBB*	8	100.0
-	512	-	-	-
-	362	-	-	-
-	256	-	-	-

Raw ODTV 1688
Net ODTV 1688

Sample No. : **25716-B16** **Undiluted**
Predilution: **1**
Panellist No. **8**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*00000000*	0	0.0
-	5793	-	-	-
2	4096	*00000000*	0	0.0
3	2896	*00000BB0*	2	25.0
4	2048	*0000BBBB*	4	50.0
5	1448	*A000AAAA*	5	62.5
6	1024	*AA0AAAA*	7	87.5
7	724	*AAAAAAAA*	8	100.0
-	512	-	-	-
-	362	-	-	-
-	256	-	-	-

Raw ODTV 1811
Net ODTV 1811

Innisfil WPCP
Black & Veatch
Aeration Tank #3 Inlet
Date of Evaluation: October 14, 2009

Sample No. : **25716-B17** **Undiluted** **BAG LEAKED**
Predilution: **1**
Panellist No. **8**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*00000000*	0	0.0
-	5793	-		-
-	4096	-		-
-	2896	-		-
-	2048	-		-
-	1448	-		-
-	1024	-		-
-	724	-		-
-	512	-		-
-	362	-		-
-	256	-		-

Raw ODTV -
Net ODTV -

Sample No. : **25716-B18** **Undiluted**
Predilution: **1**
Panellist No. **8**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*00000000*	0	0.0
-	5793	-	-	-
-	4096	-	-	-
-	2896	-	-	-
2	2048	*00000000*	0	0.0
3	1448	*00000000*	0	0.0
4	1024	*00000000*	0	0.0
5	724	*00AA0000*	2	25.0
6	512	*A0AA0A00*	4	50.0
7	362	*AAAAAAAA*	8	100.0
-	256	-	-	-

Raw ODTV 588
Net ODTV 588

Innisfil WPCP
Black & Veatch
North Storage Tank
Date of Evaluation: October 15, 2009

Sample No. : **25716-B19** **Undiluted**
Predilution: **1**
Panellist No. **7**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*0000000*	0	0.0
-	5793	-	-	-
-	4096	-	-	-
2	2896	*0000000*	0	0.0
3	2048	*0000000*	0	0.0
4	1448	*B0000B0*	2	28.6
5	1024	*B000BBB*	4	57.1
6	724	*B000BBB*	4	57.1
7	512	*BBBBBBB*	7	100.0
-	362	-	-	-
-	256	-	-	-

Raw ODTV 1012
Net ODTV 1012

Sample No. : **25716-B20** **Undiluted**
Predilution: **1**
Panellist No. **7**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*0000000*	0	0.0
-	5793	-	-	-
-	4096	-	-	-
2	2896	*0000000*	0	0.0
3	2048	*0000000*	0	0.0
4	1448	*0000BBB*	3	42.9
5	1024	*BB00BBB*	5	71.4
6	724	*BB0BBBB*	6	85.7
7	512	*BBBBBBB*	7	100.0
-	362	-	-	-
-	256	-	-	-

Raw ODTV 1111
Net ODTV 1111

Innisfil WPCP
Black & Veatch
Clarifier #3
Date of Evaluation: October 15, 2009

Sample No. : **25716-B21** **Undiluted**
Predilution: **1**
Panellist No. **7**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*0000000*	0	0.0
-	5793	-	-	-
2	4096	*0000000*	0	0.0
3	2896	*0000000*	0	0.0
4	2048	*0000000*	0	0.0
5	1448	*A0000AA*	3	42.9
6	1024	*AAAA0AA*	6	85.7
7	724	*AAAAAAA*	7	100.0
-	512	-	-	-
-	362	-	-	-
-	256	-	-	-

Raw ODTV 1274
Net ODTV 1274

Sample No. : **25716-B22** **Undiluted**
Predilution: **1**
Panellist No. **7**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*0000000*	0	0.0
-	5793	-	-	-
2	4096	*0000000*	*0*	0.0
3	2896	*0000000*	*0*	0.0
4	2048	*00000AA*	*2*	28.6
5	1448	*A000AAA*	4	57.1
6	1024	*AAAAAAA*	7	100.0
-	724	-	-	-
-	512	-	-	-
-	362	-	-	-
-	256	-	-	-

Raw ODTV 1687
Net ODTV 1687

Innisfil WPCP
Black & Veatch
Small Digester
Date of Evaluation: October 15, 2009

Sample No. : **25716-B23** **Undiluted**
Predilution: **1**
Panellist No. **7**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*0000000*	0	0.0
-	5793	-	-	-
2	4096	*0000000*	0	0.0
3	2896	*000A0AA*	3	42.9
4	2048	*A00AAAA*	5	71.4
5	1448	*AAAAAAA*	7	100.0
-	1024	-	-	-
-	724	-	-	-
-	512	-	-	-
-	362	-	-	-
-	256	-	-	-

Raw ODTV 2483
Net ODTV 2483

Sample No. : **25716-B24** **Undiluted**
Predilution: **1**
Panellist No. **7**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*0000000*	0	0.0
-	5793	-	-	-
2	4096	*0000000*	*0*	0.0
3	2896	*00000BB*	*2*	28.6
4	2048	*BB0BBBB*	*6*	85.7
5	1448	*AAAAAAA*	7	100.0
-	1024	-	-	-
-	724	-	-	-
-	512	-	-	-
-	362	-	-	-
-	256	-	-	-

Raw ODTV 2499
Net ODTV 2499

Innisfil WPCP
Black & Veatch
Filter Building (Repeat)
Date of Evaluation: October 15, 2009

Sample No. : **25716-B25** **Undiluted**
Predilution: **1**
Panellist No. **7**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*0000000*	0	0.0
-	5793	-	-	-
-	4096	-	-	-
2	2896	*0000000*	0	0.0
3	2048	*0000000*	0	0.0
4	1448	*BBBB000*	4	57.1
5	1024	*BBBBBBB*	7	100.0
-	724	-	-	-
-	512	-	-	-
-	362	-	-	-
-	256	-	-	-

Raw ODTV 1460
Net ODTV 1460

Sample No. : **25716-B26** **Undiluted**
Predilution: **1**
Panellist No. **7**

Test No.	Dilution	Responses	No.	Percent
1	Blank	*0000000*	0	0.0
-	5793	-	-	-
-	4096	-	-	-
2	2896	*0000000*	0	0.0
3	2048	*00000A0*	1	14.3
4	1448	*AA00AAA*	5	71.4
5	1024	*BBB0BBB*	6	85.7
6	724	*BBBBBBB*	7	100.0
-	512	-	-	-
-	362	-	-	-
-	256	-	-	-

Raw ODTV 1492
Net ODTV 1492

Innisfil WPCP
Black & Veatch
Aeration Tank #3 Inlet (Repeat)
Date of Evaluation: October 15, 2009

Sample No. : 25716-B27 Undiluted
Predilution: 1
Panellist No. 7

Test No.	Dilution	Responses	No.	Percent
1	Blank	*0000000*	0	0.0
-	5793	-	-	-
-	4096	-	-	-
2	2896	*0000000*	0	0.0
3	2048	*0000000*	0	0.0
4	1448	*AA00A0A*	4	57.1
5	1024	*AAAAAAA*	7	100.0
-	724	-	-	-
-	512	-	-	-
-	362	-	-	-
-	256	-	-	-

Raw ODTV 1460
Net ODTV 1460

Sample No. : 25716-B28 Undiluted
Predilution: 1
Panellist No. 7

Test No.	Dilution	Responses	No.	Percent
1	Blank	*0000000*	0	0.0
-	5793	-	-	-
-	4096	-	-	-
1	2896	*0000000*	0	0.0
2	2048	*00000AA*	2	28.6
3	1448	*AA000AA*	4	57.1
4	1024	*BBB0BBB*	6	85.7
5	724	*BBBBBBB*	7	100.0
-	512	-	-	-
-	362	-	-	-
-	256	-	-	-

Raw ODTV 1506
Net ODTV 1506

APPENDIX 4

Volumetric Flow Rate Measurements
(4 pages)

Preliminary Testing Data Sheet

Method 1: SOP Number 93-T62-SP-001

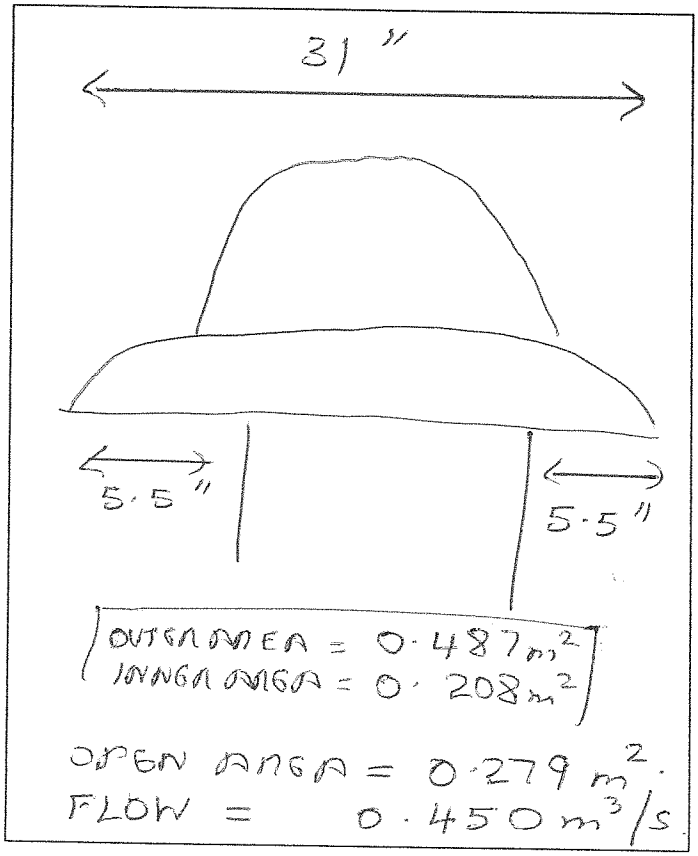
Plant	IONIS FIL
Plant Location	
Test No.:	
Test Date	OCT 15/09.
Test Location	HEADWORKS BUILDING.
Operator	Signature ES/JCW.

Diameters Upstream	
Diameters Downstream	
Ideal Location	
Non-Ideal Location	

Circular Duct		
Stack/Duct Diameter	inches	feet

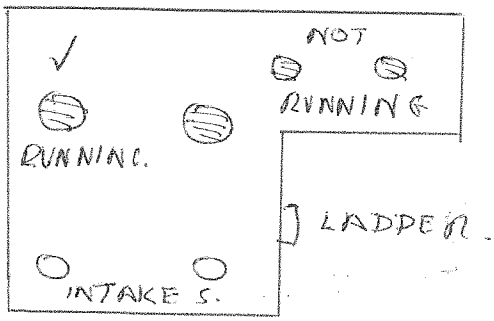
Rectangular Duct		
Length	inches	feet
Width	inches	feet
Equivalent Diameter	inches	feet

Site Diagram



Location of Sampling Sites & Sampling Points

Project No.:	25716



Port Length	inches	feet
Minimum # points		
Points / Traverse		

Point Number	Probe Markings ft/min inches
1	260
2	250
3	450
4	185
5	350
6	130
7	440
8	360
9	180
10	240
11	315
12	650
13	3810 ft/min
14	÷ 12
15	318 ft/min
16	
17	1.613 m/s.
18	
19	
20	
21	
22	
23	
24	

Preliminary Testing Data Sheet

Method 1: SOP Number 93-T62-SP-001

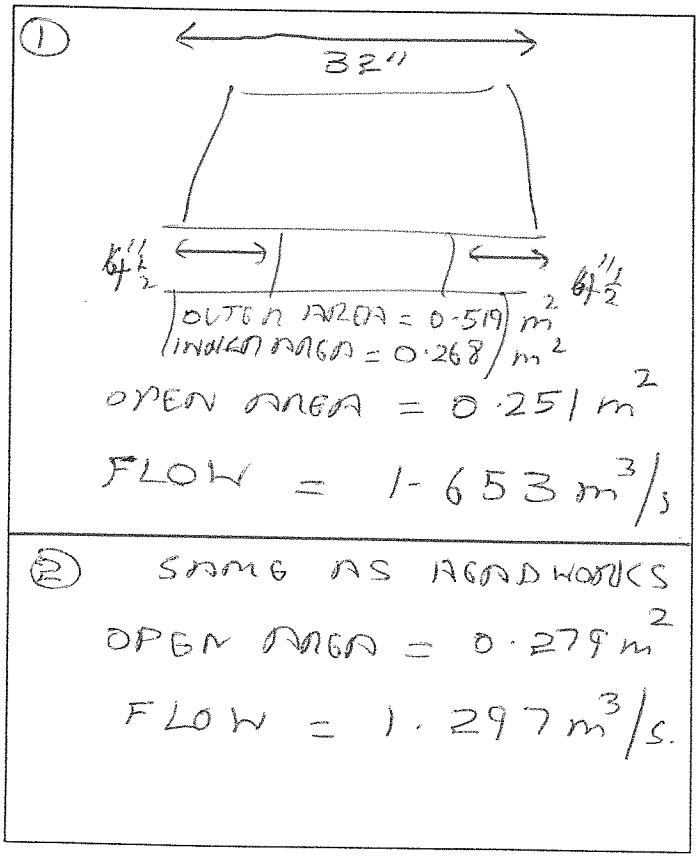
Plant	INNISFIL
Plant Location	
Test No.:	
Test Date	OCT 15/09
Test Location	FILTER BUILDING
Operator	Signature ES/ICW

Diameters Upstream	
Diameters Downstream	
Ideal Location	
Non-Ideal Location	

Circular Duct		
Stack/Duct Diameter	inches	feet

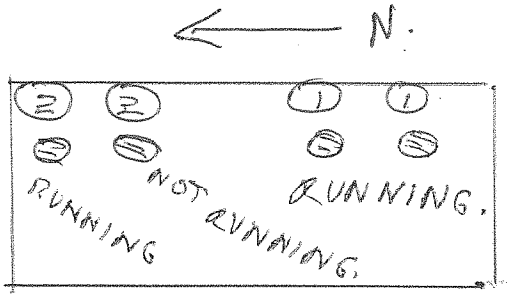
Rectangular Duct		
Length	inches	feet
Width	inches	feet
Equivalent Diameter	inches	feet

Site Diagram



Location of Sampling Sites & Sampling Points

Project No.:	25716.



TOTAL OF 3 FANS RUNNING.

Port Length	inches	feet
Minimum # points		
Points / Traverse		

Point Number (1)	Probe Markings (2) ft/m inches	ft/m
1	995	615
2	1990	510
3	1140	1500
4	870	740
5	1825	950
6	1890	1050
7	1520	1350
8	1715	1110
9	1100	830
10	550	930
11	1220	740
12	740	660
13		
14	15555	10985
15	÷12	÷12
16		
17	1296	915 ft/m
18		
19	6.585	4.650
20	m³/s	m/s
21		
22		
23		
24		

Preliminary Testing Data Sheet

Method 1: SOP Number 93-T62-SP-001

Location of Sampling Sites & Sampling Points

Project No.:	25716

Plant	INNISFIL
Plant Location	
Test No.:	
Test Date	OCT 14/09
Test Location	SCRUBBER SUMP #3/4
Operator	Signature ES/KW.

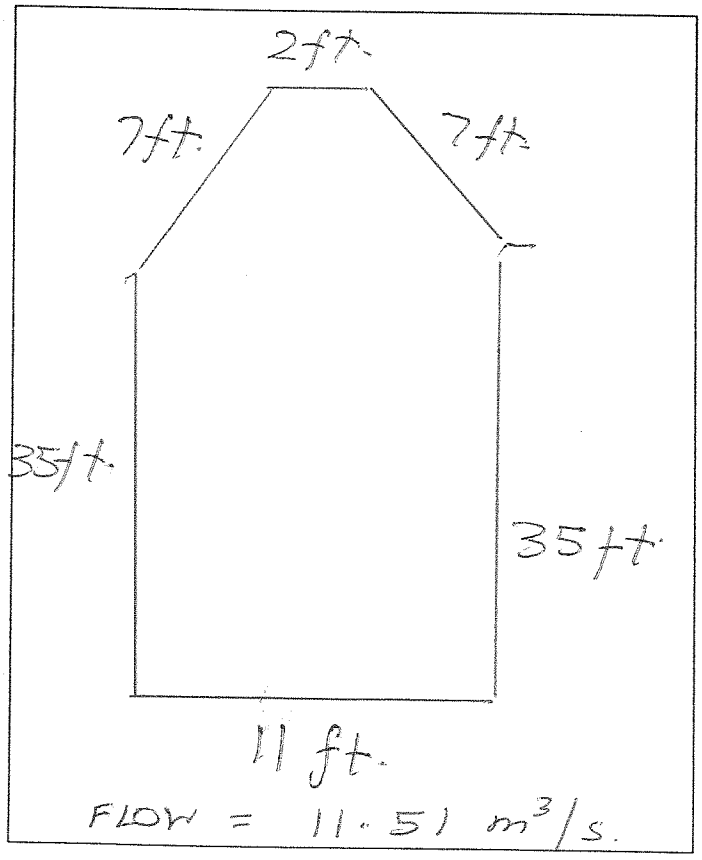
Diameters Upstream	
Diameters Downstream	
Ideal Location	
Non-Ideal Location	

Circular Duct		
Stack/Duct Diameter	inches	feet

Rectangular Duct		
Length	inches	feet
Width	inches	feet
Equivalent Diameter	inches	feet

Port Length	inches	feet
Minimum # points		
Points / Traverse		

Site Diagram



Point Number	Probe Markings ft/m, inches
1	61
2	40
3	79
4	77
5	60
6	51
7	34
8	39
9	48
10	85
11	46
12	93
13	50
14	66
15	73
16	42
17	54
18	42
19	58
20	64
21	1162 ft/m
22	÷ 20
23	58.1 ft/m
24	0.295 m/s.

Preliminary Testing Data Sheet

Method 1: SOP Number 93-T62-SP-001

Location of Sampling Sites & Sampling Points

Plant	INNISFIL.
Plant Location	
Test No.:	
Test Date	OCT 14/09.
Test Location	SCREW SUMP #1/2
Operator	Signature ES/KW

Project No.:	25716.

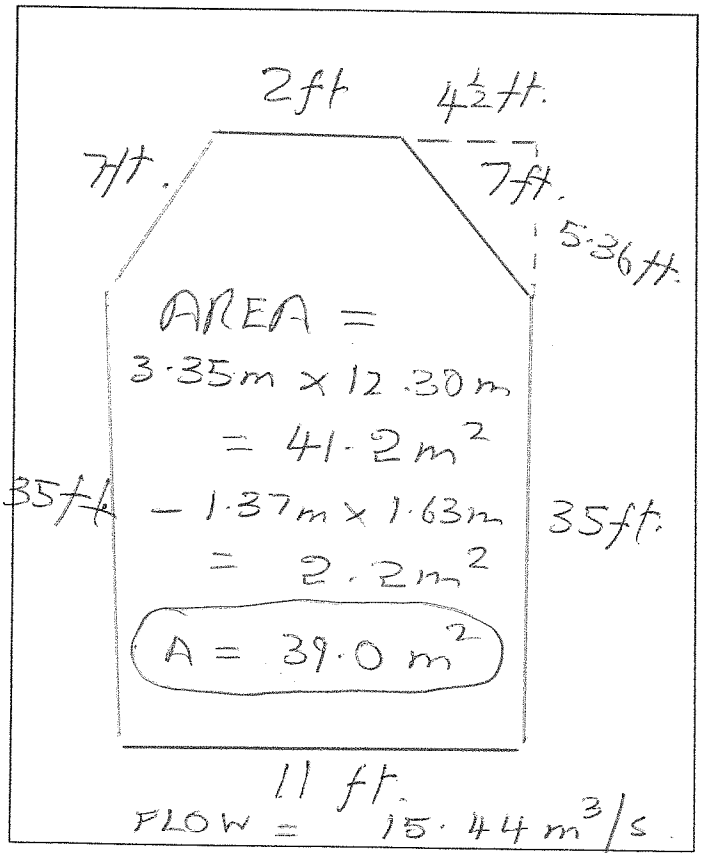
Diameters Upstream	
Diameters Downstream	
Ideal Location	
Non-Ideal Location	

Circular Duct		
Stack/Duct Diameter	inches	feet

Rectangular Duct		
Length	inches	feet
Width	inches	feet
Equivalent Diameter	inches	feet

Port Length	inches	feet
Minimum # points		
Points / Traverse		

Site Diagram



Point Number	Probe Markings ft/min inches
1	76
2	52
3	88
4	76
5	106
6	81
7	101
8	57
9	52
10	119
11	54
12	45
13	83
14	70
15	89
16	92
17	86
18	78
19	
20	1405 ft/min
21	÷ 18
22	78 ft/min
23	
24	0.396 m/s

APPENDIX B:
(Please See the Attached CD)

APPENDIX C

Combustion Spreadsheet for Generator GEN_PUMP

RWDI Project #1302274

RWDI Project Name:	Midhurst WWTP
RWDI Project Number:	1302274
RWDI Source ID:	GEN_PUMP
Manufacturer:	
Engine Model:	

Parameter	Units	Value
Engine Fuel		Diesel
Fuel Heating Value	(Btu/gal)	
Stroke Cycle		4-Stroke
Engine Loading	(%)	
Burn Style		
NOx Controlled?		No

Rating (enter one set of units)	Units	Value
Engine Power (kW)	(kW)	70
Generator Transfer Efficiency	(%)	90
Engine Combustion Efficiency	(%)	35
Calculated Engine Output	(hp)	94
	(kW)	70
	(hp)	93.800
Calculated Engine Input	(hp)	268.000

Manufacturer Emissions Data	Units	Factor
Oxides of Sulphur (SOx)	(g/hp-hr)	
Oxides of Nitrogen (NO_x)	(g/hp-hr)	
Carbon Monoxide (CO)	(g/hp-hr)	
PM	(g/hp-hr)	
Source:		

Fuel Sulphur Information	Units	Value
Natural Gas Sulphur Content	(%)	
Fuel Oil Sulphur Content	(%)	0.0015

Exhaust Temperature	Units	Value
Exhaust Temperature (ºC)	(ºC)	540
Calculated Exit Temperature	(K)	813
Exhaust Flow Rate	cfm	550
	m³/s	0.26

Emission Factors	Emission Factor Value	Emission Factor Units	Data Quality	Source of Emission Factor	Emission Rate Value	Emission Rate Units
Oxides of Sulphur (SOx)	0.00205	(lb/hp-hr)	D	AP 42 (10/1996) Ch 3.3, Tables 3.3-1	2.42E-02	g/s
Oxides of Nitrogen (NOx)	0.031	(lb/hp-hr)	D	AP 42 (10/1996) Ch 3.3, Tables 3.3-1	3.66E-01	g/s
Carbon Monoxide (CO)	0.00668	(lb/hp-hr)	D	AP 42 (10/1996) Ch 3.3, Tables 3.3-1	7.89E-02	g/s
Total Particulate Matter (TSP)	0.0022	(lb/hp-hr)	D	AP 42 (10/1996) Ch 3.3, Tables 3.3-1	2.60E-02	g/s

Sample Calculation for Nitrogen Oxides:

$$\frac{268.000\ \text{MMBTU}}{\text{hr}} \times \frac{0.031\ \text{lb}}{1\ \text{MMBTU}} \times \frac{1\ \text{h}}{3600\ \text{s}} \times \frac{453.5924\ \text{g}}{\text{lb}} = 1.05\text{E+00}\ \text{g/s}$$

Revision Date:	2017-09-14
Prepared by:	ODS
Checked by:	TR

Combustion Spreadsheet for Generator GENSET_3 and DORAN_GEN

RWDI Project #1302274

RWDI Project Name:	Midhurst WWTP & Doran Site
RWDI Project Number:	1302274
RWDI Source ID:	GENSET_3 and DORAN_GEN
Manufacturer:	
Engine Model:	

Parameter	Units	Value
Engine Fuel		Diesel
Fuel Heating Value	(Btu/gal)	
Stroke Cycle		4-Stroke
Engine Loading	(%)	
Burn Style		
NOx Controlled?		No

Rating (enter one set of units)	Units	Value
Engine Power (kW)	(kW)	250
Generator Transfer Efficiency	(%)	90
Engine Combustion Efficiency	(%)	35
Calculated Engine Output	(hp)	335
	(kW)	250
	(hp)	335.000
Calculated Engine Input	(hp)	957.143

Manufacturer Emissions Data	Units	Factor
Oxides of Sulphur (SOx)	(g/hp-hr)	
Oxides of Nitrogen (NO_x)	(g/hp-hr)	
Carbon Monoxide (CO)	(g/hp-hr)	
PM	(g/hp-hr)	
Source:		

Fuel Sulphur Information	Units	Value
Natural Gas Sulphur Content	(%)	
Fuel Oil Sulphur Content	(%)	0.0015

Exhaust Temperature	Units	Value
Exhaust Temperature (ºC)	(ºC)	456.6
Calculated Exit Temperature	(K)	730
Exhaust Flow Rate	cfm	2243
	m^3/s	1.06

Emission Factors	Emission Factor Value	Emission Factor Units	Data Quality	Source of Emission Factor	Emission Rate Value	Emission Rate Units
Oxides of Sulphur (SOx)	0.00205	(lb/hp-hr)	B	AP 42 (10/1996) Ch 3.3, Tables 3.3-1	8.65E-02	g/s
Oxides of Nitrogen (NOx)	0.031	(lb/hp-hr)	B	AP 42 (10/1996) Ch 3.3, Tables 3.3-1	1.31E+00	g/s
Carbon Monoxide (CO)	0.00668	(lb/hp-hr)	C	AP 42 (10/1996) Ch 3.3, Tables 3.3-1	2.82E-01	g/s
Total Particulate Matter (TSP)	0.0022	(lb/hp-hr)	B	AP 42 (10/1996) Ch 3.3, Tables 3.3-1	9.29E-02	g/s

Sample Calculation for Nitrogen Oxides:

$$\frac{957.143\ \text{MMBTU}}{\text{hr}} \times \frac{0.031\ \text{lb}}{1\ \text{MMBTU}} \times \frac{1\ \text{h}}{3600\ \text{s}} \times \frac{453.5924\ \text{g}}{\text{lb}} = 3.74\text{E+00}\ \text{g/s}$$

Revision Date:	2017-09-14
Prepared by:	ODS
Checked by:	TR

Combustion Spreadsheet for Generator GENSET_1 & GENSET_2 RWDI Project #1302274

RWDI Project Name:	Midhurst WWTP
RWDI Project Number:	1302274
RWDI Source ID:	GENSET_1 & GENSET_2
Manufacturer:	
Engine Model:	

Parameter	Units	Value
Engine Fuel		Diesel
Fuel Heating Value	(Btu/gal)	
Stroke Cycle		4-Stroke
Engine Loading	(%)	
Burn Style		
NOx Controlled?		No

Rating (enter one set of units)	Units	Value
Engine Power (kW)	(kW)	500
Generator Transfer Efficiency	(%)	90
Engine Combustion Efficiency	(%)	35
Calculated Engine Output	(hp)	670
	(kW)	500
	(hp)	670.000
Calculated Engine Input	(hp)	1914.286

Manufacturer Emissions Data	Units	Factor
Oxides of Sulphur (SOx)	(g/hp-hr)	
Oxides of Nitrogen (NO_x)	(g/hp-hr)	
Carbon Monoxide (CO)	(g/hp-hr)	
PM	(g/hp-hr)	
Source:		

Fuel Sulphur Information	Units	Value
Natural Gas Sulphur Content	(%)	
Fuel Oil Sulphur Content	(%)	0.1500

Exhaust Temperature	Units	Value
Exhaust Temperature (ºC)	(ºC)	505.6
Calculated Exit Temperature	(K)	779
Exhaust Flow Rate	cfm	3842
	m^3/s	1.81

Emission Factors	Emission Factor Value	Emission Factor Units	Data Quality	Source of Emission Factor	Emission Rate Value	Emission Rate Units
Oxides of Sulphur (SOx)	1.21E-03	(lb/hp-hr)	B	AP 42 (10/1996) Ch 3.4, Tables 3.4-1	1.02E-01	g/s
Oxides of Nitrogen (NOx)	0.024	(lb/hp-hr)	B	AP 42 (10/1996) Ch 3.4, Tables 3.4-1	2.03E+00	g/s
Carbon Monoxide (CO)	0.0055	(lb/hp-hr)	C	AP 42 (10/1996) Ch 3.4, Tables 3.4-1	4.64E-01	g/s
Total Particulate Matter (TSP)	0.0007	(lb/hp-hr)	B	AP 42 (10/1996) Ch 3.4, Tables 3.4-1	5.91E-02	g/s

Revision Date:	2017-09-14
Prepared by:	ODS
Checked by:	TR

ODOUR MITIGATION ASSESSMENT FOR MIDHURST WASTEWATER TREATMENT PLANT AND SEWAGE PUMPING STATIONS

Class EA Phase 3 & 4 for the Midhurst Secondary Plan

B&V PROJECT NO. 180261

PREPARED FOR

The Township of Springwater

C/O AINLEY & ASSOCIATES LIMITED

MAY 25, 2018

BLACK & VEATCH
Building a world of difference.®

Table of Contents

LIST OF TABLES

LIST OF FIGURES

1.0 BACKGROUND

Infrastructure requirements to accommodate future growth planned within the Midhurst Secondary Plan Area were considered in accordance with Phases 1 and 2 of the Municipal Class Environmental Assessment (EA) process (2000, as amended in 2007 and 2011) and documented in the "Midhurst Master Plan – Phase 1 & 2 - Water, Wastewater & Transportation, Ainley, July 2009" ("Master Plan"). The Master Plan determined that the Township of Springwater could construct a new sewerage system and treatment plant to service growth within the Midhurst Secondary Plan area with the provision for expansion to service the currently developed area in Midhurst. The new system includes a sanitary collection system, pump stations, treatment plant and effluent outfall to Willow Creek.

The new Midhurst Wastewater Treatment Plant (MWWTP) is proposed to be located on the Sand and Gravel Site at the intersection of Wilson Drive and Snow Valley Road, will have an initial (Phase 1) design capacity of 15,519 m^3/day, and will ultimately be expanded to process up to 26,891 m^3/day. Proposed plant facilities include:

- Headworks - influent pumping, screening, grit removal
- Primary and Secondary Treatment - biological nutrient removal (BNR), clarification of BNR effluent
- Tertiary treatment - flow equalization, membrane filtration and ultraviolet disinfection
- Solids treatment – thickening, autothermal thermophilic aerobic digestion (ATAD), post-digestion aeration, and liquid sludge storage.

Site plans of the proposed MWWTP are presented at the end this document which show a general site layout and proposed facilities for the plant.

In addition to liquid and solids treatment, the plant will include odour control to ensure that the new facilities do not adversely impact adjacent properties. The level of odour control provided will be guided both by the odour generation potential of selected processes and by Ontario guidelines that establish odour limits that are applied to wastewater treatment facilities.

Based on the preliminary wastewater collection system concept, it is anticipated that 10 sewage pumping stations will be required to service existing and proposed development in the Secondary Plan area. The preliminary location of sewage pumping stations was determined as part of the Master Plan process. The most common sewage pumping station layouts are Submersible and Wet well / Dry well. The type of sewage pumping station required for each of the locations will be determined during the detailed design phase.

Submersible type sewage pumping stations are equipped with submersible pumps which are located within the wet well. The wet well is typically divided for ease of maintenance. The station controls and stand-by power unit are typically located either on top of the wet well (in a building) or in a separate structure adjacent to the wet well. This type of sewage pump station is recognized as being suitable for flows up to 100 L/s. For flows greater than 100 L/s, it is common practice to use a wet well / dry well configuration. The pumps are housed outside of the wet well for ease of maintenance. All controls and the stand-by power unit are housed in a building located on top of the wet well / dry well structure.

RWDI Air Inc. has completed a preliminary dispersion modelling to predict the potential impacts for odour and air quality associated with the operations of the eventual full build-out of the proposed Midhurst Wastewater Treatment Plant (WWTP) and Water Treatment Plant (WTP), to assess the air quality impacts from a worst-case pumping station and to qualitatively assess the proposed changes to the nearby roads.

2.0 OBJECTIVES

The objectives of this memorandum are as follows:

- Identify the regulatory framework that will define odour control needs at the plant
- Preliminarily define the odour potential of proposed plant processes
- Identify potential treatment processes for odourous exhausts
- Define an implementation strategy to meet odour criteria based on the results of the preliminary dispersion modelling.

3.0 ODOUR MANAGEMENT REGULATORY FRAMEWORK

The emission of odourants and odours in Ontario is addressed on several levels by the Ontario Ministry of the Environment and Climate Change (MOECC). Mechanisms to ensure that odours from wastewater treatment plants and other facilities are appropriately mitigated are summarized in Table 1.

Table 1 - Regulatory Odour Mitigation Mechanisms

REGULATORY REQUIREMENT	REGULATORY SOURCE	SUMMARY
Nuisance Prohibition	Ontario EPA Section 14	Establishes that "no person shall discharge a contaminant or cause or permit the discharge of a contaminant into the natural environment that causes or is likely to cause an adverse effect" (odour is defined as a contaminant).
Ambient Air Quality Criteria (AAQC)	Ontario Regulation 419/05	Defines AAQC, independent of location or source, for a variety of odourants. For each AAQC averaging times are also established.
Point of Impingement (POI) Standards and Guidelines	Ontario Regulation 419/05	Establishes standards or guidelines for odourant concentrations at a specific point, specifically "where human activities regularly occur at a time when those activities regularly occur" (1)
Ambient Odour Limit (2)	MOECC Proposal	Limit defined as 1 odour unit/m^3 for an averaging period of 10 minutes, applied on a case-by-case basis. Compliance is demonstrated through dispersion modeling, with results included in Certificate of Approval application packages.
Separation Distances	Ontario MOECC Guideline D-2	Sets forth buffers between "the periphery of the noise/odour-producing source-structure, to the property/lot line of the sensitive land use". For wastewater treatment plants with capacities > 500 m^3/d and <25,000 m^3/d, min. and recommended separation distances of 100 m and 150 m,

		respectively are established. Separation distances for plants > 25,000 m^3/d, are defined on a case-by-case basis.

Notes:
(1) Environmental Commission of Ontario (ECO) 2007-2008 report
(2) Initiated as part of an Odour Policy Framework in 2005, but not yet finalized

Siting of the proposed facilities was established in consideration of Guideline D-2. A 100 m buffer around the site has been provided and this separation requirement is complied with. With proposed odour control measures, this buffer will be adequate for the expanded facility as well.

Ensuring compliance with AAQC, POI and ambient odour limits will require dispersion modeling (discussed later in this memorandum), but knowledge of the proposed wastewater and sludge treatment processes can provide preliminary guidance on both the strength of – and treatment needs - for proposed process exhausts (discussed below).

4.0 PROCESS ODOUR POTENTIAL

Wastewater contains an array of odourants, and consequently, wastewater treatment plants can be a source of odours. Key odourants can be grouped into the categories shown on Table 2. The table also shows the primary sources of these odourants.

Table 2 - Typical Wastewater Treatment Odourants

CATEGORY	EXAMPLES	TYPICAL SOURCE
Inorganic Sulfur Compounds	• Hydrogen sulfide	• Sewer systems and pumping stations • Wastewater treatment systems
Organic Sulfur Compounds	• Dimethyl Sulfide • Methyl Mercaptan • Carbon Disulfide	• Sludge holding • Sludge thickening • Sludge stabilization
Nitrogen Compounds	• Ammonia • Amines • Skatole • Indole	• Wastewater anoxic basins • Sludge digestion (anaerobic, ATAD)
Volatile Fatty Acids	• Acetic Acid • Butyric Acid • Valeric Acid	• ATAD
Aldehydes and Ketones	• Acetaldehyde • Methyl Ethyl Ketone • Acetone	• Sludge holding • Sludge thickening • Sludge stabilization

As shown in the table, some odourants are somewhat process specific. For example, organic sulfur compounds are primarily (though not exclusively) found in sludge processes.

Hydrogen sulfide (H_2S), however, is the odorant that dominates wastewater odors and it can be detected at concentrations in the parts-per-billion level and is characterized by a "rotten egg smell". H_2S is formed in sewer systems (when wastewater dissolved oxygen is low), and this formation can be exacerbated when the wastewater is pumped in a force main over a long distance (rather than conveyed in gravity sewers). H_2S gas release is enhanced where wastewater turbulence is high (influent channels, weirs, etc.).

The odour potential for wastewater treatment plants varies widely, and based on B&V's experience with both wastewater and sludge treatment processes, a relative ranking of "low", "moderate" and "high" was established for proposed Midhurst WWTP processes. This ranking is shown in Table 3.

Table 3 - Expected Relative Process Odour Potential

PROCESS AREA	PROCESS	ODOUR POTENTIAL
Catchment Sewage Pumping Stations	Pumping	Low
Headworks	Influent Pumping	High
	Screening	Moderate
	Grit Removal	Moderate
Primary and Secondary Treatment	Biological Nutrient Removal (BNR)	Low
	BNR Effluent Clarification	Very Low
Tertiary Treatment	Flow Equalization	Very Low
	Membrane Filtration	Very Low
	Ultraviolet Disinfection	Very Low
Solids Treatment	Thickening	Moderate
	ATAD	High
	Post-digestion Aeration	Moderate
	Liquid Storage	Low

Based upon the above qualitative assessment, odours from both Headworks and Solids treatment processes will be contained and treated. Potential treatment approaches are described below.

5.0 ODOUR TREATMENT TECHNOLOGIES

Technology selection is a function of both exhaust characteristics and desired performance. For Headworks exhausts, it is expected that while H_2S emissions will be higher than other site sources, they will nonetheless be relatively low. Exhausts from solids are expected to also have moderate H_2S concentrations, but reduced sulfur compounds may be present. Treatment systems for the ATAD exhausts also must include a pretreatment step for ammonia.

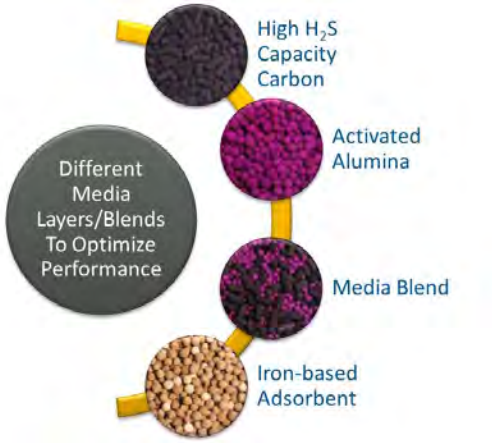
Additional data will be required to finalize candidate technologies, but preliminarily the following technologies will be appropriate to control Headworks and/or Solids Treatment odours at the Midhurst WWTP.

- Physical Adsorption (for Headworks)
- Biofiltration

Additionally, enhanced dispersion fans can be considered to further reduce offsite odour impacts. Each of these technologies is described below.

5.1 PHYSICAL ADSORPTION

Adsorption media such as carbon and alumina have been widely used to control H_2S and other odorous compounds emitted at wastewater treatment facilities. With this technology, the contaminated airstream passes through an adsorptive media where the compounds are adsorbed onto the media surface. Over time, the adsorbing sites become saturated and the media loses its effectiveness. Once saturated, the media must be replaced. As the contaminant load to the media increases, the frequency of media replacement increases as well.



The most commonly used adsorbents include coconut-based virgin carbon, high H_2S capacity carbon, and potassium permanganate impregnated alumina. Adsorptive capacity varies by compound and media type (for example, the H_2S removal capacity generally ranges from 0.02 to 0.30 gram H2S/cubic centimeter). Virgin carbon provides the lowest H_2S capacity, but offers superior removal of other odorants. Impregnated alumina offers good H_2S capacity, but also can remove reduced sulfur compounds. To leverage the individual strengths of these individual media, they are often blended, optimizing both performance and bed life. Figure 1 illustrates the variety of media available.

Figure 1 - Adsorption Media

Adsorption systems historically consisted of a tower filled with one or two beds containing the carbon media and a fan to push (or pull) odorous air through the media. These systems are still in use, but radial flow and other configurations are becoming popular as well. Low-profile units with multiple stages are seeing increased use, especially, as they allow the opportunity to "mix and match" media for maximum odor reduction and cost-effectiveness. Figure 2 illustrates a multi-stage adsorption system used in a municipal application. Regardless of their configuration, adsorption systems are typically easy to maintain and reliable, as there are no moving parts other than those on the fan.

Figure 2 - Multi Stage Adsorption System

From a performance perspective, warrantees for 99.5% removal of H_2S and 95% of odor can be obtained in most cases.

5.2 BIOFILTERS

Biofilters rely on mass transfer and biological oxidation, to remove odors. Odorous compounds dissolve into a biofilm on a fixed media where biological oxidation processes occur. Due to the type of media used and media residence times provided, biofilters are particularly suitable for treating complex airstreams associated with sludge processing.

Figure 3 - Biofilter (Courtesy of BioRem)

Biofilter media varies, and can include synthetic media, lava rock, hadite, or similar inorganic high porosity material to support microbial populations. Organic media consisting of composted green material, bark, and woodchips can also be used, but degrades with time and requires periodic replacement. Some systems use an inorganic media overlaid by a high-lignin content organic media. Synthetic media and organic media have warranted lives of ten and five years, respectively.

Biofilters can be constructed as in-ground concrete basins or manufactured as compact package units in fiberglass shells (see Figure 3). Regardless of their configuration, biofilters typically have an integrated humidification stage to saturate the incoming air stream, and to maintain moisture.

From a performance perspective, H_2S reductions of 98-99 percent and odor reductions of 90 percent are typical for manufactured systems.

5.3 ENHANCED DISPERSION FANS

Enhanced dispersion fans, also known as mixed flow induction fans, can be considered as a “second stage” for proposed odor control systems, polishing exhausts before discharge (if deemed necessary by dispersion modeling). Technically, enhanced dispersion fans are not treatment units per se, but they provide both the dilution and acceleration of exhaust gases into the atmosphere. Essentially, the units “pull in” up to 170% of the exhaust volume, diluting the odorous air stream before discharge. They also accelerate the exhaust to provide enhanced dispersion normally achieved only by a very tall stack. Unlike a tall stack, however, enhanced dispersion fans offer a low profile. In addition, they can be equipped with silencers, although experience has shown them to offer quiet operations without silencers. Figure 4 depict an installed dispersion fan system and a fan schematic, respectively.

The use of these units is increasing due to their low cost, effectiveness, and ease of operation. This belt-less fans are very easy to maintain, requiring only lubrication once every 18 months to 3 years.

Figure 4 - Enhanced Dispersion Fan System

Enhanced dispersion fans are typically applied:

- In place of treatment technologies for low strength exhaust
- As a supplement to treatment technologies, to both reduce outlet odor concentrations and improve dispersion characteristics of treated exhausts
- As redundancy for a treatment technology that is offline for maintenance or other reasons

6.0 ODOUR MANAGEMENT STRATEGY

The odours from the proposed WWTP raw sewage pump station and headworks will be collected and treated using a biofilter. The design biofilter efficiency is based on measured efficiencies at similar sites. Building air form odour free areas will be dispersed (e.g. using dispersion fans).

The odours from sludge thickening, the autothermic aerobic digester (ATAD) and the stabilized sludge storage tanks will be collected and treated by a two-stage odour treatment process provided by the ATAD vendor. The first stage scrubs out the ammonia while the second stage treats the odour causing reduced sulfur and organic acid compounds. The model includes treatment of the odours emitted when a biosolids tanker is being filled. A hood collects the odour emitted from a biosolids tanker when the biosolids are being transferred from the plant to beneficial reuse on agricultural land.

The odours from the Sewage pumping stations will be managed by design or by addition of an odour adsorption process.

7.0 REVIEW OF DISPERSION MODELLING RESULTS

Odour as a nuisance is quantified as an odour unit (OU). The value of 1 OU is defined as the level of odour that 50% of an odour panel detects. The odour panel is composed of individuals who have been tested to ensure they represent the average sensitivity of the greater population. If the air sample has to be diluted 1:1 with clean air before only half of the panel detects it, then that is two OUs. The Majority of people would not be notice by an odour strength of 3 OU if it lasted for a short period of time (e.g. a few hours).

Odour and other critical air contaminants are emitted by point sources (e.g. stacks) or by area sources (e.g. aeration tanks). The strength and flow rate of these contaminants are estimated from measured data from similar sites using similar technologies. These emissions are diluted and moved by winds and thermal currents.

AERMOD was developed by the AERMIC (American Meteorological Society (AMS)/United States Environmental Protection Agency (EPA). This air dispersion model combines the worst case emissions from a site with local meteorological data. The strength of the odour can then be estimated at a number of sites around the facility under different weather conditions.

The dispersion modeling work completed by RWDI for the WWTP shows that the maximum predicted concentrations of hydrogen sulphide, total reduced sulphur, ammonia, and nitrogen oxide were less than their respective MOECC Point of Impact Limits.

The model included odour impact assessment for ninety-one future and existing receptor sites. These sites included residences, community buildings and commercial facilities in the vicinity of the WWTP. No site experienced an odour over 5 OU. One future site, south-east of the WWTP, experiences one 4 hour event when the odour concentration reaches 4.16 odour units, however, RWDI concluded that the majority of the population would not notice or be impacted by this event if it occurred.

The model predicted that a few sites on the south of the WWTP may experience similar short-term events but at much lower concentrations (<2 OU). The model is based on a very conservative estimate of the odours generated by the headworks screens and grit removal which may not occur in practice. A detailed analysis of the model results indicates that these assumptions are the reason that the model predicts a short term odour level above 1 OU but below 3 OU under certain a meteorological conditions for these sites south of WWTP.

8.0 RECOMMENDATIONS

There are no odour concerns with the design of the current WWTP based on the detailed modeling completed and odour management strategy defined in this report. The implementation of the headworks biofilter will ensure the success of this strategy. Furthermore, as another safety measure, the headworks biofilter discharge should allow for the addition of a second stage scrubber in the unlikely event that the biofilter does not perform as expected.

APPENDIX 'T'

Environmental Screening Craig Road Corridor, Midhurst – Azimuth Environmental Consulting Inc., October, 9, 2015

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Assessments & Approvals

October 9, 2015 AEC 15-307

Ainley Group
280 Pretty River Parkway
Collingwood, Ontario
L9Y 4J5

Attention: Brad Kalus, C.E.T., LEL, Transportation Manager

RE: Environmental Screening Craig Road Corridor, Midhurst

Dear Mr. Kalus;

As per your request, Azimuth Environmental Consulting (Azimuth) has reviewed the alignment of Alternative 3 - Craig Road extension, from Russell Road to County Road 26, based on the preliminary plan and profile drawing provided along with a site visit completed on September 28, 2015.

This letter report summarizes information that has been obtained from outside sources combined with data collected during one site walk on September 28, 2015 (by Sara Murphy, Azimuth) to provide an overview of current conditions. The intent of this report is to identify environmental sensitivities that require consideration in the evaluation of study design alternatives, as part of a larger Class Environmental Assessment study. Azimuth is not involved in the evaluation of other alternatives for the Class EA at this time.

1.0 EXISTING CONDITIONS

1.1 Study Area

Craig Road corridor extending from Russell Road westerly to County Road 27 as shown on the attached Figures.

1.2 Terrestrial Resources

Vegetation

The study area appears to be primarily agricultural in nature to the east of Gill Road, dominated by what appears to be soy beans, corn, and inactive fields. To the west of Gill Road, the majority of the study area is dominated by what appears to be mature deciduous forest. Additional vegetation communities identified from air photo interpretation in proximity to the proposed alignment include:

- Hedgerows along the existing trails on the Right of Way (ROW);
- Agricultural Lands – Maintained Row Crops
- Conifer Plantations to the south of the alignment; and,
- Maintained Farm and residential properties;

Wildlife

Background information at this time indicates that the majority of the species expected to be present within the study area are common, and tolerant of human disturbance on the landscape including White-tailed Deer. Potential has been identified within the study area for area sensitive bird breeding habitat and amphibian breeding habitat (woodland) which would require additional study to characterize.

Designated Natural Areas

Review of the background data indicates that there are currently no mapped Areas of Natural and Scientific Interest (ANSIs) or Provincially Significant Wetlands (PSW) present in proximity to the proposed alignment. However, based on the size and composition of the forested area in the west portion of the study area, it would be considered potential Significant Woodland.

Species at Risk

Our preliminary screening assessment indicated that the following species had potential to occur within the Midhurst District, specifically in proximity to the study area and should thus be considered in any assessment:

- Mammals: Little Brown Myotis (*Myotis lucifugus*), and Northern Myotis (*Myotis septrentionalis*);
- Reptiles and Amphibians: Eastern Hog-nosed Snake (*Heterodon platirhinos*), and Milksnake (*Lampropeltis triangulum*);

- Birds: Bald Eagle (*Haliaeetus leucocephalus*), Barn Swallow (*Hirundo rustica*), Bobolink (*Doliichonyx oryzivorus*), Canada Warbler (*Wilsonia carolinus*), Cerulean Warbler (*Dendroica cerulea*), Chimney Swift (*Chaetura pelagica*), Common Nighthawk (*Chordeiles minor*), Eastern Meadowlark (*Sturnella magna*), Eastern Wood-Pewee (*Contopus virens*), Whip-poor-will (*Caprimulgus vociferus*), and Wood Thrush (*Hylocichla mistelina*);
- Plants and Lichens: American Ginseng (*Panax quinquefolius*), Butternut (*Juglans cinerea*); and,
- Insects: Monarch Butterfly (*Danaus plexippus*).

Ontario's *Endangered Species Act*, 2007 (ESA) provides regulatory protection to endangered and threatened species prohibiting harassment, harm and/or killing of individuals and destruction of their habitats. Habitat is broadly characterized within the ESA as the area prescribed by a regulation as the habitat of the species or an area on which the species depends, directly or indirectly, to carry on its life processes including reproduction, rearing of young, hibernation, migration or feeding. The various schedules of the ESA identify SAR in Ontario. These include species listed as extirpated, endangered, threatened and special concern. As noted above, only species listed as endangered and threatened receive protection through the ESA from harm and destruction to habitat on which they depend.

1.3 Aquatic Resources

Background mapping from Simcoe County Mapping indicates the presence of several drainage areas that discharge northerly crossing Craig Road along the study area (Figure 2). They are located within the Nottawasaga Valley Conservation Authority (NVCA) area of jurisdiction (Figure 3), that ultimately discharge to tributaries of Matheson Creek, within the Matheson Creek watershed (Figure 4).

As shown on Figure 2 there are two drainage areas between Russell Road and Gill Road, shown on background mapping labeled as crossing #1 and #2. Photographs of these crossings are provided as Photographs 1-4, and 7-10 respectively. At both of these sites, CSP culverts were dry however some channel definition indicates conveyance does occur likely following large storm events or spring freshet. There is no defined creek channel therefore these crossings do not function as fish habitat. Mapping indicates that watercourses are likely to occur further to the northwest therefore it is anticipated that drainage from these sites do ultimately enter into waterways containing fish however these sites are not watercourses, and do not constitute fish habitat.

As shown on Figure 2 Crossing #3 and #4 are shown in the woodlot between Gill Road and County Road 27. At these locations drainage does occur as evident by the topography (Photograph 14) and distribution of sand (Photograph 15) in low lying areas of the undulating unassumed road access, however there was no water or indication of wetted condition. Drainage is anticipated to occur following large storm events and spring freshet however these crossings do not constitute watercourses, and do not function as fish habitat. As with Crossing #1 and #2, it is anticipated that drainage ultimately enters into waterways containing fish.

As shown on Figure 3, the drainage pathways identified as Crossing #1 and #2 at Craig Road form the boundary of lands identified as Significant Groundwater Recharge Area however these crossings are not regulated by the NVCA. It is suggested that such lands be verified as unregulated during detail design and permitting stages to confirm work permit requirements.

The lands west of Gill Road are highlighted as regulated by the NVCA and subject to as the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation (Ontario Regulation 172/06) under Section 28 of the *Conservation Authorities Act.* The intent of the regulation is to ensures that development proposals take into consideration natural features like floodplains, steep slopes, wetlands, and watercourses.

2.0 PROPOSED DEVELOPMENT

The Ainley Group is currently evaluating road alignment alternatives for the Craig Road corridor north of Midhurst. This general alignment constitutes Alternative #3, and is subject to modification pending advancement of the Class Environmental Assessment being undertaken by others. The intent of this screening report is to assist Ainley in identifying environmental conditions based on one site visit, and to evaluate suitability of this alternative, among others proposed but not included in this screening, to assist in developing alternative design concepts for the preferred solution.

The Alternative #3 option has been preliminarily evaluated from an engineering perspective by Ainley to determine suitability. The draft plan and profile evaluation provided by Ainley indicates that in order to achieve proper road grade within the study area, minimal tree clearing is required between Russell Road and Gill Road considering the existing surrounding landuse is agricultural. West of Gill Road however the landscape is in natural condition and treed, situated in an area of undulating topography. Within this reach, significant cuts are required in order to connect Craig Road to County

Road 27. Based on the preliminary plan and profile drawing provided by Ainley, the maximum degree of cut is 34m, requiring a total width of clearing at the widest point of approximately 160m across.

From a drainage perspective, crossings will be required to facilitate drainage from south to north/northwesterly. Based on drainage features and topography it is anticipated that a total of 4-5 culverts or span crossings will be required however the ultimate quantity would be confirmed in detail design.

Preliminary concepts for stormwater management remain unknown at this preliminary stage. Other unknown environmental conditions include archaeology, ground water condition and influence, as well as the potential for contaminate or waste management within the study limits.

3.0 EVALUATION OF ENVIRONMENTAL IMPACTS

3.1 Key Natural Heritage Features

Policies relating to Key Natural Heritage Features (KNHF) often limit development within or adjacent to the features. The area of the KNHF is frequently subject to the addition of a buffer which restricts development in proximity to the KNHFs and is intended to protect the feature from impacts associated with development. KNHF are intended to reflect Natural Heritage features outlined in section 2.1 of the Provincial Policy Statement (PPS) (MMAH, 2014).

The results of our preliminary assessment and review of background information indicate the potential for the following KNHF and functions to be located on or adjacent to the study area:

- Significant Habitat for Threatened or Endangered Species;
- Potential Significant Woodlands
- Potential Significant Wildlife Habitat; and,
- Fish Habitat.

It is ultimately the responsibility of the Province and/or the Municipality to designate areas identified within Section 2.1.4 of the PPS as significant. Significant Woodlands and Significant Wildlife Habitat outlined within this letter are those with potential, as outlined within the Natural Heritage Resource Manual, to be considered as significant.

Significant Habitat for Threatened or Endangered Species

Based on the assessment of the study area undertaken to this point, potential for a number of species which receive protection has been identified within the study area.

The proposed development would require the removal of a portion of the large wooded areas in the west portion of the study area. Removal of mature forest could conceivably result in damage or destruction to the habitat of American Ginseng, Barn Swallow, Butternut, Cerulean Warbler, Chimney Swift, Little Brown Myotis, Northern Myotis, Eastern Hog-nosed Snake, and Whip-poor-will;

Further, the proposed development east of Gill Road is directly through Agricultural lands. While these areas were planted in row crops at the time of the site visit crop change to hay could present potential habitat for Bobolink, and Eastern Meadowlark.

Unauthorized damage to the habitat for any of these species, or harassment or injury to individuals of the species would be considered a contravention of the ESA if any individuals are confirmed to be present in the identified potential habitat.

Significant Woodlands

The woodland located in study are to the west of Gill Road has potential to be considered Significant Woodland. The proposed development would result in the removal of a large linear strip of the woodland which could be considered a separation of the woodland that could negatively impact the natural feature and the ecological functions contained within the woodland. A new Craig Road corridor is anticipated to have a significant impact on existing trees and forest lands west of Gill Road.

Significant Wildlife Habitat

Woodland Amphibian Breeding Habitat

Based on the observed structure of the woodland and the presence of a number of low pockets within the forested area there is potential that vernal pools could be identified in the wooded areas associated with the study area. These pools represent potential woodland amphibian breeding habitat which would require further characterization to determine the potential for impacts associated with the proposed development.

Area Sensitive Bird Breeding Habitat

The review of Ontario Breeding Bird Atlas information collected to date for the area identifies a number of birds species which are considered Area Sensitive to occur. While

it is unlikely to result in a significant impact to the potential habitat, it is recommended that additional surveys be undertaken to determine if and where area sensitive species are actually utilizing the forested areas of the study area. Without additional study, any areas of forest more than 100m from an edge could be considered area sensitive bird breeding habitat.

Habitat for Species of Special Concern

The following species of Special Concern are acknowledged to occur in the study area, and could conceivably be encountered during construction activities:

- Bald Eagle;
- Canada Warbler;
- Eastern Wood Pewee;
- Wood Thrush; and,
- Milksnake.

While these species do not receive protection under the ESA, 2007, care is recommended while working in areas where these species occur. Where possible, impacts to these species should be characterized avoided. Features which would be considered critical habitat for these species should be identified in the study area if they exist prior to construction.

The Significant Wildlife Habitat Technical Guideline (SWHTG) defines wildlife habitat as:

- Areas where plants, animals and other organisms live, and find adequate amounts of food, water, shelter, and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their life cycle; and areas which are important to migratory or non-migratory species.

Significant is defined as:

- Ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system.

Fish Habitat

The study area does not contain defined watercourses therefore there is no requirement for detailed fisheries inventory or sampling as part of future studies. Drainage corridors as identified on Figures 2, 3, and 4 may be further assessed under spring condition to

evaluate flow permanency, however based on the one site visit it is anticipated that given the lack of defined channel and dry condition these systems do not function as fish habitat. Impacts commonly associated with construction are anticipated to be mitigable (as per ESC's and project timing etc.), as developed in future detail design stages, as long as water quality and quantity conveyance is maintained post development.

From a fisheries perspective, there are limited constraints to construction through this corridor.

3.2 Recommended Field Investigations

Environmental conditions will require further review during future design stages particularly as they relate to wildlife, vegetation and SAR. Such studies will require evaluations over three seasons in order to properly evaluate environmental impacts in an Environmental Impact Study (EIS), and to develop suitable mitigation plans for mitigating and avoiding impacts to the extent possible. Further, such studies form a requirement of the approval process in order to facilitate the acquisition of environmental work permits from the NVCA for works in regulated lands.

We trust that the information provided will be useful in addressing the potential for impacts associated with this alternative at this time and look forward to working with you as the project moves forward. If you have any questions regarding this project or require further information please do not hesitate to contact the undersigned.

Yours truly,
AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Sara Murphy, B.Sc.,
Senior Aquatic Ecologist/Partner

Brad Baker, B.Sc.,
Terrestrial Ecologist

SMM:/BB:

Figure 1. Study area (source: http://maps.simcoe.ca/beta/).

Figure 2. Simcoe County Mapping Existing Conditions (http://utility.arcgisonline.com/). Study area as shown.

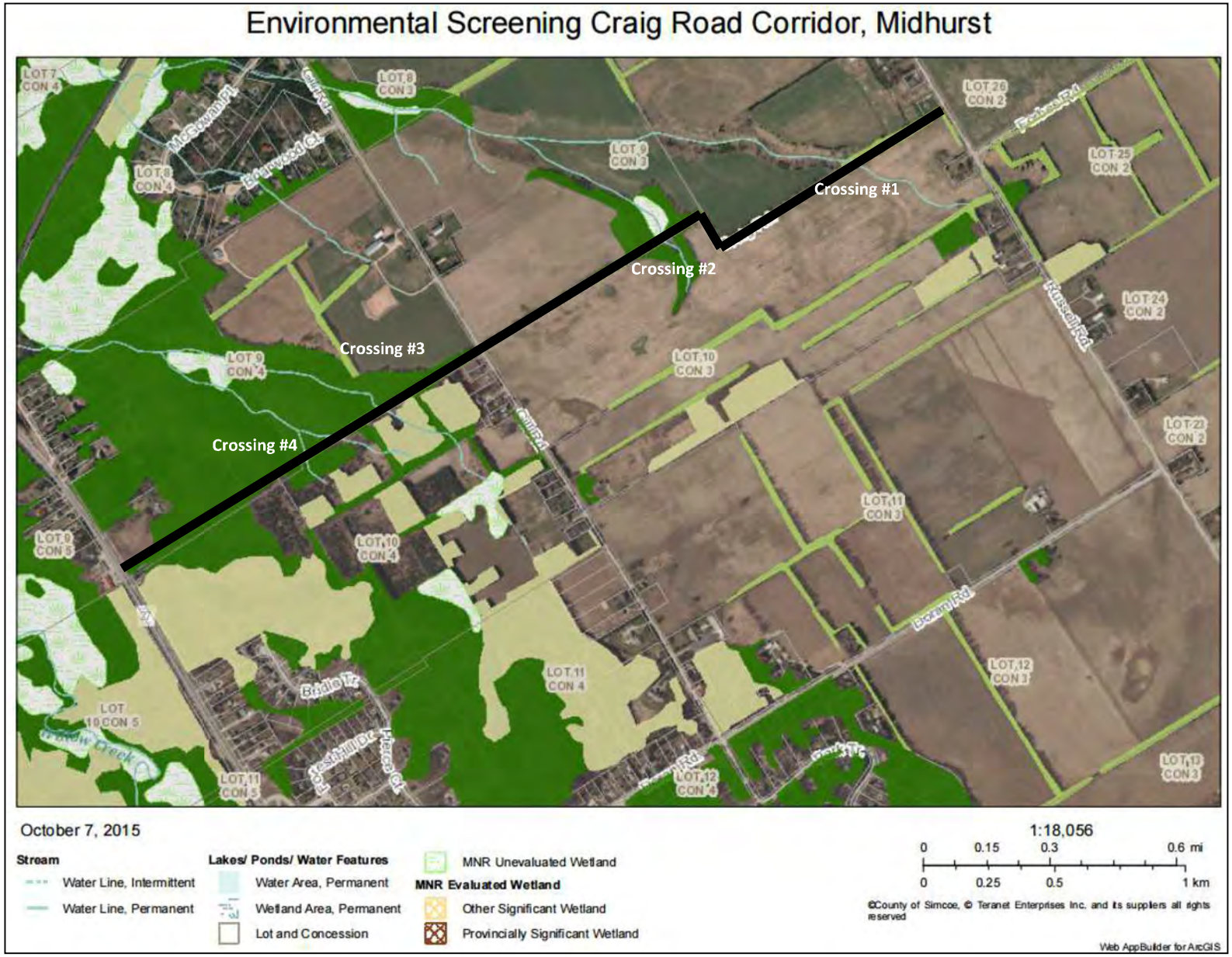


Figure 3. NVCA Regulation Mapping (study area as shown).

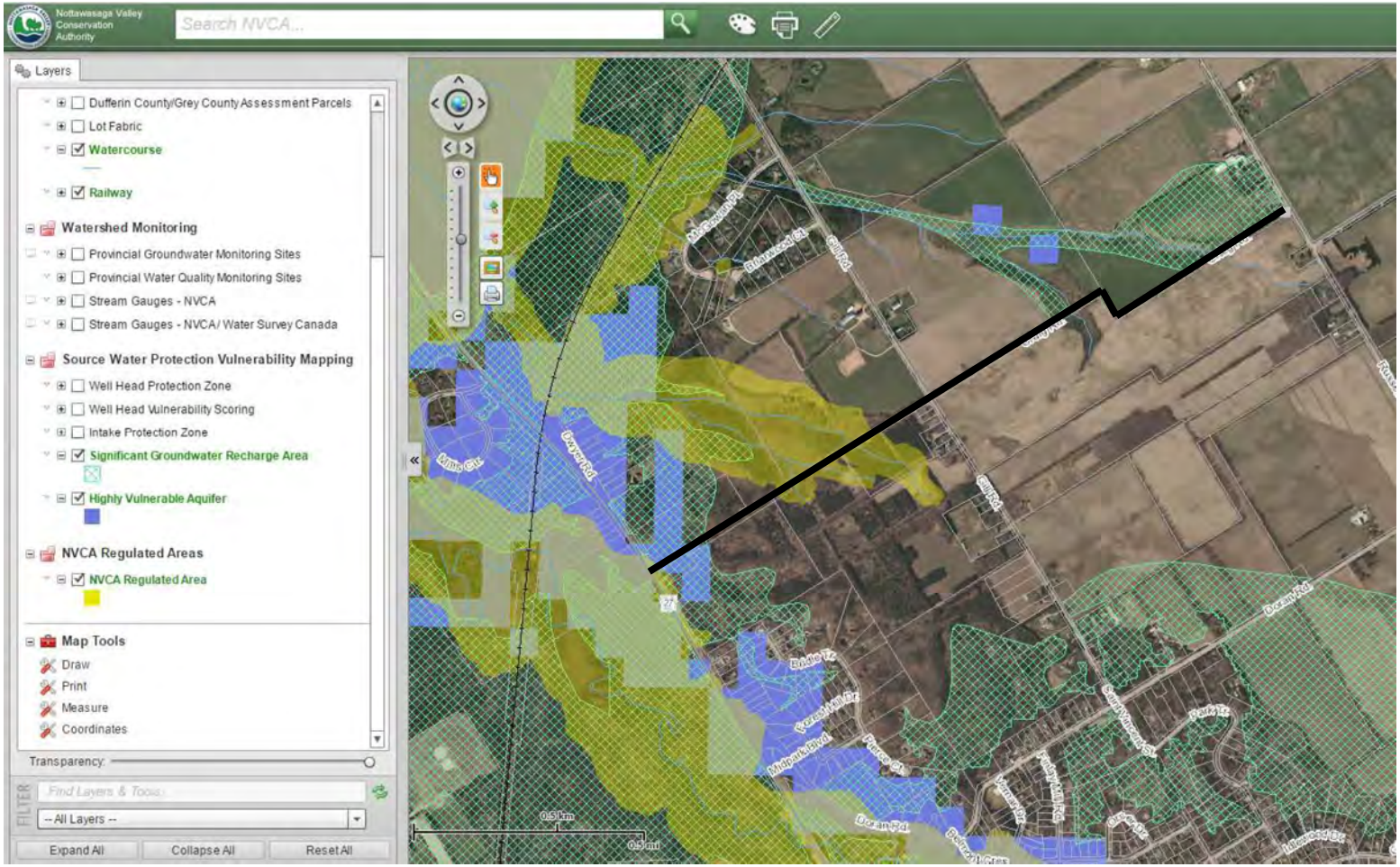
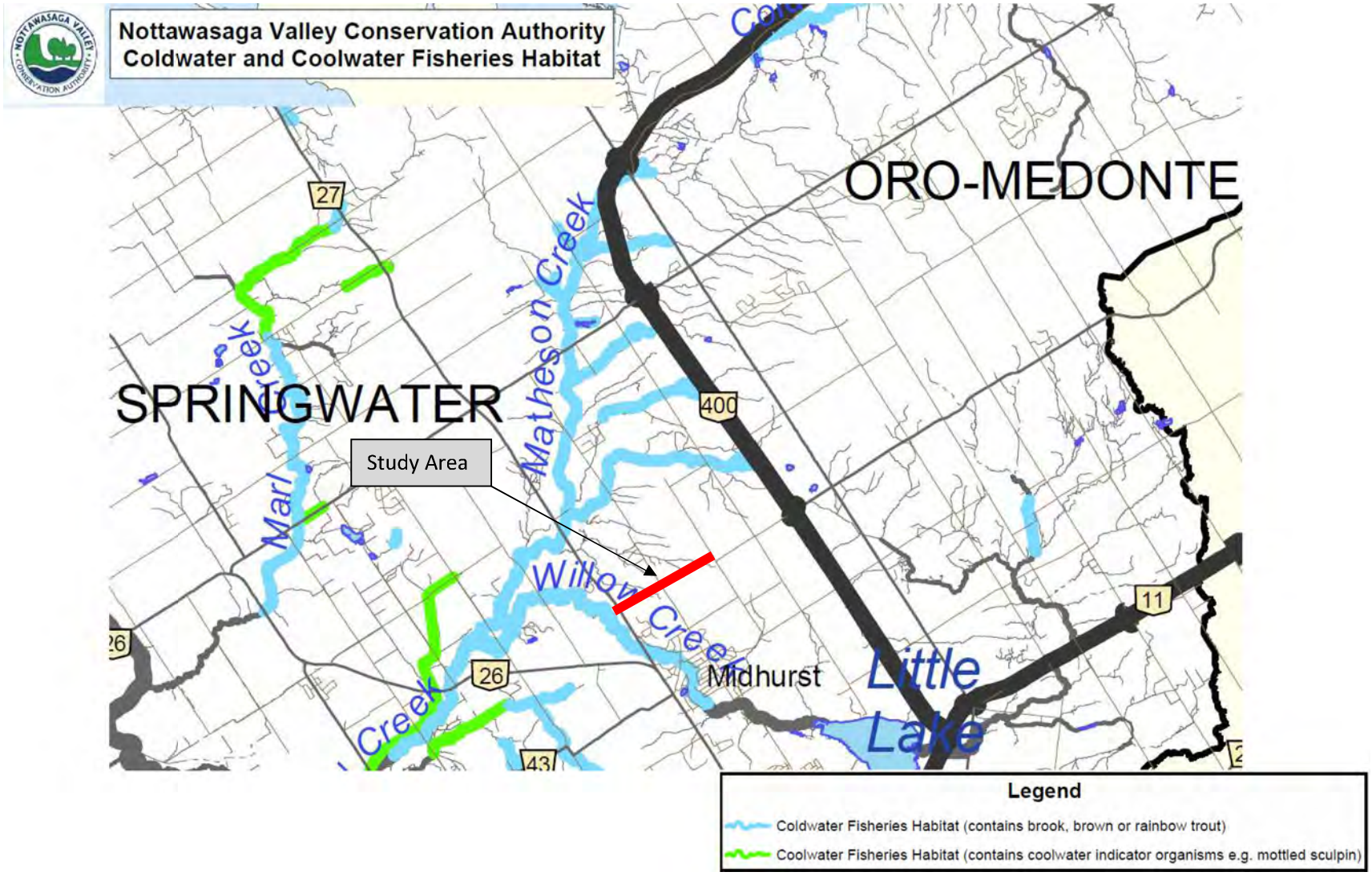


Figure 4. NVCA Fisheries Habitat. Study area as shown within the Matheson Creek watershed.



Photographs

Photograph 1. Crossing #1 (Figure 2) looking south from the treed limit of Craig Road.

Photograph 2. Crossing #1 (Figure 2) looking south from Craig Road.

Photograph 3. Crossing #1 (Figure 2) CSP culvert inlet south side Craig Road.

Photograph 4. Crossing #1 (Figure 2) CSP outlet south side Craig Road (perched).

Photographs

Photograph 5. Soy field on the south side of Craig Road.

Photograph 6. Clover field on the north side of Craig Road before the road bend.

Photograph 7. Vegetated corridor at Crossing #2 (Figure 2) on the south side of Craig Road looking south.

Photograph 8. Culvert inlet at Crossing #2 (Figure 2) with inlet weir on the south side of Craig Road.

Photographs

Photograph 9. North side of Crossing #2 (Figure 2) looking north from Craig Road.

Photograph 10. Perched CSP culvert at Crossing #2 (Figure 2) on the north side of Craig Road.

Photograph 11. Soy bean field on the south side of Craig Road, and treed row on the north side just west of the intersection with Gill Road.

Photograph 12. Access road from Gill Road looking west.

Photographs

Photograph 13. Densely treed corridor west of Gill Road.

Photograph 14. Ephemeral drainage north westerly through the treed corridor (Figure 2). Not fish habitat.

Photograph 15.Unassumed road allowance between Gill Road and County Road 27 looking west.

Photograph 16. Numerous older Maples in the road allowance west of Gill Road.

Photographs

Photograph 17. Densely treed corridor between Gill Road and CR27.

Photograph 18. Densely treed corridor between Gill Road and CR27.

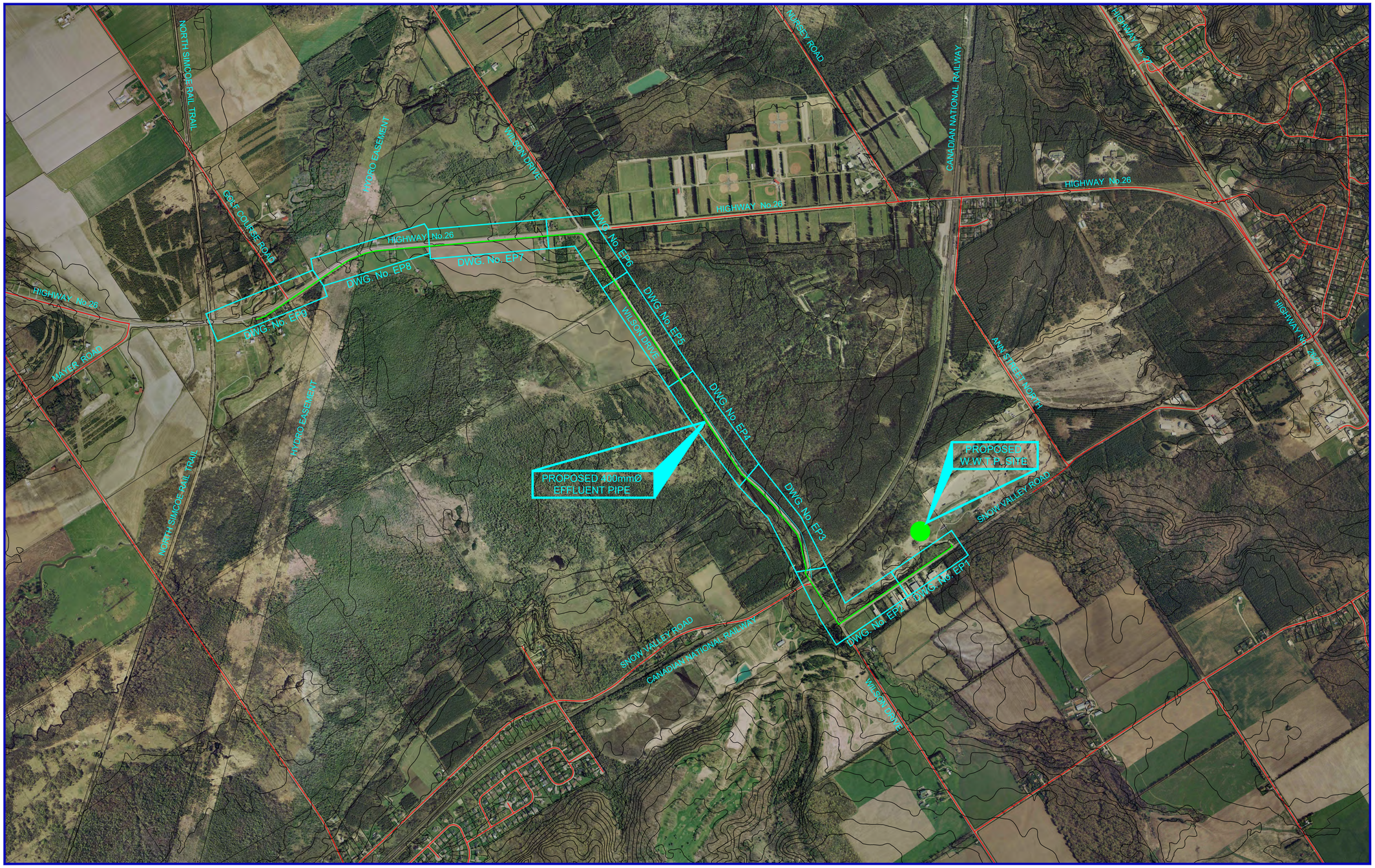
APPENDIX 'U'

Drawings

TOWNSHIP OF SPRINGWATER
MIDHURST SECONDARY PLAN SERVICING
PROPOSED EFFLUENT PIPE ALIGNMENT

Township of Springwater

Ainley GROUP — CONSULTING ENGINEERS PLANNERS



N

OVERALL PLAN
(W.W.T.P. TO WILLOW CREEK)

100m 250m 750m
0 500m
SCALE: 1:10000

AINLEYGROUP FILE No. 113027
DEC. 2015

DWG. 113027-OP1

PLOT 1=1

TOWNSHIP OF SPRINGWATER

MIDHURST SECONDARY PLAN SERVICING

PROPOSED EFFLUENT PIPE ALIGNMENT

Township of Springwater

Ainley GROUP — CONSULTING ENGINEERS PLANNERS

SNOW VALLEY ROAD - STA. 0+360 TO STA. 0+700

SCALE: 1:500

AINLEYGROUP FILE No. 113027

DEC. 2015

DWG. 113027-EP1

PLOT 1=1

TOWNSHIP OF SPRINGWATER

MIDHURST SECONDARY PLAN SERVICING

PROPOSED EFFLUENT PIPE ALIGNMENT

Township of Springwater

Ainley GROUP — CONSULTING ENGINEERS PLANNERS

WILSON DRIVE (COUNTY RD. NO.53) - STA. 2+080 TO STA. 2+403 (SNOW VALLEY ROAD)

SNOW VALLEY ROAD - WILSON DRIVE (COUNTY No.53) TO STA. 0+360

SCALE: 1:500

AINLEYGROUP FILE No. 113027
DEC. 2015

DWG. 113027-EP2

PLOT 1=1

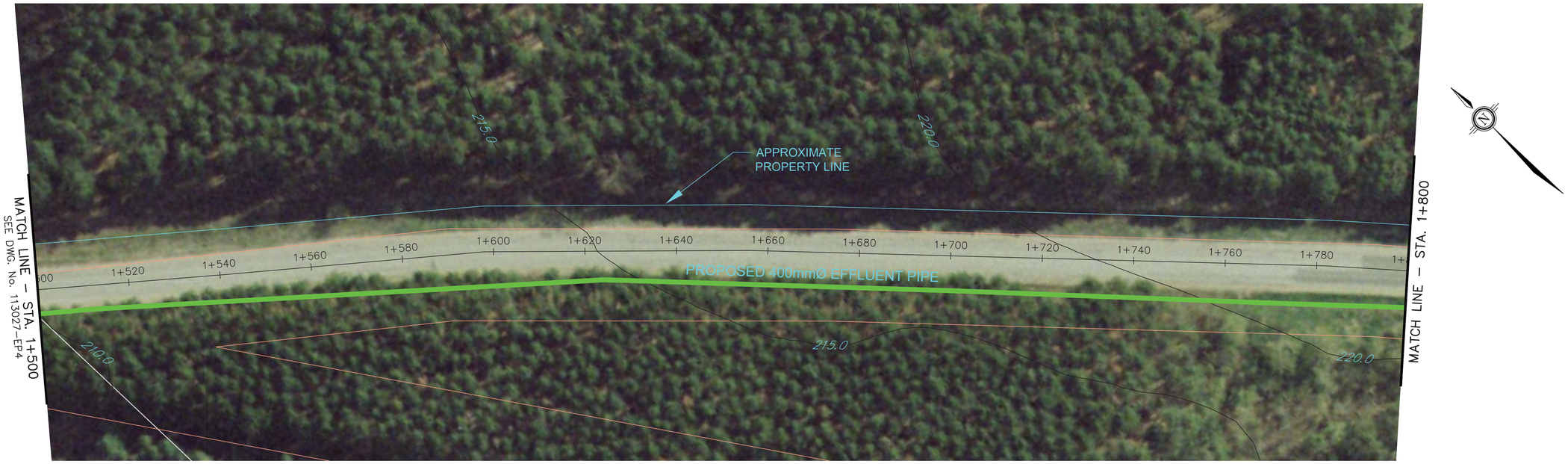
TOWNSHIP OF SPRINGWATER

MIDHURST SECONDARY PLAN SERVICING

PROPOSED EFFLUENT PIPE ALIGNMENT

Township of Springwater

Ainley GROUP — CONSULTING ENGINEERS PLANNERS



WILSON DRIVE (COUNTY RD. NO.53) - STA. 1+500 TO STA. 1+800

WILSON DRIVE (COUNTY RD. NO.53) - STA. 1+800 TO STA. 2+080

5.0m 10m 30m
0 20m 40m
SCALE: 1:500

AINLEYGROUP FILE No. 113027
DEC. 2015

DWG. 113027-EP3

PLOT 1=1

TOWNSHIP OF SPRINGWATER

MIDHURST SECONDARY PLAN SERVICING

PROPOSED EFFLUENT PIPE ALIGNMENT

Township of Springwater

Ainley GROUP CONSULTING ENGINEERS PLANNERS

WILSON DRIVE (COUNTY RD. NO.53) - STA. 0+900 TO STA. 1+200

WILSON DRIVE (COUNTY RD. No.53) - STA. 1+200 TO STA.1+500

5.0m 10m 30m
0 20m 40m
SCALE: 1:500

AINLEYGROUP FILE No. 113027
DEC. 2015

DWG. 113027-EP4

PLOT 1=1

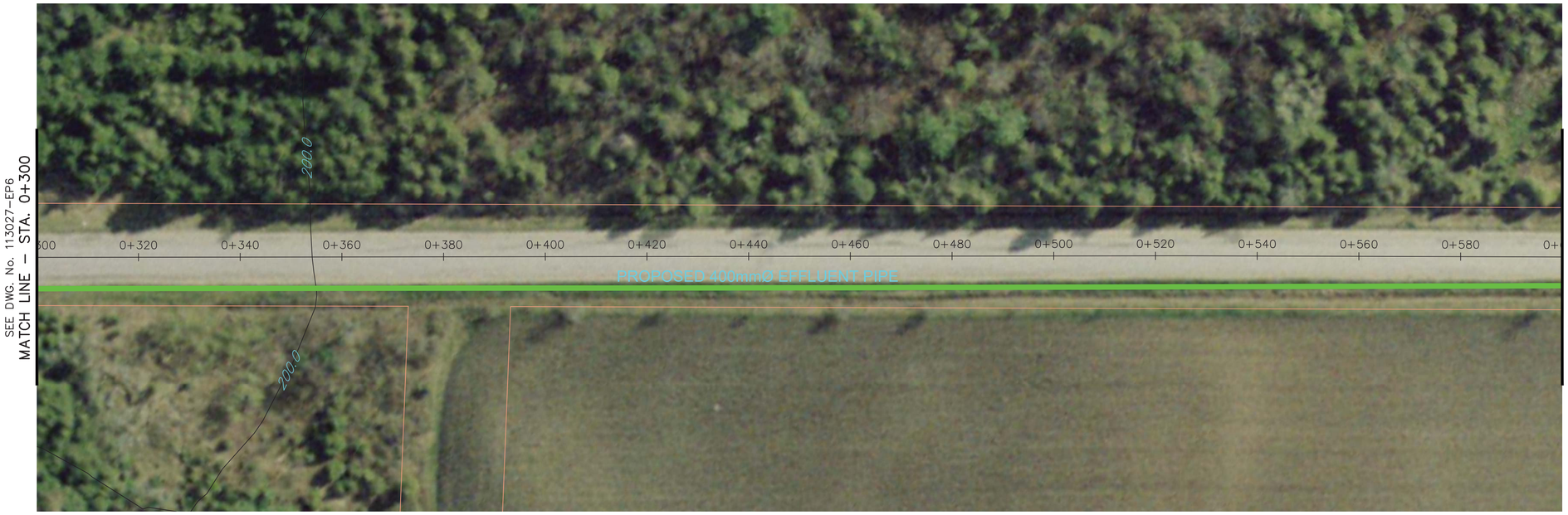
TOWNSHIP OF SPRINGWATER

MIDHURST SECONDARY PLAN SERVICING

PROPOSED EFFLUENT PIPE ALIGNMENT

Township of Springwater

Ainley GROUP — CONSULTING ENGINEERS PLANNERS



WILSON DRIVE (COUNTY RD. NO.53) - STA. 0+300 TO STA. 0+600

WILSON DRIVE (COUNTY RD. No.53) - STA.0+600 TO STA. 0+900

5.0m 10m 30m
0 20m 40m
SCALE: 1:500

AINLEYGROUP FILE No. 113027
DEC. 2015

DWG. 113027-EP5

PLOT 1=1

TOWNSHIP OF SPRINGWATER

MIDHURST SECONDARY PLAN SERVICING

PROPOSED EFFLUENT PIPE ALIGNMENT

Township of Springwater

Ainley GROUP — CONSULTING ENGINEERS PLANNERS

HIGHWAY NO.26 - STA. 1+800 TO STA. 1+975 (WILSON DRIVE)

WILSON DRIVE (COUNTY RD. No.53) - STA. 0+000 (HIGHWAY No.26) TO STA. 0+300

SCALE: 1:500

AINLEYGROUP FILE No. 113027
DEC. 2015

DWG. 113027-EP6

PLOT 1=1

TOWNSHIP OF SPRINGWATER

MIDHURST SECONDARY PLAN SERVICING

PROPOSED EFFLUENT PIPE ALIGNMENT

HIGHWAY No.26 - STA. 1+200 TO STA. 1+500

HIGHWAY NO.26 - STA. 1+500 TO STA. 1+800

SCALE: 1:500

AINLEYGROUP FILE No. 113027
DEC. 2015

DWG. 113027-EP7

PLOT 1=1

TOWNSHIP OF SPRINGWATER

MIDHURST SECONDARY PLAN SERVICING

PROPOSED EFFLUENT PIPE ALIGNMENT

Township of Springwater

Ainley GROUP — CONSULTING ENGINEERS PLANNERS

HIGHWAY No.26 - STA. 0+600 TO STA. 0+900

HIGHWAY No.26 - STA. 0+900 TO STA. 1+200

SCALE: 1:500

AINLEYGROUP FILE No. 113027
DEC. 2015

DWG. 113027-EP8

PLOT 1=1

TOWNSHIP OF SPRINGWATER

MIDHURST SECONDARY PLAN SERVICING

PROPOSED EFFLUENT PIPE ALIGNMENT

Township of Springwater

Ainley GROUP — CONSULTING ENGINEERS PLANNERS

HIGHWAY No.26 - STA. 0+000 (RAIL TRAIL) TO STA. 0+300

HIGHWAY No.26 - STA. 0+300 TO STA. 0+600

5.0m 10m 30m
0 20m 40m
SCALE: 1:500

AINLEYGROUP FILE No. 113027
DEC. 2015

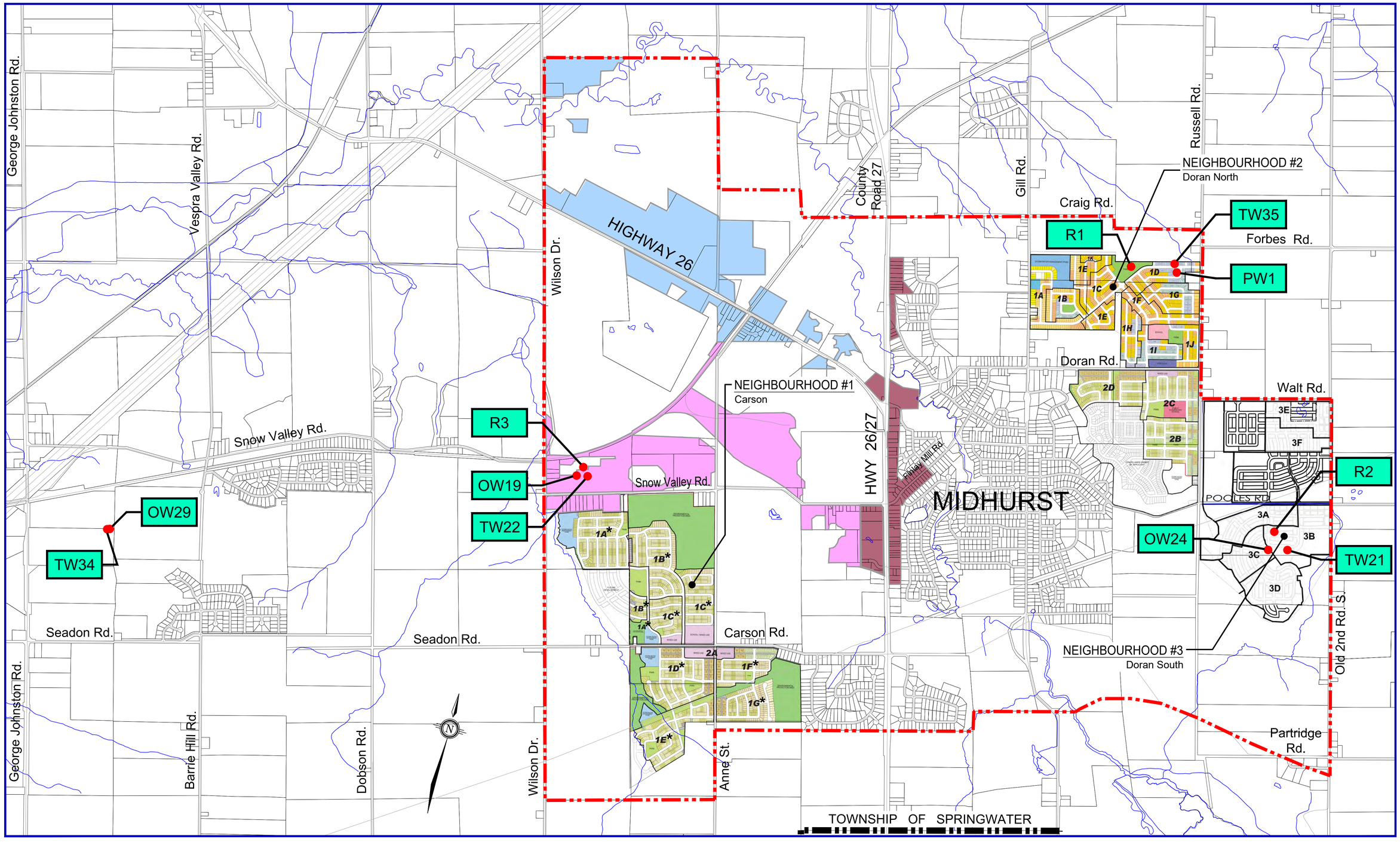
DWG. 113027-EP9

PLOT 1=1

TOWNSHIP OF SPRINGWATER

Township of Springwater

Ainley GROUP CONSULTING ENGINEERS PLANNERS



OVERALL PLAN
PROPOSED PRODUCTION WELL LOCATIONS

AINLEYGROUP FILE No. 113027
JUNE 2016

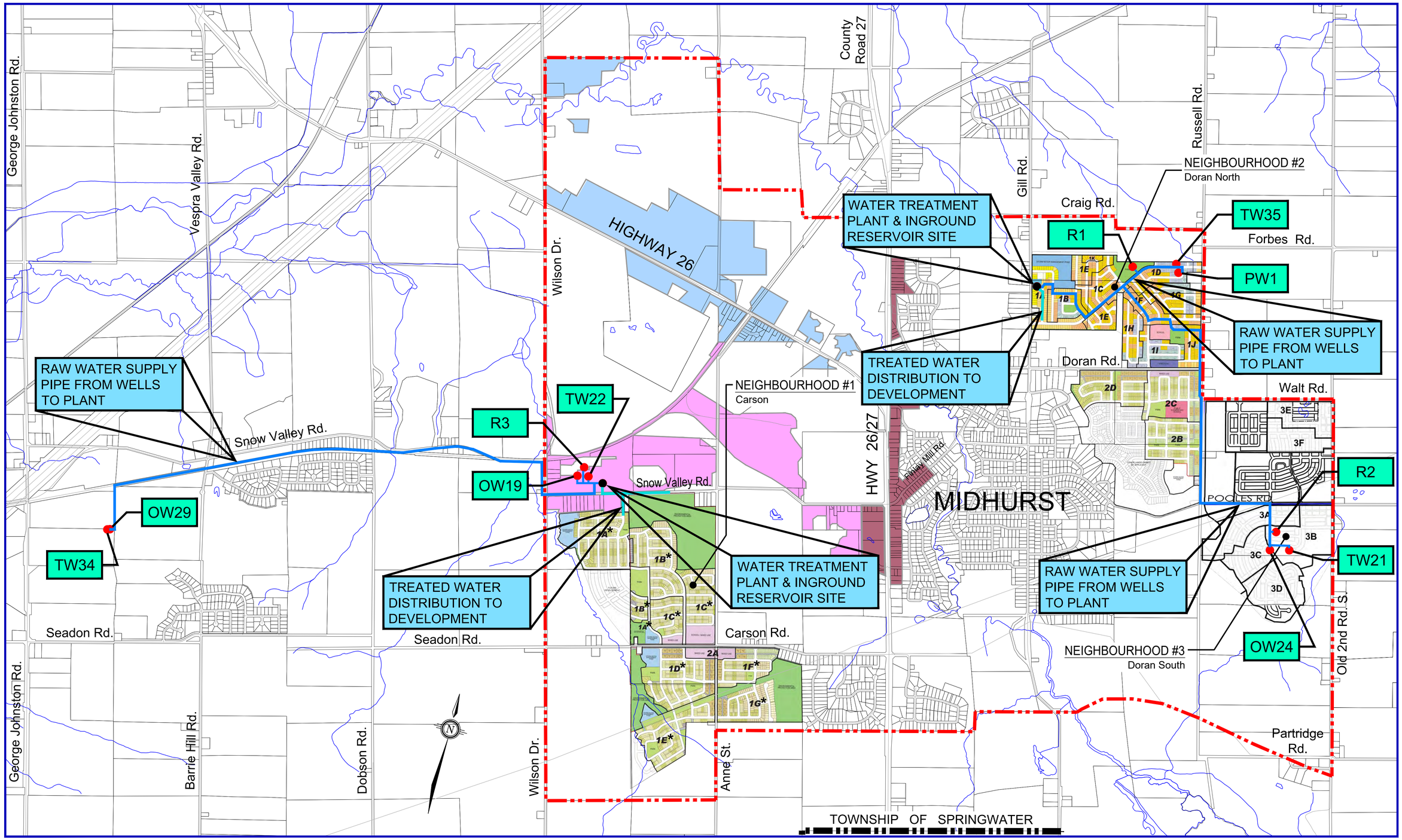
DWG. 113027-OP2

PLOT 1=1

TOWNSHIP OF SPRINGWATER

Township of Springwater

Ainley GROUP CONSULTING ENGINEERS PLANNERS



OVERALL PLAN
PROPOSED WATER SUPPLY AND DISTRIBUTION SYSTEM

SCALE: 1:15000

AINLEYGROUP FILE No. 113027
JUNE 2016

DWG. 113027-OP3

PLOT 1=1

TOWNSHIP OF SPRINGWATER

Township of Springwater

Ainley GROUP CONSULTING ENGINEERS PLANNERS

EFFLUENT DISCHARGE TO WILLOW CREEK

EFFLUENT DISCHARGE PIPE FROM PLANT TO CREEK

WASTEWATER TREATMENT PLANT SITE

SEWAGE PUMP STATION SITE ON GILL ROAD

WASTEWATER FORCEMAIN FROM STATION TO PLANT

NEIGHBOURHOOD #1
Carson

NEIGHBOURHOOD #2
Doran North

NEIGHBOURHOOD #3
Doran South

MIDHURST

TOWNSHIP OF SPRINGWATER

George Johnston Rd.

Vespra Valley Rd.

Wilson Dr.

HIGHWAY 26

County Road 27

Gill Rd.

Russell Rd.

Craig Rd.

Forbes Rd.

Doran Rd.

Walt Rd.

Snow Valley Rd.

HWY 26/27

Finlay Mill Rd.

POOLES RD.

Old 2nd Rd. S.

Seadon Rd.

Carson Rd.

Barrie Hill Rd.

Dobson Rd.

Anne St.

Partridge Rd.

1A 1B 1C 1D 1E 1F 1G 1H 1I 1J 1K

2A 2B 2C 2D

3A 3B 3C 3D 3E 3F

1A* 1B* 1C* 1D* 1E* 1F* 1G*

N

SCALE: 1:15000

OVERALL PLAN
PROPOSED WASTEWATER COLLECTION AND TREATMENT SYSTEM

AINLEYGROUP FILE No. 113027
JUNE 2016

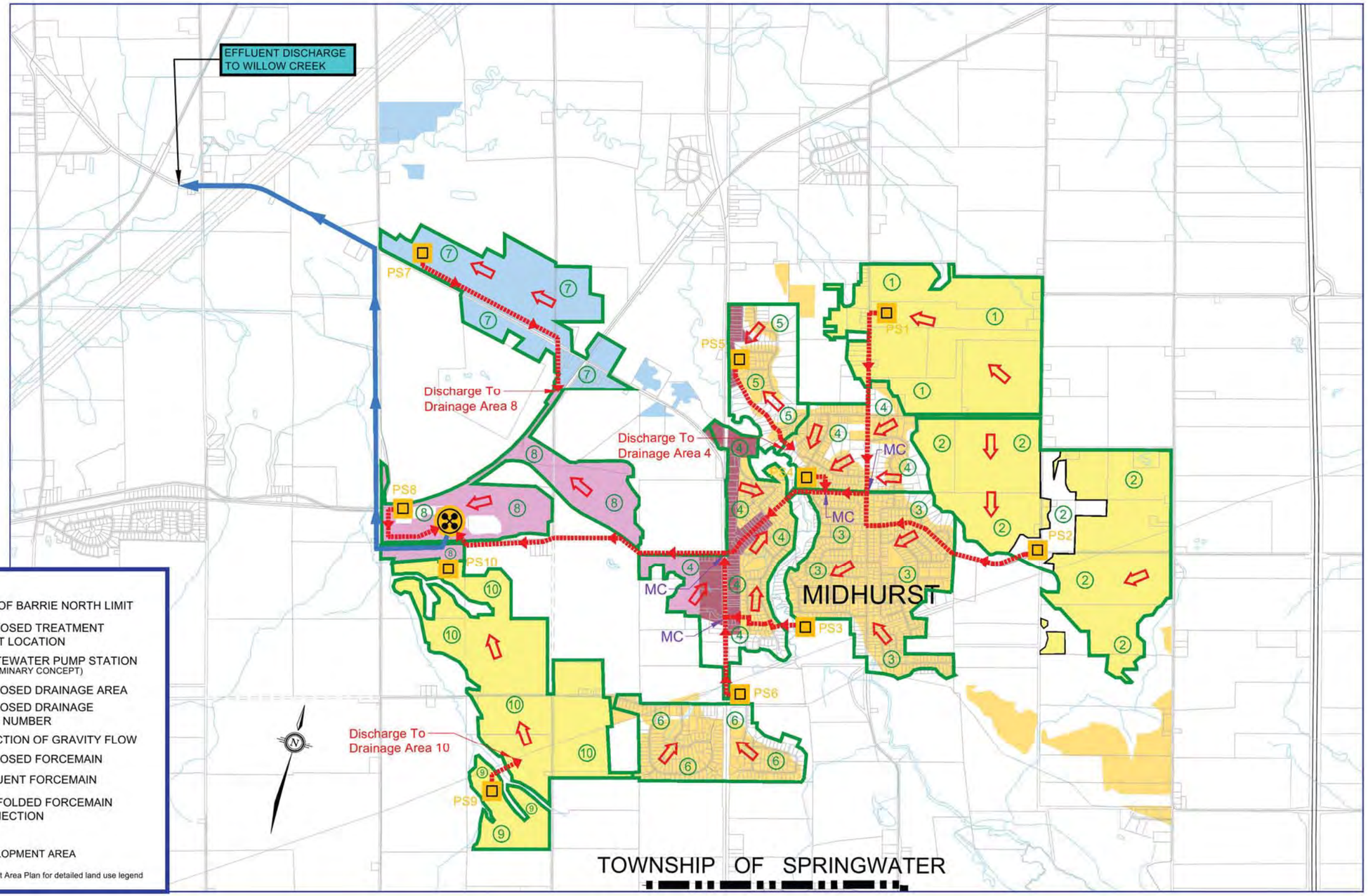
DWG. 113027-OP4

PLOT 1=1

TOWNSHIP OF SPRINGWATER

Township of Springwater

Ainley GROUP CONSULTING ENGINEERS PLANNERS



OVERALL PLAN
PREFERRED - WASTEWATER COLLECTION, TREATMENT & DISPOSAL SOLUTION

SCALE: 1: 20000

AINLEYGROUP FILE No. 113027
JUNE 2016

DWG. 113027-OP5

PLOT 1=25

TOWNSHIP OF SPRINGWATER

Township of Springwater

Ainley GROUP CONSULTING ENGINEERS PLANNERS

EFFLUENT DISCHARGE TO WILLOW CREEK

EFFLUENT DISCHARGE PIPE FROM PLANT TO CREEK

SEWAGE PUMP STATION SITE ON GILL ROAD

WASTEWATER TREATMENT PLANT SITE

WASTEWATER FORCEMAIN FROM STATION TO PLANT

NEIGHBOURHOOD #1
Carson

NEIGHBOURHOOD #2
Doran North

NEIGHBOURHOOD #3
Doran South

MIDHURST

TOWNSHIP OF SPRINGWATER

George Johnston Rd.
Vespra Valley Rd.
Wilson Dr.
County Road 27
Gill Rd.
Russell Rd.
Craig Rd.
Forbes Rd.
Doran Rd.
Walt Rd.
Snow Valley Rd.
HWY 26/27
Finlay Mill Rd.
POOLES RD.
Seadon Rd.
Barrie Hill Road
Dobson Rd.
Carson Rd.
Anne St.
Old 2nd Rd. S.
Partridge Rd.
HIGHWAY 26

PS#1 (DRAINAGE AREA 1)
PS#2 (DRAINAGE AREA 2)
PS#3 (DRAINAGE AREA 3)
PS#4 (DRAINAGE AREA 4)
PS#5 (DRAINAGE AREA 5)
PS#6 (DRAINAGE AREA 6)
PS#7 (DRAINAGE AREA 7)
PS#8 (DRAINAGE AREAS 7&8)
PS#9 (DRAINAGE AREA 9)
PS#10 (DRAINAGE AREAS 9&10)

LEGEND

- CITY OF BARRIE NORTH LIMIT
- 1A TYPICAL PHASE NUMBER
- PS#9 (DRAINAGE AREA 9) PROPOSED PUMP STATION c/w DRAINAGE AREA NUMBER
- PROPOSED MAIN FORCEMAIN
- PROPOSED FORCEMAIN

SCALE: 1:15000

OVERALL PLAN
PROPOSED WASTEWATER COLLECTION AND TREATMENT SYSTEM
(c/w DRAINAGE AREAS)

AINLEYGROUP FILE No. 113027
OCTOBER 2016

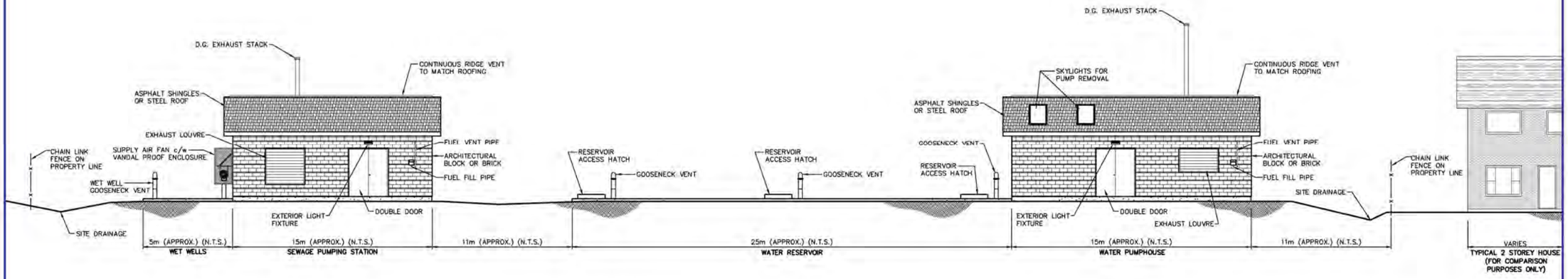
DWG. 113027-OP6

PLOT 1=1

TOWNSHIP OF SPRINGWATER
MIDHURST SECONDARY PLAN SERVICING

Township of Springwater

Ainley GROUP CONSULTING ENGINEERS PLANNERS



PRELIMINARY ELEVATION OF TYPICAL SEWAGE PUMPING STATION AND WATER PUMPHOUSE & RESERVOIR (ROAD SIDE VIEW)

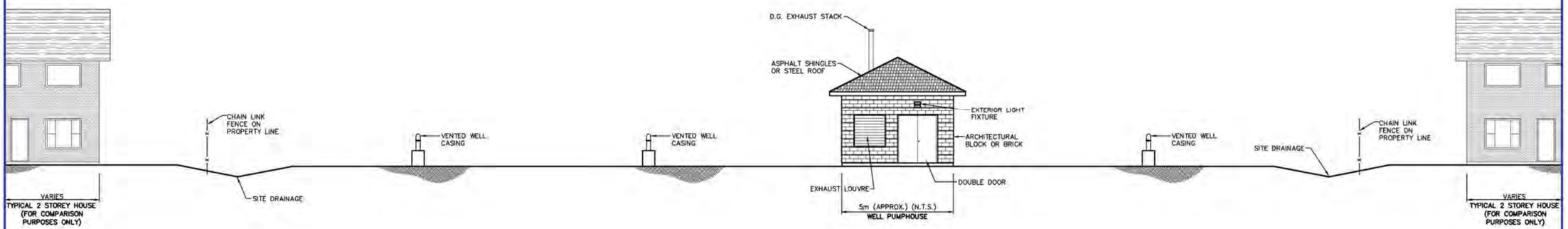
AINLEYGROUP FILE No. 113027
JUNE 2016

DWG. 113027-A1

TOWNSHIP OF SPRINGWATER
MIDHURST SECONDARY PLAN SERVICING

Township of Springwater

Ainley GROUP CONSULTING ENGINEERS PLANNERS



PRELIMINARY ELEVATION OF TYPICAL WELL PUMPHOUSE (ROAD SIDE VIEW)

AINLEYGROUP FILE No. 113027
JUNE 2016

DWG. 113027-A2

APPENDIX 'V'

Impact and Mitigation Measures Related to Water Servicing Infrastructure

EFFECT	MITIGATING MEASURES	APPLICATION WHERE/WHEN
SURFACE DRAINAGE SYSTEM		
Sedimentation and turbidity of adjacent water bodies	▪ erosion control measures ▪ buffers and setbacks ▪ sediment traps ▪ staging work ▪ bio-engineering techniques	After site grading and during construction on slopes and channels Collect sediment before entering drainage channel During biologically critical periods
Ponding effects on adjacent properties due to natural drainage disruption	▪ appropriate use of culverts, porous backfill and tile drains ▪ apply natural channel design principles	In new construction projects and expansion
Streambank erosion from diversion, construction or channelization of watercourse	▪ erosion control measures ▪ bio-engineering techniques	River crossings, drainage outlets
Contamination of surface waters through runoff, spills, leaks and disinfection activities	▪ provision for spill control ▪ fast accurate reporting of spill ▪ spill containment ▪ stockpile materials or devices for spill control ▪ avoid adverse soil conditions ▪ monitor facility for leaks ▪ implement disinfection techniques in concert with fisheries requirements ▪ pollution prevention and source control by best management land use practices and best management stormwater practices. ▪ buffers and setbacks ▪ install check dams on drainage swales	As a general practice and particularly in vicinity of water bodies, wetlands
Changes in volume of surface runoff	▪ use design measures to minimize increase in surface runoff	New impervious surfaces
GROUNDWATER		
Interference of shallow aquifers and springs	▪ hydrogeologic investigation to identify such areas in advance develop alternatives to avoid impacts	Excavations
Reduce groundwater quantity through construction dewatering	▪ locate construction activities away from groundwater users and water bearing formations (soils) where possible. ▪ proper dewatering techniques ▪ seasonal constraints on construction	Depletion or lowering of shallow aquifers and springs by groundwater utilization
Spills or leaks resulting in contamination of groundwater supply	▪ construction refuelling precautions ▪ land filling precautions	Near watercourses and on site generally. Areas of high infiltration capability

EFFECT	MITIGATING MEASURES	APPLICATION WHERE/WHEN
	▪ operation and storage precautions	
Reduced surface water recharge to groundwater particularly in soils	▪ restrict extent of impervious surfaces in zones of high	Subsurface barriers, e.g., foundations, areas of impervious
Interference with groundwater movement	▪ maintenance of the existing groundwater regime through engineering design	Excavations, drainage, construction, dewatering, e.g. in roadbeds, foundations and trenches
Contaminations of adjacent wells through runoff from construction	▪ erosion and sediment control ▪ locate projects appropriately ▪ setbacks	Construction adjacent to well sites and exposed aquifers
FISH, AQUATIC WILDLIFE AND VEGETATION		
Introduction of warmer water from ponds into colder surface watercourse	▪ appropriate selection of ponding site ▪ pond design ▪ infiltrate into groundwater system ▪ planting to provide shade	Dewatering of trench and excavations. Sediment traps. Extend detention ponds.
Reduced water quality of nearby surface water having value as wildlife habitat	▪ provisions for spill control ▪ fast and accurate reporting of spill ▪ spill containment ▪ stockpile materials or devices for spill control ▪ avoid adverse soil conditions ▪ minimize tree removal ▪ buffers and setbacks	Storm sewers, ditches, diversions and by-passing
Timing effects of construction on spawning, nesting and breeding periods	▪ staging of work to avoid spawning and breeding periods ▪ seasonal constraints for cold and warmwater systems	For stream crossings and diversions
Lowering of water table resulting in reduced contribution to streams and stress of riparian vegetation	▪ design to maintain existing groundwater flows ▪ restrict extent of impervious surfaces in zones of high infiltration	Dewatering of trenches, excavations and aquifers. Areas of newly created impervious surfaces.
Increased nutrient loading of existing habitats	▪ buffers and setbacks ▪ provisions for spill control ▪ land filling precautions	Near watercourses and on site generally.
Siltation to surface watercourses resulting in "smothered" plants and animals due to the deposition of silt and increased turbidity of surface watercourses	▪ utilize suitable backfill material ▪ trench drainage should be discharged to settling areas before being permitted to enter surface waterbodies ▪ erosion control measures ▪ staging of work	Road bed and ditch construction. Storm sewer outfalls. Erodible soils, stockpiles.
Stress on biological communities	▪ consider the carrying capacity of	Municipal infrastructure is

EFFECT	MITIGATING MEASURES	APPLICATION WHERE/WHEN
	the local natural environment ▪ avoid sensitive periods such a breeding seasons	necessary to service projected municipal / population growth. This increases stress on recreational and natural resources.
TERRESTRIAL VEGETATION AND WILDLIFE		
Changes in vegetative composition as a result of loss of topsoil and subsoil or mixing	▪ restore site by replacing soils in preconstruction horizons	Trenching or excavating
Removal or disturbance of significant trees and/or ground flora	▪ review status of species ▪ avoid these areas ▪ employ tree protection measures	During site grading and construction phase of any project
New or increased exposure of forest edge with resultant effects of windthrow, leading to loss of habitat for wildlife	▪ avoid woodlots and similar areas ▪ pre-stress woodlots ▪ restore edges	During site grading and construction phase of any project
Mortality / stress due to changes in soil moisture conditions, resulting in loss of wildlife habitat	▪ minimum fragmentation of forest habitat ▪ avoid poorly drained areas ▪ use of appropriate roadbed and backfill materials ▪ revegetation using indigenous species able to survive new conditions	During construction of roadbed and storm sewers
HERITAGE RESOURCES		
Threatened viability of, or opportunity for, retention of sites having heritage value	▪ avoid these areas ▪ record or salvage information on features to be lost	Where appropriate with respect to significance of the heritage recourse
Unavoidable alteration to or destruction of heritage structures or archaeological sites	▪ record or salvage information on features to be lost	Where appropriate with respect to significance of the heritage resource
Disruption of quiet enjoyment	▪ staging of construction to cause least disruption ▪ employ noise and dust control measures	As general practice.
RESIDENTIAL, INSTITUTIONAL, COMMERCIAL AND INDUSTRIAL		
Disruption of pedestrian movements between adjacent uses	▪ maintain continuity of pedestrian walkway system as much as possible ▪ provide walkway strips to adjacent residential areas	As general practice. Where suitable.
Disruption of tourism facilities	▪ stage construction ▪ employ noise and dust control measures ▪ provide crosswalks and sidewalks at access points	As general practice. Where suitable.

EFFECT	MITIGATING MEASURES	APPLICATION WHERE/WHEN
Facilities inconsistent with or which disrupt character of area	▪ preserve existing amenities as much as possible ▪ design and site structures to blend with adjacent building forms and materials ▪ site grading; utilize berms or other screening devices	As general practice. Where suitable.
Temporary disruption during construction and/or inconvenience to users of adjacent properties and building	▪ notify public agencies and adjacent owners of construction scheduling ▪ prepare emergency program to ensure quick resolution of servicing problems ▪ consult with public agency and/or adjacent landowners regarding temporary access routes ▪ schedule construction so as to minimize period of disruption in proximity of adjacent uses and structures ▪ ensure access for emergency response vehicles / personnel ▪ apply noise and vibration control measures (use quieter equipment, maintain equipment properly)	Where substantial inconvenience or disruption to adjacent uses would be experienced and where measures would substantially reduce effects. As general practice.
OUTDOOR RECREATION		
Temporary disruption of open space activities during construction	▪ employ noise and dust control measures ▪ staging of construction to cause least disruption	In areas within or adjacent to public open space.
SOILS GEOLOGY		
Erosion by wind, water and ice	▪ restoration planting ▪ stage work ▪ avoid highly erodible soils ▪ stabilize slopes ▪ compaction ▪ chemical stabilizers ▪ gravel blankets ▪ seeding ▪ sodding ▪ toe drainage	Erodible soils in excavations, cut and fill areas. Stockpiles, cut slopes.
Slumping of encroached slopes	▪ avoid potentially unstable slopes ▪ mechanical stabilization methods ▪ revegetation (only effective once the root infrastructure has developed) ▪ restrict dewatering near slopes ▪ engineering design to control potential slumping	Steep slopes. Cut slopes. Removal of the toe of a slope during construction. Dewatering.

EFFECT	MITIGATING MEASURES	APPLICATION WHERE/WHEN
Loss of aggregate and mineral resources	▪ avoid sites of aggregate and mineral reserves ▪ extract aggregate and minerals prior to construction	Zones of economic aggregate and mineral occurrence.
Contamination of soils by petrochemicals, etc.	▪ remedial measures to avoid spills and leaks ▪ contingency plan for clean-up	During construction.
Mixing of topsoil with subsoil	▪ stripping and stockpiling of topsoil separate from subsoil	Generally in areas of undisturbed soils.
TOPOGRAPHY / LANDFORMS		
"Scarring" of significant landscape features	▪ avoid significant features	Designation of significant feature, i.e. landmark.
CLIMATIC FEATURES		
Drought, increased flooding, changes in water levels, increases in surface water runoff due to extreme weather events and climate change	Consider the following: ▪ Design associated drainage and storm ponds to manage extreme weather events ▪ Use of pervious pavement or reduce impervious pavement and other low impact development methodologies to manage or reduce storm water runoff and on-site flow control ▪ Increase elevations of structures over waterways ▪ Increased capacity of sewer and treatment systems to accommodate additional flows ▪ Monitoring and adaptive management to manage flow rates ▪ Artificial destratification to manage evaporation ▪ Stormwater runoff to roadside ditches and/or grassed swales ▪ Back-up features and infrastructure for upset conditions and emergency response procedures (e.g. standby power for water and waste water facilities) ▪ Water conservation and efficiency through leakage/loss detection and prevention in distribution system	Construction in close proximity to buildings or activity areas
Cracked concrete during freeze thaw cycles; deterioration of roadway/structures sooner than anticipated	Consider using materials resilient to freeze-thaw effect and salting, and survive higher temperatures	Design and construction

EFFECT	MITIGATING MEASURES	APPLICATION WHERE/WHEN
PUBLIC HEALTH		
Exhaust emissions from construction equipment and vehicles	▪ Minimize operation on site, control location on site	Where adjacent uses or natural vegetation could be adversely affected
Effects on groundwater elevation of existing subsurface sewage disposal systems (e.g. septic systems)	▪ Monitor groundwater levels and, if necessary, take appropriate action	Where appropriate
Groundwater contamination	▪ construction refuelling precautions ▪ fill design and operation precautions ▪ precautions in operation and storage facilities ▪ containment of leachate maintenance facilities	On site generally.
OPERATIONAL AND CONSTRUCTION NOISE		
Proximity to noise sensitive land uses (e.g. hospitals); insufficient setbacks; road grades (steep hills); high traffic volumes; poor road surface; stopping / starting of truck traffic; operation of construction equipment	▪ relocate major roads away from sensitive land uses, divert traffic ▪ reduce grades of hills ▪ use appropriate asphalt surface to reduce tire noise ▪ institute truck prohibitions ▪ construct noise barriers ▪ modify speed limits ▪ Proper maintenance of equipment	As general practice. Construction in urban areas.

APPENDIX 'W'

Notice of Commencement, May 2013 Open House Comments and Responses

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE
NOTICE OF STUDY COMMENCEMENT

The Township of Springwater is continuing with Phase 3 & 4 of the Class Environmental Assessment (EA) Planning Process to determine the 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 aforementioned Master Plan, which is available on the Township's website at www.springwater.ca/msp, concluded that the following infrastructure projects will be required and that the Class EA planning process should be continued to complete Phases 3 and 4 as outlined by the Municipal Class EA Document, October 2000, as amended in 2007 & 2011:

- Construct new water system to service growth within the Midhurst Secondary Plan area including new wells, treatment facility, high lift pump or booster stations, water storage reservoirs and distribution system including transmission mains.
- Construct new sewage system to service growth within the Midhurst Secondary Plan area with the provision for expansion to service the currently developed area in Midhurst, including sanitary collection system, pump stations, treatment plant and outfall to a receiving water body.
- New construction on Craig Road (2 lanes) from Russell Rd. to County Rd. 27
- New construction of Wilson Drive (4 lanes) from Snow Valley Rd. to the City of Barrie limit
- New interchange at Pooles Road and Highway 400

This 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), published by the Municipal Engineer's Association.

The Township has retained Ainley Group to complete and document Phases 3 and 4 of the Class EA planning process and this Notice initiates the beginning of the Study. The Township recognizes that public consultation will be a key component of this Study and therefore, an extensive public consultation process will be arranged including the formation of a Resident Liaison Group, two Open Houses, a Public Information Centre and multiple Newspaper advertisements throughout the completion of the Class EA Study.

In conjunction with the initiation of this Class EA, the first Open House will be from **6:30 pm to 9:00 pm on Wednesday, May 29, 2013 at the Township Administration Centre** and will refresh interested parties of the findings from the approved Phase 1 & 2 Master Plan, dated July 2009.

This Open House will be an informal drop in format during which time the applicable Display Boards from the Phase 1 & 2 Master Plan will be available along with representatives of the Project Team to answer individual question in one-on-one format, relating to the approved Master Plan.

If you would like to be placed on the mailing list to receive all future notices relating to this Class EA please send your contact information to either of the Contacts listed below.

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
Email: brad.sokach@springwater.ca

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, Ontario
L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

This notice issued April 25, 2013.

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

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

April 24, 2013 File No. 113027

This letter sent to the attached Contact List.

Ref: **Township of Springwater**
Class Environmental Assessment Phases 3 and 4
Midhurst Water, Wastewater and Transportation

Dear Sir or Madam:

The Township of Springwater is continuing with the Class Environmental Assessment Planning Process to determine the 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." Phases 3 and 4 of the Class Environmental Assessment planning process will be followed and as such, please find attached the "Notice of Study Commencement" associated with this project.

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

Sincerely,

AINLEY & ASSOCIATES LIMITED

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

S:\113027\Communication Plan\113027 - Notice of Commencement Cover Ltr (Apr 25 2013).docx

cc. B. Sokach - Township of Springwater

Title	First Name	Last Name	Title1	Agency	Department	Address 1	Address 2	City, Prov.	Postal Code
Ms.	Cindy	Hood	District Manager	Ministry of Environment	Barrie District Office	54 Cedar Pointe Drive	Unit 1201	Barrie, ON	L4N 5R7
Ms.	Chunmei	Liu	Environmental Resource Planner & EA Coordinator	Ministry of Environment, Central Region	Technical Support Section	5775 Yonge Street	9th Floor	Toronto, ON	M2M 4J1
Mr.	Dan	Orr	Manager (Acting) - Technical Support Section	Ministry of Environment, Central Region	Technical Support Section	5775 Yonge Street	9th Floor	Toronto, ON	M2M 4J1
Mr.	Lou	Politano	Regional Director	Ministry of Transportation	Central Region	1201 Wilson Avenue		Downsview, ON	M3M 1J8
Mr.	Peter	Dorton	Project Manager	Ministry of Transportation	Corridor Management Section	1201 Wilson Avenue,Bldg'D'	7th Floor	Downsview, ON	M3M 1J8
Mr.	Graham	Findlay	Area Biologist	Ministry of Natural Resources	District Office	2284 Nursery Road		Midhurst, ON	L0L 1X0
Ms.	Kathy	Woeller	District Planner	Ministry of Natural Resources		2284 Nursery Road		Midhurst, ON	L0L 1X0
Mr.	Brian	Cardy	Director	Ministry of Agriculture Food & Rural Aff.	Economic Dev. Div. Rural Community Dev. Br.	1 Stone Rd. W.	4th Floor	Guelph ON	N1G 4Y2
Mr.	Ray	Valaitis	Rural Planner	Ministry of Agriculture Food & Rural Aff.		R.R.#3, 95 Dundas St.		Brighton, ON	K0K 1H0
Mr.	Tim	Haldenby	Manager, Planning Projects	Ministry of Municipal Affairs & Housing	Municipal Services Office - Central Ontario	777 Bay Street	2nd Floor	Toronto, ON	M5G 2E5
Mr.	Darryl	Lyons	Senior Planner (Acting)	Ministry of Municipal Affairs & Housing	Central Region Office	777 Bay Street		Toronto, ON	M5G 2E5
				Ministry of Tourism & Recreation	Simcoe Regional Office	2284 Nursery Road		Midhurst, ON	L0L 1X0
				Ministry of Econ. Dev. And Trade		2284 Nursery Road		Midhurst, ON	L0L 1X0
Mr.	Greg	Stewart	Regional Advisor	Ministry of Culture	Midhurst District Office	2284 Nursery Road		Midhurst, ON	L0L 1X0
Mr.	Alejandro	Cifuentes	Heritage Planner	Ministry of Culture	Programs & Services Branch - Culture Services	400 University Ave.	4th Floor	Toronto, ON	M7A 2R9
				Simcoe County Paramedic Services	Administration Centre	1110 Highway #26		Midhurst, ON	L0L 1X0
Mr.	Wayne	Wilson	CAO	Nottawasaga Valley Conservation Authority		8195 Concession 8		Utopia, ON	L0M 1T0
Mr.	Glenn	Switzer	Director of Engineering and Technical Services	Nottawasaga Valley Conservation Authority		8195 Concession 8		Utopia, ON	L0M 1T0
Const.	Mark	Kinney	Community Policing Officer	Ontario Provincial Police	Huronia District	1000 River Road West		Wasaga Beach ON	L9Z 2K8
Ms.	Carla	Ladd	CAO	City of Barrie		70 Collier Street		Barrie, ON	L4M 4T5
Ms.	Dawn	McAlpine	Clerk	City of Barrie		70 Collier Street		Barrie, ON	L4M 4T5
Mr.	Mark	Aitken	CAO	County of Simcoe	Administration Centre	1110 Highway #26		Midhurst, ON	L0L 1X0
Mr.	Brenda	Clark	Clerk	County of Simcoe	Administration Centre	1110 Highway #26		Midhurst, ON	L0L 1X0
Ms.	Debbie	Korolnek	General Manager of Engineering, Planning and Environmen	County of Simcoe	Administration Centre	1110 Highway #26		Midhurst, ON	L0L 1X0
Mr.	David	Parks	Director of Planning, Development and Tourism	County of Simcoe	Administration Centre	1110 Highway #26		Midhurst, ON	L0L 1X0
Mr.	Christian	Meile	Director, Transportation Maintenance	County of Simcoe	Administration Centre	1110 Highway #26		Midhurst, ON	L0L 1X0
Mr.	Jim	Hunter	Director, Transportation Construction	County of Simcoe	Administration Centre	1110 Highway #26		Midhurst, ON	L0L 1X0
Mr.	Allan	Greenwood	Manager, Corporate Communications	County of Simcoe	Administration Centre	1110 Highway #26		Midhurst, ON	L0L 1X0
Mr.	Robin	Dunn	CAO	Township of Oro-Medonte		148 Line 7 South		Oro, ON	L0L 2X0
Mr.	George	Vadeboncoeur	CAO	Town of Wasaga Beach		30 Lewis Street		Wasaga Beach, ON	L9Z 1A1
Ms.	Sue	Mackenzie	CAO	Township of Clearview		217 Gideon Street	Box 200	Stayner, ON	L0M 1S0
Mr.	Doug	Luker	CAO/Clerk	Township of Tiny		130 Balm Beach Road W.		Perkinsfield, ON	L0L 2J0
Ms.	Simone	Latham	CAO/Acting Clerk	Township of Tay		450 Park St.	Box 100	Victoria Harbour, ON	L0K 2A0
Mr.	Greg	Murphy	CAO	Township of Essa		5786 County Road 12		Utopia, ON	L0M 1T0
Mr.	Rick	Howse	Central Main, Supervisor	Simcoe County District School Board	Education Centre	1170 Highway #26		Midhurst, ON	L0L 1X0
Ms.	Jennifer	Sharpe	Senior Planner (Acting)	Simcoe Muskoka Catholic District School Board		46 Alliance Blvd.		Barrie, ON	L4M 5K3
Dr.	Charles	Gardner	Chief Medical Officer	Simcoe County District Health Unit		15 Sperling Drive		Barrie, ON	L4M 6K9
Mr.	Ted	Devine	Director	Simcoe County District Health Unit		15 Sperling Drive		Barrie, ON	L4M 6K9
Mr.	Colin	Bonnell		Bell Canada		136 Bayfield Street	Floor 12	Barrie, ON	L4M 3B1
Ms.	Gail	Best	Representative	Enbridge Gas		10 Churchill Dr.		Barrie, ON	L4N 8Z5
Mr.	Luke	Cechetto	Construction	Enbridge Gas		10 Churchill Dr.		Barrie, ON	L4N 8Z6
Ms.	Shelley	Van Sickle	Manager of Planning, Special Projects	Enbridge Gas		500 Consumers Rd.		North York ON	M2J 1P8
Mr.	James	Duarte	Planning & Design Analyst	Enbridge Gas		498 Markland Street	Unit 1	Markham ON	L6C 1Z6
Mr.	Bernie	Cyr		Rogers Cable		1 Sperling Drive		Barrie, ON	L4M 6B8
Mr.	Carsten	Schnuelle	System Planner	Rogers Cable		244 Newkirk Road		Richmond Hill ON	L4C 3S5
Ms.	Heather	McTeer		Hydro One		420 Welham Rd.		Barrie, ON	L4N 8Z2
Mr.	Wayne	White	Georgian Bay Hub	Ontario Clean Water Agency		100 Woodland Drive		Wasaga Beach ON	L9Z 2V4
Mr.	Martin	Rukavina	Advisor	Ministry of Aboriginal Affairs	Policy & Relationship Branch	160 Bloor Street East	9th Floor	Toronto, ON	M7A 2E6
Ms	Miranda	Lesperance	Environmental Officer	Ministry of Indian & Northern Affairs Canada		25 St. Clair Avenue, East	8th Floor	Toronto, ON	M4T 1M2
Mr.	Richard	Saunders	Director	Corporate Policy and Management Branch, Ontario	Native Affairs Secretariat	720 Bay Street	4th Floor	Toronto, ON	M5G 2K1
Ms.	Pam	Wheaton	Director	Ministry of Aboriginal Affairs	Aboriginal and Ministry Relationships Branch	160 Bloor St. E.	9th Floor	Toronto, ON	M7A 2E6
Mr.	Francois	Lachance	Senior Policy Advisor	Ministry of Aboriginal Affairs	Policy and Relations Branch	720 Bay Street	4th Floor	Toronto On	M5G 2K1
Ms.	Heather	Levecque	Manager, Consultation Unit	Ministry of Aboriginal Affairs	Aboriginal and Ministry Relationships Branch	160 Bloor St E.	9th Floor	Toronto On	M7A2E6

Title	First Name	Last Name	Title1	Agency	Department	Address 1	Address 2	City, Prov.	Postal Code
Ms.	Josee	Beauregard	Litigation Team Leader, Litigation Portfolio Operations East	Department of Indian & Northern Affairs Canada	Litigation Management & Resolution Branch	25 Eddy Street		Gatineau, QC	K1A 0H4
Mr.	Jonathan	Allen	Team Leader	Department of Indian & Northern Affairs Canada		1430-25 Eddy Street		Gatineau, QC	K1A 0H4
Mr.	Fred	Hosking	Senior Claims Analyst	Department of Indian & Northern Affairs Canada	Specific Claims Branch, Ontario Research Team	10 Wellington St.	Room 1310	Gatineau, QC	K1A 0H4
Mr.	Guy	Morin	Policy Analysis	Department of Indian & Northern Affairs Canada	Treaties and Aboriginal Government	10 Wellington St.	8th Floor	Gatineau, QC	K1A 0H4
Mr.	Kevin	Clement	A/Director	Department of Indian & Northern Affairs Canada	Litigation Management & Resolution Branch	10 Wellington St.		Gatineau, QC	K1A 0H4
Mr.	Marc-Andre	Millaire	Litigation Team Leader for Ontario	Department of Indian & Northern Affairs Canada	Litigation Man & Resolution Branch	10 Wellington St.		Gatineau, QC	K1A 0H4
Mr.	Guy	Morin	Policy Analysis	Department of Indian & Northern Affairs Canada	Treaties and Aboriginal Government	10 Wellington St.	8th Floor	Gatineau, QC	K1A 0H4
Ms.	Janet	Townshend	A/Claims Analyst Ontario Team	Department of Indian & Northern Affairs Canada	Special Claims, Ontario	10 Wellington St.	Rm 1310	Gatineau, QC	K1A 0H4
Mr.	Sean	Darcy	Manager, Assessment and Research	Department of Indian & Northern Affairs Canada		10 Wellington St.		Gatineau, QC	K1A 0H4
Mr.	Glenn	Gilbert	Manager Environmental Unit	Department of Indian & Northern Affairs Canada	Land and Trust Services	25 St. Clair Avenue, East	8th Floor	Toronto On	M4T 1M2
Mr.	Daniel	Johnson	Environmental Officer	Department of Indian & Northern Affairs Canada	Ontario Region	25 St. Clair Avenue, East	8th Floor	Toronto On	M4T 1M2
Mr.	Jeffery	Betker	Senior Policy Analyst	Office of the Federal Interlocutor for Metis and non-status Indians		66 Slater Street	1225	Ottawa, ON	K1A 0H4
Mr.	Richard	Saunders	Director	Native Affairs Secretariat	Corporate Policy and Management Branch, ON	720 Bay Street	4th Floor	Toronto On	M5G 2K1
Chief	James R.	Marsden		Alderville First Nations		11696 Second Line	Box 46	Roseneath ON	K0K 2X0
Chief	Roly	Monague Jr.		Beausoleil First Nations		1-O-Gema Street		Christian Island On	L0K 1C0
				Chiefs of Ontario	Administrative Office	111 Peter Street	Suite 804	Toronto On	M5V 2H1
Chief	Donna	Big Canoe		Chippewas of Georgina Island		RR#2	Box 12	Sutton W On	L0E 1R0
Chief	Keith	Knott		Curve Lake First Nation	dutytoconsult@curvelakefn.ca				
Mr.	Allan	Vallee	President	Georgian Bay Metis Council		355 Cranson Crescent	Box 4	Midland ON	L4R 4K6
Chief	Laurie	Carr		Hiawatha First Nations	lcarr@hiawathafn.ca	123 Paudash Street	RR#2	Keene On	K0L 2G0
Mr.	James W.	Wagar	Consultation Assesment Coordinator	Metis Nation of Ontario	Lands, Resources and Consultation	75 Sherbourne St.	Unit 222	Toronto, ON	M5A 2P9
				Metis Consultation Unit	Metis Natin of Ontario - Head Office	500 Old St. Patrick St.	Unit D	Ottawa, ON	K1N 9G4
Ms.	Shelley	Gray	Consultation Coordinator	Mississaugas of Alderville First Nation		P.O. Box 4		Roseneath, ON	K0K 2X0
Ms.	Jennifer	Copegog		Beausoliel First Nation		One O-Gema Street		Christian Island, ON	L0K 1P0
Chief	Tracy	Gauthier		Mississaugas of Scugog Island	Tgauthier@scugogfirstnation.com	22521 Island Rd.	RR#5	Port Perry On	L9L 1B6
				Moose Deer Point First Nation		P.O. Box 119		Mactier, ON	P0C 1H0
Ms.	Karry	Sandy-McKenz	Coordinator	Williams Treaties First Nations		8 Creswick Court		Barrie, ON	L4M 2J7
Chief	Sharon	Stinson Henry		Chippewas of Rama First Nation		5884 Rama Road	Suite 200	Rama, ON	L0K 1T0
Ms.	Kelly	LaRocca	Councillor	Mississaugas of Scugog		RR#5	22521 Island	Port Perry, ON	L9L 1B6
				Curve Lake First Nation		Curve Lake Post Office		Curve Lake, ON	K0L 1R0
				Wahta Mohawk		P.O. Box 327		Bala, ON	P0C 1A0
Ms.	Wanda	McGonigle		Ojibways of Hiawatha First Nation		RR#2		Keene, ON	K0L 2G0
Mrs.	Chief Line	Gros-Louis		Huron Wendat Council		255, Place Michel Laveau		Wendake, QC	G0A 4V0
Mr.	Luc	Lainé		Huron Wendat Council		255, Place Michel Laveau		Wendake, QC	G0A 4V0
Mr.	Lyle	Littlejohn				Box 269		Midhurst, ON	L0L 1X0
Mr.	Robert	Byers				67 Finlay Mill Road	Box 191	Midhurst, ON	L0L 1X0
Mr.	Steven A.	Cathcart				14 Wattie Road		Midhurst, ON	L0L 1X0
Ms.	Jean	Oostrom		coryjean@rogers.com					
Ms.	Lois	Bertram		Mr. Paul Bertram		R.R.#1, 14772 Cty. Rd. 27		Elmvale, ON	L0L 1P0
Dr.	Jim	Simon				2609 Russell Road, Box 175		Midhurst, ON	L0L 1X0
Mr.	Norman	Godfrey				#1400-75 The Donway West		Toronto, ON	M3C 2E9
Ms.	Darlene	Duiker				308 Miller Drive		Barrie, ON	L4N 9X7
Mr.	John R	Boos				29 Pooles Road		Midhurst, ON	L0L 1X0

WELCOME

TOWNSHIP OF SPRINGWATER

MIDHURST - WATER , WASTEWATER & TRANSPORTATION

CLASS ENVIRONMENTAL ASSESSMENT PHASE 3 & 4

OPEN HOUSE NO. 1

MAY 29, 2013

Background of the Class EA process

- **Purpose of this Open House**
  - To refresh residents and interested parties of the findings from the approved Phase 1 & 2 Master Plan, dated July 2009;
  - To provide a brief outline of the activities and schedule for the Phase 3 & 4 Class EA process;
- **Key Principles of Class EA**
  - Consultation with affected parties early in and throughout the process.
  - Consideration of a reasonable range of alternatives.
  - Consideration of effects on all aspects of the environment.
  - Systematic evaluation of alternatives.
  - Documentation – traceability.

Background of the Class EA process

Infrastructure Projects undertaken by a Municipality or by a Developer vary in their environmental impacts and are therefore classified in one of the four (4) different Schedules as follows:

Schedule "A"

- generally includes normal or emergency operational and maintenance activities;
- the environmental effects of these activities are usually minimal and, therefore, these projects are pre-approved;

Schedule "A+"

- These projects are pre-approved, however the public is to be advised prior to project implementation. The manner in which the public is advised is to be determined by the proponent;

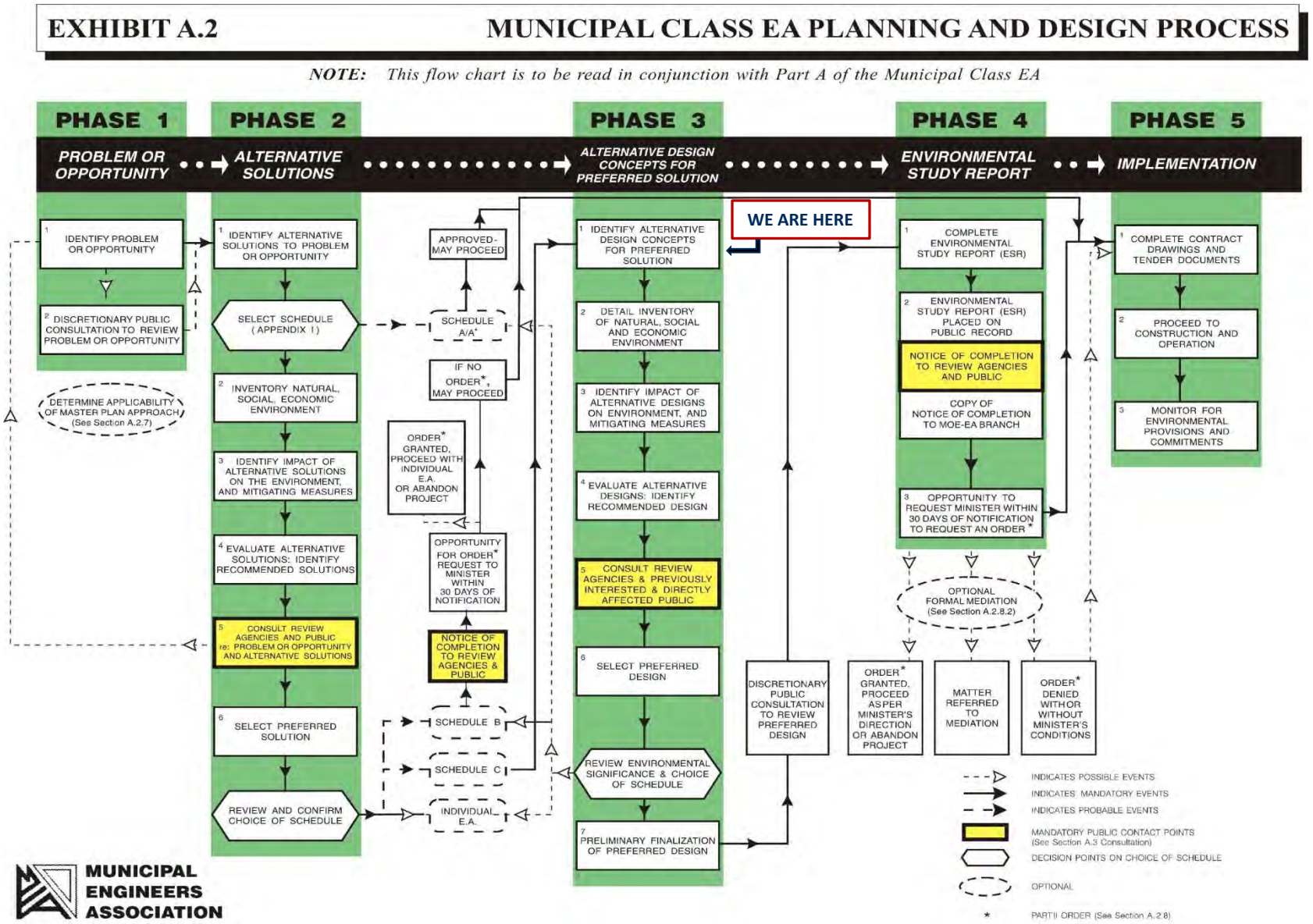
Schedule "B"

- generally includes improvements and minor expansions to existing facilities and there is the potential for minor adverse environmental impacts and therefore the proponent is required to proceed through a screening process including consultation with those who may be affected;

Schedule "C"

- generally includes the construction of new facilities and major expansions to existing facilities and these projects proceed through the environmental assessment planning process outlined in the Class EA;

Midhurst – Water, Wastewater & Transportation Class Environmental Assessment (Phase 3 & 4)



Midhurst Master Plan (Phase 1 & 2)

- In the Spring of 2008 Ainley was authorized to proceed with the Midhurst Water, Wastewater and Transportation Master Plan (Phase 1 & 2) for the Midhurst Secondary Plan area;
- The purpose of this study was to identify water, wastewater and transportation solutions for the existing development and to accommodate the future growth as identified in the Midhurst Secondary Plan;
- A Notice of Study Commencement was published in the local newspapers on June 14 and June 21, 2008 and sent to appropriate Review Agencies;
- A Notice of Public Information Centre (PIC) was advertised on August 15, 2008 and held on August 28, 2008 at the Midhurst United Church, in conjunction with the Secondary Plan Public Meeting;
- A total of 58 individuals attended the PIC.
- The Master Plan was available for the mandatory 30 day Public Review from July 9, 2009 to August 10, 2009.

DESIGN POPULATION

EXISTING

EXISTING AREA	NUMBER OF UNITS	EQUIVALENT POPULATION
Existing Municipal Water Supply System (Including Del Trend)	1,225	3,675
Existing, Developed, Unserviced	113	339
TOTAL EXISTING HOUSEHOLDS/EQUIVALENT POPULATION	**1,338**	**4,014**

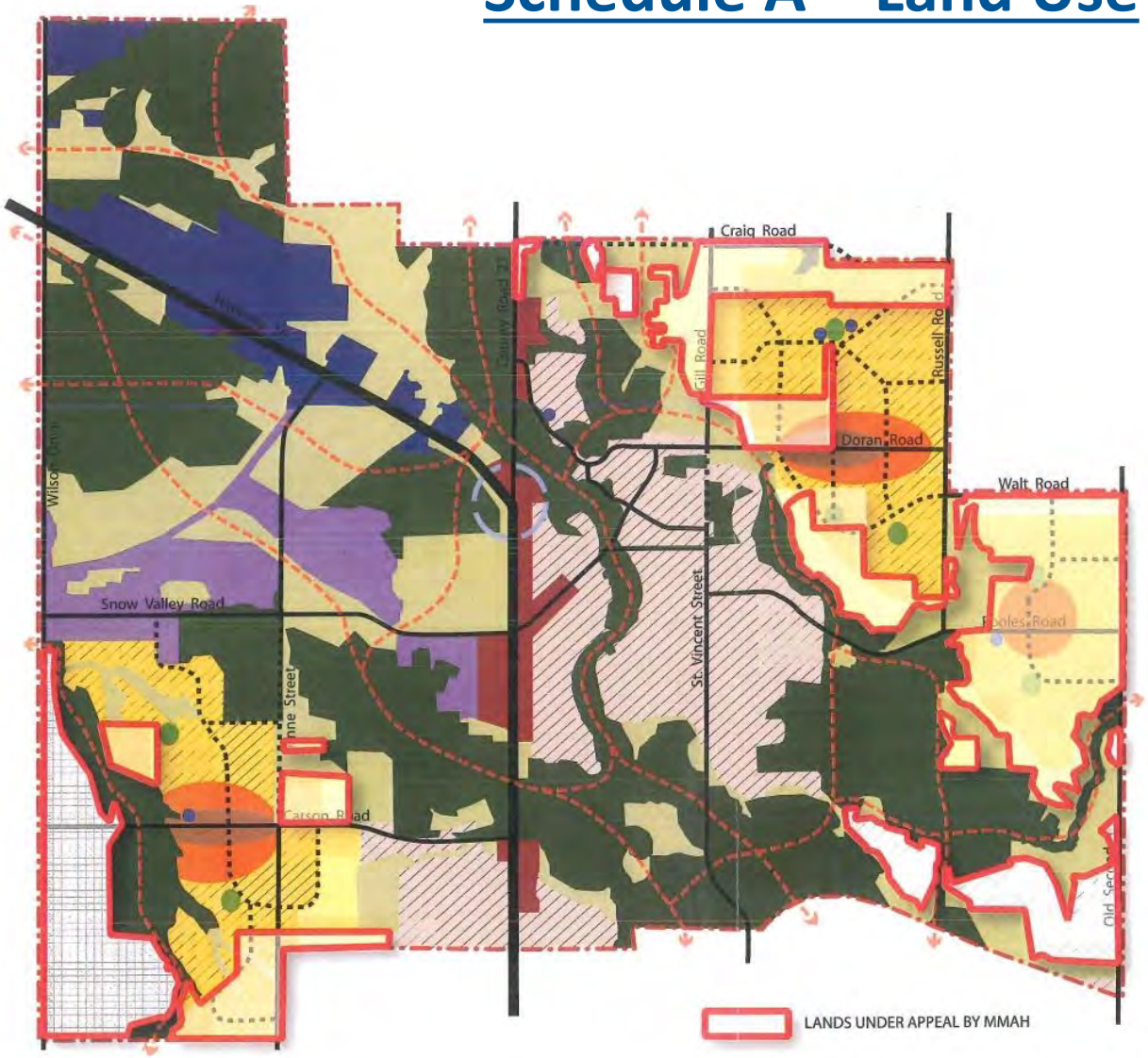
FUTURE

FUTURE	NUMBER OF UNITS	EQUIVALENT POPULATION
Development Area 1 – Doran Road North	2,379	7,137
Development Area 2 – Doran Road South	2,920	8,760
Development Area 3 – Carson Road West	2,559	7,677
Allowance for Existing and Future Public and Government Employment Lands	350	1,050
TOTAL FUTURE HOUSEHOLDS/EQUIVALENT POPULATIONS	**8,208**	**24,624**
TOTAL EXISTING AND FUTURE HOUSEHOLDS/EQUIVALENT POPULATION	**9,546**	**28,638**

Current Status

- The Province withdrew its appeal on the majority of the lands and policies within OPA 38, including a withdrawal of their appeal of 300ha of residential greenfield lands as shown on the attached Schedule A – Land Use map.
- All lands shown hatched in pink, remain the subject of the Provinces appeal, as do the listed policies with respect to these lands. All other lands and policies within the secondary plan are now finally approved and in effect as of November 28, 2012.

Current Status
Schedule A – Land Use



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

November 27, 2012

Current Status

- The in effect OPA 38 permits a first phase of residential greenfield development of 3,850 units plus employment generating uses and limited infill to proceed. It also provides for additional phases of new greenfield development beyond this phase to proceed on the basis of satisfying certain holding provisions.
- The first phase of new residential development under OPA 38 of 3,850 units encompasses approximately 225 hectares. The next phase of development, which will encompass further lands within the 300 hectares of residential greenfield lands approved in the secondary plan, must satisfy holding provisions as set out in the approved OPA 38, in order to proceed.

Midhurst Master Plan (Phase 1 & 2)

WATER SUPPLY OPTIONS

- **OPTION A –** Do Nothing
- **OPTION B –** Obtain Water Supply from City of Barrie
- **OPTION C –** Expand Existing Municipal Well Site Capacities
- **OPTION D –** Develop New Municipal Wells on New Sites – One Overall Water System
- **OPTION E –** Develop New Municipal Wells on New Sites – Four Separate Systems
- **OPTION F –** Develop New Municipal Wells on New Sites – Three Overall Water Systems (Preferred Option)

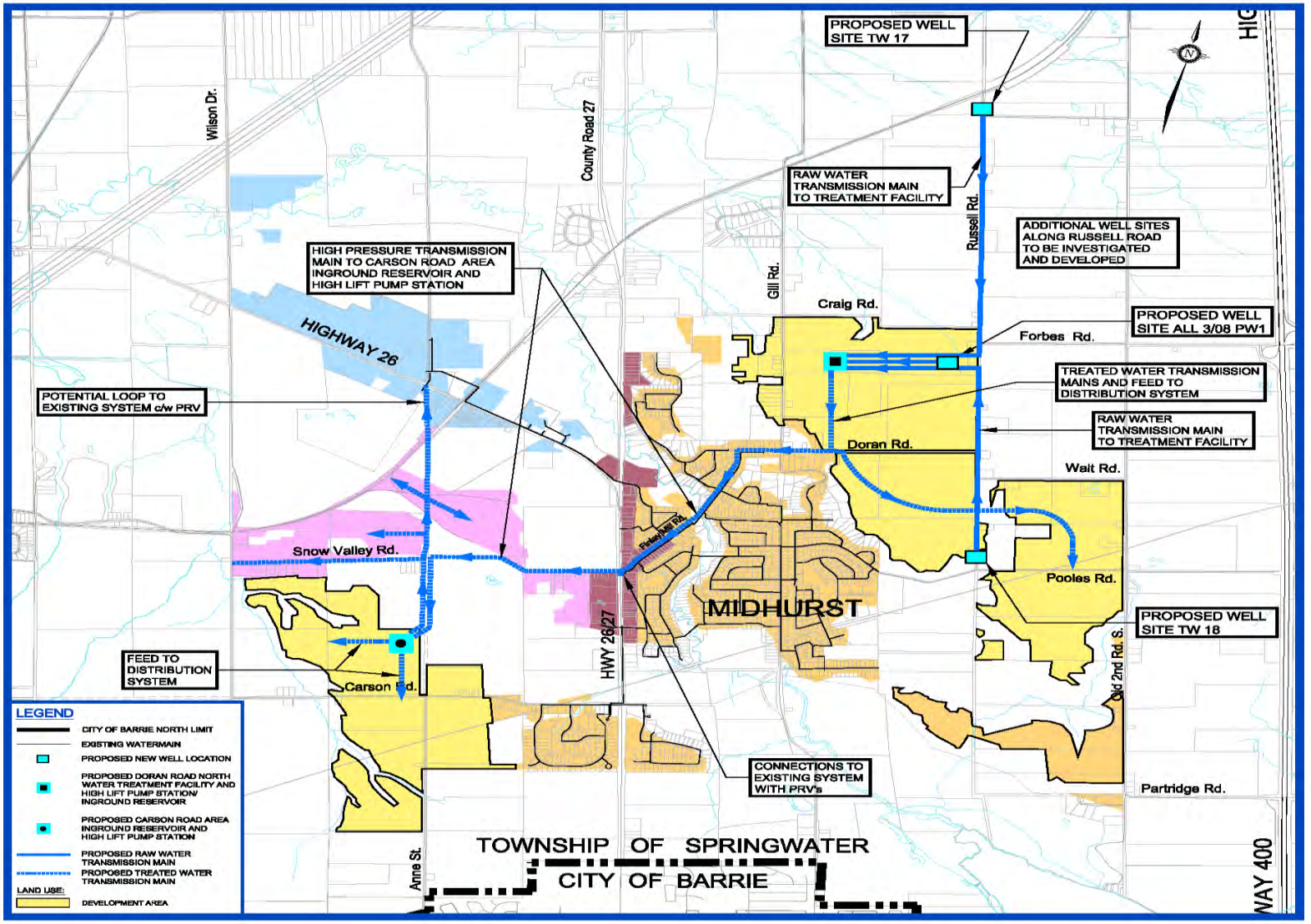
Midhurst Master Plan (Phase 1 & 2)

PREFERRED - WATER TREATMENT, STORAGE & DISTRIBUTION SOLUTION

OPTION F – Develop New Municipal Wells along Russell Road with two (2) in-ground storage reservoirs within proposed Developments:

- One Water Treatment Facility for disinfection and treatment to be located South of Craig Rd. in Doran Road North Development;
- Six (6) Municipal wells (40 Litres/sec each) along Russell Road, each pumping raw water to the aforementioned Water Treatment Facility through dedicated raw water transmission mains. The locations for the proposed wells will be re-evaluated based on the Wellhead protection guidelines in accordance with the Ontario Clean Water Act;
- Two In ground Reservoirs (one in the east and one in the west) fed directly from Water Treatment Facility through dedicated treated water transmission mains;
- Connect to existing Midhurst system with a pressure regulating valves (PRV's);
- Provides a potential loop to existing system at Highway 26 and Nursery Rd.

PREFERRED - WATER TREATMENT, STORAGE & DISTRIBUTION SOLUTION



Midhurst Master Plan (Phase 1 & 2)

WASTEWATER TREATMENT & DISPOSAL OPTIONS

- **OPTION A** – Do Nothing
- **OPTION B** – Convey untreated Wastewater to the City of Barrie system via highway 26/27 and Bayfield Street
- **OPTION C** – Untreated Wastewater to the Snow Valley Wastewater Treatment Plant(s) and/or future Centre Vespra Wastewater Treatment Plant
- **OPTION D** – Single new wastewater treatment facility located on proposed development lands with single or multiple effluent sub-surface disposal site(s) located on development lands
- **OPTION E** – Multiple Wastewater Treatment facilities located on development lands with multiple effluent sub-surface effluent disposal sites located on development lands
- **OPTION F** – Two Wastewater Treatment facilities (one in the east and one in the west) with two or more sub-surface disposal sites (east and west) located on development lands
- **OPTION G** – Single new wastewater treatment facility located on proposed development lands with the disposal of effluent to Willow Creek (Preferred Option)

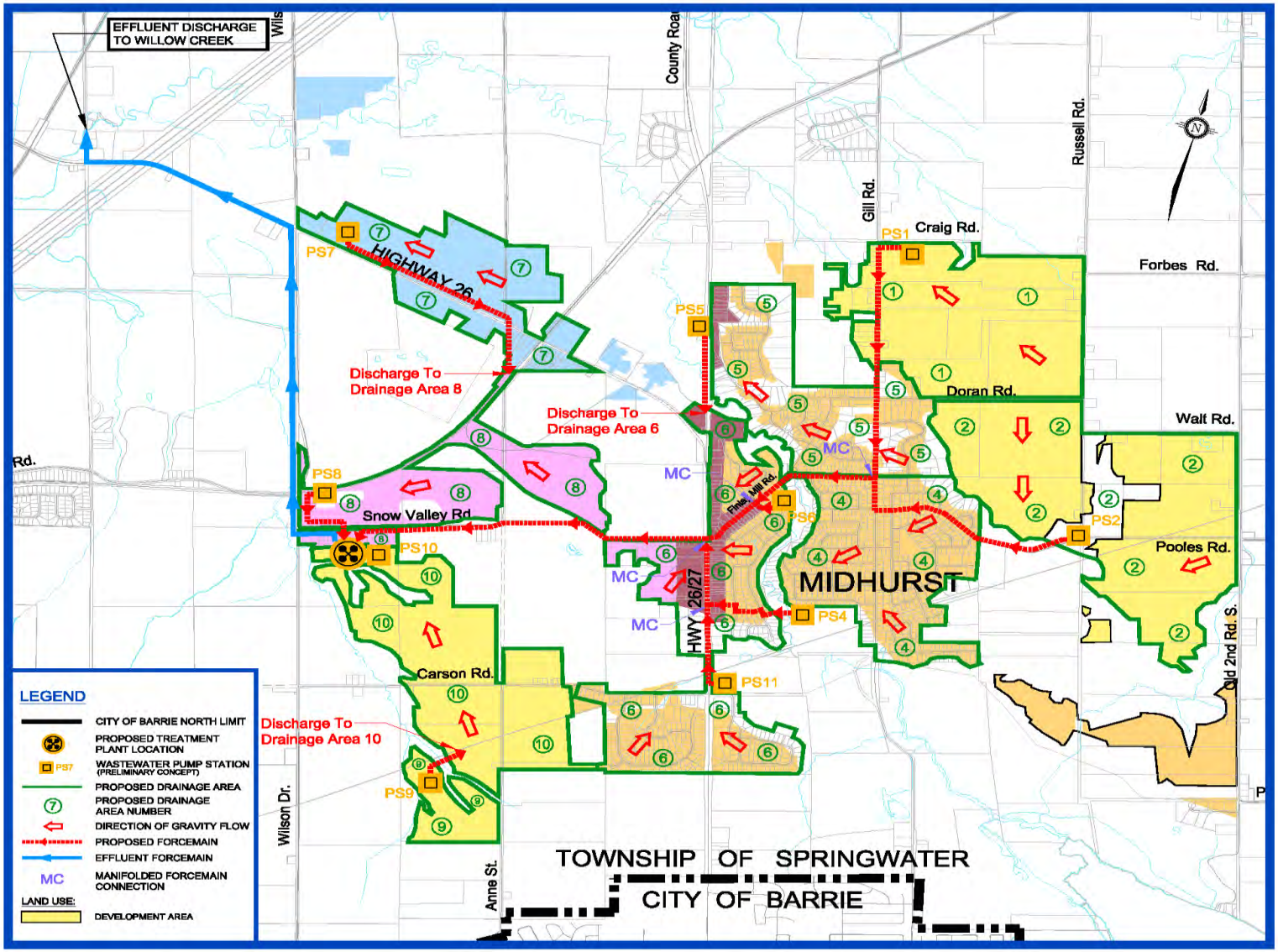
Midhurst Master Plan (Phase 1 & 2)

PREFERRED - WASTEWATER COLLECTION, TREATMENT & DISPOSAL SOLUTION

OPTION G – New Wastewater Treatment facility in the vicinity of Carson Road & Wilson Drive with a discharge to Willow Creek on Golf Course Road (north of Hwy 26).

- One Wastewater Treatment Plant to be located in the North West corner of the Carson Rd. Development area. The treatment process is to be determined;
- Proposed Wastewater Treatment Plant to be modular, allowing for phased development and servicing of existing Midhurst area;
- Sewage Pump Stations as required with Manifolded forcemain connections;
- Effluent discharge to Willow Creek on Golf Course Road north of Hwy 26;
- Infrastructure can be phased with development.

PREFERRED - WASTEWATER COLLECTION, TREATMENT & DISPOSAL SOLUTION



Midhurst Master Plan (Phase 1 & 2)

TRANSPORTATION OPTIONS

- ***Option 1*** **- (Do Nothing) assumes the existing infrastructure condition of the Midhurst area without any road network improvements;**
- ***Option 2*** **- "Proposed Simcoe Area Network Improvements" for the year 2028. This Alternative shows the proposed road network improvements identified by Simcoe County as outlined in their recent *County of Simcoe Transportation Master Plan, Final Report, June 2008*;**
- ***Option 3*** **- "Proposed By Developers" and comprises those improvements identified by area landowner/developers in their traffic studies. This alternative is based on the proposed road network improvements recommended by the developer's consultants;**
- ***Option 4*** **- This alternative includes reconstruction/upgrade of existing two-lane roads to provide auxiliary turn lanes and/or improve general platform integrity at Russell Road, Walt Road, Old Second Road (between Walt Road and Pooles Road), Pooles Road, Doran Road, Finlay Mill Road, Carson Road and Anne Street. Notable improvements include:**
  - **A new extension of Craig Road to County Road 27 as a two-lane road with auxiliary turn lanes, as required;**
  - **Widening of St. Vincent Street (south of Pooles Road) with an auxiliary turn lane, as required;**
  - **A new extension of St. Vincent Street to Gill Road;**
  - **Widening of County Road 27 (from north of Highway 26 to Horseshoe Valley Road) to a four-lane road (as identified by Simcoe County); and**
  - **Widening of Wilson Drive (from Snow Valley Road to Sunnidale Road) to a four-lane road (as identified by Simcoe County).**

Midhurst Master Plan (Phase 1 & 2)

TRANSPORTATION OPTIONS

- ***Option 5*** **- This alternative is similar to Alternative 4 but with no link connection from St. Vincent Street to Gill. Notable improvements include:**
  - **A new partial interchange at Pooles Road on Highway 400 providing movements to and from south;**
  - **A new extension of Craig Road to County Road 27 as a two-lane road with auxiliary turn lanes, as required;**
  - **Widening of County Road 27 (from north of Highway 26 to Horseshoe Valley Road) to a four-lane road (as identified by Simcoe County); and**
  - **Widening of Wilson Drive (from Snow Valley Road to Sunnidale Road) to a four-lane road (as identified by Simcoe County).**
- ***Option 6*** **- This alternative is a combination of Option 4 & 5. Notable improvements includes (Preferred Option):**
  - **A new extension of Craig Road to County Road 27 as a two-lane road with auxiliary turn lanes, as required;**
  - **A new partial interchange at Pooles Road on Highway 400 providing movements to and from south;**
  - **A new extension of St. Vincent Street to Gill Road;**
  - **Widening of St. Vincent Street (south of Pooles Road) with an auxiliary turn lane, as required;**
  - **Widening of Snow Valley Road between Hwy 26 & Wilson Drive with auxiliary turn lanes, as required;**
  - **Widening of County Road 27 (from north of Highway 26 to Horseshoe Valley Road) to a four-lane road (as identified by Simcoe County); and**
  - **Widening of Wilson Drive (from Snow Valley Road to Sunnidale Road) to a four-lane road (as identified by Simcoe County).**

Midhurst Master Plan (Phase 1 & 2)

PREFERRED – TRANSPORTATION SOLUTION

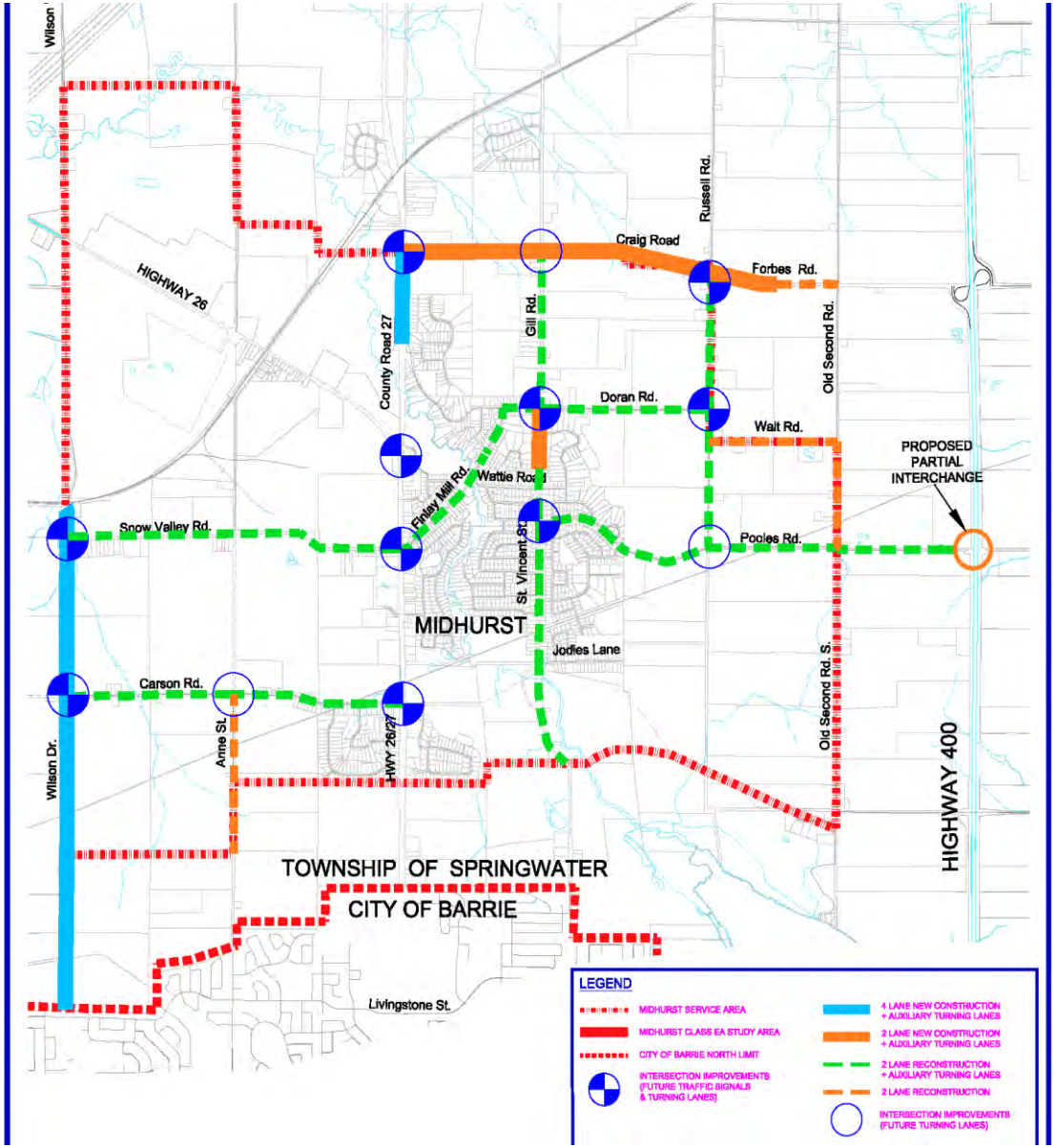
Option 6 - This option includes Reconstruction/ upgrade of existing two-lane roads to provide auxiliary turn lanes:

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

Reconstruction of the following existing Roads (to two lanes)

- Walt Road, Old Second Road (between Walt Road and Pooles Road), Pooles Road, Doran Road, Finlay Mill Road, Carson Road and Anne Street

PREFERRED – TRANSPORTATION SOLUTION



Midhurst Master Plan (Phase 1 & 2)

- The Master Plan was made available for the mandatory 30 day Public Review Period from July 9, 2009 to August 10, 2009;
- During this Public Review Period no Part II Orders (Bump Ups) were received and therefore the Master Plan (Phase 1 & 2) was completed.

With the completion of the Master Plan (Phase 1 & 2) the following is a summary of the Schedule "A", "B" & "C" projects:

SCHEDULE "A+" PROJECTS – Pre-approved 2-lane reconstruction projects which could proceed to construction:

- Pooles Road from Highway 400 to Silverwood Crescent towards St. Vincent Street
- Old Second Road from Pooles Road to Walt Road
- Walt Road from Old Second Road to Russell Road
- Russell Road from Forbes Road to Pooles Road
- Doran Road from Russell Road to Gill Road

Midhurst Master Plan (Phase 1 & 2)

SCHEDULE "A+" PROJECTS – Pre-approved 2-lane reconstruction projects which could proceed to construction: (contd.)

- St. Vincent Street from Wattie Road to the Barrie City limits
- Finlay Mill Road
- Carson Road from Highway 27 to Wilson Drive
- Anne Street from Carson Road to the Barrie City limits
- Snow Valley Road from Wilson Drive to County Road 27
- 2-lane re-construction of Gill Road from Craig Road to Doran Road

SCHEDULE "B" PROJECTS – that are now Approved and could proceed to Construction:

- 2-lane new construction of St Vincent Street from Doran Rd to Wattie Rd
- 2-lane new construction of Forbes Road from Old Second Rd to Russell Rd
- 4-lane new construction of County Road 27, from existing 4-lane to new Craig Road extension

Midhurst Master Plan (Phase 1 & 2)

SCHEDULE "C" PROJECTS – that require additional study through Phases 3 & 4 of the Municipal Class EA process:

- New water system including new wells, treatment works and water distribution system;
- New sewage system including sewers, treatment plant and outfall to Willow Creek;
- New interchange at Pooles Road with Highway 400;
- 2-lane new construction of Craig Road from Russell Road to County Road 27;
- 4-lane new construction of Wilson Drive from Snow Valley Road to Barrie City Limits.

Midhurst - Phase 3 & 4 Class EA

- The anticipated timeline associated with the completion of Phases 3 & 4 Class EA Study is approximately 12 months;
- Recognizing that public consultation will be a key component of this Study an extensive public consultation process has been arranged including the formation of a Resident Liaison Group, two Open Houses, a Public Information Centre and multiple Newspaper advertisements throughout the completion of the Class EA Study:
- **Notice of Study Commencement** – This Notice formally advises interested parties that the Township is initiating Phase 3 & 4 Class EA process. The Notice was advertised in the local newspapers on April 18, 2013, posted on the Township website and emailed to interested parties that had previously registered with the Township to be kept informed. This Notice also invited interested parties to advise the Township if they wish to be added to the mailing list for all future Class EA Notices;

Midhurst - Phase 3 & 4 Class EA

- **Open House No 1** - This first Open House is being held from 6:30 pm to 9:00 pm on Wednesday, May 29, 2013 at the Township Administration Centre and will refresh interested parties of the findings from the approved Phase 1 & 2 Master Plan, dated July 2009 (this meeting).

- **Notice of Public Information Centre (PIC)** – This Notice will be advertised in the local newspapers, sent to interested parties and posted on the Township website, will advise of the formal Public Information Centre.

- **Public Information Centre (PIC)** This Public Information Centre will be held near the end of Phase 3 at which time the Project Team will present the findings of the Phase 3 Study including the evaluation criteria along with the Recommended Water, Wastewater & Transportation solutions. It is currently anticipated that this PIC will be held in Sept/Oct 2013.

Midhurst - Phase 3 & 4 Class EA

- **Notice of Study Completion** - This Notice, which will be advertised in the local newspapers and posted on the Township website, will advise interested parties that the DRAFT ESR is being placed in the public record for the formal 30 day public review period and invite interested parties to submit comments within the 30 days. It is currently anticipated that this Notice will be published in Feb/Mar 2014 .
- **Open House No 2** – This Open House will be held in Phase 4 and during the formal 30 day public review period. At this Open House the Project Team will present the findings of the DRAFT Environmental Study Report (ESR). It is currently anticipated that this Open House will be held Mar/Apr 2014.
- If any requests for Part II Orders (Bump Ups) are received during the aforementioned 30 day Public Review process, they will be dealt with at that time.

Midhurst - Phase 3 & 4 Class EA

During Phase 3 & 4 the Water, Wastewater and Transportation options identified in Phases 1 & 2 will be analyzed in more detailed including the:

- The Wastewater Treatment process and confirmation of the effluent criteria;
- Further details associated with the discharge of the effluent to Willow Creek on Golf Course Road (north of Hwy 26);
- The Water Treatment process and associated design criteria;
- Phasing and timing for the proposed Infrastructure including:
  - the timing for the local road and intersection reconstructions;
  - the timing for the construction of new roads;

NEXT STEPS:

- After completion of the Class EA, the Detailed Design and subsequent construction of the required Infrastructure could proceed.

WHAT CAN YOU DO?

- Add your name to the Mailing List and stay Informed
- Fill out a comment sheet
- Send your comments to:

Mr. Brad Sokach, P. Eng.
Director of Planning & Public Works
Township of Springwater
2231 Nursery Road
Minesing, ON, L0V 1V2
Tel: (705) 728-4784 Ext. 2034
Fax: (705) 728-6957
Email: brad.sokach@springwater.ca

Mr. Joe Mullan, P.Eng.
President & C.E.O
Ainley & Associates Limited
280 Pretty River Parkway,
Collingwood, ON, L4N 8Z7
Tel: 705-445-3451
Fax: 705-445-0968
Email: midhurst.classea@ainleygroup.com

Reid Mitchell

113027

From: Joe Mullan <mullan@ainleygroup.com>
Sent: Monday, May 13, 2013 11:42 AM
To: Reid Mitchell CET; Gary Scott P.Eng; Mike Neumann; Mike Ainley
Cc: Nicole Sartor; Ainley Collingwood
Subject: Midhurst Water, Wastewater & Transportation Class EA Phases 3 & 4 (113027)
Attachments: Midhurst Phases 3&4 Class EA-May13-13.pdf

FYI.

Regards

J. A. Mullan, P.Eng.
Sent from my BlackBerry 10

From: Liu, Chunmei (ENE)
Sent: Monday, May 13, 2013 11:06 AM
To: midhurst.classea@ainleygroup.com; brad.sokach@springwater.ca
Cc: Panko, Dan (ENE); Hyde, Chris (ENE); Hood, Cindy (ENE)
Subject: Midhurst Water, Wastewater & Transportation Class EA Phases 3 & 4

Please find the attached letter as our general comments for the above-noted Phases 3 & 4 Class EA. If you have any questions regarding these comments, please feel free to contact the undersigned.

Thanks,
Chunmei Liu
EA and Planning Coordinator
Technical Support, Central Region
Ministry of the Environment
416-326-4886

Ministry of the Environment
Central Region
Technical Support Section
5775 Yonge Street, 8th Floor
North York, OntarioM2M 4J1
Tel.: (416) 326-6700
Fax: (416) 325-6347

stère de l'Environnement
Région du Centre
Section d'appui technique
5775, rue Yonge, 8ème étage
North York, Ontario M2M 4J1
Tél. : (416) 326-6700
Téléc. : (416) 325-6347

Ontario

Via Email Only

May 13, 2013

EA01-06-11

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
Class Environmental Assessment Phases 3 and 4

Dear Mr. Mullan,

The Ministry of the Environment (MOE) received your letter dated April 24, 2013 indicating that the Township of Springwater is continuing with Phases 3 & 4 of the Class EA planning process to determine the water, wastewater and transportation infrastructure requirements to accommodate the future growth within the Midhurst Secondary Plan, in accordance with the Midhurst Master Plan Phases 1 & 2 Water, Wastewater & Transportation completed in July 2009. The ministry provides the following recommendations to assist you on the forthcoming Phases 3 & 4 of the Class EA regarding the proposed wastewater treatment for the Midhurst Secondary Plan.

Based on the information submitted, the MOE Central Region is providing the general comments to assist your project team in effectively addressing the following issues:

- Ecosystem Protection and Restoration
- Provincial Policy and Plan
- Surface Water and Groundwater
- Air Quality, Noise and Dust
- Servicing and Facilities
- Waste Materials and Spills
- Mitigation and Monitoring
- Class EA Process
- Aboriginal Consultation

Ecosystem Protection and Restoration

Any impacts to ecosystem form and function must be avoided where possible. The Environmental Assessment Report (ESR) should describe any proposed mitigation measures and how project planning will protect and enhance the local ecosystem.

All natural heritage features should be identified and described in detail to assess potential impacts and to develop appropriate mitigation measures. The Class EA study should identify if the following sensitive environmental features are located within or adjacent to the study area and what mitigation measures are needed to minimize the impacts from the

proposed works:

- Areas of Natural and Scientific Interest (ANSIs)
- Environmentally Sensitive Areas (ESAs)
- Rare Species of Flora or Fauna
- Wetlands
- Watercourses
- Woodlot

The ESR must include a sufficient level of information to demonstrate that there will be no negative impacts on these environmental features. The MOE also recommends consulting with the Ministry of Natural Resources (MNR), Fisheries and Oceans Canada (DFO) and your local conservation authority to determine if special measures or additional study will be necessary to preserve and protect these sensitive features.

The County of Simcoe and the Township of Springwater Official Plans policies related to ecosystem protection within the study area should be referenced to ensure that all environmental protection policies are satisfied. The ESR should also discuss the levels of growth proposed for the area, how this proposal addresses those levels of growth, and how any proposed road improvements will affect local traffic flows.

Provincial Policy and Plan

The 2005 *Provincial Policy Statement* contains policies that protect Ontario's Natural Heritage. Applicable policies should be referenced in the ESR, and you should demonstrate how this proposed project is consistent with these policies.

The *Places to Grow Plan* contains policies which guide decisions on a range of issues such as infrastructure planning and land-use planning to ensure that stronger and more prosperous communities are built in the Greater Golden Horseshoe. The ESR should demonstrate how this project adheres to the relevant policies of the *Places to Grow Plan*, including Sections 3 and 6, which contain specific policies for Infrastructure to Support Growth and Simcoe Sub-area.

Surface Water and Groundwater

The discharge of any effluent to receiving water will require an approval under the *Ontario Water Resource Act* (OWRA) Section 53 (Sewage Works). As part of the approval requirements, appropriate effluent criteria should be submitted to the MOE Central Region office for review and acceptance. The Class EA study should include evaluation of whether the receiving water has adequate capacity to assimilate the wastewater discharge and recommend appropriate effluent criteria. Residue management facilities should be assessed as part of the proposed wastewater treatment system through this Class EA process.

The ESR must include a sufficient level of information to demonstrate that there will be no negative impacts on the natural features or ecological functions of any watercourses within the study area. Measures should be included in the planning and design process to ensure that any impacts to watercourses from construction or operational activities

(e.g. spills, erosion, and pollution) are mitigated as part of the proposed undertaking. The MOE's Guideline B-6, *Evaluating Construction Activities Impacting on Water Resources* should be used to plan and construct this project.

Additional stormwater runoff from new pavement can impact receiving watercourses and flood conditions. Quality and quantity control measures to treat stormwater runoff should be considered for all new impervious areas and, where possible, existing surfaces. The MOE's *Stormwater Management Planning and Design Manual* (2003) should be referenced in the ESR and utilized when designing stormwater control methods. The MOE recommends that a Stormwater Management Plan should be prepared as part of the Class EA process that includes:

- Strategies to address potential water quantity and erosion impacts related to stormwater draining into streams or other sensitive environmental features, and to ensure that adequate (enhanced) water quality is maintained
- Watershed information, drainage conditions, and other relevant background information
- Future drainage conditions, stormwater management options, information on erosion and sediment control during construction, and other details of the proposed works
- Information on maintenance and monitoring commitments

The status of, and potential impacts to, any well water supplies should be addressed. If the project involves groundwater takings or changes to drainage patterns, the quantity and quality of groundwater may be affected due to drawdown effects or the redirection of existing contamination flows. In addition, project activities may infringe on existing wells such that they must be reconstructed or sealed and abandoned. Appropriate information to define existing groundwater conditions should be included in the ESR.

If the potential construction or decommissioning of water wells is identified as an issue, the ESR should refer to Ontario Regulation 903, Wells, under the *Ontario Water Resources Act*.

The MOE recommends preparing a Contingency Plan for dealing with potential adverse effects on surface water (e.g. spills) and groundwater (e.g. well impacts), and including a description of this plan in the ESR.

Potential impacts to groundwater-dependent natural features should be addressed. Any changes to groundwater flow or quality from groundwater taking may interfere with the ecological processes of streams, wetlands or other surficial features. In addition, discharging contaminated or high volumes of groundwater to these features may have direct impacts on their function. Any potential effects should be identified, and appropriate mitigation measures should be recommended. The level of detail required will be dependent on the significance of the potential impacts.

Any potential approval requirements for groundwater taking or discharge should be identified in the ESR. In particular, a Permit to Take Water (PTTW) under the *Ontario Water Resources Act* will be required for any water takings that exceed 50,000 litres per day. A PTTW application must be accompanied by an assessment of potential effects as noted above, and may require a higher level of detail than what is provided in the ESR. Please note that when significant long-term water taking is proposed, the

maximum rate identified in the ESR must not be exceeded in any subsequent PTTW applications. For more information on the application and approval process, The MOE suggests you refer to the MOE *Permit to Take Water Manual* (April 2005).

Air Quality, Noise and Dust

We recommend that the Air Quality Impact Assessment, contaminants such as but not limiting to – hydrogen sulfide (H_2S), ammonia (NH_3), Total Reduced Sulphur (TRS) and Mercaptans from the current and future operation of the proposed sewage facility be conducted during the Class EA Phases 3 & 4 planning process.

The general approach to a Class EA Air Quality Impact Assessment for a proposed sewage treatment plant is as follows:

1. Determine the air quality impacts from existing operations;

2. Determine the air quality impacts from future expansion;

3. Assess plant-wide odour impacts from key process operations including, but not limiting to:

   - headworks area,
   - primary tanks area,
   - process exhaust stacks,
   - septage receiving station,
   - solids processing facilities.

   If odour impacts are found at the most impacted sensitive receptor (s), then mitigation measures should be discussed and implemented.

4. Development of an existing and future emission inventory following the ministry's requirements as stipulated under Guideline A-10 *"Emission Summary Dispersion Modeling Report"* dated March 2009;

5. Conduct screening dispersion modeling to assess the maximum off-site impacts and at sensitive receptors (Guideline A-11" Air Dispersion Modeling Guideline for Ontario" dated March 2009);

6. Compare the predicted existing and future concentrations with O. Reg. 419/05 standards – "*Summary of O. Reg. 419/05 Standards and Point of Impingement Guidelines & Ambient Air Quality Criteria (AAQCs)*" (MOE, February 2008) which includes the 10-minute odour guidelines for individual species;

If there are potential significant noise impacts from the proposed undertaking or public concerns over the noise issue, we recommend that a Noise Impact Assessment be conducted to address the potential impacts during the Class EA process. This assessment includes the evaluation of existing and future operations and noise reduction measures if required.

Dust and noise control measures should also be addressed and included in the construction plans to ensure that nearby residential and other sensitive land uses within

the study area are not adversely affected during construction activities. If dust suppressants are proposed to be used, The MOE recommends the use of non-chloride based compounds to protect water quality.

Servicing and Facilities

Reference to MOE's "D-Series" guidelines - Land Use Compatibility, is recommended to ensure that all applicable ministry procedures are followed in planning for infrastructure and public service facilities.

Subsequent approval requirements should be described in the ESR. Please consult with the MOE's Barrie District Office and the Environmental Approvals Branch (EAB) to determine whether an Environmental Compliance Approval will be required for the proposed wastewater infrastructure. Consultation with the Barrie District Office and EAB should be documented.

Reference to the following MOE's documents is recommended in the ESR to ensure that all applicable ministry procedures are followed in planning for water and sewage services:

- Guideline D-5, *Planning for Sewage and Water Services*;
- Guideline F-5-3, *Derivation of Sewage Treatment Works Effluent Requirements for the Incorporation of Effluent Requirements into Certificates of Approval for New or Expanded Sewage Treatment Works*;
- Guideline B-1-5, *Deriving Receiving- Water Based, Point-Source Effluent Requirements for Ontario Waters* (July 1994); and
- *Guide for Applying for Approval of Municipal and Private Water and Sewage Works* (Sections 52 and 53 Ontario Water Resources Act R.S.O. 1990).

Waste Materials and Spills

All waste generated during construction must be disposed of in accordance with the MOE's requirements.

Since the removal or movement of soils may be required, appropriate tests to determine contaminant levels from previous land uses or dumping should be undertaken. If the soils are contaminated, you must determine how and where they are to be disposed of, consistent with Part XV.1 of the *Environmental Protection Act* (EPA) and Ontario Regulation 153/04, Records of Site Condition, which details the new requirements related to site assessment and clean up. The MOE recommends contacting the MOE's Barrie District Office for further consultation if contaminated sites are present.

Any current or historical waste disposal sites should be identified in the ESR. The status of these sites should be determined to confirm whether approval pursuant to Section 46 of the *Environmental Protection Act* may be required for land uses on former disposal sites.

The ESR should identify any underground transmission lines in the study area. The owners should be consulted to avoid impacts to this infrastructure, including potential spills.

The location of any underground storage tanks should be included in the ESR. Measures should be identified to ensure the integrity of these tanks and to ensure an appropriate response in the event of a spill. The MOE Spills Action Centre in the Barrie District must be contacted in such an event.

Mitigation and Monitoring

Design and construction reports and plans should be based on a best management approach that centres on the prevention of impacts, protection of the existing environment, and opportunities for rehabilitation and enhancement of any impacted areas.

Contractors must be made aware of all environmental considerations so that all environmental standards and commitments for both construction and operation are met. Mitigation measures should be clearly referenced in the ESR and regularly monitored during the construction stage of the project. In addition, The MOE encourages you to conduct post-construction monitoring to ensure all mitigation measures have been effective and are functioning properly. The construction and post-construction monitoring plans should be documented in the ESR.

Class EA Process

The ESR should provide clear and complete documentation of the planning process in order to allow traceability of decision-making. It must also demonstrate how the consultation provisions of the Class EA have been fulfilled, including documentation of all public consultation efforts undertaken during the planning process. Additionally, it should identify all concerns that were raised and how they have been addressed throughout the planning process. You should include copies of any comments submitted on the project by interested stakeholders, and your responses to these comments.

The Class EA requires the consideration of the effects of each alternative on all aspects of the environment. The ESR should include a level of detail (e.g. hydrogeological investigations, terrestrial and aquatic assessments) such that all potential impacts can be identified and appropriate mitigation measures can be developed. Any supporting studies conducted during the Class EA process should be referenced and included as part of the ESR.

Please include in the ESR a list of all subsequent permits or other approvals that may be required for the implementation of the preferred alternative, including Permits to Take Water, Environmental Compliance Approval or other ministerial approvals, approval under the *Canadian Environmental Assessment Act* (CEAA), and conservation authority permits.

Please note that the MOE's guidelines and other information related to the issues noted above are available at www.ene.gov.on.ca under the publications link. The MOE encourages you to review all the available guides and to reference any relevant information in the ESR.

Consultation with First Nation and Métis Communities

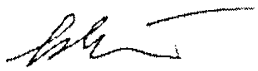
The Crown has a duty to consult First Nation and Métis communities if there is a potential impact to Aboriginal or treaty rights. As the proponent of this project, you have a responsibility to conduct adequate consultation with First Nation and Métis communities as part of the environmental assessment process. The Crown is therefore, delegating the procedural aspects of consultation to you as outlined in the attached document.

You must contact the Director, Environmental Approvals Branch if a project may **adversely affect an Aboriginal or treaty right**, or if a **Part II Order request is anticipated**; the MOE will then determine whether the Crown has a duty to consult. Information and resources to assist you in fulfilling this requirement are provided as an attachment.

Thank you for the opportunity to comment on this project. A draft copy of the ESR should be sent to this office prior to the filing of the final report, allowing a minimum of 30 days for the ministry's technical reviewers to provide comments. Please also forward our office the Notice of Completion and ESR when completed.

Should you or any members of your project team have any questions regarding the above, please feel free to contact me at 416-326-4886 or via an email: Chunmei.Liu@ontario.ca.

Yours truly,



Chunmei Liu
Environmental Assessment and Planning Coordinator
Air, Pesticides and Environmental Planning

c. C. Hood, Manager, Barrie District Office, MOE
B. Sokach, Township of Springwater
Central Region EA File
A & P File

ABORIGINAL CONSULTATION INFORMATION

Interest-based consultation with First Nation and Métis Communities

Proponents subject to the *Environmental Assessment Act* are required to consult with interested First Nation and Métis communities in addition to consultation with interested persons. Special effort may be required to ensure that First Nation and Métis communities are made aware of the project and are afforded an opportunity to provide comments.

Proponents are required to contact the Ministry of Aboriginal Affairs (MAA) and Aboriginal Affairs and Northern Development Canada (AANDC) to help identify which First Nation and Métis communities may be impacted by your project. **It is important to ensure that MAA and AANDC are advised of any communities identified for consultation during previous stages of the project when making this request.** For more information in this regard, refer to the Aboriginal Information Resources web page of the Ministry of the Environment's internet site at:

http://www.ene.gov.on.ca/en/eaab/aboriginal-resources.php

You are advised to provide notification directly to all of the First Nation and Métis communities who may be interested in the project.

Rights-based consultation with First Nation and Métis Communities

Proponents should also be aware that certain projects may affect the ability of a First Nation or Métis community to exercise their confirmed or asserted Aboriginal or treaty rights. In such cases, Ontario may have a duty to consult to ensure the protection of the potentially affected right. Activities which may restrict access to unoccupied Crown lands, or could result in a potential to impact to land or water resources, generally have the potential to impact Aboriginal or treaty rights. For assistance in determining whether your project could affect these rights, refer to the attached "Preliminary Assessment Checklist: First Nation and Métis Community Interest."

If there is an impact to Aboriginal or treaty rights, accommodation may be required to avoid or minimize the adverse impacts. Accommodation is an outcome of consultation and includes any mechanism used to avoid or minimize adverse impacts to Aboriginal or treaty rights and traditional uses. Solutions could include adjustments in the timing or geographic location of the proposed activity; accommodation does not necessarily require the provision of financial compensation.

The proponent must contact the Director, Environmental Approvals Branch if a project may **adversely affect an Aboriginal or treaty right**, or if a **Part II Order or an elevation request is anticipated**; the Ministry will then determine whether the Crown has a duty to consult.

The Director of the Environmental Approvals Branch can be notified either by email with the subject line "Potential Duty to Consult" to EAASIBgen@ontario.ca or by mail or fax at the address provided below:

Email:	EAASIBgen@ontario.ca Subject: Potential Duty to Consult
Fax:	416-314-8452
Address:	Environmental Approvals Branch 12A Flr 2 St Clair Ave W Toronto ON M4V1L5

Delegation of Procedural Aspects of Consultation

Proponents, by virtue of their knowledge and participation in project activities, have an important and direct role in the consultation process to ensure both success and certainty. Where the Crown's duty to consult is triggered, **Ontario is delegating these procedural aspects of this rights-based consultation to you as the proponent of the project.**

Ontario will have an oversight role as the consultation process unfolds but will be relying on the steps undertaken and information you obtain to ensure adequate consultation has taken place. To ensure that First Nation and Métis communities have the ability to assess a project for its potential to impact on an Aboriginal or treaty right, there are certain procedural aspects of consultation that Ontario requires proponents to undertake.

The responsibilities of the proponent for procedural aspects of consultation include:

- Providing notice to the elected leadership of the First Nation and/or Métis communities (e.g., First Nation Chief) as early as possible regarding the project;
- Providing First Nation and/or Métis communities with information about the proposed project including anticipated impacts, information on timelines and your environmental assessment process;
- Following up with First Nation and/or Métis communities to ensure they received project information and that they are aware of the opportunity to express comments and concerns about the project; **if you are unable to make the appropriate contacts (e.g. are unable to contact the Chief) please contact the Ministry of the Environment for further direction.**
- Providing First Nation and/or Métis communities with opportunities to meet with appropriate representatives to discuss the project;
- Gathering information about how the project may adversely impact the Aboriginal and/or Treaty rights (for example, hunting, fishing) or sites of cultural significance (for example, burial grounds, archaeological sites);
- Considering the comments and concerns provided by First Nation and/or Métis communities and providing responses;
- Where appropriate, discussing potential mitigation strategies with First Nation and/or Métis communities;

- Bearing the reasonable costs associated with these procedural aspects of consultation.
- Maintaining a Consultation Record and upon request, providing copies of the Consultation Record to Ontario. The Consultation Record should:
    - summarize the nature of any comments and questions received from First Nation and/or Métis communities
    - describe the response to comments and how concerns were considered
    - include a communications log indicating the dates and times of all communications; and
    - document activities in relation to consultation.

Successful consultation depends, in part, on early engagement by proponents with First Nation and Métis communities. Information shared with communities must be clear, accurate and complete, and in plain language where possible. The consultation process must maintain sufficient flexibility to respond to new information, and we trust you will make all reasonable efforts to build positive relationships with all First Nation and Métis communities contacted.

Preliminary Assessment Checklist: First Nation and Métis Community Interest

Some main concerns of First Nation and Métis communities deal with/address rights for hunting, gathering, trapping, and fishing – these activities generally occur on Crown land or water bodies. As such, projects related to Crown land or water bodies, or changes to them, may be of concern.

Where you have identified that your project may trigger rights-based consultation through the following questions, a pre-consultation meeting with the ministry and proponent will provide an early opportunity to confirm whether Ontario's duty to consult is triggered and to discuss roles and responsibilities in that event.

Please answer the following questions. A "yes" response will indicate a potential impact on Aboriginal or treaty rights.

	YES	NO
1. Are you aware of concerns from First Nation and Métis communities about your project or a similar project in the area? The types of concerns can range from interested inquiries to environmental complaints, and even to land use concerns. You should consider whether the interest represents on-going, acute and/or widespread concern.		
2. Is your project occurring on Crown land, or is it close to a water body, or might it change access to either?		
3. Is the project located in an open or forested area where hunting or trapping could take place?		
4. Does the project involve the clearing of forested land?		

5. Is the project located away from developed, urban areas?		
6. Is your project close to, or adjacent to, an existing reserve? Projects in areas near reserves may be of interest to your First Nation and Métis community neighbours.		
7. Will the project affect First Nations and/or Métis right of access?		
8. Is the area subject to a land claim? Information about land claims filed in Ontario is available from the Ministry of Aboriginal Affairs; information about claims filed with the federal government is available from Aboriginal Affairs and Northern Development Canada.		
9. Does the project have potential to cause cumulative effects at the present time or over a long period of time (e.g. several small expansions of an urban area)?		
10. Does the project have the potential to impact any archaeological sites?		

Nicole Sartor 13027

From: [redacted]
Sent: May 9, 2013 10:47 AM
To: midhurst.classea@ainleygroup.com
Subject: re: consultation Request
Attachments: J.A. Mullan.docx

reply to your consultation request regarding the township of springwater class environmental assessment

Receptionist
Alderville First Nation
Phone: 905-352-2011
Fax: 905-352-3242

ALDERVILLE FIRST NATION

[redacted]

Chief: James R Marsden
Councilor: Pam Crowe
Councilor: Wes Marsden
Councilor: Dave Mowat

May 9, 2013

Ainley and Associates Limited
280 Pretty River Parkway, Cillingwood ON
L9Y 4J5

Att: J.A. Mullan P. Eng.

Re: Township of Springwater Class Environment Assessment Phases 3 and 4 Midhurst water, wastewater and transportation

Dear Joe,

Thank you for your consultation request to Alderville First Nation regarding the Township of springwater class environmental assessment which is being proposed within our Traditional and Treaty Territories. We appreciate the fact that Ainley and Associates recognizes the importance of First Nations Consultation and that your office is conforming to the requirements within the Duty to Consult Process.

As per the Alderville First Nation Consultation Protocol, please forward in a timely manner project information such as; a project information overview, PIC meeting agendas, all required project assessment summaries, addendums, and updates, etc. directly to myself, either, at the mailing address above or electronically via email, at the email address below.

In addition to those, hard copies of the relevant Environmental Site Assessment and Site Selection studies, or draft plan of subdivision, as well as all applicable Reports (Stage 1-3) of Archaeological Assessments conducted for the subject property, would be appreciated via Canada Post or courier service.

In order to assist us in providing you with timely input it would be appreciated if you could provide a summary statement indicating how the project will address the following areas that are of concern to our First Nation within our Traditional and Treaty Territory, such as; possible environmental impact to drinking

water, endangerment to wild game, impact on Aboriginal heritage and cultural values, and to endangered species, lands, savannas etc.

Additionally, we are interested in being made aware of any undertaking in the Alderville First Nation Traditional and Treaty Territories that have potential economic benefits to community members, for example; construction contracts, employment opportunities, hiring of community monitors on archaeological field crews, natural resources benefit sharing, etc.

As well, where opportunities in the process allow, e.g. individual EA undertakings, etc., we will be interested in obtaining funding for outside peer review of the undertakings.

Although we may not always have representation at all stakeholders meetings, it is our wish to be kept apprised throughout all phases of this project. I can be reached at the contact information below.

In good faith and respect,

Dave Simpson

Lands and Resources

Communications Officer

Alderville First Nation

Nicole Sartor 113027

From: Cragg, Beth (MNR) <Beth.Cragg@ontario.ca>
Sent: May 3, 2013 11:44 AM
To: brad.sokach@springwater.ca; midhurst.classea@ainleygroup.com
Cc: Thomas, Scott (MNR)
Subject: Class EA for Midhust Water, Wastewater and Transportation Infrastructure

Hello Mr. Sokach and Mr. Mullan,

Please add the following two names to your distribution list for any correspondence relating to the above Class EA process:

Beth Cragg
Park Planner, Ontario Parks
451 Arrowhead Park Road
Huntsville, ON P1H 2J4
Tel: 705-789-7328
Beth.cragg@ontario.ca

And

Scott Thomas
Superintendent, Bass Lake Provincial Park
2540 Bass Lake, Sideroad E
Orillia, ON L3V 6H2
Tel: 705-326-7054 x223
Scott.thomas@ontario.ca

Thank you,

Beth Cragg
Park Planner, Ontario Parks

Reid Mitchell

From: Joe Mullan <mullan@ainleygroup.com>
Sent: Tuesday, April 30, 2013 8:37 AM
To: Reid Mitchell; Nicole Sartor
Cc: Andrea Potter
Subject: Correspondence pertaining to Class Environmental Assessment - Midhurst Water, Wastewater and Transportation

FYI

Regards,

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

Ainley

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

From: Collingwood [mailto:collingwood@ainleygroup.com]
Sent: April-30-13 8:36 AM
To: Joe Mullan
Subject: FW: Correspondence pertaining to Class Environmental Assessment - Midhurst Water, Wastewater and Transportation

From: Jenny Cooper [mailto:Jenny.Cooper@enbridge.com]
Sent: April 30, 2013 8:10 AM
To: collingwood@ainleygroup.com
Cc: Municipal Notices; Sales Area50
Subject: Re: Correspondence pertaining to Class Environmental Assessment - Midhurst Water, Wastewater and Transportation

Attn: Joe Mullan:

On April 24th 2013 two letters arrived at this office addressed to Ms. Gail Best and Mr. Luke Cechetto both of whom are retired.

In future any correspondence with regards Environmental Assessments should go to municipalnotices@enbridge.com

I will forward these two letters. Please use the email information for future notices.

Thanks, Jenny

Jennifer M. Cooper

Enbridge Gas Distribution
Field Representative, Customer Connections
705-739-5244

Nicole Sartor 113027

From: Gonzalez, Alejandra (MAH) <Alejandra.Gonzalez@ontario.ca>
Sent: April 30, 2013 4:10 PM
To: brad.sokach@springwater.ca; midhurst.classea@ainleygroup.com
Cc: Gonzalez, Alejandra (MAH)
Subject: Class EA - Phase 3 and 4 for Midhurst

Hello,

Our office received a Notice of Study Commencement regarding Township of Springwater's Class Environmental Assessment (Phase 3 & 4) Water, Wastewater and Transportation Infrastructure for Midhurst. As per the Ainley and Associates Limited correspondence dated April 24, 2013, by copy of this email, I am requesting to be placed on the mailing list to receive all future notices relating to this Class Environmental Assessment.

If you require any additional information, do not hesitate to contact me.

Regards,
Alejandra

Alejandra Gonzalez, MCIP, RPP
Planner
Municipal Services Office - Central Ontario
Ministry of Municipal Affairs and Housing
777 Bay Street, 2nd Floor
Toronto, ON M5G 2E5

Telephone: 416-585-7323
Toll Free: 1-800-668-0230
Fax: 416-585-6882

Nicole Sartor 13027

From: Armando Perez <[redacted]>
Sent: April 29, 2013 4:17 PM
To: midhurst.classea@ainleygroup.com
Subject: Midhurst EA notices

Please include my e-mail for further notices.

Armando Pérez
[redacted]

Nicole Sartor

113027

From: Bruce Elliott | Solarc Systems Inc. <[redacted]>
Sent: April 29, 2013 11:48 AM
To: midhurst.classea@ainleygroup.com
Cc: brad.sokach@springwater.ca
Subject: Request to be added to the mailing list to receive all future notices regarding Midhurst Secondary Plan Class EA

Dear Ainley Group - Please add me to the mailing list to receive all future notices regarding Midhurst Secondary Plan Class EA

Bruce Elliott
[redacted]

COMMENT FOR THE PUBLIC RECORD:
Please put the proposed large sewage treatment somewhere else. There are other better sites that are:
- at lower elevation to save pumping costs,
- not directly across from Vespra Hill Golf Course, where instead nice houses on this south facing slope ought to be, so some people can perhaps walk to the golf course instead of driving,
- not in direct view to motorists driving north on Wilson Drive,
- not directly upwind from the many proposed homes towards Barrie.

Note that at 1515 Snow Valley Road, there is a residential detached accessory dwelling at the back of the property, abutting the proposed sewage treatment plant site.

Thank you

Bruce Elliott, P.Eng
President, Solarc Systems Inc.
[redacted]

Joe Mullan

From:	Dorton, Peter (MTO) <Peter.Dorton@ontario.ca>
Sent:	May-22-13 8:29 AM
To:	'brad.sokach@springwater.ca'; 'midhurst.classea@ainleygroup.com'
Cc:	Doyle, Heather (MTO); Allen, Eric (MTO); Garces, Olga (MTO); Aurini, Shawn (MTO); Gulamhussein, Tiffany (MTO); Boone, Jonathan (MTO)
Subject:	Midhurst Secondary Plan, Class EA (Phase 3 and 4) for Water, Wastewater and Transportation, Township of Springwater
Attachments:	20130501115318348.pdf; midhurst.pdf; midhurst sec plan.pdf

Brad / Joe:

In response to the attached Notice of Study Commencement, technical comments previously provided by MTO on the Secondary Plan and associated Infrastructure Class EA remain valid (2008 and 2009 comments attached). Below is a summary of our comments.

- The Township should carry out a detailed transportation study to support the Midhurst Secondary Plan to assess impacts on the provincial highway network, and submit to MTO for review.
- The need, justification, technical feasibility, operational analysis, and EA Study for a new interchange at Highway 400 and Pooles Rd must be presented to MTO for approval.
- Current MTO practice is to avoid close interchange spacing and to avoid partial interchanges. The Highway 400 / Forbes Rd Interchange is approximately 2 km north of the proposed partial interchange at Pooles Road; 2.0 km is considered to be an extreme minimum interchange spacing.
- The proposed interchange on Highway 400 and proposed intersection improvements on Highway 26 are a direct result of the Midhurst Secondary Plan and are not justified by provincial needs. The Township will be financially responsible for implementing / co-ordinating these and any other improvements that are a direct result of the development outlined in the Midhurst Secondary Plan.
- MTO approvals and permits must be obtained for all proposed works within the MTO Right of Way on both Highway 400 and Highway 26, including the proposed interchange and intersection improvements.
- Highway 26 is designated as a Controlled Access Highway. Lands not zoned commercial before May 21, 1981 will not be permitted commercial highway access.
- The City of Barrie and Simcoe County are currently updating their transportation master plans. It would be prudent for the Township of Springwater to ensure that there are no major conflicts between the various master plans as they pertain to Midhurst.

Please continue to provide information and updates to the MTO throughout the Class EA process.

Please feel free to contact me if you have any questions.

Thanks,
Peter Dorton
Project Manager
MTO Central Region
Corridor Management Section
7th Floor, Building D
1201 Wilson Avenue
Downsview, ON M3M 1J8

Ph: 416-235-4280
Fx: 416-235-4267
Email: peter.dorton@ontario.ca

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

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

April 24, 2013

File No. 113027

Mr. Peter Dorton, Project Manager
Ministry of Transportation
Corridor Management Section
1201 Wilson Avenue,Bldg'D' 7th Floor
Downsview, ON
M3M 1J8

Ref: **Township of Springwater**
Class Environmental Assessment Phases 3 and 4
Midhurst Water, Wastewater and Transportation

Dear Sir or Madam:

The Township of Springwater is continuing with the Class Environmental Assessment Planning Process to determine the 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." Phases 3 and 4 of the Class Environmental Assessment planning process will be followed and as such, please find attached the "Notice of Study Commencement" associated with this project.

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

Sincerely,

AINLEY & ASSOCIATES LIMITED

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

S:\113027\Communication Plan\113027 - Notice of Commencement Cover Ltr (Apr 25 2013).docx

cc. B. Sokach - Township of Springwater

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE
NOTICE OF STUDY COMMENCEMENT

The Township of Springwater is continuing with Phase 3 & 4 of the Class Environmental Assessment (EA) Planning Process to determine the 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 aforementioned Master Plan, which is available on the Township's website at www.springwater.ca/msp, concluded that the following infrastructure projects will be required and that the Class EA planning process should be continued to complete Phases 3 and 4 as outlined by the Municipal Class EA Document, October 2000, as amended in 2007 & 2011:

- Construct new water system to service growth within the Midhurst Secondary Plan area including new wells, treatment facility, high lift pump or booster stations, water storage reservoirs and distribution system including transmission mains.
- Construct new sewage system to service growth within the Midhurst Secondary Plan area with the provision for expansion to service the currently developed area in Midhurst, including sanitary collection system, pump stations, treatment plant and outfall to a receiving water body.
- New construction on Craig Road (2 lanes) from Russell Rd. to County Rd. 27
- New construction of Wilson Drive (4 lanes) from Snow Valley Rd. to the City of Barrie limit
- New interchange at Pooles Road and Highway 400

This 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), published by the Municipal Engineer's Association.

The Township has retained Ainley Group to complete and document Phases 3 and 4 of the Class EA planning process and this Notice initiates the beginning of the Study. The Township recognizes that public consultation will be a key component of this Study and therefore, an extensive public consultation process will be arranged including the formation of a Resident Liaison Group, two Open Houses, a Public Information Centre and multiple Newspaper advertisements throughout the completion of the Class EA Study.

In conjunction with the initiation of this Class EA, the first Open House will be from **6:30 pm to 9:00 pm on Wednesday, May 29, 2013 at the Township Administration Centre** and will refresh interested parties of the findings from the approved Phase 1 & 2 Master Plan, dated July 2009.

This Open House will be an informal drop in format during which time the applicable Display Boards from the Phase 1 & 2 Master Plan will be available along with representatives of the Project Team to answer individual question in one-on-one format, relating to the approved Master Plan.

If you would like to be placed on the mailing list to receive all future notices relating to this Class EA please send your contact information to either of the Contacts listed below.

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
Email: brad.sokach@springwater.ca

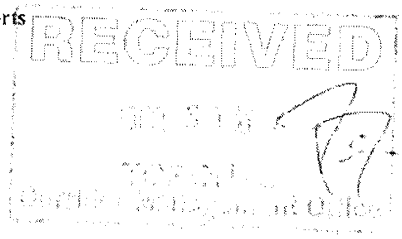
Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, Ontario
L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

This notice issued April 25, 2013.

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

Ministry of Transportation

Ministère des Transports



Ontario

Contract Management and
Operations Branch – Operations Office
Garden City Tower
301 St. Paul Street, 2nd Floor
St. Catharines, Ontario L2R 7R4
Tel: (905) 704-2913
Fax: (905) 704-2848

Date: October 29, 2008

Township of Springwater
Simcoe County Administration Centre
1110 Highway 26
Midhurst, Ontario
L0L 1X0

Dear Madam or Sir:

RE: Draft Official Plan Amendment for the
Township of Springwater
Midhurst Secondary Plan
Toronto Area – Highway 93

Thank you for the circulation of the Midhurst Secondary Plan. As a partner Ministry, MTO can provide technical comments to a municipality under Section 2.2.1 of the One-Window Protocol. The comments provided to you are technical in nature and relate to the provincial highway transportation system and MTO's permit authority under the Public Transportation and Highway Improvement Act (PTHIA) only.

Highway 26 through the study area is designated as a Controlled Access Highway. All lands not zoned commercial prior to date of designation (May 21, 1981) will not be permitted highway access.

Highway improvements may be required as a direct result of the policies stated in the secondary plan. Specifically, the main area targeted for commercial development is the Highway 26 corridor. The municipality should be aware that opportunities for additional commercial development adjacent to Highway 26 may be limited due to the CAH designation noted above.

The secondary plan should make provisions to ensure that developers are aware that any development within the ministry's permit control area requires ministry approval and permits prior to the commencement of construction operations under Sec. 38(2) of the Public Transportation and Highway Improvement Act.

The secondary plan should make provisions to ensure that developers are aware that highway improvements required as a result of growth are the sole financial responsibility of the municipality and /or developer and a signed legal agreement between the municipality and/or developer and the ministry will be required as a condition of approval.

We would suggest that the municipality undertake a detailed transportation study to support this proposed Secondary Plan (such a study, as referenced under Section 7 - Transportation, has yet to be circulated to MTO). The municipality should plan for, coordinate implementation, and (if not already in place) establish mechanisms to fund highway improvements that may be identified in a Secondary Plan transportation study.

Sections 7.2 and 7.3 reference Arterial and Collector Roads, respectively, however, only Provincial Highway and Primary Road are labeled on Schedule A. All provincial highways in Official Plan documents must show Provincial highways as provincial highways not as arterials.

All references in the draft Secondary Plan (including on Schedule A - Land use) to Bayfield Street North should include in brackets Controlled Access Highway 26.

Section 6.3.1(e) indicates that "development lots having substantial frontage onto Bayfield Street North ... may be permitted to have a second access to parking from either Montrose road provided." It is not clear what is meant by this statement, and it should be noted that MTO access policies will govern on controlled access Highway 26

Yours truly,

Heather Doyle
Senior Planner
Corridor Management and
Property Section

c.c County of Simcoe - Planning Department
M.M.A.H – Darryl Lyons
Central Region

Ministry of Transportation

Central Region
Corridor Management Section
7th Floor, Bldg. D
1201 Wilson Avenue
Downsview, ON M3M 1J8
Tel.: 416-235-4280
Fax.: 416-235-4267
Email: peter.dorton@ontario.ca

Ministère des Transports

Région du Centre
Section de gestion des couloirs routiers
7e étage, edifice D
1201, avenue Wilson
Downsview, ON M3M 1J8
Tél.: 416-235-4280
Téléc.: 416-235-4267

Ontario

August 10, 2009

Via Email

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Pkwy
Collingwood, ON L9Y 4J5

Dear Mr. Mullan:

Re: Midhurst Water, Wastewater & Transportation Master Plan
Township of Springwater Class EA, Notice of Study Completion

We have reviewed your July 6, 2009 circulation of the above noted, including the Draft Master Plan Document (Phase 1 and 2 Report), and we offer the following comments:

While suggested in municipal progress meeting minutes from September 2008 (Appendix B) and in discussions we had last year that a meeting with MTO would be arranged to review associated Highway 400 traffic impacts, an MTO meeting on traffic matters has not been proposed to us, and MTO has not been consulted to the best of my knowledge on the preparation of this Master Plan.

We understand that this Master Plan has been prepared in support of the Midhurst Secondary Plan. MTO provided technical comments on the Secondary Plan to Springwater Township in October 2008, however we are not aware of where this plan sits with Simcoe County, or if the Secondary Plan will be circulated to the province for comments. We also are not aware of what, if any, consultations have occurred with other provincial ministries on the Master Plan.

As we are not aware of what will be the approved growth figures for Midhurst, and in light of the above uncertainties, we have not undertaken a detailed review of the Draft Master Plan Document. We do note however that, while there are growth projections and scenarios included in the Master Plan that MTO would not be in a position to confirm, there is a recommendation for both a new and partial interchange at Highway 400 / Pooles Rd. (Section 17.4). The need, justification, technical feasibility, operational analysis (including impact assessment on mailine Hwy 400 and adjacent interchanges) and EA Study for a new interchange would all need to be presented by the Township to MTO for approval.

Section 17.4 also recommends a traffic signal at Highway 26 / Carson Rd., however please note that this intersection is already signalized.

Section 8.3.4 refers to a Barrie By-pass as proposed by MTO. We are not aware of any such MTO proposal.

Sections 18.4, 18.5, 18.6 and 18.7, all discuss various transportation demand strategies, including the transit-supportive nature of the new developments, but there is no indication if municipal transit services are currently provided or need to be developed.

Section 20 references various permits and approvals, but does not include MTO approvals and permits required for any proposed works on MTO ROW, including proposed interchange.

In light of the above noted comments, please advise if you have detailed traffic analysis you would like reviewed by MTO.

Please feel free to contact me if you have any questions.

Sincerely,

Peter Dorton
Project Manager

cc. Brad Sokach, P. Eng., Springwater Director of Public Works
H. Doyle
G. Higgins
B. Stephenson
S. Aurini

Nicole Sartor

From: The Pongo Family <[redacted]>
Sent: May 21, 2013 4:28 PM
To: midhurst.classea@ainleygroup.com
Subject: Midhurst Class EA Notices

Hello,
Please add us to the Midhurst Class EA notice mailing list.
Thanks

Steve and Kim Pongo
[redacted]

13027

Reid Mitchell

From: Mike Neumann <neumann@ainleygroup.com>
Sent: Tuesday, May 14, 2013 7:02 AM
To: Reid Mitchell
Subject: FW:
Attachments: Ainly Group - Town of Wasaga Beach.pdf

BCB - PLEASE CHANGE PAR NEXT MAILINGS RM

fyi

From: Barb Bell [mailto:bell@ainleygroup.com]
Sent: May-13-13 2:19 PM
To: Joe Mullan; Nicole Sartor; Heidi Dimakos; Mike Neumann
Subject: FW:

This came to the Collingwood general email address. Not sure if this email applies to everyone's EA list, I will check your lists. I guess when we get this type of email or letter in the mail we should circulate to all, (to avoid this type of email). As well before we send out Notices we need to perhaps check the internet to make sure we have the correct address or name. This seems to happen mainly with the Agency list, maybe we should have just one list??

From: Collingwood [mailto:collingwood@ainleygroup.com]
Sent: May 13, 2013 2:07 PM
To: Bell
Subject: FW:

From: Tina Durand [mailto[redacted]]
Sent: May 13, 2013 2:03 PM
To: collingwood@ainleygroup.com
Cc: 'constance gros-louis'; 'johanne couture'; 'Melanie Vincent'
Subject:

Good afternoon,

*This is my third email requesting Ainly Group remove the following people from your mailing list.

Please note that neither Luc Lainé nor Mrs Heather Bastien represent the Huron-Wendat Nation. Please remove them from your mailing list and all other lists pertaining to York Region.

All future correspondence should be addressed to Ms. Line Gros-Louis, family Chief in charge of our Ontario file. The mailing address stays the same and you can send all emails to my attention via this address. In addition, Ms. Melanie Vincent is our consultant in charge of communications in this file.

Best regards,

Tina Durand
Secrétaire exécutive jr., secteur politique
Conseil de la Nation huronne-wendat

Chippewas of RAMA
First Nation
[redacted]
A Proud Progressive First Nation Community
OFFICE OF THE CHIEF

May 22, 2013

Ainley and Associates Ltd.
280 Pretty River Parkway
Collingwood, ON L9Y 4J5

Attention: Joe Mullan, P.Eng., President and CEO

Re: Township of Springwater
Class Environmental Assessment Phases 3 and 4
Midhurst Water, Wastewater and Transportation

Dear Mr. Mullan:

As a member of the Williams Treaties First Nations, Rama First Nation acknowledges receipt of your letter of April 24, 2013, which was received on April 30, 2013.

A copy of your letter has been forwarded to Karry Sandy-McKenzie, Barrister & Solicitor, Coordinator for Williams Treaties First Nations for further review and response directly to you. Please direct all future correspondence and inquires, with a copy to Rama First Nation, to Ms. Sandy-McKenzie at 8 Creswick Court, Barrie, ON L4M 2J7 or her email address at [redacted] Her telephone number is [redacted]

We appreciate your taking the time to share this important information with us.

Sincerely,

Chief Sharon Stinson Henry

c: Council, Rama First Nation
Jeff Hewitt, General Counsel
Karry Sandy-McKenzie, Coordinator for Williams Treaties First Nations
Chief Roland Monague, Portfolio Chief for Williams Treaties First Nations

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

① Will hypochlorite be used as disinfectant? If so will it be made on site? And again if so how will the transport of chemicals to the site be done? How will the residual be removed before discharge.

② Will disinfection be done year round? Likely needed given the sensitivity of the Minesing Wetlands

③ Would like copy of Bylaw or other document which changed the Midhurst Study Area into a "settlement area"

Do you wish to be informed of future Notices relating to this project? Please provide written response to all questions.

☑ Yes ☐ No

Please submit this comment sheet by **Wed, June 12, 2013** to:

Mr. Brad Sokach, P. Eng.
Director of Planning and Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Tel: (705) 728-4784 ext. 2034
Fax: (705) 728-6957
Email: brad.sokach@springwater.ca

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

For Official Use.
Do not fill out
Ref # 114

Ref # 114

Name Louise Spek

Mailing Address Box 59, Midhurst, ON, L0L 1X0

Telephone # 705-721-8190 E-mail Address esl@rogers.com

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

1 - Wastewater Collection, Treatment + Disposal : Residents concerned that ~~preferred~~ proposed forcemain cuts through built-up area of Midhurst. Will impact existing residences + environmental features such as Willow Creek. Also proposed location may open up the possibility of future Councils to force residents to hook up to the wastewater collection system at their cost. Should consider alternation route location further north, outside of current built-up area of Midhurst.

Do you wish to be informed of future Notices relating to this project?

☒ Yes ☐ No

Please submit this comment sheet by **Wed, June 12, 2013** to:

Mr. Brad Sokach, P. Eng.
Director of Planning and Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Tel: (705) 728-4784 ext. 2034
Fax: (705) 728-6957
Email: brad.sokach@springwater.ca

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

For Official Use.
Do not fill out
Ref # 115

[redacted]

2.- Preferred Transportation Solution: Map only considers motor vehicles., important to include and integrate alternative transportation opportunities including cycling, walking and transit. as part of the Class EA evaluation and recommendations. Must evaluate bike routes, dedicated lanes, trails, sidewalks + potential transit routes (bus.) as part of the internal + external road network for Midhurst. Consider linking key land uses (schools, ~~instit~~ churches, gov't offices, retail and employment areas.), commuter parking areas, etc.). Also, external linkages to Barrie (Anne/St. Vincent Streets.) and the County trail system.

3.) Preferred Transportation Solution: Map identifies 8 proposed intersections with signals + turning lanes + 3 with future turning lanes. Residents concerned that ~~the~~ these intersections will further intensify ~~the urban form~~ an urban – car focused character which is not consistent with Midhurst's more small town character. Strongly recommend that round-a-bouts be considered + evaluated to replace typical signalized intersection because: are safe + efficiently facilty traffic movement; character more supportive and less intensive, environmentally sensitive (air quality - with less ~~#~~ stop + go), will work during power outages which are common in Midhurst, have been implemented successfully throughout Ontario, Canada, Australia, Europe with a great track record for local, collector + arterial roads. Time for the County of Simcoe to get out of the 1950's mind set.

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

4.) Residents of Midhurst very concered that proposed developpment will generate traffic that will overwhelm the community and change its character to a typical congested urban area. Recommend developing a plan or map which graphically shows the increase in traffic flows on key existing and future roads based on new developpment. This could be phased in (see back pg

Do you wish to be informed of future Notices relating to this project?

☐ Yes ☐ No

Please submit this comment sheet by **Wed, June 12, 2013** to:

Mr. Brad Sokach, P. Eng. Director of Planning and Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Tel: (705) 728-4784 ext. 2034 Fax: (705) 728-6957 Email: brad.sokach@springwater.ca	Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Phone: (705) 445-3451 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com

For Official Use.
Do not fill out
Ref #_____

[redacted]

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

5 year increments. Traffic levels on each road could be shown by corresponding thickness of lines + classified by their level of service (ie good, marginal, poor, ~~to unacceptable~~ unacceptable).
Suggest start a current traffic flows as a base level.

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

PLEASE SEE ENCLOSED PAPER. (THREE PAGES)

Do you wish to be informed of future Notices relating to this project?

☑ Yes ☐ No

Please submit this comment sheet by **Wed, June 12, 2013** to:

Mr. Brad Sokach, P. Eng.
Director of Planning and Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Tel: (705) 728-4784 ext. 2034
Fax: (705) 728-6957
Email: brad.sokach@springwater.ca

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

For Official Use.
Do not fill out
Ref # 116

[redacted]

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

COMMENT SHEET – PLEASE PRINT

Sorry to use this format, but your official form do not accept manipulation.

From the numbers we see in the Environmental Assessment **EA** we can conclude that among the several problems that require special attention, the projected timeline to complete the proposed Secondary Plan OPA # 38 is the most important. On May 14, 2013 during the open meeting at the Township, we were told that 3.85 thousand houses out of the 7.86 thousand (or 10.0 thousand recently mentioned) total would be built during the first phase to be populated within the next 15 year.

If that is correct, what kind of timing is expected for the remaining number of units?

I will try to present the points that concern me the most in such an orderly way to allow you to include or discard them as questions waiting for an answer.

A:- Can you predict the amount of construction work, time line, cost and phasing to fulfil the requirements for:

1. Roads, parking areas, walkways and trails
2. Parks and green areas
3. Storm catching ponds, swales and infiltration trenches
4. Public services (firefighters-police-post office), public transportation
5. Schools
6. Commercial and public use buildings, clinics, pharmacies, etc
7. Drinking water supply, purification method and distribution
8. Waste water sewages, transfer pump stations, equalization tank, WWTP process equipment, sludge treatment and disposal, effluent quality and discharge to superficial water body, odor control and hazardous material handling and storage.

B:- The topography of the projected area, the increase in stormwater run-offs and the high density housing, transform the infiltration process into a big problem to be solved. It is possible

that water from precipitation will not percolate or infiltrate into the ground as it does today which will affect the water table recharge of the superficial aquifers. Have you foreseen this?

C:- As mentioned above, the distribution curve of the number of new settlers and the extended period of time to fulfill the Developer's estimates, draw our attention to the WWTP as a point of major concern.

C1. It is possible that the Wastewater Treatment Plant WWTP will not perform within the high quality parameters as expected since day number one of operation due to the slow growth of sewer influent, starting at almost zero to grow within many years to 122 lps.
To prevent this it will be advisable that the Township ask for a Letter of Compromise from the supplier of a.- basic engineering, b.- detailed engineering and c.- equipment (Degremont in the case of a Bardenpho/Densadeg solution). This will assure the Township that the plant will produce treated water within the quality parameters since the first day of operation (after trials and start up) regardless of flow and load.

C2. It is hard to visualize what is said in {*17.3 Wastewater Servicing, point - 2. The plant can be constructed in stages but must be expandable in the future to accommodate the servicing of existing Midhurst*}. Few processes could attain low Phosphorous and Nitrogen content in the effluent. All of them require constant flow rate, stable retention time and a narrow average organic mass load to achieve the final quality. It is hard to imagine an expandable and flexible plant to accommodate the different flow rates.

C3. To reduce the contaminants to the level required to dump the treated water into the Willow Creek, a full process train (a fully equipped WWTP) will be required.

C4. The proposed modified Bardenpho® Biological System for the WWTP is not a "LEGO bricks building game". There will be no way to reach the effluent quality standards with a fraction of the equipment or with mini process trains to accommodate the wide variable inflow of sewer water (directly related to the amount of people), from the first stage of populated units to the final saturation of the Midhurst settlement project.

C5. In order for the process to work with the small availability of waste water during the first stages of the development, the Developers will have to spend a large amount of extra money and commit for a long term to:

- Start with a small provisional package plant like RBC "Rotary Biological Contactors" (who are fully expandable) with a final ultra filtration polishing unit. The installed capacity could be estimated in 15 lps / 1K units.

- Once the development grows to 3,850 units (after 15 years as per Power Point presentation May 14, 2013) to sustain a 61 lps (liters per second) WWTP plant, which is half the future capacity required by the project. A full process train of 61 lps could be installed (that is 50 % of the 122 lps total average inflow).

- After the new homes sales reaches close to 80 % of the saturation number of 7,858 units, a second full process train of 61 lps has to be installed to cover the project figures.

Final comments:

The simplistic way the whole Secondary Plan OPA # 38 Waste Water Treatment Plant solution has been presented and the lack of serious technical analysis by the Township of Springwater make us believe that in a near future, once the Developers transfer the installation and responsibility to the Township and the formed corporations dissolved, we as taxpayers could be facing environmental fines and problems just because we followed through a plan that should have been accepted as is already imposed.

Running a biological reactor at an extreme reduced load makes the process impossible to control no matter the experience or skills of the operator. The clarifiers will be dealing with dead biomass besides the sludge from the domestic water, Phosphorous and Nitrogen will increase due to the lysis of the endogenous phase and the extended holding time.

The almost inevitable operation difficulties of the WWTP due to chemical treatment and ultra filtration units running on a clogging stream will make impossible to cope with the stringent quality parameters. Operational cost in the order of 5 million CD/yr plus Environmental problems and fines will be discharged to the Township and not to the Developers. This is only an extra stone in this crooked settlement process.

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

I live right at the corner of Snowfalley & Wilson. My properties back onto the gravel pit where you are installing the main Sewage treatment Plant. I have many concerns, on Smell, health issues, light pollution, water pollution of my well, how lack of drinking water from said well, noise from pumping station & main treatment plant.

Do you wish to be informed of future Notices relating to this project?

☒ Yes ☐ No

Please submit this comment sheet by **Wed, June 12, 2013** to:

Mr. Brad Sokach, P. Eng.
Director of Planning and Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Tel: (705) 728-4784 ext. 2034
Fax: (705) 728-6957
Email: brad.sokach@springwater.ca

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

For Official Use.
Do not fill out
Ref # 113

[redacted]

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

If & when said treatment plant is installed I would like ~~berm~~ a berm built around my properties and an easement for a wild life corridor and

With this development. I believe it will impact on my property values and effect my rental property rates as well.

I would like the developers, township & county to keep me informed about all the development regarding the Sewerage Treatment plant. . .

Thank you.

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

It was refreshing to see maps showing the proposed locations of the wells, the water treatment etc. Till I had heard earlier were vacuous. Over all I think the proposed development is to much too fast. The future residents have no access to public transportation so they probably need 2 cars. There are few jobs in the Barrie area and not much hope for more. Springwater has almost no hope of attracting employment opportunities ~~somewhere~~ and how do these folks make a living.

Do you wish to be informed of future Notices relating to this project?

☑ Yes ☐ No

Please submit this comment sheet by **Wed, June 12, 2013** to:

Mr. Brad Sokach, P. Eng. Director of Planning and Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Tel: (705) 728-4784 ext. 2034 Fax: (705) 728-6957 Email: brad.sokach@springwater.ca	Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Phone: (705) 445-3451 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com

For Official Use.
Do not fill out
Ref # 108

[redacted]

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

We do not feel that current residents of Midhurst have had enough of an opportunity to state their concerns/queries in this projected development. Truth be told, we all know that there will be a negative impact on the environment, one which can't be corrected. This should not happen- haven't we learned from our mistakes!

Do you wish to be informed of future Notices relating to this project?

☐ Yes ☐ No

Please submit this comment sheet by **Wed, June 12, 2013** to:

Mr. Brad Sokach, P. Eng. Director of Planning and Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Tel: (705) 728-4784 ext. 2034 Fax: (705) 728-6957 Email: brad.sokach@springwater.ca	Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Phone: (705) 445-3451 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com

For Official Use.
Do not fill out
Ref # 109

[redacted]

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

All I see tonight is a mortal wound to Midhurst and Springwater Township and experts discussing where the band-aids should be placed. Listen to the residents and stop the madness.

Do you wish to be informed of future Notices relating to this project?

☑ Yes ☐ No

Please submit this comment sheet by **Wed, June 12, 2013** to:

Mr. Brad Sokach, P. Eng.
Director of Planning and Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Tel: (705) 728-4784 ext. 2034
Fax: (705) 728-6957
Email: brad.sokach@springwater.ca

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

For Official Use.
Do not fill out
Ref # 110

[redacted]

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

Do you wish to be informed of future Notices relating to this project?

☒ Yes ☐ No

Please submit this comment sheet by **Wed, June 12, 2013** to:

Mr. Brad Sokach, P. Eng.
Director of Planning and Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Tel: (705) 728-4784 ext. 2034
Fax: (705) 728-6957
Email: brad.sokach@springwater.ca

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

For Official Use.
Do not fill out
Ref # 111

[redacted]

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

CRAIGS Rd should be a PRIORITY

PLAN - MORE to subdivision development
at DONARD Rd & FORBES Rd AREA

TRUCK TRAFFIC will go through an area that can't handle it - winding Rd - narrow bridge - major popula

Do you wish to be informed of future Notices relating to this project?

☑ Yes ☐ No

Please submit this comment sheet by **Wed, June 12, 2013** to:

Mr. Brad Sokach, P. Eng.
Director of Planning and Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Tel: (705) 728-4784 ext. 2034
Fax: (705) 728-6957
Email: brad.sokach@springwater.ca

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

For Official Use.
Do not fill out
Ref # 112

[redacted]

Ref # 112

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

I would like to thank Ainley for the information they made available. I have tried to provide input on how we can preserve the core of Midhurst by adopting the principle of traffic restrictions such as "homezones", "crescents", "Wohnerle". The central

Do you wish to be informed of future Notices relating to this project?

☑ Yes ☐ No

Please submit this comment sheet by **Wed, June 12, 2013** to:

Mr. Brad Sokach, P. Eng.
Director of Planning and Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Tel: (705) 728-4784 ext. 2034
Fax: (705) 728-6957
Email: brad.sokach@springwater.ca

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

For Official Use.
Do not fill out
Ref # 107

[redacted]

principles are:
1 Traffic is diverted from the centre to ring roads and bypasses on the periphery (2) In areas of highest density traffic is slowed to walking speed. Pedestrians, cyclists and vehicles have equal rights
(3) Streets leading out from the centre have traffic impediments such as chicanes, narrowed streets (not widened) wide sidewalks, bicycle lanes with, in many cases, physical separation, 30 km speed limits, narrowed entrances to intersections and large physical indications that drivers are entering speed restricted areas.
I declare myself available to provide the research staff and others have already undertaken.

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

The road data for road expansion was collected in 2008, can this be updated to represent current usage and ~~expect~~ include existing changes by year pre and post development?

If we want to save farmland, why aren't the plans to build condos on the 400?

Are the trails and bike lanes going in pre-development? Or only if the new developments go through?

Do you wish to be informed of future Notices relating to this project?

☑ Yes ☐ No

Please submit this comment sheet by **Wed, June 12, 2013** to:

Mr. Brad Sokach, P. Eng.
Director of Planning and Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Tel: (705) 728-4784 ext. 2034
Fax: (705) 728-6957
Email: brad.sokach@springwater.ca

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

For Official Use.
Do not fill out
Ref # 106

[redacted]

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

I keep coming back to the mistake that was made in the first place - that back in 2008 a decision was made to go from a growth of 6,500 for the township to an increase of 23,000 to Midhurst alone, and this without notifying the residents of this drastic change. Consequently, all the work + planning that has →

Do you wish to be informed of future Notices relating to this project?

☑ Yes ☐ No

Please submit this comment sheet by **Wed, June 12, 2013** to:

Mr. Brad Sokach, P. Eng. Director of Planning and Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Tel: (705) 728-4784 ext. 2034 Fax: (705) 728-6957 Email: brad.sokach@springwater.ca	Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Phone: (705) 445-3451 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com

For Official Use.
Do not fill out
Ref # 105

[redacted]

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

since taken place should be all for naught. It is building a structure on a false or weak base.

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

WOULD LIKE TO REQUEST WELL MONITORING ON OUR PRIVATE WELL WHEN YOU DO THE TESTING.

Do you wish to be informed of future Notices relating to this project?

☑ Yes ☐ No

Please submit this comment sheet by **Wed, June 12, 2013** to:

Mr. Brad Sokach, P. Eng.
Director of Planning and Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Tel: (705) 728-4784 ext. 2034
Fax: (705) 728-6957
Email: brad.sokach@springwater.ca

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

For Official Use.
Do not fill out
Ref # 104

[redacted]

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

WHAT CONSIDERATION IS GIVEN TO OUTLET FOR THE WILLOW AT THE BOTTOM. END. NEAR. GEORGE JOHNSTON RD. NO MAINTENCE HAS BEEN DONE ON THE WILLOW SINCE "1980" THE SAND. TRAPS WHERE CLOSED AND THE WILLOW KEEP RISING OVER.

Do you wish to be informed of future Notices relating to this project?

☒ Yes ☐ No

Please submit this comment sheet by **Wed, June 12, 2013** to:

Mr. Brad Sokach, P. Eng.
Director of Planning and Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Tel: (705) 728-4784 ext. 2034
Fax: (705) 728-6957
Email: brad.sokach@springwater.ca

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

For Official Use. Do not fill out
Ref # 103

Name BILL HAIGHT

Ref # 103

Mailing Address 2117 GEORGE JOHNSTON RD MINESING

Telephone # 705 728-1537 E-mail Address HAIGHT45C.LIVE.CA

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

OUTLETS OF TILE DRAINS ARE BEING AFFECTED TO FARM LAND. ARE WE GROWING CROPS OR RAISING DUCK AND GEESE

MY PROPERTY IS ALREADY AFFECTED TO FLOODING WILLOW HAS NO OUTLET AND MORE RUN OFF IS BEING PROPOSED TO THE WILLOW.

"NO OUTLET" FIRST

Bill Hayden

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

Reid Mitchell

From: Joe Mullan <mullan@ainleygroup.com>
Sent: June 14, 2013 9:07 AM
To: Reid Mitchell; Nicole Sartor; Gary Scott
Subject: FW: Midhurst Plan
Attachments: FOMW_MidhurstLetter (3).docx

FYI

Regards,

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

Ainley

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

From: Brad Sokach [mailto:Brad.Sokach@springwater.ca]
Sent: June-14-13 9:00 AM
To: Joe Mullan
Subject: FW: Midhurst Plan

Please add to EA distribution list.

Brad Sokach, P.Eng.
Director of Planning and Public Works
Township of Springwater
2231 Nursery Road
Minesing, ON L0L 1Y2
P. 705.728.4784 ext 2034
F. 705.728.6957

Springwater Customer Service Survey!

Notice of Collection/Use/Disclosure: All information submitted through the Clerk's Office in support of meetings of Council is collected in accordance with the *Municipal Act, 2001*, s.8 and 239(1) and may be used in Council deliberations, and disclosed in full, including email, names and addresses to persons requesting access to records of Council. All information submitted to the municipality is

subject to disclosure under the *Municipal Freedom of Information Act* (MFIPPA). Questions about this notice of collection should be directed to the Clerk's Office 705-728-4784 Ext. 2026.

From: John Daly
Sent: Thursday, June 13, 2013 4:21 PM
To: Brent Spagnol; Brad Sokach; Elaine Cairncross
Subject: FW: Midhurst Plan

I have directed the author to our email list; see attached for your action as deemed appropriate.

From: Jim Anderson [mailto[redacted]
Sent: June-13-13 4:06 PM
To: John Daly
Cc: 'Byron Wesson'
Subject: Midhurst Plan

Hello Mr. Daly

Please accept the attached letter as an expression of our concerns with the Midhurst secondary plan and as a request to be included in any future communications.

Thanks,

Jim Anderson

Co-Chair,

C/O **Nottawasaga Valley Conservation Authority**
8195 8th Line
Utopia, Ontario LOM 1T0

[redacted]

June 5.2013

John Daly, Director of Corporate Services, Clerk

[redacted]

The Friends of Minesing Wetlands would like to express their concerns on the proposed future development of the Midhurst Secondary Plan.
The Friends of Minesing Wetlands is a not for profit organization that strives to protect and preserve the Minesing Wetlands. Our goal is to maintain and enhance the biodiversity and integrity of the Minesing Wetlands for generations to come. Our membership is comprised of residents of the Township of Springwater as well as neighboring townships.
Our concern with the development primarily lies with the waste water discharge and the potential negative impacts that it creates with respect to the Willow Creek and downstream to the Minesing Wetlands.

On behalf of our membership we would like to request that we be included in any future communications related to the Midhurst Secondary Plan and any related future development.
Thank you for your consideration,

Sincerely:

Jim Anderson

Jim Anderson, Co Chair, Friends of Minesing Wetlands

Nicole Sartor

From: Joe Mullan <mullan@ainleygroup.com>
Sent: June 12, 2013 9:06 PM
To: Nicole Sartor
Subject: Fw: Class Environmental Assessment phase 3_4

Regards

J. A. Mullan, P.Eng.
Sent from my BlackBerry 10

From: Brad Sokach
Sent: Wednesday, June 12, 2013 9:04 PM
To: Joe Mullan
Subject: Fwd: Class Environmental Assessment phase 3_4

Sent from my iPhone

Begin forwarded message:

> **From:** "Hallam, Linda" <LHallam@simcoe.com>
> **Date:** 12 June, 2013 6:45:06 PM EDT
> **To:** "brad.sokach@springwater.ca" <brad.sokach@springwater.ca>
> **Subject: Class Environmental Assessment phase 3_4**
>
> Dear Mr. Sokach,
>
> I am requesting that you place me on the mailing list to receive all future notices relating to the water, wastewater & transportation infrastructure notice of study commencement.
>
> Please address it to:
> Dennis and Linda Hallam
> [redacted]
>
> I have to say that I am not amused that as a taxpayer, to Springwater township, and living IN the area directly referred to in this study - that I have to ASK to continue to be informed about this!
>
> Regards,
>
> LINDA HALLAM
> Classified Co-ordinator
> Metroland North Media
> [redacted]

Reid Mitchell

11307

From: Joe Mullan <mullan@ainleygroup.com>
Sent: June 12, 2013 5:00 PM
To: Reid Mitchell CET; Mike Neumann; Gary Scott P.Eng; Nicole Sartor
Subject: Fw: Midhurst Water Wastewater & Transportation Comments
Attachments: Midhurst Comment Sheet June 12 2013.pdf

FYI

Regards

J. A. Mullan, P.Eng.
Sent from my BlackBerry 10

From: Ralph Scheunemann
Sent: Wednesday, June 12, 2013 4:24 PM
To: brad.sokach@springwater.ca; midhurst.classea@ainleygroup.com
Cc: SPatterson@barrie.ca; Bob Kahle
Subject: Midhurst Water Wastewater & Transportation Comments

Brad/Joe - attached please find some comments/concerns, from the City of Barrie, associated with the Midhurst Water Wastewater & Transportation Infrastructure Phase 3 & 4 Class EA.

Have a good day.

Ralph Scheunemann, P.Eng.
Infrastructure Planning Engineer
The City of Barrie
Central Ontario's Premier Waterfront Community

Engineering Department
6th Floor

Mailing Address:
P.O. Box 400, Barrie ON, L4M 4T5
Tel: 705-739-4220 ext. 4782
Fax: 705-739-4247

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

See Over →

Do you wish to be informed of future Notices relating to this project?

☒ Yes ☐ No

Please submit this comment sheet by **Wed, June 12, 2013** to:

Mr. Brad Sokach, P. Eng. Director of Planning and Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Tel: (705) 728-4784 ext. 2034 Fax: (705) 728-6957 Email: brad.sokach@springwater.ca	Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Phone: (705) 445-3451 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com

For Official Use.
Do not fill out
Ref # 117

[redacted]

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

The City of Barrie has the following comments/concerns.

Water:

The north end of Barrie utilizes ground water and there would be concerns that the proposed development plans may affect the quality and quantity of available ground water.

Landuse:

The City owns land around Little Lake and has developed a Park Master Plan. Please advise what impact the proposed development would have on the natural environment in and surrounding Little Lake.

Transportation:

The City is concerned about the potential impact proposed development may have on Barrie roads.

As part of the Midhurst Master Servicing Plan the consultant forwarded information to the City which showed a major Highway bypass around Barrie. What is the current status of this bypass?

Please provide latest estimated future traffic volumes for Wilson Drive/Ferndale, Anne Street, Bayfield & St Vincent, just north of Barrie (please indicate the time horizon).

What is the latest status of the proposed interchange at Pooles Road with respect to the County's Update to the Transportation Master Plan?

The City latest draft of the Multi-Modal Active Transportation Master Plan is available by clicking on the following link.

http://www.barrie.ca/City%20Hall/growth/Pages/DocumentsResources.aspx

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

GOVERNMENT SERVICES BUILDING
AND CULTURAL CENTRE

CURVE LAKE
FIRST NATION

CURVE LAKE, ONTARIO K0L 1R0

PHONE (705) 657-8045
FAX (705) 657-8708

RM

File No
113027

June 4, 2013

Joe Mullan
280 Pretty River Parkway
Collingwood, Ontario K9Y 4J5

Dear Joe Mullan,

RE: Township of Springwater, Class EA Phases 3 and 4, Midhurst Water, Wastewater and Transportation File No. 113027

We would like to acknowledge receipt of your correspondence, which we received on 4/29/2013 regarding the above noted project.

As you may be aware, the area in which your project is proposed is situated within the Traditional Territory of Curve Lake First Nation. Our First Nation's Territory is incorporated within the Williams Treaty Territory and the spirit and intent of treaties is acknowledged in Canada's Constitution Act, 1982. As a result of a specific claim we are involved in, we request that you provide Karry Sandy-Mackenzie, Williams Treaty First Nation Claims Coordinator, 8 Creswick Court, Barrie, ON L4M 2S7, with a copy of your proposal.

Although we have not conducted exhaustive research nor have we the resources to do so, Curve Lake First Nation Council is not currently aware of any issues that would cause concern with respect to our Traditional, Aboriginal and Treaty rights. Providing information however, does not meet the legal requirements of consultation and accommodation. Consultation and accommodation as stated in Supreme Court rulings should include meaningful dialogue with the rights holders (potentially impacted First Nations).

Please note that we have particular concern for the remains of our ancestors. Should excavation unearth bones, remains or other such evidence of a native burial site or any Archaeological findings, we must be notified without delay. In the case of a burial site, Council reminds you of your obligations under the *Cemeteries Act* to notify the nearest First Nation Government or other community of Aboriginal people which is willing to act as a representative and whose members have a close cultural affinity to the interred person. As I am sure you are aware, the regulations further state that the representative is needed before the remains and associated artifacts can be removed. Should such a find occur, we request that you contact our First Nation immediately.

Curve Lake First Nation also has available, trained Archaeological Liaisons who are able to actively participate in the archaeological assessment process as a member of a field crew, the cost of which will be borne by the proponent.

If any new, undisclosed or unforeseen issues should arise, that has potential for anticipated negative environmental impacts or anticipated impacts on our Treaty and Aboriginal rights we require that we be notified regarding these as well.

Thank you for recognizing the importance of information sharing and respecting your duty to consult obligations as determined by the Supreme Court of Canada.

Should you have further questions or if you wish to hire a liaison for a project, please feel free to contact Melissa Dokis at [redacted] or [redacted].

Yours sincerely,

Chief Phyllis Williams
Curve Lake First Nation

C.C. Brad Sokach, Director of Planning and Public Work

Nicole Sartor

From: Joe Mullan <mullan@ainleygroup.com>
Sent: May 30, 2013 11:38 AM
To: Nicole Sartor
Subject: Midhurst Class EA

Hi Nicole:

Can you please add this person to our list.

Regards,

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

Ainley

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

From: Brad Sokach [mailto:Brad.Sokach@springwater.ca]
Sent: May-30-13 9:22 AM
To: Joe Mullan
Cc: Katherine Williams
Subject: FW:

Can you please add the email below to the EA distribution list.

Katherine can you please add the email below to the Midhurst distribution list.

Regards,

Brad Sokach, P.Eng.
Director of Planning and Public Works
Township of Springwater
2231 Nursery Road
Minesing, ON L0L 1Y2
P. 705.728.4784 ext 2034
F. 705.728.6957

Springwater Customer Service Survey!

Notice of Collection/Use/Disclosure: All information submitted through the Clerk's Office in support of meetings of Council is collected in accordance with the *Municipal Act, 2001*, s.8 and 239(1) and may be used in Council deliberations, and disclosed in full, including email, names and addresses to persons requesting access to records of Council. All information submitted to the municipality is subject to disclosure under the *Municipal Freedom of Information Act* (MFIPPA). Questions about this notice of collection should be directed to the Clerk's Office 705-728-4784 Ext. 2026.

From: tere amado [mailto[redacted]]
Sent: Wednesday, May 29, 2013 9:43 PM
To: Brad Sokach
Subject:

Mr. Sockach:
Could you please include me on the list to be informed of the Envirolmental Asessment of the Midhurst Secondary Plan ?
I thought I was on the list but I haven't received any information from Ainley so far.
My email address is : [redacted]
Thank you,
Teresa Amado

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

I don't want to see any adverse impact on Hollow Creek & The Minesing Wetlands

Do you wish to be informed of future Notices relating to this project?

☑ Yes ☐ No

Please submit this comment sheet by **Wed, June 12, 2013** to:

Mr. Brad Sokach, P. Eng.
Director of Planning and Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Tel: (705) 728-4784 ext. 2034
Fax: (705) 728-6957
Email: brad.sokach@springwater.ca

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

For Official Use.
Do not fill out
Ref # 101

[redacted]

TOWNSHIP OF SPRINGWATER
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
FOR THE MIDHURST
WATER, WASTEWATER & TRANSPORTATION INFRASTRUCTURE

Open House No. 1– May 29, 2013
6:30 p.m. to 9:00 p.m. – Township Administration Centre

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

- AS A CURRENT RESIDENT ON SEPTIC IT IS IMPERATIVE THAT WE NOT BE MANDATED TO CONNECT ON NEW SEWAGE TREATMENT FACILITIES BEING IMPLEMENTED FOR THE NEW DEVELOPMENTS.
- IN LIEU OF THIS, IF WE ARE REQUIRED TO CONNECT THEN WE SHOULD NOT BE ENCUMBERED BY ANY COSTS ASSOCIATED WITH THIS.

Do you wish to be informed of future Notices relating to this project?

☒ Yes ☐ No

Please submit this comment sheet by **Wed, June 12, 2013** to:

Mr. Brad Sokach, P. Eng.
Director of Planning and Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Tel: (705) 728-4784 ext. 2034
Fax: (705) 728-6957
Email: brad.sokach@springwater.ca

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

For Official Use.
Do not fill out
Ref # 102

[redacted]

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

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

June 25, 2013

File No. 113027

Doug and Jo Appleby
[redacted]

Ref: Township of Springwater
Midhurst Water, Wastewater & Transportation Infrastructure
Class Environmental Assessment – Phases 3 and 4

Dear Mr. and Mrs.Appleby:

We are responding on behalf of the Township of Springwater to your comments received following the May 29, 2013 Open House, with respect to the Midhurst Class EA.
Your name has been added to the mailing list for this Project.

Well Monitoring
As part of the work plan within Phase 3 & 4 of the Class EA we will be re-evaluating the proposed municipal well sites and we will ensure that if any additional testing is done that your well is monitored.

Thank you for your input into the planning process. We will keep you informed and encourage you to please stay in touch.

Sincerely,

Reid Mitchell, CET

AINLEY & ASSOCIATES LIMITED

cc. Brad Sokach, P. Eng. Director of Planning and Public Works, Township of Springwater
John Easton, P. Eng., Golder Associates

s:\113027\Communication Plan\First Response Letters\Appleby.doc

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

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

June 25, 2013

File No. 113027

Mr. Dave Simpson
Lands and Resources Communications Officer
Alderville First Nation
[redacted]

Ref: Township of Springwater
Midhurst Water, Wastewater & Transportation Infrastructure
Class Environmental Assessment – Phases 3 and 4

Dear Mr. Simpson:

We are responding on behalf of the Township of Springwater to your letter dated May 9, 2013 with respect to the Midhurst Class EA.

Your name has been added to the mailing list for this Project.

Project Information
We wish to advise that all relevant project information will be documented in a final Environmental Study Report (ESR) which will be available for public review during Phase 4.

Site Selection
Site selection studies and archaeological assessments for proposed municipal infrastructure works, will be included in the ESR. The ESR will be available on the Township web site at the end of Phase 4 which is anticipated in the Spring of 2014. We note that the Phase 1 and 2 Report is currently on the Township's web site along with the material that was presented at the May 29, 2013 Open House.

Summary Statement
The ESR will include an Executive Summary which should address your request for a "summary statement".

Economic Benefits
With respect to economic benefits, the public in general will be interested in economic benefits which will include employment opportunities related to construction labour, supply of construction materials and, ultimately, commercial and industrial jobs.

Thank you for your input into the planning process. We will keep you informed and encourage you to please stay in touch.

Sincerely,

Reid Mitchell, CET

AINLEY & ASSOCIATES LIMITED

cc. Brad Sokach, P. Eng. Director of Planning and Public Works, Township of Springwater

s:\113027\Communication Plan\First Response Letters\Alderville.doc

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

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

June 25, 2013

File No. 113027

Mr. Armand Perez
[redacted]

Ref: Township of Springwater
Midhurst Water, Wastewater & Transportation Infrastructure
Class Environmental Assessment – Phases 3 and 4

Dear Mr. Perez:

We are responding on behalf of the Township of Springwater to your email dated April 29, 2013 and to your Comment Sheet, received following the May 29, 2013 Open House, with respect to the Midhurst Class EA.

Your name has been added to the mailing list for this Project.

Timing of Remaining Units
The timing of Phase 1 and the remainder of the developments will be market driven according to the policies of the Secondary Plan.

Timing, Costing and Phasing
A cost/phasing/timing prediction will be developed during Phase 3 of the EA for all identified infrastructure solutions including water supply and distribution, wastewater collection and treatment and transportation (including active transportation items). The other services that you have identified will be assessed as part of the Draft Plan approval.

Stormwater Run-off
Stormwater run-off will be considered as part of the Draft Plan Approval process.

Rate of Development vs Wastewater Treatment Plant Performance
During Phase 3 of the Class EA we will be establishing flow and loadings to the new WWTP over time. We will also be establishing the effluent quality that the plant will be required to meet and we will then establish treatment alternatives available to meet these requirements. Phase 3 will include an evaluation of these treatment alternatives and one aspect of this evaluation will be the ability to handle changing flow and loading from the beginning of the development through to full build out. A preferred treatment process will be identified during the Class EA, however, equipment vendors are not selected until the project design stage after the Class EA is completed. While guarantees and warranties ("letters of compromise") represent one aspect of design, they are by no means the only

way that plant performance is assured. Design quality assurance is an issue that is typically addressed during project implementation.

The Ministry of Environment permit for the plant will likely include strict monitoring for compliance from the first day the plant goes into operation. Clearly the preferred solution will need to take this into account and we are confident that a solution will be found, which meets effluent requirements during initial low flow stages. Typically Municipal WWTPs are very flexible in handling flow and loading changes up to their design capacities.

To meet effluent requirements, we anticipate a full treatment process will be required, as you suggest, and a biological phosphorus removal stage may or may not be included depending on the outcome of the process evaluation. While the initial stages of development may require a different operating strategy, we do not anticipate that the preferred solution will include a completely different treatment process for the initial stages of the development such as the RBC/Ultrafiltration you suggest.

Thank you for your input into the planning process. We will keep you informed and encourage you to please stay in touch.

Sincerely,

Reid Mitchell, CET

AINLEY & ASSOCIATES LIMITED

cc. Brad Sokach, P. Eng. Director of Planning and Public Works, Township of Springwater

s:\113027\Communication Plan\First Response Letters\Armand Perez.doc

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

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

June 25, 2013

File No. 113027

Dana & Brian Bessette
[redacted]

Ref: Township of Springwater
Midhurst Water, Wastewater & Transportation Infrastructure
Class Environmental Assessment – Phases 3 and 4

Dear Mr. and Mrs. Bessette:

We are responding on behalf of the Township of Springwater to your comments received following the May 29, 2013 Open House, with respect to the Midhurst Class EA.

Your name has been added to the mailing list for this Project.

Opportunity for Comment
In response to your comment on opportunity for residents to state their concerns, we note that the Class EA planning process (all Phases) is a Provincially legislated process that provides multiple opportunities for public input. With regard to this particular Class EA we will be exceeding the number of required Public Information Centers in Phases 3 and 4 plus we have formed a Residents Liaison Committee to ensure that the public and interested parties are informed throughout the Class EA. The observations made by the Residents Liaison Committee will be reported to Council for consideration. We also wish to note that the entire Class EA planning process will be documented in a Draft Environmental Study Report which will be available for public review for 30 days at the end of Phase 4.

Negative Impact on Environment
With regard to "...negative impact on the environment.." we wish to advise that the planned infrastructure for the proposed new development in Midhurst will be designed, constructed, operated and maintained to meet current all Provincial legislation.

Thank you for your input into the planning process. We will keep you informed and encourage you to please stay in touch.

Sincerely,

Reid Mitchell, CET

AINLEY & ASSOCIATES LIMITED

cc. Brad Sokach, P. Eng. Director of Planning and Public Works, Township of Springwater
s:\113027\Communication Plan\First Response Letters\Bessette.doc

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

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

June 25, 2013

File No. 113027

Chief Phyllis Williams
Curve Lake First Nation
Curve Lake, ON
K0L 1R0

Ref: Township of Springwater
Midhurst Water, Wastewater & Transportation Infrastructure
Class Environmental Assessment – Phases 3 and 4

Dear Chief Williams:

We are responding on behalf of the Township of Springwater to your letter dated June 4, 2013, received following the May 29, 2013 Open House, with respect to the Midhurst Class EA.

We wish to advise you that Karry Sandy-Mackenzie was included in the mailing list and we will continue to send her all Notices related to this Class EA. The presentation of May 29, 2013 is available on the Township web site.

We will continue to ensure that meaningful dialogue with all rights holders is included in the planning process.

Thank you for your input into the planning process. We will keep you informed and encourage you to please stay in touch.

Sincerely,

Reid Mitchell, CET

AINLEY & ASSOCIATES LIMITED

cc. Brad Sokach, P. Eng. Director of Planning and Public Works, Township of Springwater

s:\113027\Communication Plan\First Response Letters\Curve Lake.doc

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

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

June 25, 2013

File No. 113027

Mr. Jim Anderson Co-Chair
Friends of Minesing Wetlands
C/O Nottawasaga Valley Conservation Authority
[redacted]

Ref: Township of Springwater
Midhurst Water, Wastewater & Transportation Infrastructure
Class Environmental Assessment – Phases 3 and 4

Dear Mr. Anderson:

We are responding on behalf of the Township of Springwater to your letter dated June 5, 2013, received following the May 29, 2013 Open House, with respect to the Midhurst Class EA.

Your name has been added to the mailing list for this Project.

With respect to your concern on the proposed wastewater effluent discharge to Willow Creek, The Ministry of the Environment (MOE) and the NVCA have strict guidelines that will be met. Approvals from those two review agencies will require us to meet those guidelines. In addition, stormwater run-off is also administered by the MOE and the NVCA at the time of Draft Plan Approvals.

Thank you for your input into the planning process. We will keep you informed and encourage you to please stay in touch.

Sincerely,

Reid Mitchell, CET

AINLEY & ASSOCIATES LIMITED

cc. Brad Sokach, P. Eng. Director of Planning and Public Works, Township of Springwater

s:\113027\Communication Plan\First Response Letters\Jim Anderson.doc

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

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

June 25, 2013

File No. 113027

Ms. Kate Harries
[redacted]

Ref: Township of Springwater
Midhurst Water, Wastewater & Transportation Infrastructure
Class Environmental Assessment – Phases 3 and 4

Dear Ms. Harries:

We are responding on behalf of the Township of Springwater to your comments received following the May 29, 2013 Open House, with respect to the Midhurst Class EA.

Your name has been added to the mailing list for this Project.

The potential for adverse impacts on Willow Creek and the Minesing wetlands will be addressed through the approvals process. The Ministry of the Environment and the Nottawasaga Valley Conservation Authority have strict guidelines that will be met with respect to wastewater effluent discharges to Willow Creek. Approvals from those two review agencies will require us to meet those guidelines.

Thank you for your input into the planning process. We will keep you informed and encourage you to please stay in touch.

Sincerely,

Reid Mitchell, CET

AINLEY & ASSOCIATES LIMITED

cc. Brad Sokach, P. Eng. Director of Planning and Public Works, Township of Springwater

s:\113027\Communication Plan\First Response Letters\Kate Harries.doc

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

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

June 25, 2013

File No. 113027

Ms. Megan Arnott
[redacted]

Ref: Township of Springwater
Midhurst Water, Wastewater & Transportation Infrastructure
Class Environmental Assessment – Phases 3 and 4

Dear Ms. Arnott:

We are responding on behalf of the Township of Springwater to your comments received following the May 29, 2013 Open House, with respect to the Midhurst Class EA.

Your name has been added to the mailing list for this Project.

Your comments are noted. We will consider these comments in the selection of the final solution.

Thank you for your input into the planning process. We will keep you informed and encourage you to please stay in touch.

Sincerely,

Reid Mitchell, CET

AINLEY & ASSOCIATES LIMITED

cc. Brad Sokach, P. Eng. Director of Planning and Public Works, Township of Springwater

s:\113027\Communication Plan\First Response Letters\Megan Arnott.doc

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

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

June 25, 2013

File No. 113027

Ms. Chunmei Liu
EA and Planning Coordinator
Technical Support, Central Region
Ministry of the Environment
[redacted]

Ref: Township of Springwater
Midhurst Water, Wastewater & Transportation Infrastructure
Class Environmental Assessment – Phases 3 and 4

Dear Ms. Chunmei Liu:

We are responding on behalf of the Township of Springwater to your letter dated May 13, 2013 with respect to the Midhurst Class EA.

We will address all of the issues raised in your letter throughout the planning process and we will document our responses in the ESR. At this time we request a meeting to discuss the project in general terms including effluent discharge criteria (7Q20 update). We respectfully request that MOE specialists be invited to the meeting. We will contact you in the near future to arrange a meeting.

Thank you for your input into the planning process. We will keep you informed and encourage you to please stay in touch.

Sincerely,

FOR Joe Mullan, P. Eng., President and CEO

AINLEY & ASSOCIATES LIMITED

cc. Brad Sokach, P. Eng. Director of Planning and Public Works, Township of Springwater

s:\113027\Communication Plan\First Response Letters\MOE.doc

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

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

June 25, 2013

File No. 113027

Mr. Ralph Scheunemann, P. Eng
City of Barrie Engineering Dept.
[redacted]

Ref: Township of Springwater
Midhurst Water, Wastewater & Transportation Infrastructure
Class Environmental Assessment – Phases 3 and 4

Dear Mr. Scheunemann:

We are responding on behalf of the Township of Springwater to your comments received following the May 29, 2013 Open House, with respect to the Midhurst Class EA.

Mr. Patterson's name has been added to the mailing list for this Project.

Water
The quantity and quality of available ground water will be addressed by the Project Hydrogeologist. A Report will be included in the ESR.

Landuse
The proposed municipal infrastructure identified by this Class EA will not have any impact on Little Lake. Impacts related to the proposed Development Applications will be assessed as part of the future Draft Plan Approval process.

Transportation
Traffic impacts on Barrie Roads from the proposed development are within acceptable thresholds.

The referenced "major highway bypass" is not shown as part of the Midhurst Preferred Solution. We are not aware that the referenced bypass has any "status" however, as such a bypass is Provincially legislated, and we suggest that you contact the MTO to determine its status.

The traffic volumes for Wilson Drive, Anne Street, Bayfield Street and St. Vincent Street are included in the URS traffic study. We will re-evaluate these figures based on current traffic information. The volumes stated in the URS Study are for full build-out of the development.

It is our understanding that the County is in the process of updating its Transportation Master Plan. There is no change in the status of the proposed interchange from what was proposed in the Phase 1 and 2 Report.

The City's Multi-Modal Active Transportation Plan will be reviewed.

Thank you for your input into the planning process. We will keep you informed and encourage you to please stay in touch.

Sincerely,

Reid Mitchell, CET

AINLEY & ASSOCIATES LIMITED

cc. Brad Sokach, P. Eng. Director of Planning and Public Works, Township of Springwater

s:\113027\Communication Plan\First Response Letters\R Scheunemann.doc

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

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

June 25, 2013

File No. 113027

Ms. Sandy Oakley
[redacted]

Ref: Township of Springwater
Midhurst Water, Wastewater & Transportation Infrastructure
Class Environmental Assessment – Phases 3 and 4

Dear Ms. Oakley:

We are responding on behalf of the Township of Springwater to your comments received following the May 29, 2013 Open House, with respect to the Midhurst Class EA.

Your name has been added to the mailing list for this Project.

Location of WWTP
As part of the work plan within Phase 3 & 4 of the Class EA a full assessment will be undertaken to identify all impacts (positive and negative) of a location for the Wastewater Treatment Plant (WWTP). Detailed site mapping will be studied and your concerns will be addressed as part of the approval process with the Ministry of the Environment. Regardless of the location of the WWTP berming, screening and other mitigative measures will be considered.

We note your concern re: property values and rental rates.

Thank you for your input into the planning process. We will keep you informed and encourage you to please stay in touch.

Sincerely,

Reid Mitchell, CET

AINLEY & ASSOCIATES LIMITED

cc. Brad Sokach, P. Eng. Director of Planning and Public Works, Township of Springwater

s:\113027\Communication Plan\First Response Letters\Sandy Oakley.doc

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

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

June 25, 2013

File No. 113027

Ms. Sarah Kutcher
[redacted]

Ref: Township of Springwater
Midhurst Water, Wastewater & Transportation Infrastructure
Class Environmental Assessment – Phases 3 and 4

Dear Ms. Kutcher:

We are responding on behalf of the Township of Springwater to your comments received following the May 29, 2013 Open House, with respect to the Midhurst Class EA.

Your name has been added to the mailing list for this Project.

Road Data
As part of the work plan within Phase 3 & 4 of the Class EA we will be updating, where necessary, the 2008 traffic data. With regard to the development we will be preparing a staged growth projection that will be based upon the number of units being developed in lieu of "by year" changes.

Condos on Hwy. 400
The proposed development is defined by the approved Secondary Plan. The development plan allows for low, medium and high density residential (including condos).

Trails and Bike Lanes
The need for trails and bike lanes will be analysed as part of the Active Transportation plan being developed. However, we anticipate that it would only be possible to design and construct these trails and lanes when the proposed development proceeds.

Thank you for your input into the planning process. We will keep you informed and encourage you to please stay in touch.

Sincerely,

Reid Mitchell, CET

AINLEY & ASSOCIATES LIMITED

cc. Brad Sokach, P. Eng. Director of Planning and Public Works, Township of Springwater
s:\113027\Communication Plan\First Response Letters\Sarah Kutcher.doc

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

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

June 25, 2013

File No. 113027

Mr. William Arnott
[redacted]

Ref: Township of Springwater
Midhurst Water, Wastewater & Transportation Infrastructure
Class Environmental Assessment – Phases 3 and 4

Dear Mr. Arnott:

We are responding on behalf of the Township of Springwater to your comments received following the May 29, 2013 Open House, with respect to the Midhurst Class EA.

Your name has been added to the mailing list for this Project.

As part of the work plan within Phase 3 & 4 of the Class EA we will be evaluating the timing of Craig Road.

Thank you for your input into the planning process. We will keep you informed and encourage you to please stay in touch.

Sincerely,

Reid Mitchell, CET

AINLEY & ASSOCIATES LIMITED

cc. Brad Sokach, P. Eng. Director of Planning and Public Works, Township of Springwater

s:\113027\Communication Plan\First Response Letters\Armando Perez.doc

Reid Mitchell

From: Reid Mitchell <mitchell@ainleygroup.com>
Sent: June 27, 2013 1:50 PM
To: '[redacted]'
Cc: Joe Mullan (mullan@ainleygroup.com); Brad Sokach (brad.sokach@springwater.ca)
Subject: Midhurst Servicing Class Environmental Assessment - Phases 3 and 4

Mr. and Mrs. Pongo. We are responding on behalf of the Township of Springwater to your email dated May 21, 2013 re: Midhurst Servicing Class EA. As requested, we have added your name to our mailing list.

Thank you for your input into the planning process. We will keep you informed and we encourage you to please stay in touch.

Reid Mitchell, CET

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

Reid Mitchell

From: Reid Mitchell <mitchell@ainleygroup.com>
Sent: June 27, 2013 1:50 PM
To: [redacted]
Cc: Joe Mullan (mullan@ainleygroup.com); Brad Sokach (brad.sokach@springwater.ca)
Subject: Midhurst Servicing Class Environmental Assessment - Phases 3 and 4

Ms. Duran. We are responding on behalf of the Township of Springwater to your email dated May 13, 2013 re: Midhurst Servicing Class EA. As requested, we have revised our mailing list and we will address all future correspondence to Ms. Line Gros-Louis.

Thank you for your input into the planning process. We will keep you informed and we encourage you to please stay in touch.

Reid Mitchell, CET

Ainley

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

Reid Mitchell

From: Reid Mitchell <mitchell@ainleygroup.com>
Sent: June 27, 2013 1:50 PM
To: 'Beth.Cragg@ontario.ca'
Cc: Joe Mullan (mullan@ainleygroup.com); Brad Sokach (brad.sokach@springwater.ca)
Subject: Midhurst Servicing Class Environmental Assessment - Phases 3 and 4

Ms. Cragg. We are responding on behalf of the Township of Springwater to your email dated May 3, 2013 re: Midhurst Servicing Class EA. As requested, we have added two additional MNR contacts to our mailing list – Beth Cragg and Scott Thomas.

Thank you for your input into the planning process. We will keep you informed and we encourage you to please stay in touch.

Reid Mitchell, CET

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

Reid Mitchell

From: Reid Mitchell <mitchell@ainleygroup.com>
Sent: June 27, 2013 1:50 PM
To: 'municipalnotices@enbridge.com'
Cc: Joe Mullan (mullan@ainleygroup.com); Brad Sokach (brad.sokach@springwater.ca)
Subject: Midhurst Servicing Class Environmental Assessment - Phases 3 and 4

Ms. Cooper. We are responding on behalf of the Township of Springwater to your email dated April 30, 2013 re: Midhurst Servicing Class EA. As requested, we have revised the email address in our mailing list.

Thank you for your input into the planning process. We will keep you informed and we encourage you to please stay in touch.

Reid Mitchell, CET

Ainley

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

Reid Mitchell

From: Reid Mitchell <mitchell@ainleygroup.com>
Sent: June 27, 2013 2:44 PM
To: 'Alejandra.Gonzalez@ontario.ca'
Subject: Midhurst Servicing Class Environmental Assessment - Phases 3 and 4

Ms. Gonzalez. We are responding on behalf of the Township of Springwater to your email dated April 29, 2013 re: Midhurst Servicing Class EA. As requested, we have added your name to our mailing list.

Thank you for your input into the planning process. We will keep you informed and we encourage you to please stay in touch.

Reid Mitchell, CET

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

Reid Mitchell

From: Reid Mitchell <mitchell@ainleygroup.com>
Sent: June 27, 2013 1:50 PM
To: 'Alejandra.Gonzalez@ontario.ca'
Cc: Joe Mullan (mullan@ainleygroup.com); Brad Sokach (brad.sokach@springwater.ca)
Subject: Midhurst Servicing Class Environmental Assessment - Phases 3 and 4

Ms. Gonzalez. We are responding on behalf of the Township of Springwater to your email dated April 29, 2013 re: Midhurst Servicing Class EA. As requested, we have added your name to our mailing list.

Thank you for your input into the planning process. We will keep you informed and we encourage you to please stay in touch.

Reid Mitchell, CET

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

Reid Mitchell

From: Reid Mitchell <mitchell@ainleygroup.com>
Sent: June 27, 2013 2:42 PM
To: [redacted]
Subject: Midhurst Servicing Class Environmental Assessment Phases - 3 and 4

Mr. Elliot. We are responding on behalf of the Township of Springwater to your email dated April 29, 2013 re: Midhurst Servicing Class EA. As requested, we have added your name to our mailing list.

With respect to the location of the proposed sewage treatment plant, the Phase 1 & 2 Report identified the general location of the Wastewater Treatment Plant (WWTP) site as being in the northern portions of Development Area 3 (Carson Road Development close to Snow Valley Road). As part of the Phase 3 & 4 work will be looking at an exact location of the WWTP and we will take your points into consideration at that time.

Thank you for your input into the planning process. We will keep you informed and we encourage you to please stay in touch.

Reid Mitchell, CET

Reid Mitchell

From: Reid Mitchell <mitchell@ainleygroup.com>
Sent: June 27, 2013 1:50 PM
To: [redacted]
Cc: Joe Mullan (mullan@ainleygroup.com); Brad Sokach (brad.sokach@springwater.ca)
Subject: Midhurst Servicing Class Environmental Assessment Phases - 3 and 4

Mr. Elliot. We are responding on behalf of the Township of Springwater to your email dated April 29, 2013 re: Midhurst Servicing Class EA. As requested, we have added your name to our mailing list.

With respect to the location of the proposed sewage treatment plant, the Phase 1 & 2 Report identified the general location of the Wastewater Treatment Plant (WWTP) site as being in the northern portions of Development Area 3 (Carson Road Development close to Snow Valley Road). As part of the Phase 3 & 4 work will be looking at an exact location of the WWTP and we will take your points into consideration at that time.

Thank you for your input into the planning process. We will keep you informed and we encourage you to please stay in touch.

Reid Mitchell, CET

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

APPENDIX 'X'

Phase 3 PIC Information and Communication Plan Comments and Responses

The Township of Springwater

Midhurst Water, Wastewater & Transportation

Class Environmental Assessment (Phases 3 & 4)

Notice of Public Information Centre

The Township of Springwater is continuing with Phases 3 & 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, identified the infrastructure that will be required and also concluded that Phases 3 and 4 of the Class EA process needed to be completed.

Phases 3 & 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. In particular Phases 3 & 4 of the Class EA process will focus on the following Water, Wastewater & Transportation infrastructure:

- 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;
- Upgrading of the Forbes Road and Highway 400 Interchange;

Public Information Centre

As part of the Class EA, a Public Information Centre (PIC) has been arranged for **4:30 pm to 9:00 pm on Tuesday, October 18, 2016 at Snow Valley Resort** (2632 Vespra Valley Road). At this PIC detailed material will be available relating to the proposed Water, Wastewater & Transportation Infrastructure. Additionally, the Display Boards will be posted on the Township's website.

This Open House will predominantly be an informal drop in format, during which time the applicable Display Boards will be available. Representatives of the Project Team will be available to answer individual questions in a one-on-one format, relating to Phases 3 & 4 Class EA Process. A formal presentation will be made between **7:00 pm to 8:00 pm** followed by a brief 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.

Feedback

Public consultation is vital and key to the success of this study and the Township wants to ensure that anyone interested in this study has the opportunity to get involved and provide input. Therefore, you are encouraged to either attend the PIC or review the materials that will be available on-line and provide your comments to the project team so that they may be included in the study. Public input and comments on the project will be received until December 1, 2016 and can be sent to either of the Contacts listed below.

Mr. Mark Archer, CET
Director of Public Works
Township of Springwater
2231 Nursery Road,
Minesing ON, L0L 1Y2
Fax: (705) 728-6957
Email: midhurst.classea@springwater.ca

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

Subject to comments received as a result of this Notice, the Township plans to proceed with the completion of the Class EA for this project and an Environmental Study Report will be prepared and placed on the public record for a minimum of 30 days.

This notice issued September 19, 2016.

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

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

September 19, 2016 File No. 113027

Ref: **Township of Springwater**
Class Environmental Assessment (Phase 3)
Midhurst Water, Wastewater and Transportation
Notice of Public Information Centre (PIC)

Dear Sir or Madam:

Further to Notice of Study Commencement issued April 25, 2013, the Township of Springwater is proceeding with a Class Environmental Assessment planning process to identify and assess servicing options (water, wastewater and transportation) for the Midhurst Secondary Plan.

A Public Information Centre (PIC) will be held on Tuesday, October 18, 2016. Please find enclosed a copy of the Notice of PIC, which will be advertised in the local newspaper.

Should you have any questions or comments in reviewing the Notice, please do not hesitate to contact the undersigned.

Sincerely,

AINLEY & ASSOCIATES LIMITED

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

Encl.
c.c Mark Archer, CET, Director of Public Works, Township of Springwater

S:\113027\Communication Plan\2016 09 19 - Notice of PIC (letter).docx

Title	First Name	Last Name	Title1	Agency	Department	Address 1	Address 2	City, Prov.	Postal Code
Mr.	Rob	Dobos	Manager, Environmental Assessment Sectio	Environment Canada		867 Lakeshore Road	Box 5050	Burlington, ON	L7R 4A6
Ms.	Cindy	Hood	District Manager	Ministry of Environment & Climate Change	Barrie District Office	54 Cedar Pointe Drive	Unit 1201	Barrie, ON	L4N 5R7
Ms.	Chunmei	Liu	Environmental Resource Planner & EA Coo	Ministry of Environment & Climate Change	Technical Support Section	5775 Yonge Street	8th Floor	Toronto, ON	M2M 4J1
Mr.	Peter	Makule	Regional Director (Acting)	Ministry of Transportation	Central Region	159 Sir William Hearst Ave.	Bldg. D	Toronto, ON	M3M 0B7
Mr.	Peter	Dorton	Senior Project Manager	Ministry of Transportation	Corridor Management Section	159 Sir William Hearst Ave.	Bldg. D	Toronto, ON	M3M 0B7
Mr.	Graham	Findlay	Area Biologist	Ministry of Natural Resources & Forestry	District Office	2284 Nursery Road		Midhurst, ON	L0L 1X0
Ms.	Amanda	McLachlan	District Planner	Ministry of Natural Resources & Forestry		2284 Nursery Road		Midhurst, ON	L0L 1X0
Ms.	Beth	Cragg	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
Ms.	Cheryl	Moore	Assistant Park Superintendent	Bass Lake Provincial Park		2540 Bass Lake, Sideroad E	Box 2178	Orillia, ON	L3V 6H2
Mr.	Arthur	Churchyard	Rural Planner	Ministry of Agriculture Food & Rural Affairs	Economic Dev. Div. Rural Comm	1 Stone Rd. W.		Guelph ON	N1G 4Y2
			Rural Planner	Ministry of Agriculture Food & Rural Affairs		R.R.#3, 95 Dundas St.		Brighton, ON	K0K 1H0
Mr.	Mark	Christie	Manager, Communicty & Development Proje	Ministry of Municipal Affairs & Housing	Municipal Services Office - Cen	777 Bay Street	13th Floor	Toronto, ON	M5G 2E5
Ms.	Alejandra	Gonzalez	Planner	Ministry of Municipal Affairs & Housing	Central Ontario	777 Bay Street	13th Floor	Toronto, ON	M5G 2E5
Ms.	Jessica	Dionne	Regional Advisor - Acting	Ministry of Tourism, Culture & Sport	Simcoe Regional Office	2284 Nursery Road		Midhurst, ON	L0L 1X0
Mr.	Sam	Bleiweiss	Manager, Central Region	Ministry of Tourism, Culture & Sport		180 Dundas Street, West	Suite 502	Toronto, ON	M7A 2R9
Mr.	David	Aldersey	Senior Business Advisor	Ministry of Economy Dev., Employment & Infrastructrure		2284 Nursery Road		Midhurst, ON	L0L 1X0
Mr.	Stephen	Trafford	Deployment & Planning Supervisor	Simcoe County Paramedic Services	Administration Centre	1110 Highway #26		Midhurst, ON	L0L 1X0
Mr.	Charles	Burgess	Senior Planner	Lake Simcoe Region Conservation Authority		120 Bayview Parkway	Box 282	Newmarket, ON	L3Y 4X1
Mr.	Chris	Hibbert	Director, Planning Services	Nottawasaga Valley Conservation Authority		8195 Concession 8		Utopia, ON	L0M 1T0
Ms.	Gayle	Wood	CAO	Nottawasaga Valley Conservation Authority		8195 Concession 8		Utopia, ON	L0M 1T0
Mr.	Glenn	Switzer	Director of Engineering and Technical Servi	Nottawasaga Valley Conservation Authority		8195 Concession 8		Utopia, ON	L0M 1T0
Const.	Mark	Kinney	Community Policing Officer	Ontario Provincial Police	Huronia District	1000 River Road West		Wasaga Beach ON	L9Z 2K8
Mr.	Alex	Nuttall	Member of Parliament Barrie, Springwater &	Barrie Constituency Office		48 Alliance Blvd.	Unit 104	Barrie, ON	L4M 4K3
Ms.	Ann	Hoggarth	Member of Parliament Barrie, Springwater &	Barrie Constituency Office		20 Bell Farm Road	Unit 14	Barrie, ON	L4M 6E4
Mr.	Ralph	Scheuneman	Senior Infrastructure Engineer	City of Barrie		70 Collier Street		Barrie, ON	L4M 4T5
Mr.	Bala	Araniyasundara	Program Coordinator, Growth Development	City of Barrie		70 Collier Street		Barrie, ON	L4M 4T5
Mr.	Stew	Patterson		City of Barrie	spatterson@barrie.ca	70 Collier Street		Barrie, ON	L4M 4T5
Mr.	Mark	Aitken	CAO	County of Simcoe	Administration Centre	1110 Highway #26		Midhurst, ON	L0L 1X0
Ms.	Debbie	Korolnek	General Manager of Engineering	County of Simcoe	Administration Centre	1110 Highway #26		Midhurst, ON	L0L 1X0
Mr.	David	Parks	Director of Planning, Development and Tour	County of Simcoe	Administration Centre	1110 Highway #26		Midhurst, ON	L0L 1X0
Mr.	Christian	Meile	Director, Construction, Transportation Maint	County of Simcoe	Administration Centre	1110 Highway #26		Midhurst, ON	L0L 1X0
Ms.	Julie	Scruton	Manager, Transportation Construction	County of Simcoe	Administration Centre	1110 Highway #26		Midhurst, ON	L0L 1X0
Mr.	Allan	Greenwood	Director of Corporate Communications	County of Simcoe	Administration Centre	1110 Highway #26		Midhurst, ON	L0L 1X0
Mr.	Robin	Dunn	CAO	Township of Oro-Medonte		148 Line 7 South		Oro, ON	L0L 2X0
Mr.	George	Vadeboncoeur	CAO	Town of Wasaga Beach		30 Lewis Street		Wasaga Beach, ON	L9Z 1A1
Mr.	Steven	Sage	CAO	Township of Clearview		217 Gideon Street	Box 200	Stayner, ON	L0M 1S0
Mr.	Doug	Luker	CAO/Clerk	Township of Tiny		130 Balm Beach Road W.		Perkinsfield, ON	L0L 2J0
Mr.	Robert	Lamb	CAO	Township of Tay		450 Park St.	Box 100	Victoria Harbour, ON	L0K 2A0
Mr.	Greg	Murphy	CAO	Township of Essa		5786 County Road 12		Utopia, ON	L0M 1T0
Ms.	Holly	Spacek	Planning Officer	Simcoe County District School Board	Education Centre	1170 Highway #26		Midhurst, ON	L0L 1X0
Ms.	Kristin	Dibble-Pechko	Senior Planner	Simcoe Muskoka Catholic District School Board		46 Alliance Blvd.		Barrie, ON	L4M 5K3
Ms.	Bonnie	Branch	Transportation Coordinator	Simcoe County Student Transportation Consortium		64 Cedar Pointe Drive	Unit 1043	Barrie, ON	L4N 5R7
Ms.	Morgan	Levison	Public Health Promotor	Simcoe County District Health Unit		15 Sperling Drive		Barrie, ON	L4M 6K9
Mr.	Andrew	Zuk		Bell Canada		136 Bayfield Street	Floor 2	Barrie, ON	L4M 3B1
Mr.	Arnel	Mangalino	Distribution Asset Management	Enbridge Gas Distribution Inc.	4th Floor - Post A2-VPC	500 Consumers Rd.		North York ON	M2J 1P8
				Enbridge Gas	municipalnotices@enbridge.com				
Mr.	Graham	McPherson	System Planner	Rogers Cable	graham.mcpherson@rci.rogers.com				
Ms.	Heather	McTeer		Hydro One		420 Welham Rd.		Barrie, ON	L4N 8Z2
Mr.	Mile	Sullivan	Senior Network Management Officer	Hydro One Networks Inc.	michael.sullivan@hydroone.com				416-345-5686
Mr.	Richard	Shannon		Hydro One Networks Inc.	richard.shannon@hydroone.com				
Ms.	Leah	Emms	Member Service Representative for Peel, Si	Ontario Federation of Agriculture	Administration Centre	1110 Highway #26		Midhurst, ON	L0L 1X0
Mr.	Jeffery	Betker	Senior Policy Analyst	Office of the Federal Interlocutor for Metis and non-status Indians		66 Slater Street	1225	Ottawa, ON	K1A 0H4
Mr.	Richard	Saunders	Director	Native Affairs Secretariat	Corporate Policy and Managem	720 Bay Street	4th Floor	Toronto On	M5G 2K1
				Chiefs of Ontario	Administrative Office	111 Peter Street	Suite 804	Toronto On	M5V 2H1
Mr.	David	Dusome	President	Georgian Bay Metis Council		355 Cranson Crescent	Box 4	Midland ON	L4R 4K6
Mr.	Alden	Barty	Consultantion Assessment Coordinator	Georgian Bay Metis Council			Box 4	Midland ON	L4R 4K6
Mr.	Aly	Alibhai	Director of Lane Resources & Consultantion	Metis Nation of Ontario	Lands, Resources and Consulta	500 Old St. Patrick St.	Unit D	Ottawa, ON	K1N 9G4
				Metis Consultation Unit	Metis Nation of Ontario - Head (	500 Old St. Patrick St.	Unit D	Ottawa, ON	K1N 9G4

Ms.	Lynette	Davis	Director of Operations		Metis National Council	340 MacLaren Street		Ottawa, ON	K2P 0M6	
Ms.	Karry	Sandy-McKenz	Coordinator	Williams Treaties First Nations	k.a.sandy-mekenzie@rogers.co	8 Creswick Court		Barrie, ON	L4M 2J7	
Mr.	Louis	Lesage	Director du Bureau du Nionwentsio	Nation Huronne - Wendat Council		255, Place Michel Laveau		Wendake, QC	G0A 4V0	
Ms.	Melanie	Vincent	Project Management	Nation Huronne - Wendat Council	melanievincent21@yahoo.ca	255, Place Michel Laveau		Wendake, QC	G0A 4V0	
			Consultation and Accommodation Unit	Aboriginal Affairs and Northern Development Canada		UCA-CAU@aadnc-aandc.gc.ca				
Chief	Christopher	Plain		Aamjiwnaang First Nation		978 Tashmoo Avenue		Sarnia, ON	N7T 7H5	
Chief	James Robert	Marsden		Alderville First Nation			P.O. Box 46	Roseneath, ON	K0K 2X0	
	Dave	Simpson		Alderville First Nation		11696 Second Line	P.O. Box 46	Roseneath, ON	K0K 2X0	
Chief	Patsy	Corbiere		Aundeck-Omni_Kaning		R.R. #1, COMP 21		Little Current, ON	P0P 1K0	
Chief	Roland	Monague		Beausoleil First Nation		GENERAL DELIVERY		CEDAR POINT, ON	L0K 1C0	
Chief	Donna	Big Canoe		Chippewas of Georgina Island		R.R. #2	P.O. Box 13	Sutton West, ON	L0E 1R0	
Chief	Rodney	Noganosh		Chippewas of Rama First Nation		5884 Rama Road	Suite 200	Rama, ON	L3V 6H6	
Chief	Thomas M.	Bressette		Chippewas of Kettle and Stony Point		6247 Indian Lane		Kettle & Stony Point Firs	N0N 1J1	
Chief	Gregory	Nadjiwon		Chippewas of Nawash First Nation		R.R. #5		Wiarton, ON	N0H 2T0	
Chief	Leslee	Whiteye		Chippewas of the Thames First Nation		R.R. #1		Muncey, ON	N0L 1Y0	
Chief	Phyllis	Williams		Curve Lake First Nation		GENERAL DELIVERY		Curve Lake, ON	K0L 1R0	
Chief	Gregory	Cowie		Hiawatha First Nation		R.R. #2		Keene, ON	K0L 2G0	
Chief	Linda	Debassige		M'Chigeeng First Nation		53 HWY 557	P.O. Box 333	M'Chigeeng, ON	P0P 1G0	
Chief	Kelly	Larocca		Mississauga of Scugog Island		22521 Island Road		Port Perry, ON	L9L 1B6	
Chief	Ralph	Laforme		Mississauga of New Credit		R.R. #6	2789 Mississa	Hagersville, ON	N0A 1H0	letter returned address incomplete, I updated and resent Sept.26
Chief	Abraham	Benedict		Mohawks of Akwesasne			P.O. Box 579	Cornwall, ON	K6H 5T3	
Chief	R. Donald	Maracle		Mohawks of the Bay of Quinte		R.R. #1		Deseronto, ON	K0K 1X0	
Chief	Barron	King		Moose Deer Point First Nation			P.O. Box 119	MacTier, ON	P0C 1H0	
Chief	Vernon	Roote		Saugeen First Nation		R.R. #1		Southhampton, ON	N0H 2L0	
Chief	Andrew	Aguonia		Sheguiandah First Nation			P.O. Box 101	Sheguiandah, ON	P0P 1W0	
Chief	Gail Ava	Hill		Six Nations of the Grand River			P.O. Box 500	Ohsweken, ON	N0A 1M0	
Chief	Phillip	Franks		Wahta Mohawk			P.O. Box 260	Bala, ON	P0C 1A0	
Chief	Dan	Miskokomon		Walpole First Nation		R.R. #3		Wallaceburg, ON	N8A 4K9	
Chief	Warren	Tabobondung		Wasauksing First Nation			P.O. Box 250	Parry Sound, ON	P2A 2X4	
Chief	Irene	Kells		Zhiibaahaasing First Nation		36 Sagon		Zhiibaahaasing, ON	P0P 1X0	
Mr.	Landon	Morris	District Manager, North Central Ontario	Purolator		330 Bayview Drive	Box 1732	Barrie, ON	L4N 8X9	name & address updated Sept. 28, 2016 by Purolator
Attn:	Francine	Germain	Office Manager	Canada Post		North Coblat Post Office	General Del.	North Cobalt, ON	P0J 1R0	
Attn.	Office Manager			UPS Canada		1022 Champlain Avenue		Burlington, ON	L7L 0C2	
Attn.	Doug	Tam	Office Manager	Federal Express Canada Ltd.		5985 Explorer Drive		Mississauga, ON	L4W 5K6	
Messrs	Peter J. Smith	& Ryan Guetter		Weston Consulting Group Inc.		201 Millway Avenue	Unit 19	Vaughan, ON	L4K 5K8	
	Celeste	Phillips		Celeste Phillips Planning Inc.		85 Bayfield Street,	Suite 300	Barrie, Ontario	L4M 3A7	
Mr.	Richard	Eagle		Ontario Clean Water Agency	reagle@ocwa.ca					
Ms.	Michelle	Cutts		Rudy & Associates Ltd.		6 Frederick Street	Box 834	Orillia, ON	L3V 6K8	
Ms.	Nicola	Mitchinson		Mitchinson Planning & Development Consultants		57 Highland Avenue		Barrie, ON	L4M 1N2	
	Vimal	Patel		Geranium	vimalp@geraniumcorporation.com					
Mr.	David D.	Stewart		John G. Williams Limited, Architect		40 Vogell Road	Unit 46	Richmond Hill, ON	L4B 3N6	
Mr.	Darren	Vella		Innovative Planning Solutions		89 Collier Street	Suite 101	Barrie, ON	L4M 1H2	
Mr.	Gerry	Lynch		Cole Engineering Group Ltd		70 Valleywood Drive,		Markham, ON	L3R 4T5	
Ms.	Teresa	Amado				53 Eder Trail		Minesing, ON	L0L 1Y3	teramado@gmail.com
Mr.	Jim	Anderson	Friends of Minesing Wetlands	c/o Nottawasaga Valley Conservation Authority		8195 Concession 8		Utopia, ON	L0M 1T0	
Mr. Doug	& Ms. Jo	Appleby				Box 139, 26 Park Trail		Midhurst, ON	L0L 1X0	4applesbys@rogers.com
Ms.	Megan	Arnott				85 Doran Road		Midhurst, ON	L0L 1X0	meganarnott@hotmail.com
Mr.	William	Arnott				85 Doran Road		Midhurst, ON	L0L 1X0	
Mr. Bill	& Ms. Terri	Arnott				85 Doran Road		Midhurst, ON	L0L 1X0	
Ms.	Katy	Austin				21 Stone Street		Elmvale, ON	L0L 1P0	katy.austin@sympatico.ca
Mr. Bruce	& Ms. Wendy	Beard				P.O. Box 221		Midhurst, ON	L0L 1X0	
	Rick & Michele	Bownan				2433 Russell Road,		Midhurst, ON	L0L 1X0	mbowman@scdsb.on.ca
Mr. Brian	& Ms. Dana	Bessette				16 Crystalwood Lane		Midhurst, ON	L0L 1X0	bdcbessette@yahoo.ca
Mr.	John R	Boos				29 Pooles Road		Midhurst, ON	L0L 1X0	
Ms.	Bette	Bull				6 Whattie Road		Midhurst, ON	L0L 1X0	
Mr.	Bob	Burns				76 Finlay Mill Road		Midhurst, ON	L0L 1X0	bobleoburns@hotmail.com
Ms.	Cathy	Byers				#1003 - 33 Ellen Street		Barrie, ON	L4N 6E9	catherinebyers@hotmail.com
Mr.	Bob	Byers				126 Hamner Street, East		Barrie, ON	L4M 6V9	
Mr.	Steven A.	Cathcart				14 Wattie Road		Midhurst, ON	L0L 1X0	
Mr.	Steven A.	Chesney				23 Pooles Road		Midhurst, ON	L0L 1X0	steven_chesney@rogers.com
Ms.	Nancy	Chong				31 Willow Landing Road		Midhurst, ON	L0L 1X1	eric-nancy@sympatico.ca

Mr.	Peter	Clarke				44 Willow Landing Road		Midhurst, ON	L0L 1X1	
Mr. Frank	& Ms. Nadia	DeAmicis				17 DeAmicis Crescent		Midhurst, ON	L0L 1X0	nadiasellsbarrie@rogers.com
Ms.	Darlene	Duiker				308 Miller Drive		Barrie, ON	L4N 9X7	
Mr. John	& Ms. Arlene	Edgar				5 McCartney Gate		Midhurst, ON	L0L 1X0	arlene705@rogers.com
Mr.	Bruce	Elliot		1515 SVR Inc.		1515 Snow Valley Road		Minesing, ON	L0L 1Y3	
	Chris	Evans				10 Coles Court, SS33		Midhurst, ON	L0L 1X0	chrisgevans55@gmail.com
Mr.	Paul	Fleming				57 Belmont Crescent		Midhurst, ON	L0L 1X0	pfleming@rogers.com
Mr.	Paul	Frankcom				114 Doran Road		Midhurst, ON	L0L 1X0	
	Regan	Frankcom				114A Doran Road		Midhurst, ON	L0L 1X0	
Mr.	Bill	French				3612 Grenfel Road, RR2		Barrie, ON	L4M 4S4	bill.french@hotmail.com
Mr.	Bill	Haight				2117 George Johnston Rd.		Minesing, ON	L0L 1Y0	haight45@live.ca
Mr. Denni	& Ms. Linda	Hallam				51 Belmont Cres		Midhurst, ON	L0L 1X0	lhallam@simcoe.com
Ms.	Kate	Harries				1186 Flos Road 16E		Elmvale, ON	L0L 1P0	kateharries@gmail.com
Mr.	W.	Harris				14 Cardinal Crescent		Midhurst, ON	L0L 1X1	
Mr.	David	Hutton				2296 Gill Road		Midhurst, ON	L0L 1X0	dhutton@rogers.com
Mr.	Mike	Jacobs				9 Glenview Avenue		Elmvale, ON	L0L 1P0	
Mr. Ralph	& Ms. Kathleen	Knegt				1947 Russell Road		Midhurst, ON	L0L 1X0	
Ms.	Sarah	Kutcher				10 Bridle Trail		Midhurst, ON	L0L 1X0	kutcherbw@golden.net
Mr.Joe	& Ms. Vivian	Lafranier				20 Mills Circle		Midhurst, ON	L0L 1X0	jlafranier@rogers.com
Mr.	Lyle	Littlejohn				16 Willow Bay Drive		Midhurst, ON	L9X 0R2	lylemarg@sympatico.ca
	W.E.	Mallory				2006 Penetanguishene Rd.	Box 100	Barrie, ON	L4M 4S9	
	Maher	Michael Hanna				19 Corley Avenue		Toronto, ON	M4E 1T8	
Mr.	Kevin	Newman				3 Silverwood Crescent		Midhurst, ON	L0L 1X0	K.Newman@rogers.com
Mr.	Bill	Nieuwland				73 Finlay Mill Road		Midhurst, ON	L0L 1X0	bnieu0403@rogers.com
Ms.	Ruth	Noland-Flores			ruth.noland@rogers.com	19 Letitia Street		Barrie, ON	L4N 1N7	
	Sandy	Oakley				2611 Wilson Drive		Minesing, ON	L0L 1Y3	s.oakley@live.com
	K. E.	O'Connor				3024 Old Second South	R.R.#1	Midhurst, ON	L0M 1X0	
Mr. Ken	& Ms. Ruth	Parkes				3 Willow Bay Drive		Midhurst, ON	L0L 1X0	parkes@rogers.com
Mr & Mrs	Steve & Kim	Pongo				70 Doran Road		Midhurst, ON	L0L 1X0	
Mr.	Dave	Shepherd				13 Valley View Drive, RR1		Minesing, ON	L0L 1Y0	daveshepherd@sympatic.ca
Ms.	Constance	Spek				Box 59		Midhurst, ON	L0L 1X0	esi0@rogers.com
Ms.	Ann	Spence				32 Finlay Mill Road		Midhurst, ON	L0L 1X0	ann.spence@sympatico.ca
Mr.	David	Strachan				47 Finlay Mill Road		Midhurst, ON	L0L 1X0	davidstrachan@yahoo.com
Mr.	Bruce	Thompson				1732 Partridge Road	R.R.#1	Midhurst, ON	L0L 1X0	
	Christine	Toth				42 Park Trail		Midhurst, ON	L0L 1X1	
Mr.	Robert	Wright				2064 Russell Rd.	R.R.#1	Midhurst, ON	L0L 1X0	
Mr.	Tiziano	Zaghi				2 Forest Hill Drive		Midhurst, ON	L0L 1X0	tzaghi@rogers.com
				The Brereton Field Naturalists' Club of Barrie		Box 1084		Barrie, ON	L4M 5E1	
	Barry H.	Peyton	Provista Group Inc.			3344 Green River Drive	R.R.#1	Washago, ON	L0K 2B0	
Ms.	Barb	Kutcher			kutcherbw@golden.net					
Mr.	Gary	Greenall			gmgreenall@rogers.com					
Ms.	Helen	Hutton			h.hutton@rogers.com					
Mr.	Stan	Kirsch			skirsch@bellnet.ca					
Ms.	Anne Learn	Sharpe			sharpe.family@sympatico.ca					
Ms.	Jean	Oostrom			coryjean@rogers.com					
Mr.	Armando	Pérez			kaitoo_mx@yahoo.com					kaitoo_mx@yahoo.com
Mr		Tkachenko			amtkachenko@aol.com					
	George	Todd			gwtodd@rogers.com					
Mr.	Andy	Duncan			aduncan@apotex.com					aduncan@apotex.com

address update by owner

WELCOME

Public Information Centre

Midhurst – Water, Wastewater & Transportation

Township of Springwater

Class Environmental Assessment Phase 3 & 4

Ainley GROUP CONSULTING ENGINEERS PLANNERS

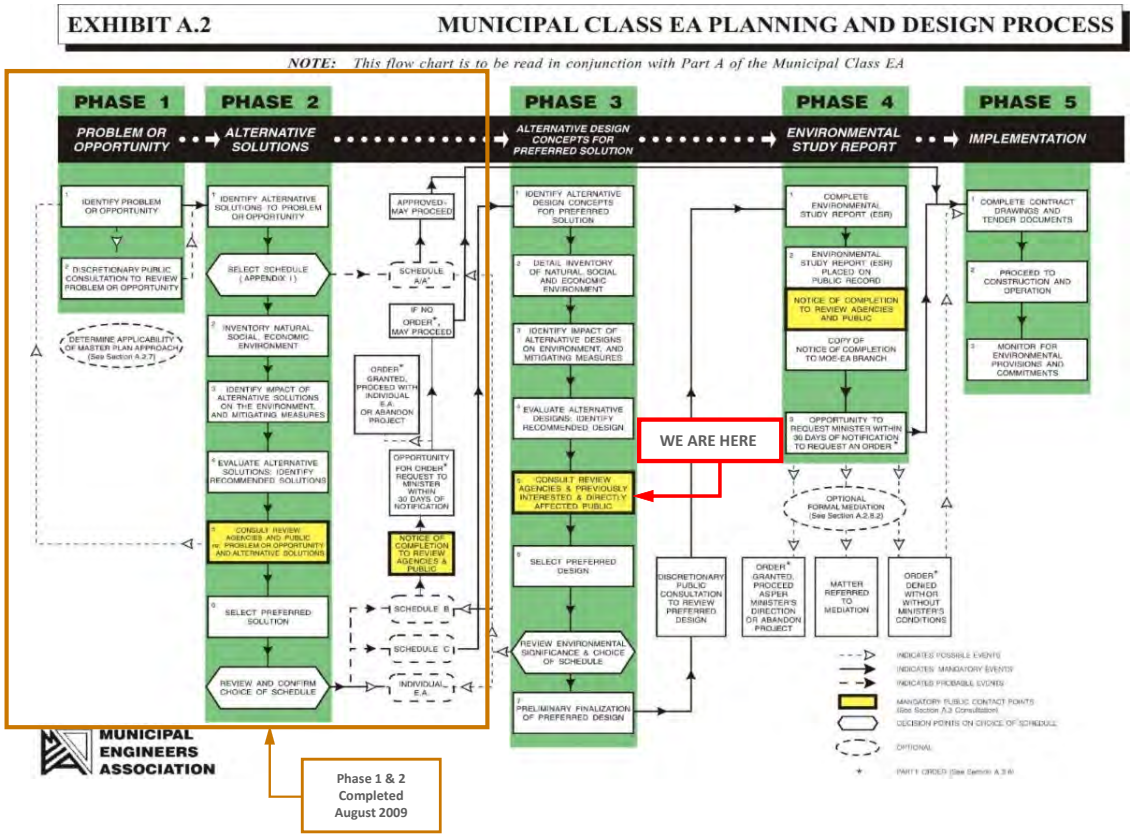
Date: October 18, 2016

The Class Environmental Assessment (EA)Process

The Class EA Process is a Provincially approved planning process under Ontario's Environmental Assessment Act for various "Classes" of projects.

Purpose of Today's PIC

- To refresh residents and interested parties of the findings from the approved Phase 1 & 2 Master Plan, dated July 2009;
- To outline minor changes to the Phase 1 & 2 Master Plan;
- To present the design alternatives associated with Water, Wastewater and Transportation solutions;
- To ask for your input and comments on the design alternatives;
- To outline steps remaining for completion of the Class EA process;



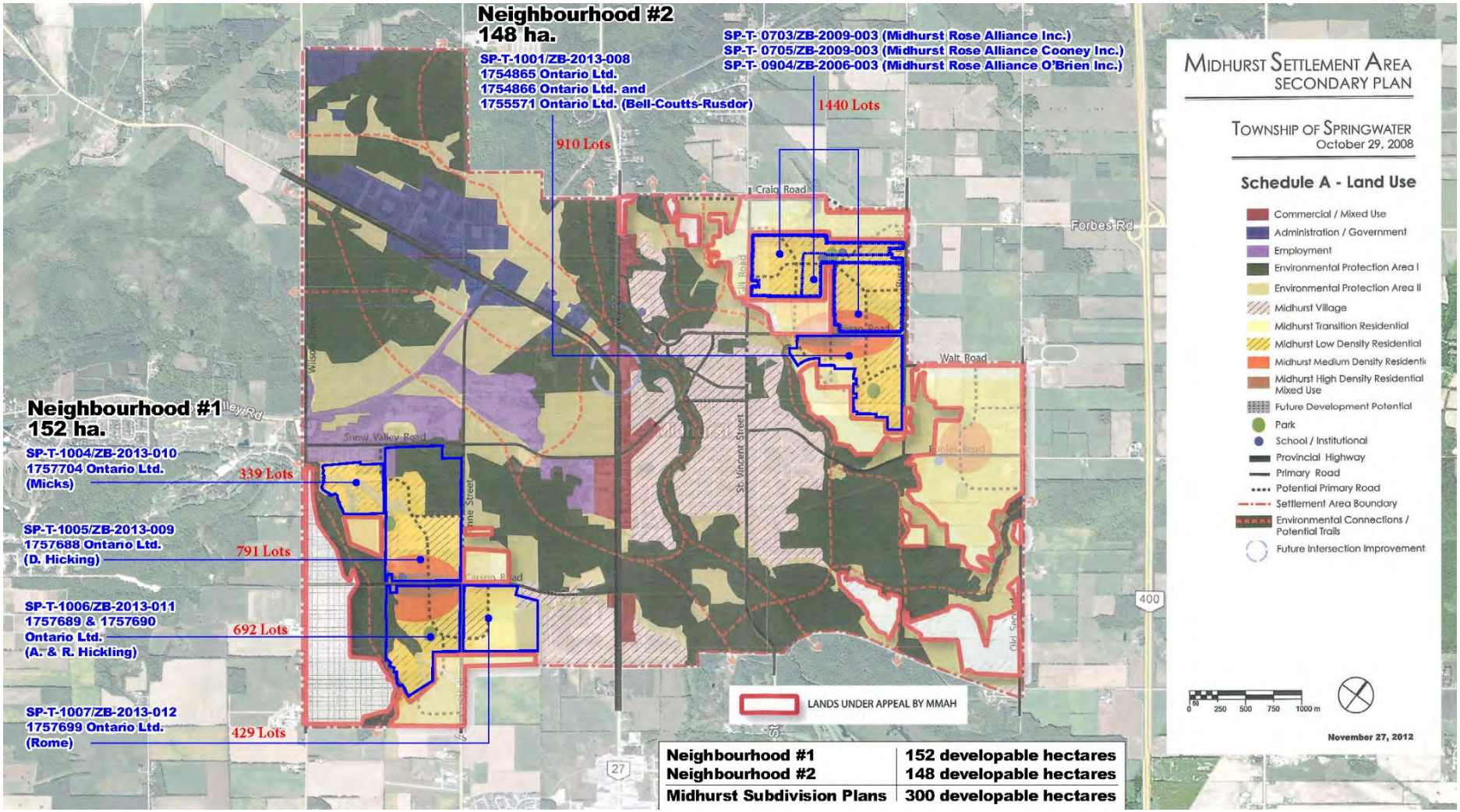
Midhurst Secondary Plan

- On November 28, 2012 the Ministry of Municipal Affairs and Housing (MMAH) partially withdrew its appeal of the Midhurst Secondary Plan;
- As a result of the MMAH's partial withdrawal, 300 hectares (ha) of the total 756 ha proposed to be re-designated 'urban' in Official Plan Amendment (OPA) 38 were cleared for development;
- The 300 ha (Phase 1) equates to approximately 5,000 units;
- The remaining 456 ha (Phase 2) and all related policies to OPA 38 currently remain under appeal at the Ontario Municipal Board (OMB);
- Of the 300 ha, OPA 38 permits development of 3,850 units plus employment generating uses to proceed. Prior to the remaining 1,250 units proceeding certain holding provisions with the Secondary Plan have to be fulfilled.

Midhurst Phase 1 & 2 Master Plan

- Midhurst Phase 1 & 2 Master Plan (Water, Wastewater and Transportation) for the Midhurst Secondary Plan area started Spring of 2008 and was completed in August 2009.

Midhurst Secondary Plan
Schedule A – Land Use

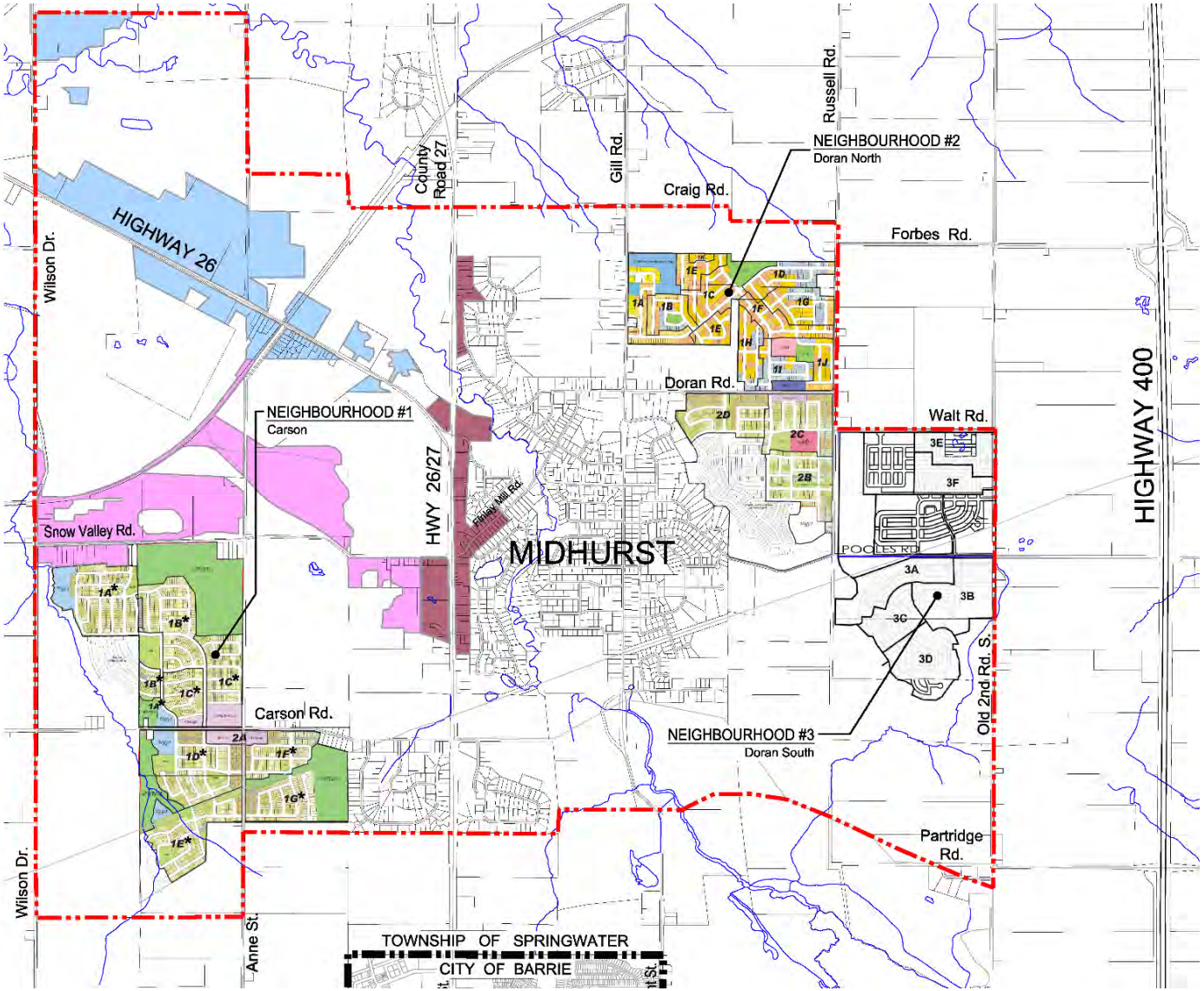


Development Phasing and Staging Projections – Table

Development Phase & Infrastructure Stage		Existing	Carson Road Neighbourhood			Doran Road Neighbourhood		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**

In accordance with the Phase 1 & 2 Master Plan, this Class EA accommodates 7,858 new residential units plus 350 equivalent units for Employment, for a total of 8,208 equivalent new units.

Development Phasing and Staging Projections – Map



Revisions to Phase 1 & 2 Master Plan

1) Subsequent to Phase 1 & 2 Master Plan in 2009, the Province legislated the Clean Water Act to protect drinking water supplies.

Upon review it was concluded that the proposed well locations, identified during Phase 1 & 2, may no longer be suitable;

During Phase 3 additional hydrogeological assessments identified new well locations;

The latest Hydrogeological Study proposed the following:

Carson Road

- Construction of three production wells at the Sand & Gravel site on Snow Valley Rd;
- Construction of two production wells, west of Snow Valley;

Doran Road

- Construction of three production wells, north of Doran Road and west of Russel Rd;
- Construction of three production wells, south of Pooles Road and east of Russel Rd.

Revisions to Phase 1 & 2 Master Plan

2) As a result of new proposed Well locations, the benefits of one Water Treatment Plant (WTP) versus two WTP's was re-analyzed. This analysis recommended that Carson Road and Doran Road neighbourhoods have separate WTP's;

3) The Wastewater Treatment Plant (WWTP) is proposed to be re-located from within the Carson Road Neighbourhood (south of Snow Valley Road) to the employment lands on the north side of Snow Valley Road;

4) Increasing of the proposed Fire Flows for Residential and Employment areas to 133 L/s for 3 hours (previously 133 L/s for 2 hours);

5) Following the receipt of comments from MTO, it was determined that a better traffic solution was to upgrade the existing Highway 400 interchange at Forbes Road, rather than creating a new interchange at Pooles Road;

6) As a result of the proposed improvement to the Hwy 400/Forbes Rd Interchange, improvements will be required along Forbes Road and Russell Road;

7) The feasibility of using traffic roundabouts (in lieu of traffic signals or stop signs) was assessed.

Proposed Proposed Design Criteria & Water Demands (Assuming Two Water Systems)

- Water Treatment Plant (WTP) will be rated to meet Max Day Demand (MDD) plus 5% allowance for filter backwash waste;
- Per Capita Water Demand = 380 L/Day
- Water MDD Factor for Carson Road = 2.0 and Doran Road = 1.9
- Disinfection to achieve 2-log inactivation of viruses and to ensure adequate residual concentration of chlorine in the distribution system;
- Fire flow of 133 L/s for 3 hours in each Water system;
- Design pressure range 50 to 90 PSI (345 to 620 kPa);
- Storage to be Inground Reservoirs.

Phase & Stage		Carson Road	Doran Road
		Max. Day Demand	
		L/s	
Phase 1	Stage i (1A + 1B)	23.5	6.1
	Stage ii (1C + 1D)	48.9	14.0
	Stage iii (1E + 1F)	65.2	21.6
	Stage iv (1G to 1I)	72.7	32.3
	Stage v (1J, 1K, 2B, C &D)	73.4	61.8
Phase 1 Totals		**73.4**	**61.8**
Phase 2	Stage i	80.6	78.5
	Stage ii	80.6	101.3
	Stage iii	80.6	120.4
	Stage iv	80.6	139.5
Phase 1 & 2 Totals		**81.0**	**140.0**

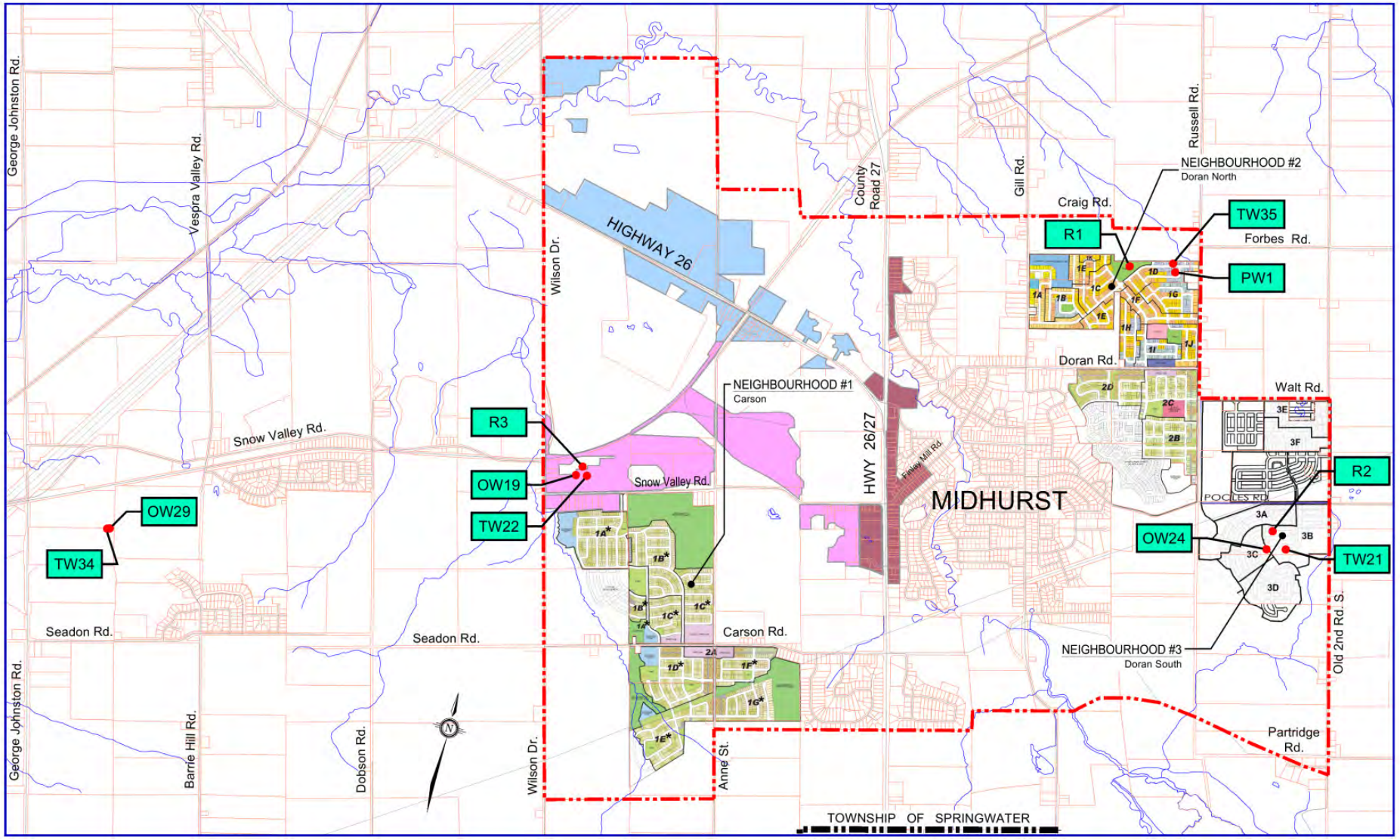
Note: All values include allowance for 5% backwash

Summary of Hydrogeological Investigation

- Aquifers A3, A4 (which are deep aquifers) were targeted for exploration program;
- Test wells were constructed and pumped to yield clear sand-free water;
- Tests included stepped rate pumping, constant rate pumping, suspended sediment, and comprehensive water quality;
- Ground water modelling was undertaken to evaluate sustainability of, and potential groundwater impacts from long-term operation of potential wells;
- Stand-by wells will be built at each well site.

Well No	Location	Carson Road Neighbourhood	
TW34 & OW29	West of Snow Valley	Well sites can support twin wells for a combined capacity of 113 L/s	• Slightly Elevated iron and manganese • Slight sulfurous odour, acceptable taste • All parameters below Ontario Drinking Water Standards, no discernable odour, acceptable taste • Nitrate within acceptable limits, however treatment will still be installed
TW22, OW 19 & R3	North of Snow Valley Road (sand and gravel pit)		
Well No	**Location**	**Doran Road Neighbourhood**	
TW35, PW1 & R1	North of Doran Road, west of Russell Rd	Well sites can support twin wells for a combined capacity of 140 L/s	• Slightly elevated iron and manganese • All parameters below Ontario Drinking Water Standards, no discernable odour, acceptable taste
TW21, OW24 & R2	South of Pooles Road, east of Russell Rd		

Proposed Production Well Locations



Water Supply System Options

- **Option No. 1** – Construct a single Water Treatment Plant (WTP) and reservoir in the Carson Road Neighbourhood at the Sand and Gravel site, and build a pumping station and reservoir to service the area in the Doran Road Neighbourhood. Wells in both Doran and Carson supply raw water to this WTP.
- **Option No. 2** – Construct a single WTP and reservoir in the Doran Road Neighbourhood on Gill Road, and build a pumping station and reservoir to service the area in the Carson Road Neighbourhood. Wells in both Doran and Carson supply raw water to this WTP.
- **Option No. 3** – Construct two WTP's and reservoirs: one in Carson Road (gravel pit)and one in Doran Road (Gill Road) Neighbourhoods with no connection between the neighbourhoods. Wells in Doran and Carson supply raw water to their respective WTP's.

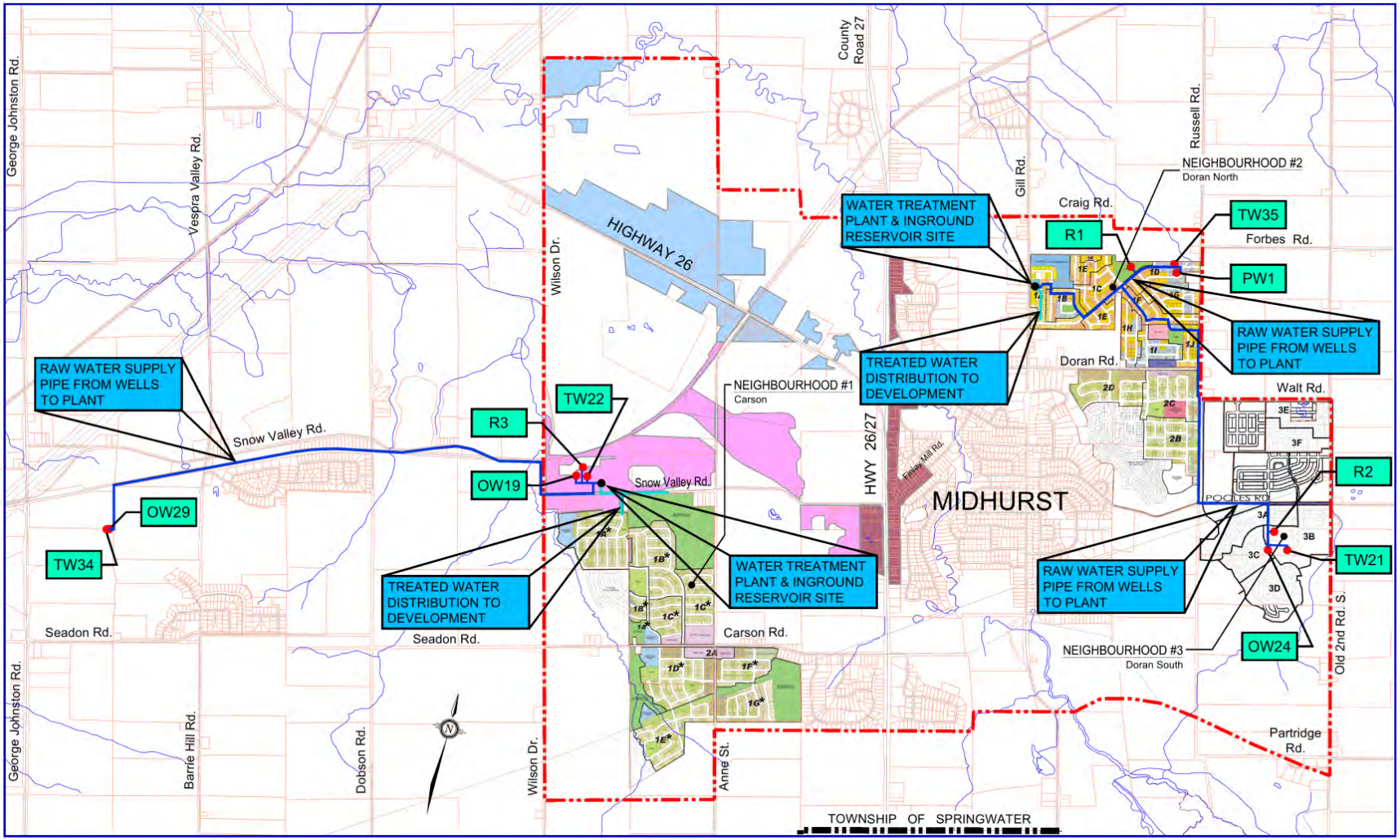
The Recommended Solution is Option No. 3

Recommended Solution For Water Supply, Treatment, Storage & Distribution

The infrastructure associated with the Recommended Water solution includes:

- Eleven new municipal wells;
- One Water Treatment Plant, with an in-ground reservoir, to be located within the Doran Road North Neighborhood, south of Craig Rd and east of Gill Rd;
- One Water Treatment Plant, with an in-ground reservoir, to be located within the abandoned gravel pit, north of Snow Valley Road, east of Wilson Drive;
- Potential for connection to existing Midhurst system with pressure regulating valves (PRV's) to augment emergency capabilities in existing system;
- Provides a potential loop to existing system at Highway 26 and Nursery Rd.

Recommended Solution – Water Supply, Treatment, Storage & Distribution



Water Supply, Treatment, Storage & Distribution – Design Summary and Estimated Capital Costs

Description	Doran Road WTP	Carson Road WTP
Phase 1 Max Day Demand (MDD) Capacity (L/s)	61	73
Phase 2 Max Day Demand (MDD) Capacity (L/s)	140	81
Treatment	• Oxidation and filtration to remove iron and manganese • Disinfection by chlorination	• Ion exchange to remove nitrate • Oxidation and filtration to remove iron and manganese • Aeration to srip the methane • Disinfection by chlorination
Phase 1 Water Storage Volume (m^3)	3,500	3,684
Raw Water Supply – Phase 1 Estimate	$1,410,000	$870,000
WTP Cost Estimate – Phase 1	$3,659,000	$3,535,000
Water Storage Cost Estimate - Phase 1	$2,474,000	$2,638,000
Other Costs (General requirements, Approvals, Permits, Engineering & Contingency)	$4,098,000	$3,825,000
Total Phase 1 Estimate	**$11,600,000**	**$10,900,000**
Phase 2 Water Storage Volume (m^3)	5,400	3,868
Raw Water Supply – Phase 2 Estimate	$3,100,000	$3,138,000
WTP Cost Estimate – Phase 2	$380,000	$701,000
Water Storage Cost Estimate - Phase 2	$1,724,000	$0
Other Costs Other Costs (General requirements, Approvals, Permits, Engineering & Contingency)	$2,835,000	$2,098,000
Total Phase 2 Estimate	**$8,000,000**	**$5,900,000**

Wastewater Treatment Plant

An overview of the processes within a modern Wastewater Treatment Plant (WWTP) are identified below:

Process	Brief Description and Treatment Focus
Preliminary Treatment	Conveyance to treatment plant and removal of screenings and grit
Primary Treatment	Removal of settleable solids by gravity
Secondary Treatment	Processes to oxidize organics, oxidize ammonia, remove nitrogen and phosphorus
Tertiary Treatment	Further removal of total phosphorus and suspended solids to meet the effluent criteria
Disinfection	Inactivation of pathogenic organisms
Biosolids Management	Process to thicken, stabilize and dewater the liquid sludge for re-use
Effluent Pumping	Transfer the final effluent to the discharge point

Proposed Wastewater Flows and Effluent Compliance & Objectives

Phase & Stage		Average Daily Flows	
		Total	Cumulative Total
		(m^3/day)	
Phase 1	Stage i (1A + 1B)	1,393	1,393
	Stage ii (1C + 1D)	1,569	2,962
	Stage iii (1E + 1F)	1,133	4,094
	Stage iv (1G to 1I)	872	4,967
	Stage v (1J, 1K, 2B, C &D)	1,484	6,450
Total Phase 1			**6,450**
Phase 2	Stage i	1,302	7,752
	Stage ii	968	8,719
	Stage iii	935	9,654
	Stage iv	934	10,588
Existing Un-Serviced (1,334 Units)		1,726	12,314
Total Phase 1, 2 & Existing			**12,314**

Description	Units	Objective	Compliance Limits	
			Phase 1	Phase 2
Carbonaceous Biochemical Oxygen Demand ($cBOD_5$)	mg/L	10	15	15
Total Suspended Solids (TSS)	mg/L	10	15	15
Ammonia-N (Jun 1 to Oct 31)	mg-N/L	1	1.5	1
Ammonia-N (Nov 1 to May 31)	mg-N/L	2	3	2
Total Inorganic Nitrogen (TIN) (Ammonia-N + Oxidized-N)	mg-N/L	15	17	17
Total Phosphorus (TP)	mg/L	0.03	0.05	0.03
Disinfection (E. coli)	/100 mL	100	200	200

Willow Creek - 7Q20 Flow Assessment

What is 7Q20?

- The Ministry of the Environment and Climate Change (MOECC) requires the use of a 7Q20 flow, which is the lowest mean flow for seven consecutive days that has a 20-year recurrence interval period, calculated from a minimum of 10 years of data;
- Water Survey of Canada has maintained a stream flow gauging station on Willow Creek at Highway 26, since 2006;

Results of the 7Q20 Flow Assessment

- A 7Q20 value of 430 L/s was calculated for Willow Creek for assimilation capacity modelling;

Willow Creek - Assimilative Capacity Study

Models for discharge of the Effluent from the Waste Water Treatment Plant (WWTP) to Willow Creek were run for two scenarios:

a. Phase 1 = 6,450 m^3/day (74.65 L/s)

b. Phase 1 & 2 = 12,314 m^3/day (142.53 L/s)

The Assimilative Capacity Study (ACS) identifies that:

- The present-day 75th percentile concentration of total phosphorus (TP) in Willow Creek is 0.031 mg/L. This exceeds the Provincial Water Quality Objective (PWQO) of 0.03mg/L and therefore it is classified as a "Policy 2" receiver for TP;
- The existing concentration of ammonia in Willow Creek translates to 0.002mg/L of un-ionized ammonia. This is below the PWQO of 0.02 mg/L, which classifies it as a "Policy 1" receiver for ammonia;

Willow Creek - Assimilative Capacity Study (cont.)

- Phase 1 and Phase 2 WWTP effluent will have maximum un-ionized ammonia concentrations of approximately 0.038 mg/L and 0.057 mg/L, respectively, well below the 0.27 mg/L threshold for effluent.
- Phase 1 effluent will have a TP concentration of approximately 0.05 mg/L resulting in 118 kg/yr of new phosphorus loading to Willow Creek.
- Phase 2 effluent will have a TP concentration of approximately 0.03 mg/L resulting in 134 kg/yr of new phosphorus loading to Willow Creek.
- The Phase 2 effluent will reduce the TP concentrations within Willow Creek from the present day values of 0.031 mg/L;

Phosphorus Budget for Midhurst Secondary Plan

The Nottawasaga Valley Conservation Authority (NVCA) requested an assessment of the cumulative loading of phosphorus from Stormwater Management and the Wastewater Treatment Plant discharge to Willow Creek and the Minesing Wetland.

The assessment included:

- Calculation of the Stormwater Pre-Development and Post-Development phosphorus loadings from the Midhurst Secondary Plan;
- Calculation of the phosphorus loading from the Wastewater Treatment Plant;
- A cumulative assessment of the phosphorus loading;
- Establishment of a target of a net-zero increase in phosphorus loading to the Minesing Wetland;

The phosphorus budget modelling tool was developed and adapted specifically for the NVCA, from the tool that was developed for the Lake Simcoe Protection Plan by the Ministry of Environment and Climate Change (MOECC), along with new industry standards for Low Impact Development (LID) in Ontario.

Overall Phosphorus Budget for Midhurst Secondary Plan (cont.)

Phosphorus loads were calculated for the three post-development scenarios with LID techniques: no infiltration, 20 mm (conservative) and 25 mm (aggressive) infiltration.

Implementation of effective Low Impact Development (LID) techniques will significantly reduce the post-development phosphorus loadings compared to existing.

The results of the phosphorus budget analysis are shown below:

Infiltration of the first 20 mm of precipitation runoff results in a net Phase 2 annual load of 66 kg of phosphorus to Willow Creek.

Summary of Phosphorus Loadings (kg/yr) from the redevelopment of MSPA

	Phase 1			Full Build Out		
Infiltration	**None**	**20 mm**	**25 mm**	**None**	**20 mm**	**25 mm**
Pre-development*	**46**	**46**	**46**	**134**	**134**	**134**
Runoff	213	21	11	663	66	33
Change in Phosphorus Load from Runoff	167	-25	-35	529	-68	-101
WWTP Load	118	118	118	134	134	134
Total Post Development	**331**	**139**	**129**	**797**	**200**	**167**
Change in P export	**285**	**93**	**83**	**663**	**66**	**33**

Assessment of Phosphorus & Ammonium on Willow Creek & Minesing Wetland

- The Minesing Wetland is a ~6,000 hectares (ha) network of swamps, fens, bogs and marshes. Willow Creek represents 11% ± of its catchment:
- Assimilation processes in Willow Creek will maintain un-ionized ammonia concentrations below the Provincial Water Quality Objectives (PWQO). The Minesing Wetland will therefore not be negatively affected by ammonia from the development;
- Analyses have concluded that the discharge of treated WWTP effluent will not alter the overall nutrient dynamic of the Willow Creek or the Minesing Wetland;
- Total annual phosphorus loading to the Minesing wetland varies greatly from year to year, but is estimated to be between 35,000 and 40,000 kg/year. The increased phosphorus loading of 66 kg per year from the Midhurst Secondary Plan Area represents less than 0.5% of the annual phosphorus loading within the Minesing Wetland;
- Development of the Midhurst Secondary Plan will not alter the nutrient status of Willow Creek or the Minesing Wetland;
- The Development Group are committed to a target of net-zero increase in phosphorus and will work closely with the NVCA to implement improvements in the watershed, if needed.

Evaluation of Treatment Technologies

A long list of alternatives for the treatment processes were evaluated.

- This table outlines the long list of treatment technologies that were evaluated, along with the short list of alternatives (shown in bold) that were carried forward.

Primary / Secondary Treatment	Tertiary Treatment	Disinfection Treatment
1 Modified Ludzack Ettinger process for nitrogen removal with chemical addition for phosphorus removal	**1 Membrane filtration**	1 Chlorination + Dechlorination
2 Step feed Biological Nitrogen Removal with Chemical Addition for Phosphorus Removal	**2 Two stage filtration**	2 Ozone
3 Sequencing Batch Reactor (SBR) with Biological Nitrogen Removal, with Chemical Addition for Phosphorus Removal	3 Cloth Disc Filters	3 **Ultraviolet**
4 Integrated Fixed-Film Activated Sludge for nitrogen removal with chemical addition for phosphorus removal	4 Actiflo®	
5 Biological Nitrogen and phosphorus removal with activated primary clarifiers	5 Deep Bed Filtration	
6 Biological nitrogen and phosphorus removal with primary sludge fermentation	**6 Blue PRO® filtration**	
7 Biological nitrogen and phosphorus removal with return activated sludge fermentation		
8 Membrane biological nitrogen removal with mechanical primary treatment and chemical addition for phosphorus removal		
9 Donut activated sludge		
10 Two stage biological aerated filters		

Tertiary Treatment Technologies

The following Three "Short Listed" tertiary treatment technologies were evaluated:

1. **Membrane Filtration**
   - The technology provides tighter barrier to fine particles therefore provides higher security to achieve lower total phosphorus limits consistently;
   - MOECC has granted lower phosphorus limits to plants with this technology than to those with two stage sand filtration;
2. **Two Stage Filtration**
   - Currently six installations in Ontario;
   - Almost eight years of data from an installation in New York State;
   - Operating cost only 14% lower because of a higher chemical dose rate;
3. **Blue PRO®**
   - Good track record outside of Ontario;
   - Does not provide the same advantages as the membrane technology (smaller pore filtration) even though the net present value is similar;

The Recommended tertiary treatment is Option 1.

Evaluation of Primary/Secondary and Tertiary Treatment Trains

The following four “Short Listed” treatment trains were evaluated:

1. Step Feed Biological Nitrogen Removal with Chemical Addition For Phosphorus Removal, followed by membrane filtration and UV disinfection;
2. Sequencing Batch Reactor (SBR) with Biological Nitrogen Removal With Chemical Addition for Phosphorus Removal, followed by membrane filtration and UV disinfection;
3. Biological Nitrogen and Phosphorus Removal, followed by membrane filtration and UV disinfection;
4. Membrane Bioreactor with Biological Nitrogen Removal, followed by membrane filtration and UV disinfection;

The Recommended liquid treatment train is Option No 1 .

Biosolids Management

- Biosolids result from the biological treatment of municipal wastewater;
- The selection of the recommended Biosolids Management Plan starts with the determining the preferred end use of the Biosolids product;
- Once the characteristics of the product is defined based on the end use, the evaluation of treatment technology at the WWTP was conducted;

Biosolids Management Strategies

Evaluation of the end use alternatives concluded that the Beneficial Re-use is the preferred.

End Use	Product
Beneficial Re-use	**Stabilized liquid sludge**
	Stabilized cake
	Lime stabilized cake to beneficial re-use or fuel
	Composted biosolids
	Solar dried pellets
Another Facility	Unstabilized cake to another facility for thermal destruction
	Liquid stabilized sludge to another facility for disposal
	Unstabilized liquid sludge to another facility for disposal
	Unstabilized cake to an offsite contractor for lime treatment and storage
	Stabilized cake to another facility for disposal
Landfill	Unstabilized cake

Beneficial Re-Use Biosolids Management Treatment Alternatives

Option No 1: Biological **stabilized liquid sludge** for beneficial re-use, treated with mechanical thickening and aerobic digestion;

Option No 2: Biological **stabilized cake** for beneficial re-use, treated with mechanical thickening, aerobic digestion and dewatering;

Option No 3: Solar dried, **stabilized pellets** for beneficial re-use with mechanical thickening, aerobic digestion, dewatering and solar drying;

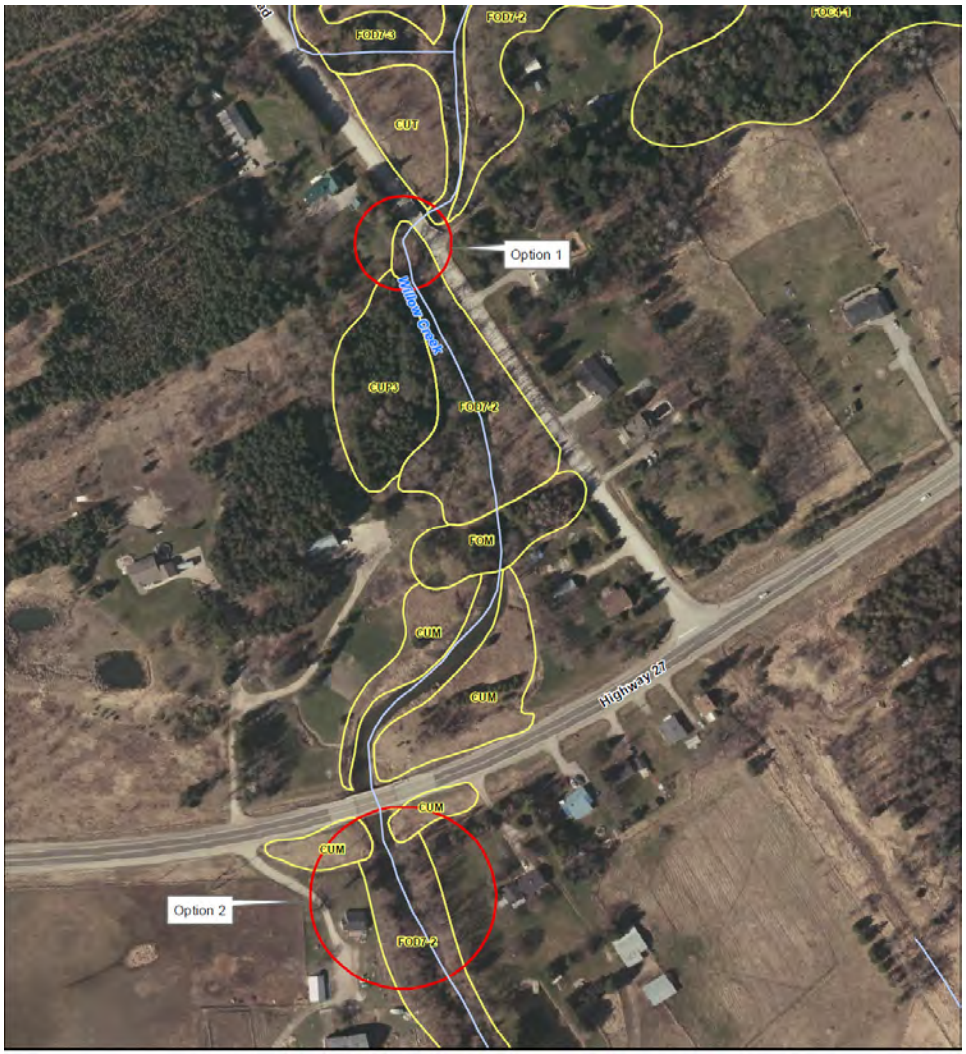
Option No 4: Biological **stabilized liquid sludge** for beneficial re-use, treated with mechanical thickening and Autothermal Thermophilic Aerobic Digestion (ATAD);

Option No 5: Biological **stabilized cake** for beneficial re-use, treated with mechanical thickening, Autothermal Thermophilic Aerobic Digestion (ATAD) and dewatering;

Option No 6: Solar dried, **stabilized pellets** for beneficial re-use with mechanical thickening, Autothermal Thermophilic Aerobic Digestion (ATAD), dewatering and solar drying.

The Recommended Biosolids Management Treatment process is Option No 4

Assessment of Effluent Outfall Locations on Willow Creek



Site investigations were conducted to characterize the vegetation communities and natural features along Willow Creek near two potential WWTP outfall locations:

- Option 1 – Willow Creek outfall at Golf Course Road
- Option 2 – Willow Creek outfall at HWY 26

Legend

Potential WWTP Outfall Locations

ELC Communities

Watercourse

ELC Communities:
FOC4-1 – Fresh – Moist White Cedar Coniferous Forest
FOM – Mixed Forest
FOD7-2 – Fresh – Moist Ash Lowland Deciduous Forest
FOD7-3 – Fresh – Moist Willow Lowland Deciduous Forest
CUM1-1 – Dry – Moist Old Field Meadow
CUT – Cultural Thicket
CUP3 – Coniferous Plantation

Assessment of Effluent Outfall Locations on Willow Creek

Option No. 1 – Willow Creek Outfall at Golf Couse Road

The following vegetation communities were identified adjacent to the reach of Willow Creek:

- Moist White Cedar Coniferous Forest – upstream
- Moist Ash Lowland Deciduous Forest – upstream and downstream
- Moist Willow Lowland Deciduous Forest – upstream
- Cultural Thicket – upstream

Option No. 2 – Willow Creek Outfall at Hwy26

The following vegetation communities were identified adjacent to the reach of Willow Creek:

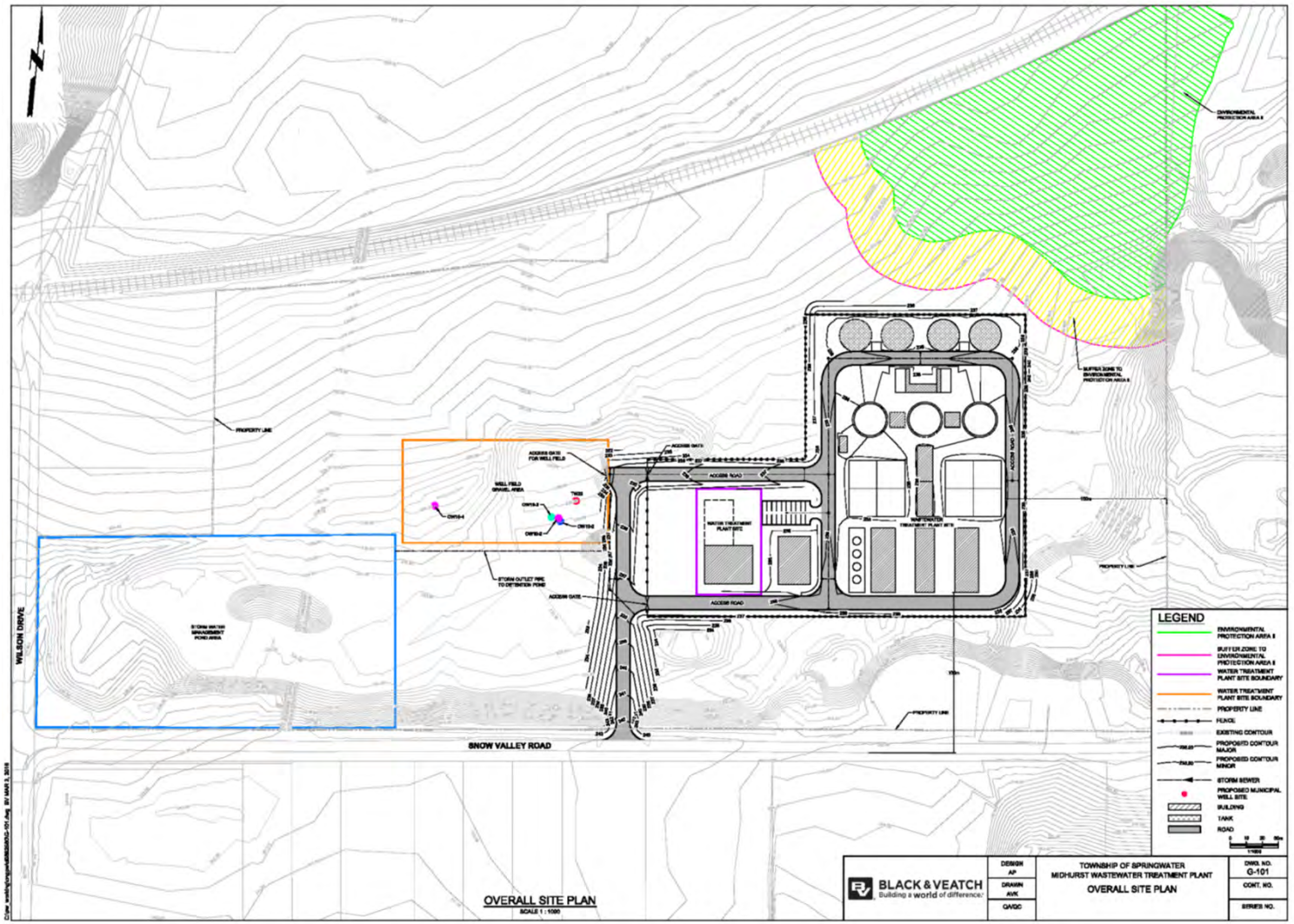
- Moist Old Field Meadow – upstream and downstream
- Coniferous Plantation – downstream

A Fluvial Geomorphological Assessment identified that neither outfall location would increase downstream erosion rates.

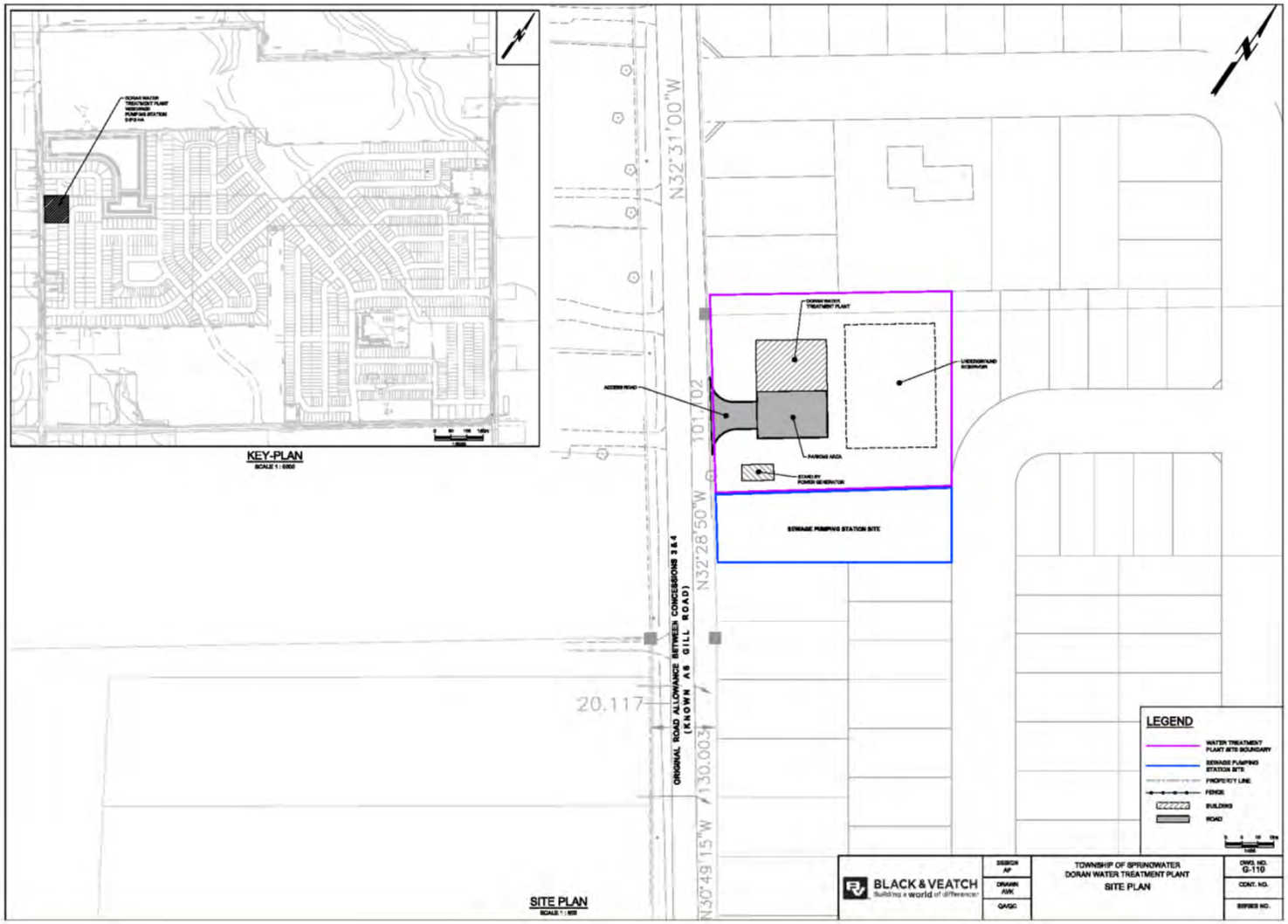
From a terrestrial perspective option 2 (Hwy 26) is the more appropriate location for the WWTP outfall. No trees will be affected by the construction of the outfall and existing bank will rehabilitated to fix existing erosion.

The Recommended location for the effluent outfall is Option No 2.

Wastewater Treatment and Water Treatment Plants Site Plan on Snow Valley Road



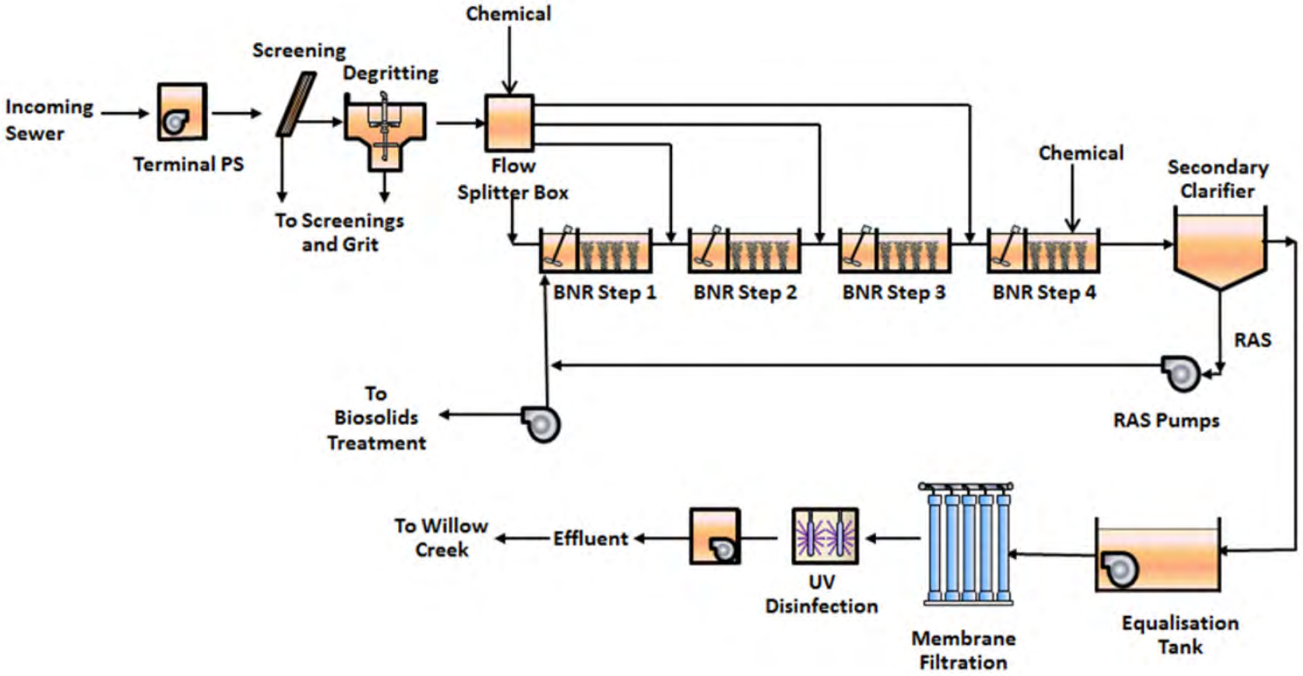
Doran Road Wastewater Pump Station & Water Treatment Plant Site Plan



Recommended Wastewater Liquid Treatment Train

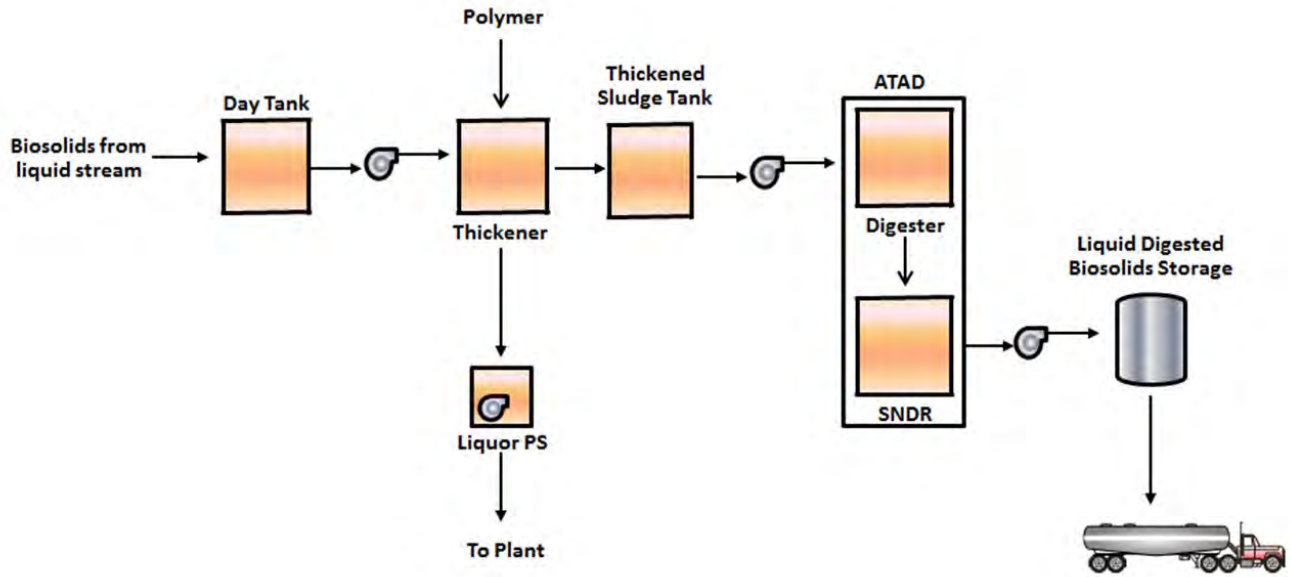
Based on the evaluation the Recommended liquid treatment train is:

- Preliminary treatment including screening and degritting.
- Step Feed Biological Nitrogen Removal (BNR) (primary & secondary treatment) , followed by Membrane filtration (tertiary treatment).
- Final treatment will include UV Disinfection, before pumping to discharge point



Recommended Biosolids Treatment Train

Biological Stabilized liquid sludge to beneficial re-use with mechanical thickening and Auto-thermal Thermophilic Aerobic Digestion (ATAD)

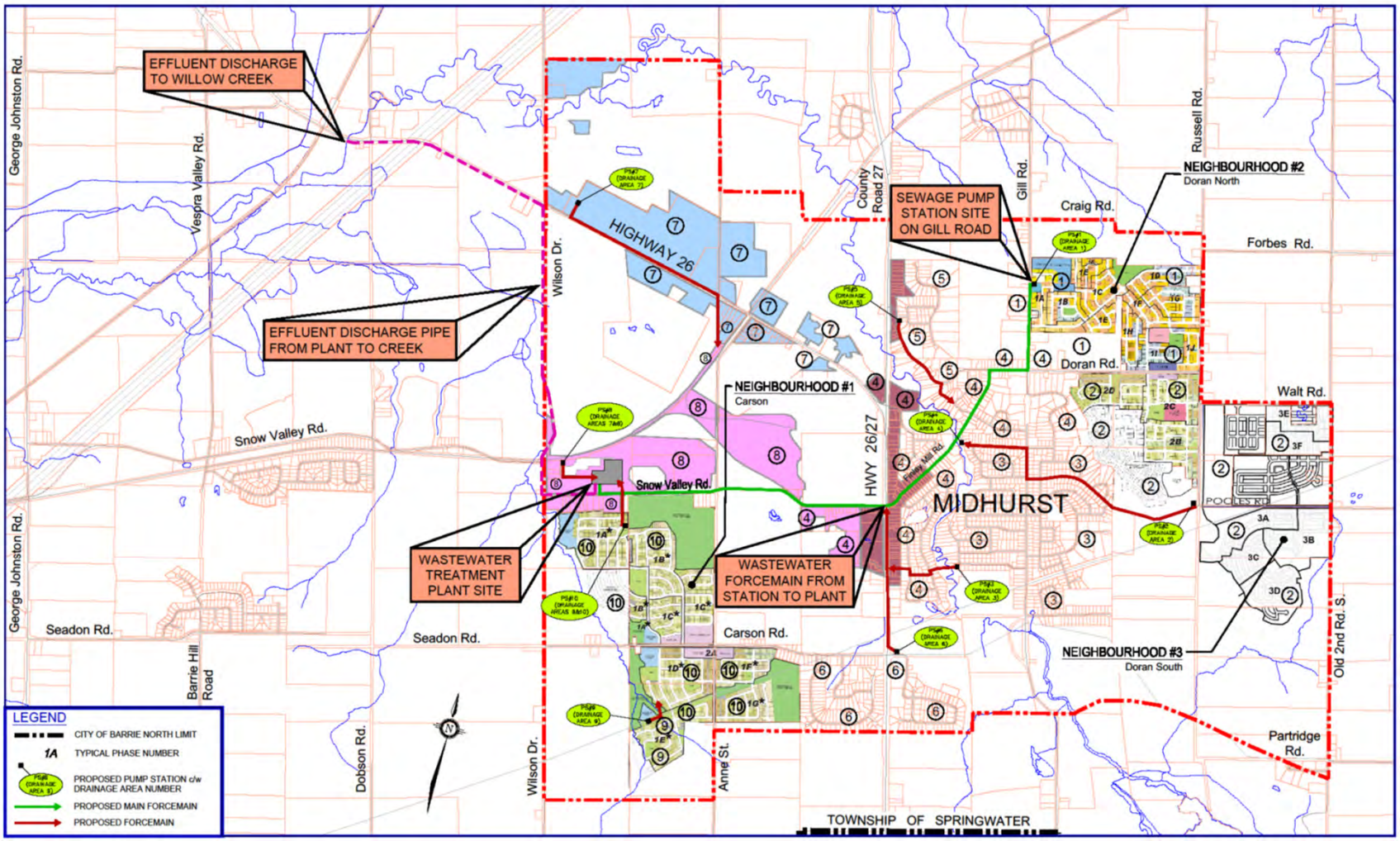


Recommended Wastewater Collection, Treatment and Disposal Alternative

The infrastructure associated with the Recommended Wastewater solution includes:

- Wastewater Treatment Plant to be located in the former gravel pit, north of Snow Valley Rd;
- Proposed Wastewater Treatment Plant to be modular, allowing for phased development and servicing of existing Midhurst area, if required;
- Sewage Pump Stations as required, with future manifolded forcemain connections;
- Forcemain from Doran Road Area to WWTP via Gill Rd, Doran Rd, Finlay Mill Rd & Snow Valley Rd.
- Effluent discharge to Willow Creek (at crossing of Hwy 26) via pipe along Wilson Drive and Hwy 26;
- Infrastructure to be phased with development;

Recommended Wastewater Collection, Treatment and Disposal Alternative



WWTP Estimated Capital Costs

Capital Cost Estimate for the WWTP		
Description of Process	**Phase 1**	**Phase 2**
Preliminary Treatment	$2,656,000	$1,993,000
Secondary Treatment	$12,585,000	$9,914,000
Tertiary Treatment	$6,037,000	$3,848,000
Disinfection	$1,025,000	$675,000
Effluent Pumping	$462,000	$387,000
Biosolids Treatment	$14,565,000	$12,605,000
Utilities, Site Preparation, Landscaping, Administration Building	$3,275,000	$1,250,000
Contingency (10%)	$4,060,500	$3,067,200
Engineering Fees, Permits etc. (17%)	$6,902,850	$5,214,240
Total (excluding HST)	**$51,600,000**	**$39,000,000**

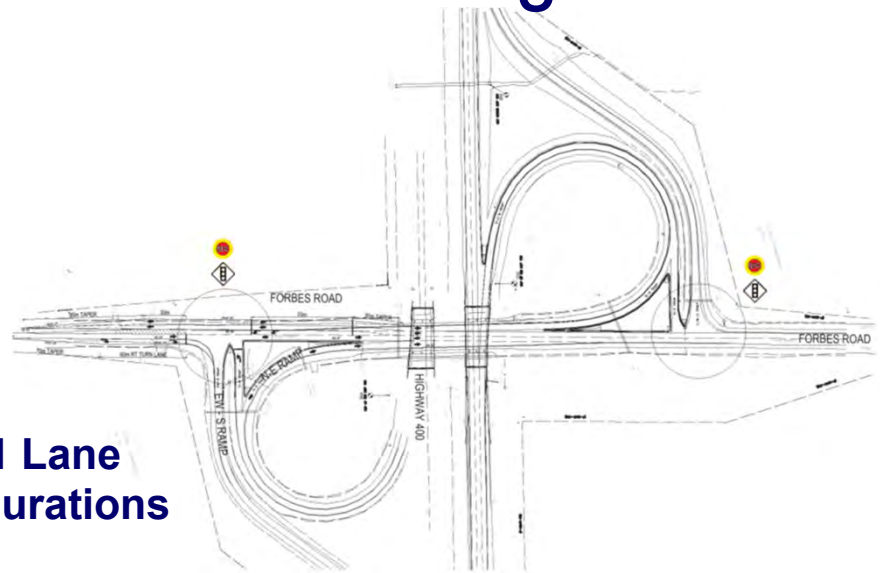
Highway 400 & Forbes Road Interchange

The Technical Report regarding the Hwy 400 & Forbes Road interchange concluded that:

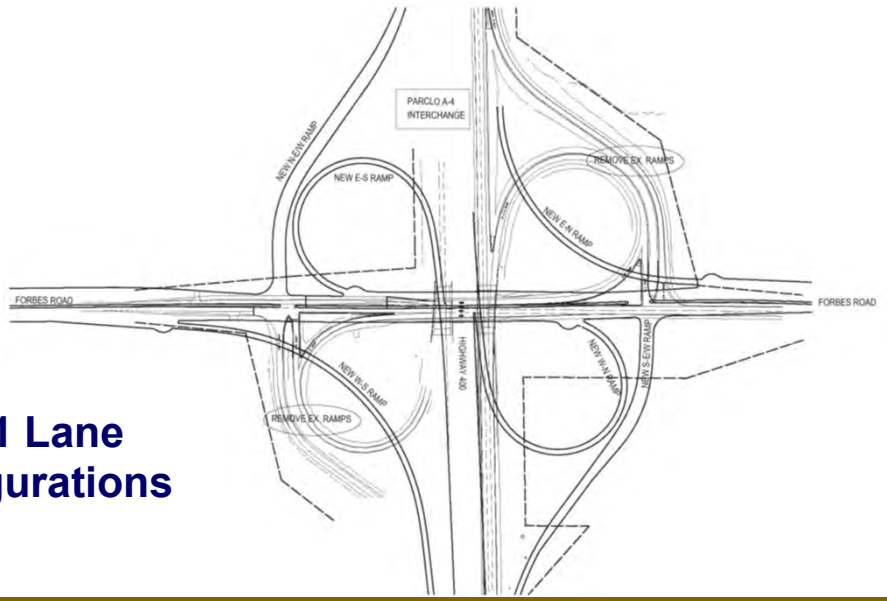
- In conjunction with Phase 1 signalization of both ramp terminals plus an eastbound right turn and a westbound left turn lanes onto Hwy 400 South at the west ramp terminal.

- In conjunction with Phase 2 widening of Forbes Rd & Russell Rd to four lanes and the upgraded Hwy 400 / Forbes Road Interchange.

2031 Lane Configurations



2041 Lane Configurations

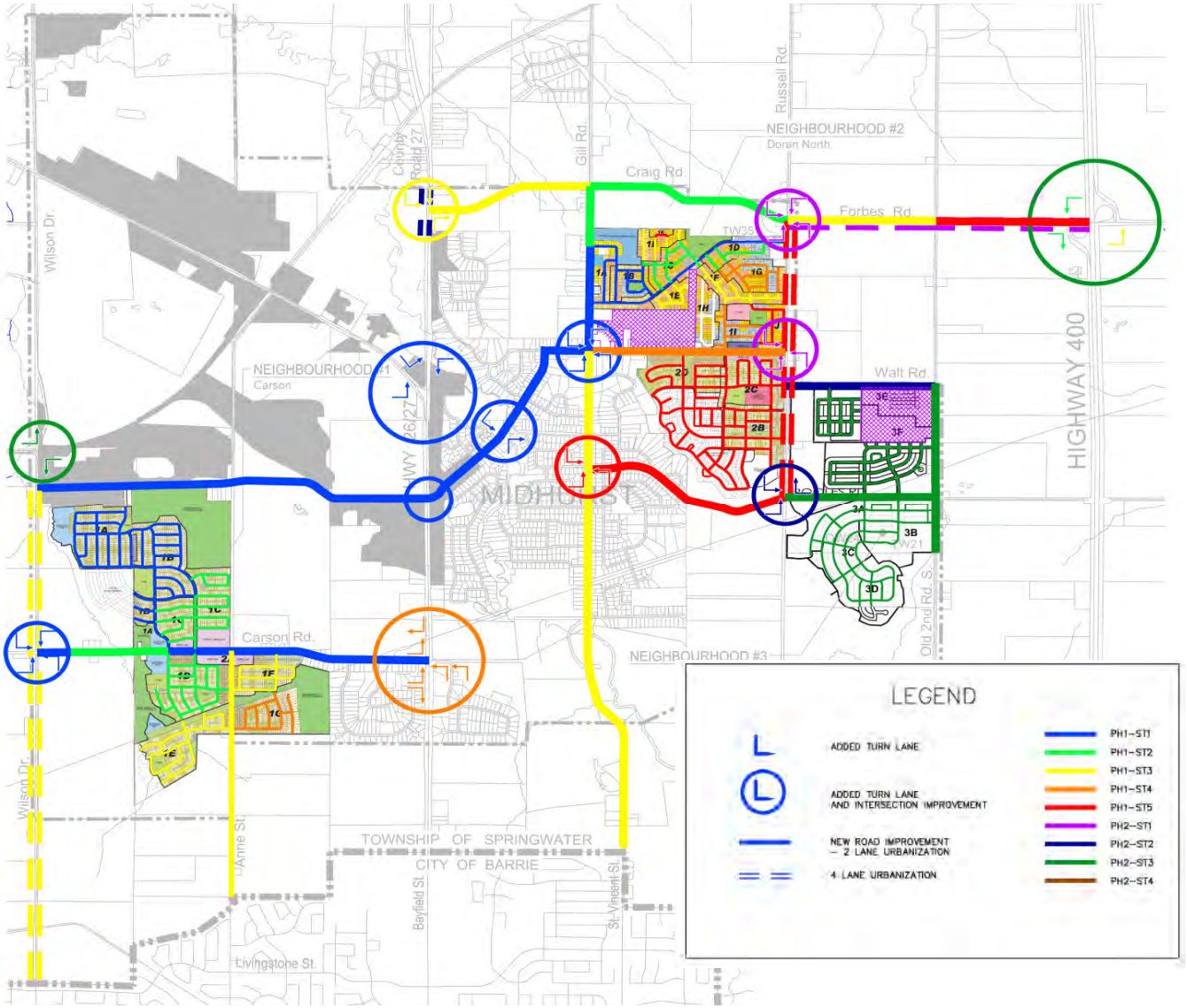


Traffic Operational Analysis

- Multiple traffic count surveys have been completed over the years, the most recent were completed in 2013;
- The background traffic volumes were increased by 2.2% per year to reflect 2015 estimated traffic numbers;
- Traffic volumes from the proposed developments were calculated in accordance with the industry standard Trip Generation Manual, published by the Institute of Traffic Engineers;
- New traffic volumes were then added to the existing background traffic volumes (which were subject to annual increases of 1.1%) to produce total traffic numbers for the 2031 and 2041planning horizon;
- Using traffic modeling software, the operations and capacity of the key intersections and roads was analysed using the calculated peak hour AM and PM total traffic volumes;
- The results of the traffic analysis and a summary of the recommended road improvement strategy is presented on the various display boards and is described in the Traffic Operational Analysis report which is available on the Township website.

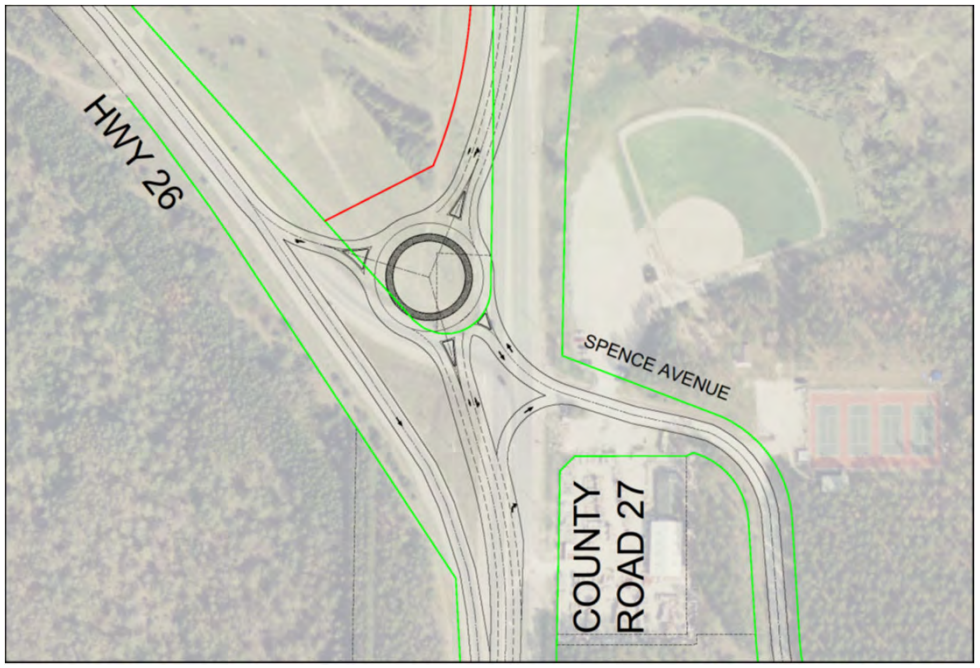
Phasing of Proposed Road Improvements

- 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;



Highway 26 & Country Road 27

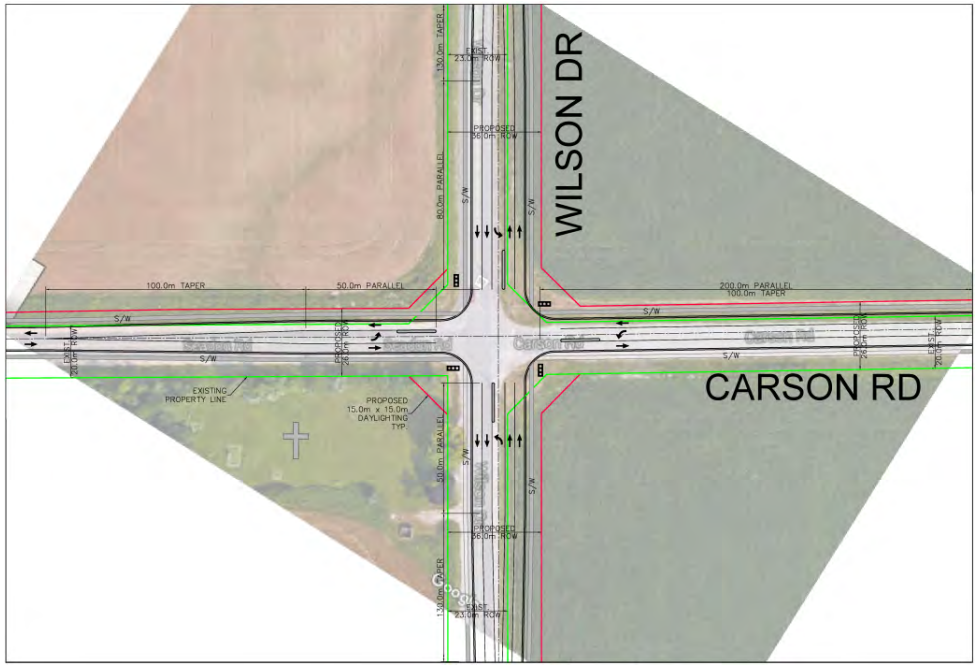
Signalized Intersection



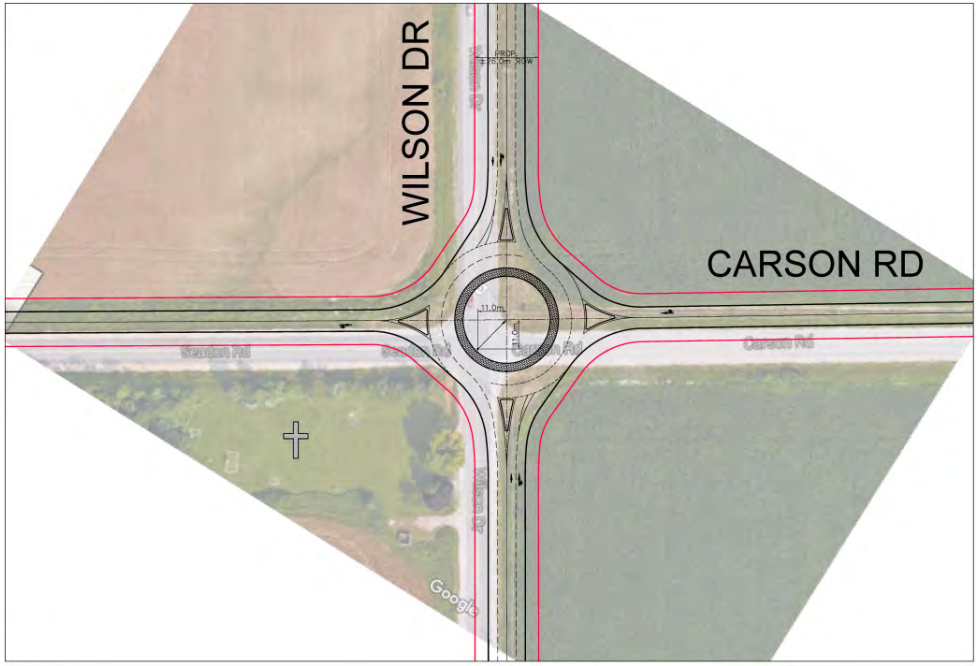
Roundabout

The Recommended solution will be determined after further discussions with MTO, County of Simcoe and receipt of comments from the Public and interested parties.

Carson Road & Wilson Drive



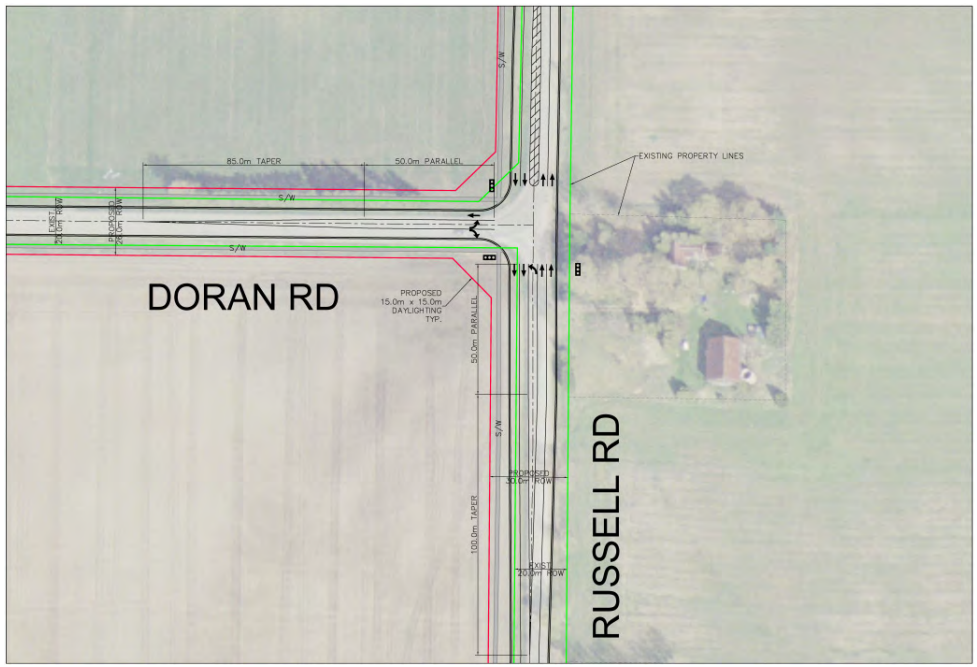
Signalized Intersection



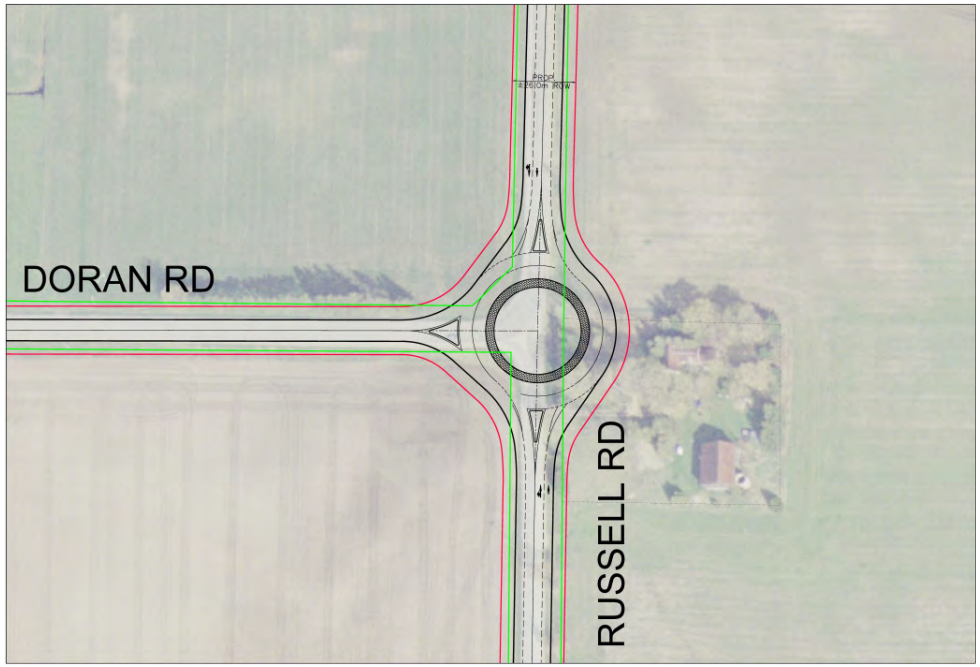
Roundabout

The Recommended solution will be determined after further discussions with the County of Simcoe and receipt of comments from the Public and interested parties.

Russell Road & Doran Road



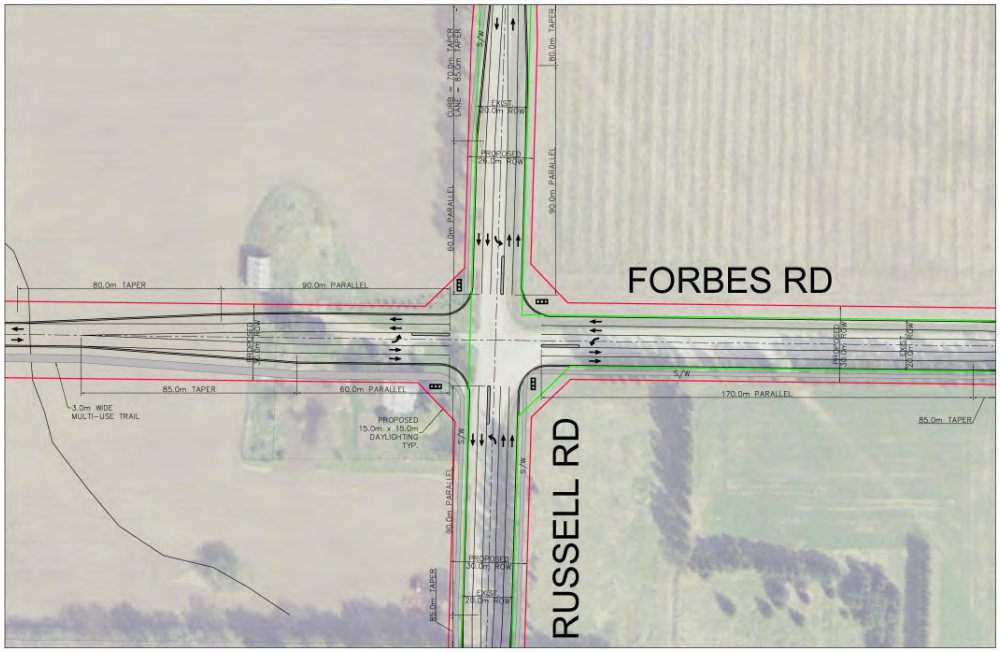
Signalized Intersection



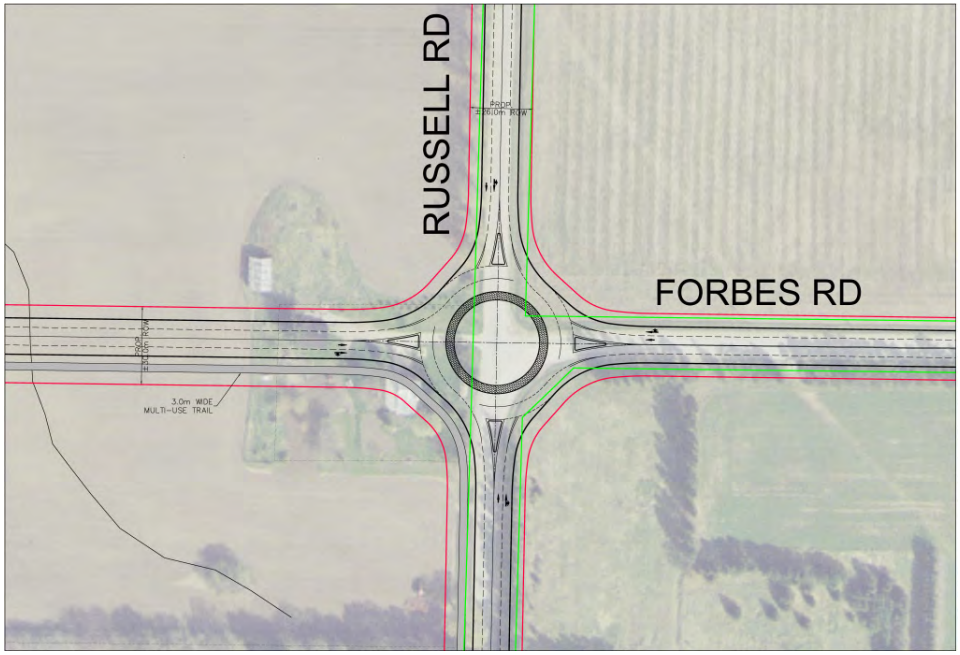
Roundabout

The Recommended solution is the Signalized Intersection

Forbes Road & Russell Road



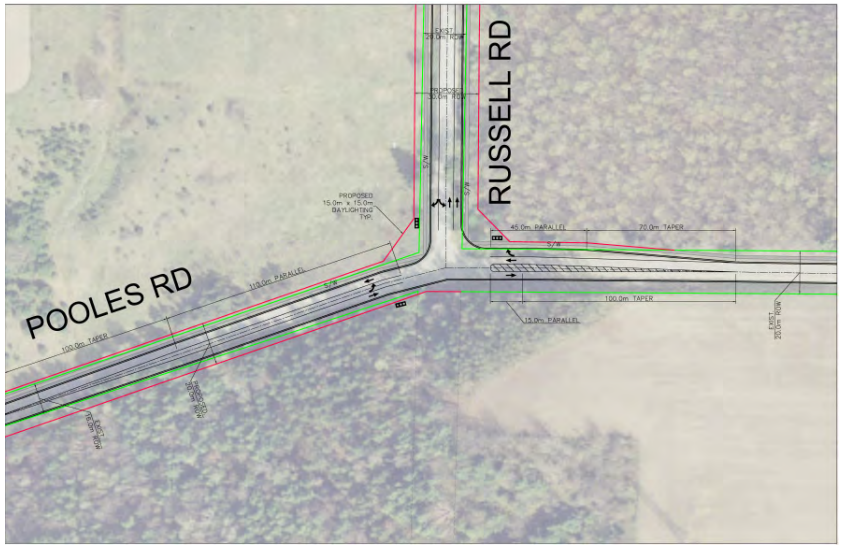
Signalized Intersection



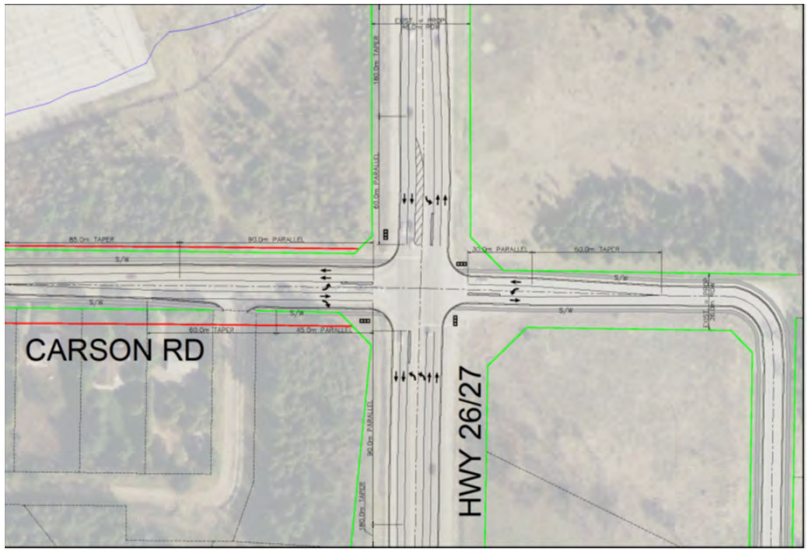
Roundabout

The Recommended solution will be determined after receipt of comments from the Public and interested parties.

Finlay Mill Rd & Wattie Rd

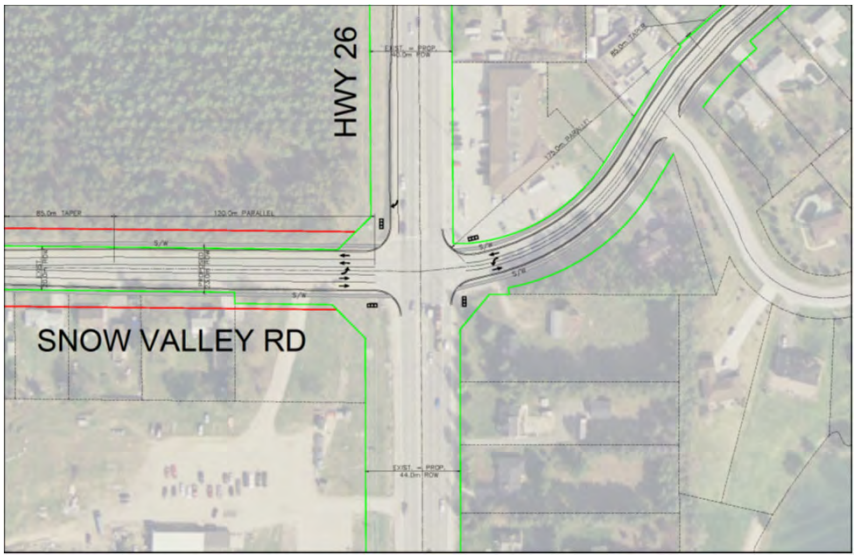


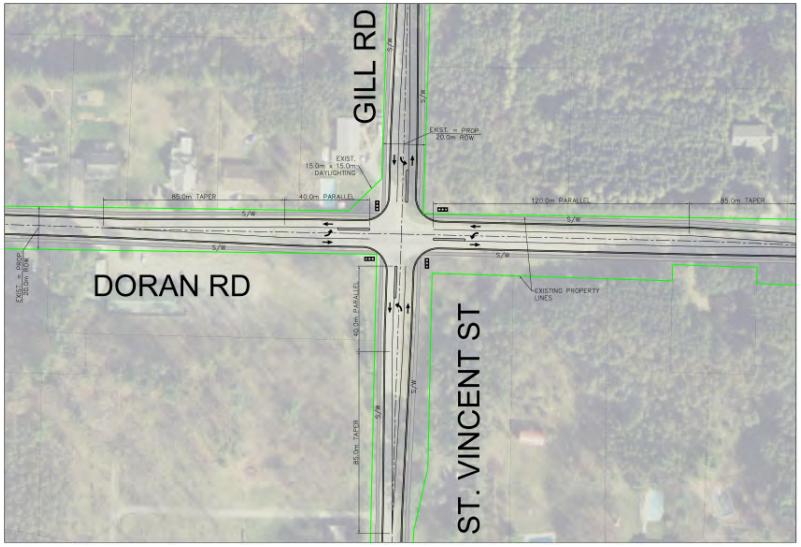
Pooles Rd & Russell Rd



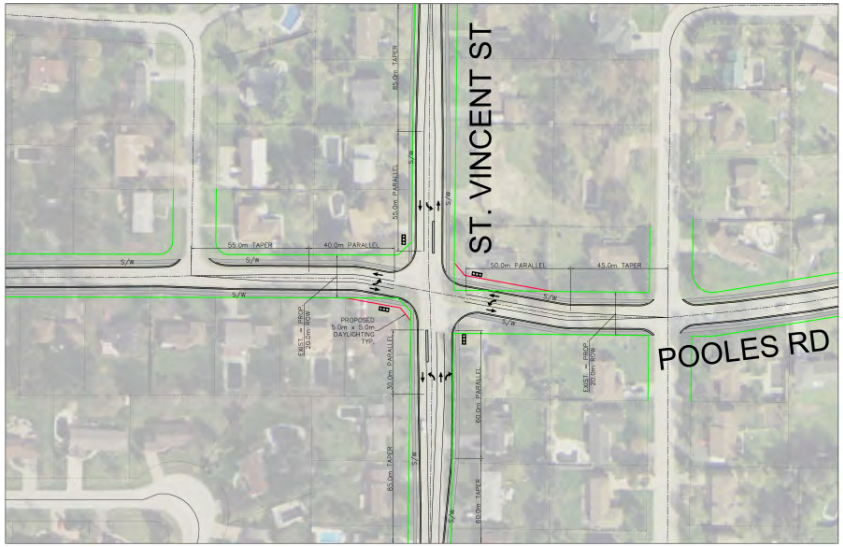
Carson Rd & Hwy 26/27

Hwy 26 & Snow Valley Rd



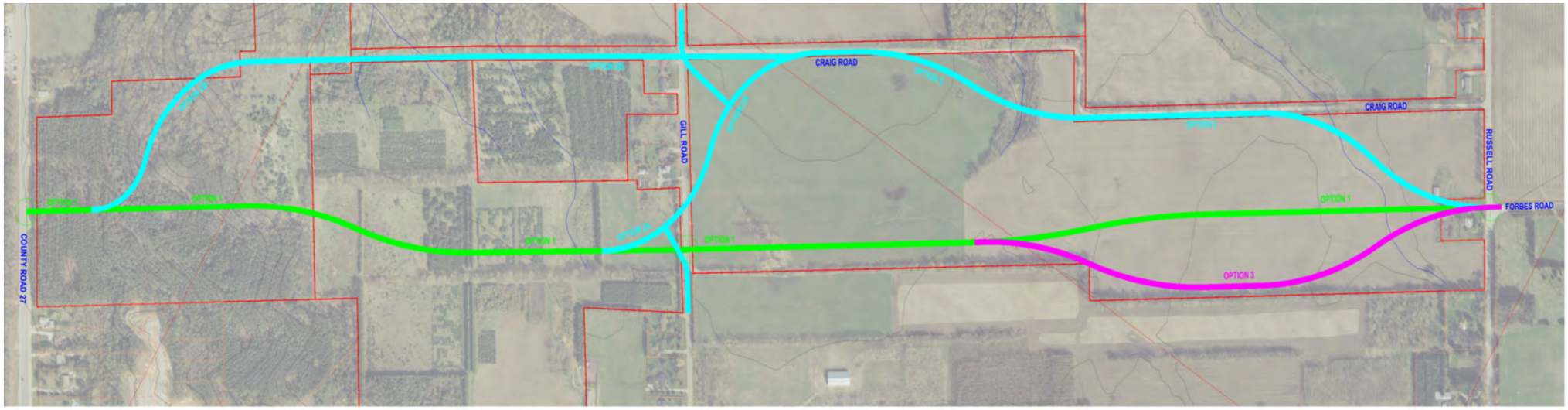


Doran Rd & St. Vincent



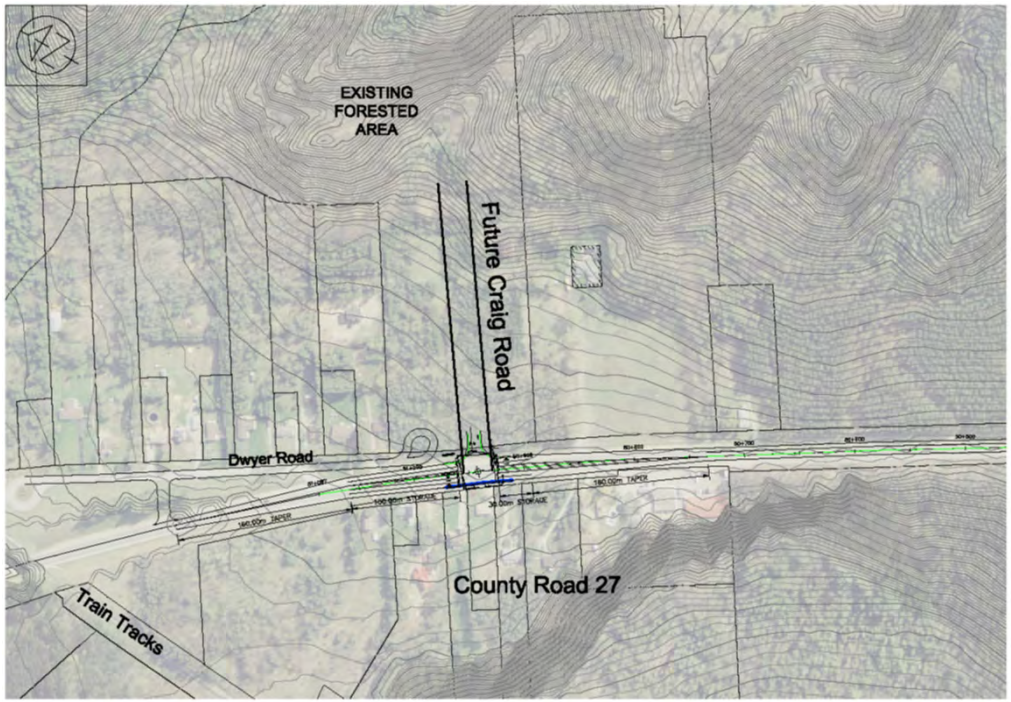
Pooles Rd & St. Vincent

Craig Road Extension
Short List of Alternatives

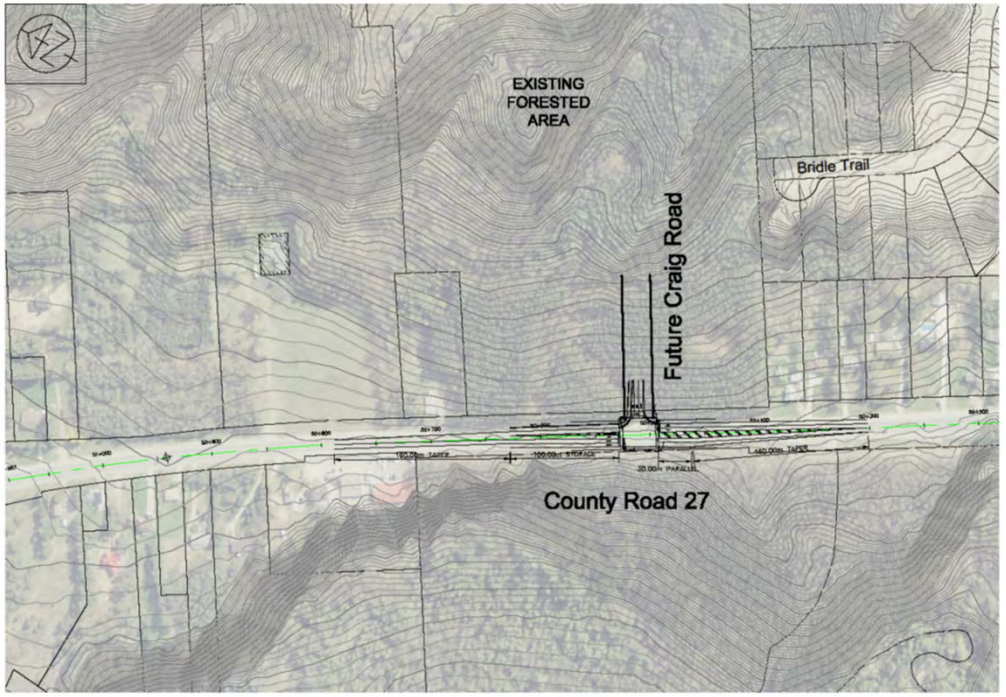


The Recommended solution, with regard to new route for Craig Rd will be determined after receipt of comments from the Public and interested parties.

Craig Road Extension
Locations for connection with County Rd 27



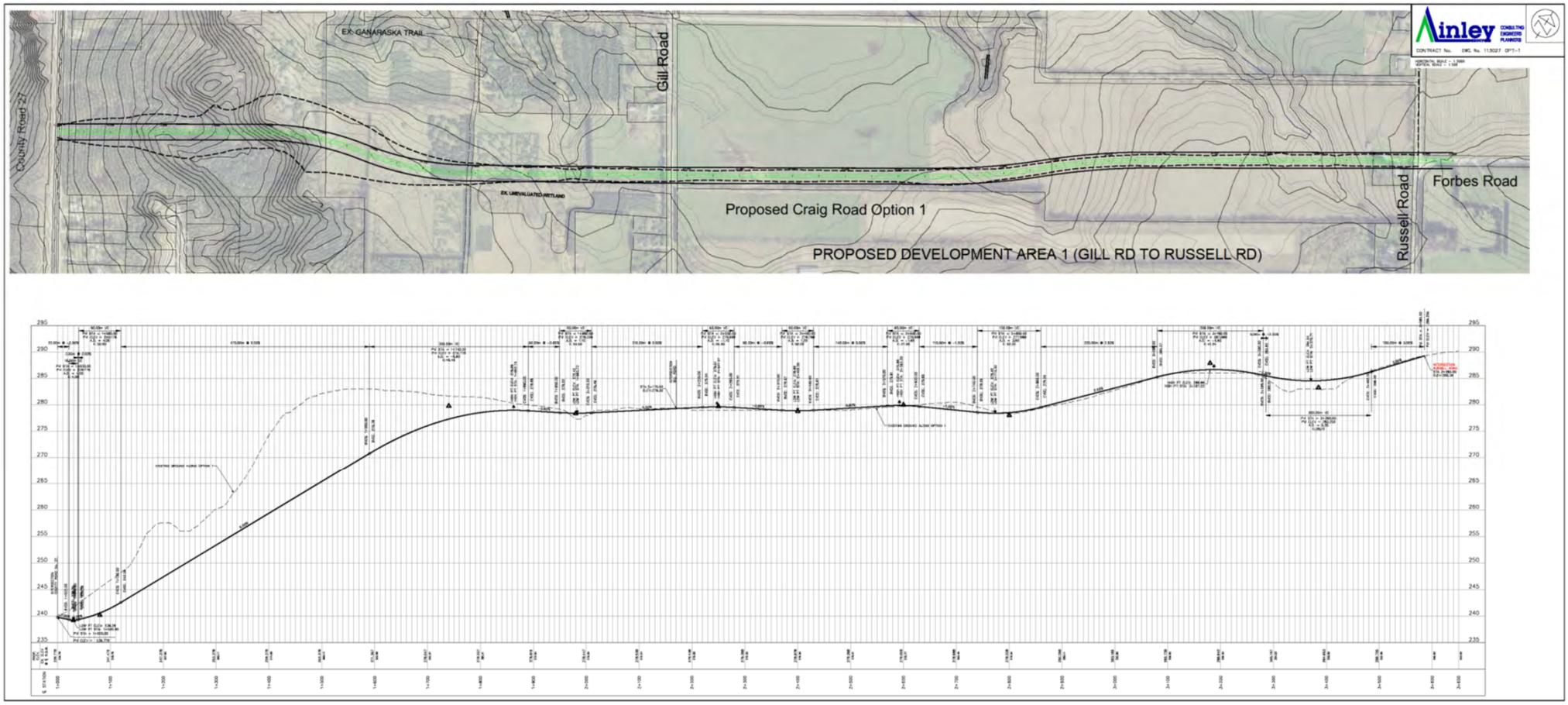
Option No. 1



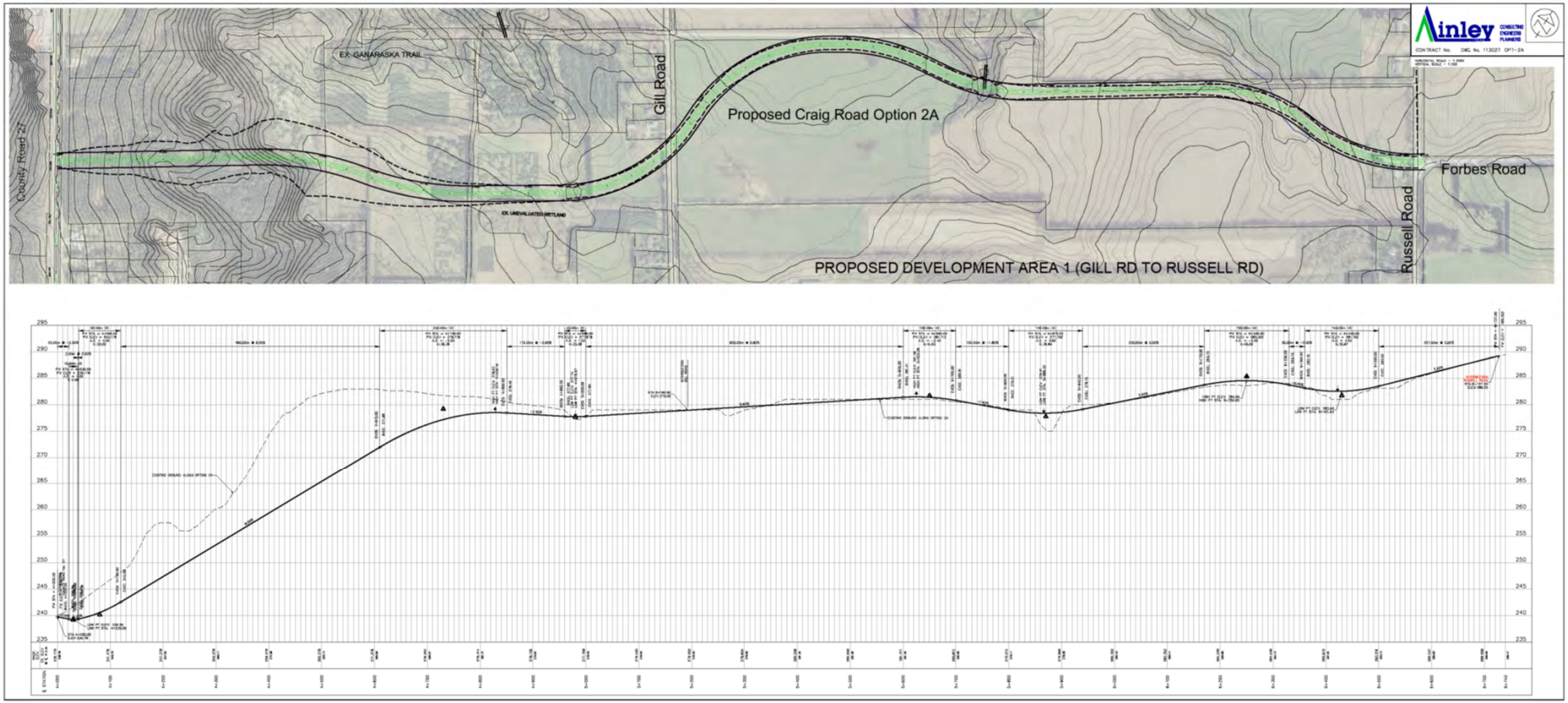
Option No. 2

Option No. 2 – is the Recommended location for the connection with County Road 27

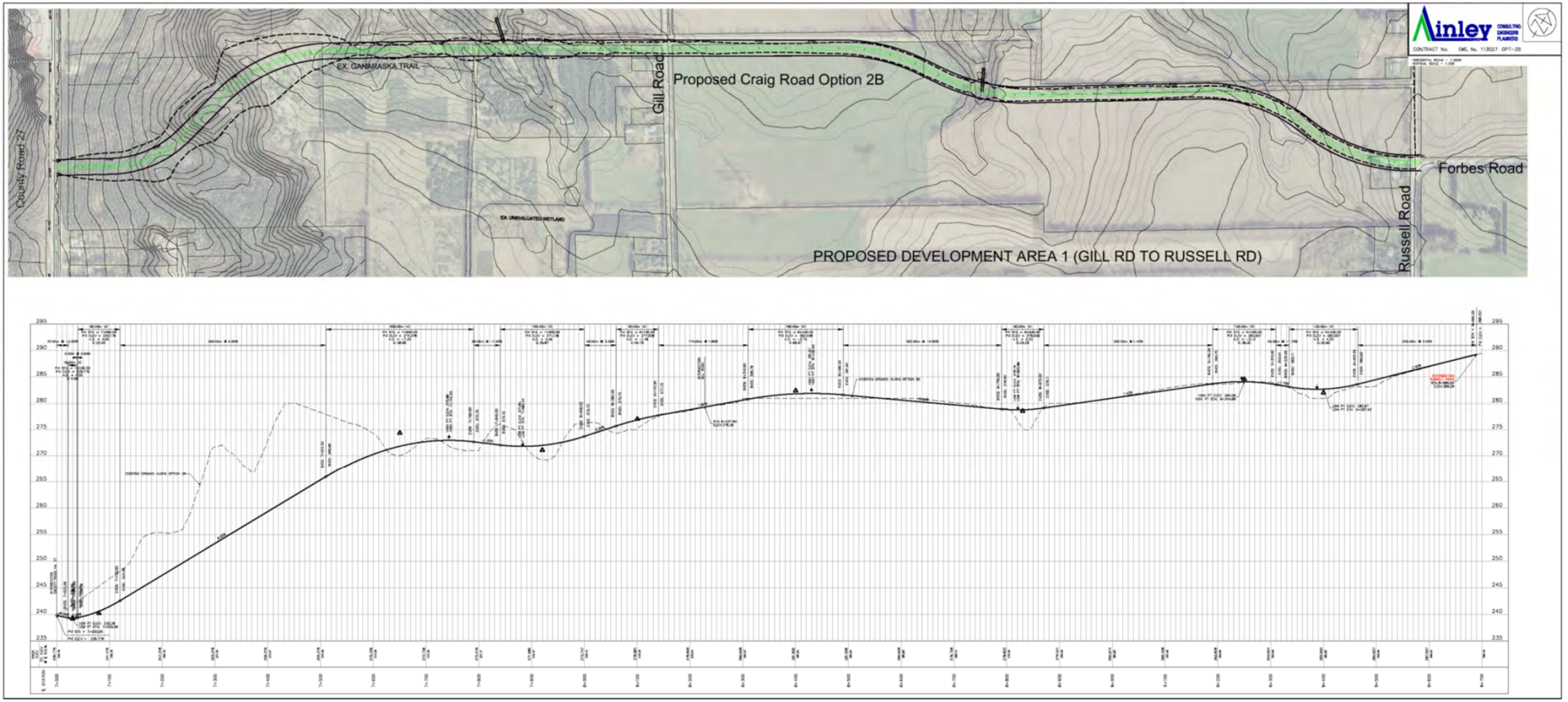
Craig Road Extension
Alternative 1



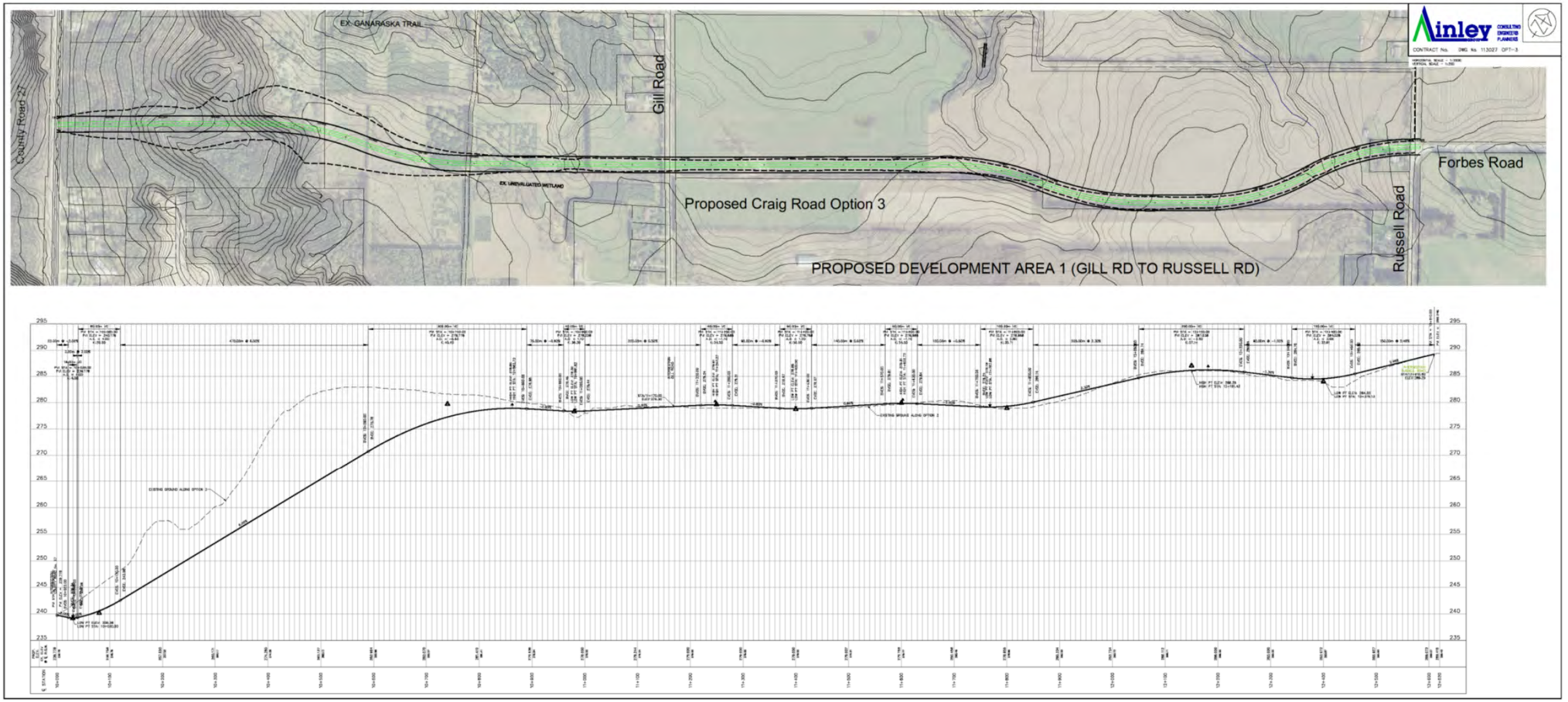
Craig Road Extension
Alternative 2A



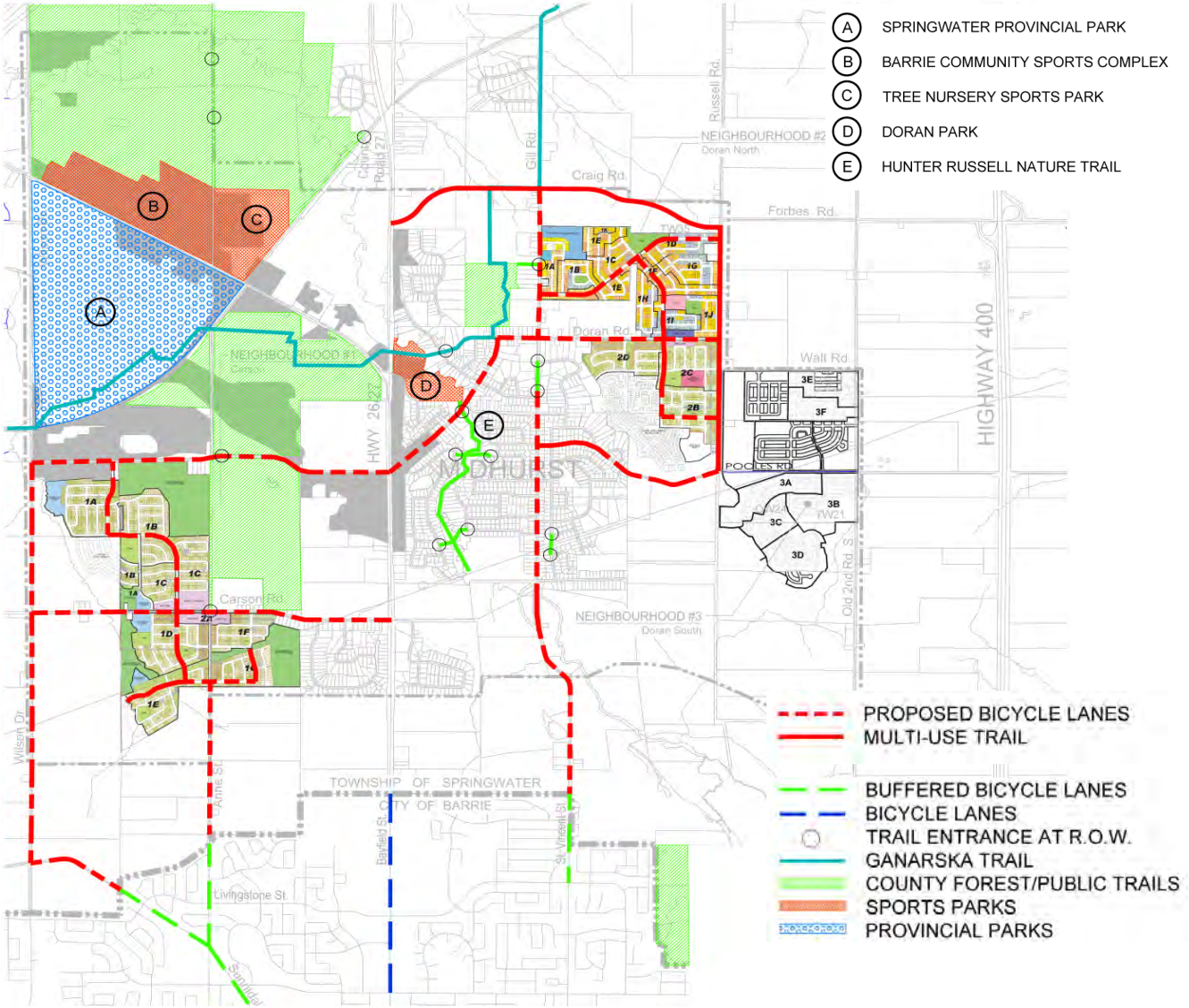
Craig Road Extension
Alternative 2B



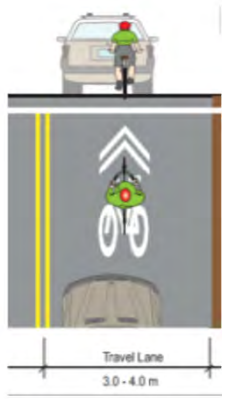
Craig Road Extension
Alternative 3



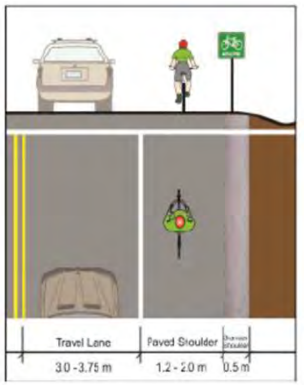
Active Transportation Routes/Links



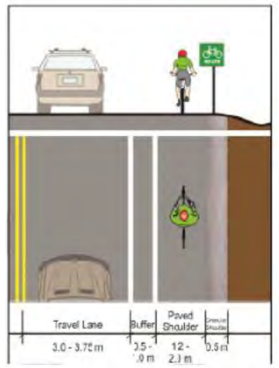
No Dedicated Bicycle Lane



Bicycle Lane



Buffered Bicycle Lane



Transportation Estimated Capital Costs

Phase	Stage	Street Name	Interesections		Length (km)	No. of Existing Lanes	Proposed Road Improvements	No. of Instersection Improvements	Cost/m	BASE COST	FEATURE	FEATURE COST	TOTAL COST
Phase 1	1	Finlay Mills Road		Hwy 26 to Gill Road	1.5	2 Lanes	2 Lane Urbanization	5	$2,800	$4,200,000	Bridge / Two Way Left Turn Lane	$2,100,000	$6,300,000
		Snow Valley Road		Wilson to Gill Road	2.8	2 Lanes	2 Lane Urbanization	2	$3,100	$8,680,000	Hydro	$1,400,000	$10,080,000
		Doran Road		St Vincent to Findley Mill	0.3	2 Lanes	2 Lane Urbanization	1	$2,800	$840,000			$840,000
		Gill Road		Craig Road to St. Vincent	0.9	2 Lanes	2 Lane Urbanization	0	$3,100	$2,635,000			$2,635,000
		Carson Road		Anne St. to Hwy 26	1.9	2 Lanes	2 Lane Urbanization	3	$3,100	$5,890,000			$5,890,000
			Carson Road - Wilson Drive							$500,000			$500,000
			Finlay Mill - Wattie Road							$250,000			$250,000
			Finlay Mill -HWY 26/27 - Snow Valley Road							$400,000			$400,000
			Gill Road - Doran Road							$250,000			$250,000
			HWY 26 - HWY 27							$600,000			$600,000
					7.4								**$27,745,000**
	2	Gill Road		Link to St. Vincent	0.4	2 Lanes	2 Lane Urbanization	0	$3,100	$1,240,000	Grade & Retaining Walls	$600,000	$1,840,000
		Criag Road		Russel Road to Gill Road	1.5	NA	2 Lane Urbanization	2	$3,100	$4,650,000			$4,650,000
		Carson Road			1.0	2 Lanes	2 Lane Urbanization	0	$3,100	$3,100,000			$3,100,000
			Hwy 400 - Forbes Road							$1,000,000			$1,000,000
					2.9								**$10,590,000**
	3	Forbes Road		Russell to Old Second Road	1.1	2 Lanes	2 Lane Urbanization	2	$2,800	$3,080,000			$3,080,000
		St. Vincent Street		Doran Rd. To Barrie Limits	3.9	2 Lanes	2 Lane Urbanization	10	$3,100	$12,090,000	Willow Cr Bridge	$2,200,000	$14,290,000
		Anne Street		Carson Rd. To Barrie Limits	1.9	2 Lanes	2 Lane Urbanization	1	$3,100	$5,890,000			$5,890,000
		Wilson Drive		N. Barrie Limits to Snow Valley	3.8	2 Lanes	4 Lane Rural	2	$3,200	$12,160,000	Hydro	$1,900,000	$14,060,000
		Criag Road		Gill Road to Cty Road 27	1.2	NA	2 Lane Rural	2		$8,500,000			$8,500,000
			Craig Road - HWY 27							$1,400,000			$1,400,000
					11.9								**$47,220,000**
	4	Doran Road		Russel to St Vincent	1.4	2 Lanes	2 Lane Urbanization	2	$3,100	$4,340,000	Retaining Walls	$350,000	$4,690,000
			Carson Road - HWY26/27							$1,500,000			$1,500,000
					1.4								**$6,190,000**
	5	Forbes Road		Old Second Rd to Hwy 400	1.2	2 Lanes	2 Lane Urbanization	1	$3,100	$3,720,000			$3,720,000
		Pooles Road		Russell to St Vincent	1.5	2 Lanes	2 Lane Urbanization	7	$3,100	$4,650,000	Vert and Horz Alignment, Property Acquisition	$1,400,000	$6,050,000
		Russel Road		Forbes to Pooles Rd.	2.1	2 Lanes	4 Lane Urbanization	4	$5,000	$10,500,000			$10,500,000
			Pooles Road - St. Vincent Street							$750,000			$750,000
					4.8								**$21,020,000**
				PHASE 1 LENGTH	**28**							**PHASE 1 COST**	**$112,765,000**
Phase 2	1	Forbes Road		Russell to Hwy 400	2.3	2 Lanes	4 Lane Urbanization	1	$4,800	$11,040,000	Hydro	$1,200,000	$12,240,000
			Russell Road - Forbes Road							$500,000			$500,000
			Russell Road - Doran Road							$350,000			$350,000
					2.3								**$13,090,000**
	2	Walt Road		Old Second to Russell Rd.	1.1	2 Lanes	2 Lane Urbanization	2	$2,800	$3,080,000			$3,080,000
			Pooles Road - Russell Road							$350,000			$350,000
					1.1								**$3,430,000**
	3	Old 2nd Road South		Walt Rd. To Pooles Rd.	1.2	2 Lanes	2 Lane Urbanization	2	$2,800	$3,360,000			$3,360,000
		Pooles Road		Old Second Rd to Russell Rd.	1.1	2 Lanes	2 Lane Urbanization	1	$2,800	$3,080,000			$3,080,000
			Hwy 400 - Forbes Road							$6,000,000			$6,000,000
					2.3								**$12,440,000**
	4												
				PHASE 2 LENGTH	**5.7**							**PHASE 2 COST**	**$28,960,000**
				TOTAL PHASE 1& 2 LENGTH	**34.1**							**TOTAL PHASE 1 & 2 COST**	**$141,800,000**

Proposed Schedule for Completion Class EA

- Receive Public and Agency Comments until Dec 1, 2016;
- Provide a Status Update to Council on progress of Class EA in Jan. 2017;
- Host Public Information Centre No. 2 in Mar. 2017 in conjunction with the publication of Notice of Study Completion and filing of the Environmental Study Report (ESR), which initiates the formal 30 Day Public Review Period associated with Class EA;
- During the 30 Day Public Review period if an interested party has a concern with the Class EA, that cannot be resolved with the proponent, they can request the Minister of Environment and Climate Change (MOECC) for a Part II Order;
- If no Part II orders are received the Class EA process would be completed in April 2017;
- If a Part II Order is received, the MOECC take control of the process and will conduct a comprehensive review of the concerns raised by the interested party;
- Subsequent to the comprehensive review by MOECC, the Minister will render a decision on the Part II Order, that is binding on all parties;
- Following completion Class EA (including resolution of any Part II Orders) Township will proceed with Class EA Phase 5 - Implementation (detailed engineering design).

YOUR COMMENTS ARE IMPORTANT TO US

Please Complete a Comment Sheet or Take One Home With You Before You Leave

Comment Sheets May be Placed in the Comment Box or Returned to the Study Team by Fax, Email or Mail to:

Mr. Mark Archer, CET
Director of Public Works
Township of Springwater
Fax: 705-728-6957
Email: midhurst.classea@springwater.ca
2231 Nursery Road
Minesing, ON
L9X 1A8

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley Group
Fax: 705-445-0968
Email: midhurst.classea@ainleygroup.com
280 Pretty River Parkway,
Collingwood, ON
L9Y 4J5

We would appreciate receiving your comments by December 1, 2016.

1

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

The concept of a turning circle in front of our house is not something that is acceptable. How much of our land will need to be taken to accomodate this.
Council and the developers need to listen to the existing residents for their needs with regards to this development.

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

Mr. Mark Archer, CET
Director of Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Fax: (705) 728-6957
Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

HOW DO YOU PROPOSE TO KEEP CHROMO, BSTRAZEN AND OTHER PHARMA OUT OF WILLOW CREEK, NURSING WET LANDS, THE NOTTA AND THE "BLUE" BREWERS OR WASAGA?

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

RE CRAIG RD EXTENSION - LIKE ATTACH - 3
TO FOLLOW CRAIG RD - TAKES ACCESS AWAY FROM
OUR FARM TRACTORS - TO CLOSE TO FARM LAND

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

WATER + SANITATION FACILITY (WASTE WATER)

-What happens in the event of power or mechanical failure impacting on this proposed "state of the art" facility (facilitates)
- Barrie has quite recently added "state of the art" waste water facility - in the event of prolonged power outage, the untreated effluent has gone directly into Lake Simcoe. Same scenario for Willow Creek!!
-Bell Communications has extensive records on the marked increase in Lightning strikes + Power Failures in our area.

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

5

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

I'm very concerned with this water, wastewater and transportation plans. First off to touch on the water and wastewater plans ~~that~~ are not wanted by myself! Im worried ~~about~~ the land that is being consumed to house the facilities that are required to operate such plans, plus I want my ~~own/independent~~ septic system (That was one of the pluses to moving into this area for myself and family).

Secondly transportation is a VERY negative thing for Midhurst. I moved from Barrie and lived very close to transit stops that were ~~no~~ maintained once put in place, noisy and congested, plus poorly laid out/ planned out, not something Midhurst should consider or consult with Barrie for (as their system is flawed and extremely inadequate). Midhurst is and has been a community that is elite and people have and continue to pay a premium to live here. These suggested plans will be a huge negative and transit will ~~not be what~~ trash up our area ~~area~~ allowing students ~~ext~~ to move in.

Not what we want!

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

Telephone # E-mail Address

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

6

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

I WOULD LIKE TO VOTE CRAIG ROAD EXTENSION ALTERNATIVE 3.

WE ARE A FAMILY OF 4 AND RECENTLY MOVED TO RUSSELL ROAD, WE WELCOME CHANGE BUT WORRY ABOUT THE NEW ROAD DEVELOPMENT AS OUR CHILDREN ARE VERY YOUNG.

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

7

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

The extension of Anne Street will bisect the Minesing - Little Lake wildlife corridor. If extended then wildlife culverts or bridges will need to be put in place.

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

(1) CRAIG RD – DO NOT WANT THE EXTENSION OF CRAIG RD ANYWHERE NEAR OUR PROPERTY.

(2) WE WANT TO REMAIN ON A WELL, WE HAVE FARM ANIMALS AS WE ARE A HOBBY FARM.

(3) WE DO NOT WANT ANOTHER HOUSE ON TOP OF US, NEXT TO US OR BEHIND US –

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

9

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

Huge issues all around.
Go back to drawing board and
come back with much scaled down
plan!

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

1) If this development does realign Poole / St Vincent Green Pine will the township install traffic calming to deter traffic speed

2 Current traffic surveys should be updated and included Actual dates on long weekends

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

FORBES ROAD / HWY 400 INTERCHANGE

PLEASE ADVISE WHAT PLANS YOU HAVE TO HANDLE SUMMER WEEKEND TRAFFIC CURRENTY LOOKING FOR A DETOUR OFF A BACKED-UP 400 HWY AROUND BARRIE. THIS TRAFFIC CURRENTLY FORMS A BUMPER TO BUMPER LINE-UP ALONG FINLAY MILL ROAD (I.E. THROUGH THE MIDDLE OF MIDHURST VILLAGE).

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

12

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

Please consider options re: Craig Rd. Trails in and around it are used year round for recreation. Choose option that has least affect on trails & access to them. Use of these trails enhance quality of life in our village.

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

13

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

Please consider noise pollution along existing and proposed routes. At what point will noise mitigation strategies be conisered, specifically from Hwy 27? Will round abouts produce less traffic noise than stop lights? Traffic noise / sound pollution affects the enjoyment of all outdoor spaces.

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

ALTERNATIVE 3 OR 1 CRAIG ROAD

I LIVE AT CORNER OF CRAIG RD AND GILL. YOU WON'T TO KICK ME OUT GO TO #3 OR #1

THERE IS 3 BIG REUINES BEHIND MY HOUSE YOU WILL HAVE TO DEAL WITH. IF YOU GO #1 OR 3 YOU WILL HAVE A STRAIGHT LINE AND LESS PROBLES.

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

15

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

- Do Not connect Neighbourhood # 3 using Pooles Rd at all ~~[illegible]~~ instead build a road from their most southern end to St Vincent & right to Bayfield – or straight South to Barrie
- Pooles Rd goes right thru the middle of old Midhurst

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

Mr. Mark Archer, CET
Director of Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Fax: (705) 728-6957
Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

16

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

- Please reroute traffic AWAY from POOLES Rd onto St. VINCENT (ie Study traffic already in mornings with school buses)

- Protect Old Midhurst from Urbanization

- Prefer 2 water treatment facilities ∴ do NOT transport wastewater thru Old Midhurst

- We do NOT want hookup to treatment facility

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

17

17

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

Can you provide a simple summary table illustrating the total existing & proposed P loading to Willow Creek? (sanitary + storm combined)

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

18

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

Given the stated desire to minimize new traffic through the existing Midhurst Village, would it not make sense to force the [redacted] Craig Road connection to be completed as part of Phase 1.

Similarly - why expend St. Vincent and Pooles at all. With a new and improved route from Hwy 460 to Hwy 27. It would make some sence to leave these routes alone and less attractive options compared to Forbes / Craig.

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

* A roundabout at Forbes & Russell Rd is not a good idea. Canadians are not familiar with roundabouts and they seem to cause caos at Park Place shopping area

* We need to consider bike paths on St. Vincent on the section of road that connects Barrie to Midhurst. This road is going to become extremely busy and we need to think of the safety of our young people

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

The Craig Rd Extension should be put in before Any Construction starts. The Truck Traffic ~~#~~ Through The village will be out of Control and Extremely unsafe. Cottage Traffic Has already made Fri and sundays way To busy Through The village. The gravel Trucks already use the village as a cut ~~Th~~ Throw and will get alot worse when Construction starts. CRAIG Rd Installed Before Any Constructior

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

21

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

The use of round-abouts are not a good idea. I have never seen/experienced a round-about in Canada that works well ie: Park Place and eventhe one on Hwy 26. [redacted]

Planning for bike paths/lanes along St. Vincent to allow bikers to get safely into & out of Barrie.

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

I DON'T THINK A TURNING CIRCLE OR FOUR LANES ON RUSSELL ROAD IS APPROPRIATE. OUR HOME IS OUTSIDE THE SETTLEMENT BOUNDRY, WE'RE IMPACTED THE MOST.

TRACTORS, HORSES, CYCLIST, WALKERS ARE ON RUSSELL ROAD DAILY.

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

23

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

I LIVE AT THE CORNER OF RUSSELL AND DORAN AND MY DRIVEWAY WOULD BE PART OF ANY REVISIONS TO THIS INTERSECTION

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 REROUTE THROUGH THE SETTLEMENT

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

Mr. Mark Archer, CET
Director of Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Fax: (705) 728-6957
Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

24

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

Storm sewer holding pond planned for beside my property. Will it effect my drinking water? If it does, who is going to help me?. Where will this pond discharge? I probably will have more questions to ask, so be prepared.

*You must be very careful in regards to the Minesing Swamp. It need protection and it's up to us to preserve it for future generations. It's so important. You are holding a jewel in your hands.

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

I THINK THIS IS GREAT. THE IMPROVEMENTS WILL RAISE THE VALUE OF MY HOME. THE ADDED TAX BASE - IN THE FORM OF ADDITIONAL RESIDENTS AND THE BOOST IN ASSESSMENT VALUE - WILL HELP RESOLVE THE TOWNSHIP FINANCIAL ISSUE AND IMPROVE SERVICE LEVELS FOR ALL.

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use. Do not fill out
Ref #_____

Ref #_____

Name

Mailing Address

Telephone # E-mail Address

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

26

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

OPTION one should be the route for extending Forbes road to highway 27. This option is the most direct route and will encourage traffic and discourage traffic from the current village.

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

Mr. Mark Archer, CET
Director of Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Fax: (705) 728-6957
Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

27

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

A roundabout at Wilson/Carson sounds great, but what about the cemetary?

Carson Road development is being built on the 5 generation Hickling farm. It would be lovely to ~~Honour~~ them, including a Township Reeve, by naming some streets after them.

The "shoe tree" at Anne/Carson is an eye sore that collects garbage.

*Beware of trespassing ATVs + snowmobiles through Carson. No reply needed.

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

28

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

ANNE STREET SHOULD BE EXTENDED FROM CARSON ROAD TO HIGHWAY 26.

CARSON ROAD SHOULD BE EXTENDED TO ST VINCENT STREET

ALL ROADS NEED SOME [redacted] FORM OF BYCYCLE LANES

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

[redacted]

(1) WHAT IS GOING ON WITH THE MAINTENACE OF THE OUTLET OF THE WILLOW 1980 WAS THE LAST TIME IT WAS DREGDE. SAND TRAPS REMOVED 2008 AND NO MAINTENCE BEING DONE ON THE SILT + SAND COMING DOWN STREAM.

(2) WILLOW IS FILLING UP WITH SAND AND BREAKING OUT AND FLOODING MY FIELDS NO MENTION OR CONCERN FROM AINLEY + ASSOCIATE

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

Mr. Mark Archer, CET
Director of Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Fax: (705) 728-6957
Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

(3) DRAINAGE ACT IS NOT BEING ~~FOLLOWED~~
YOU CAN NOT PUT HARM. ON LOWER LAND OWNERS.

(4) " DRAINAGE ACT READ IT.

(5) MY QUESTION ABOUT DRAINAGE WAS ~~PRESENTED~~ AT THE TOWNSHIP. EA IN 2000 STILL NO ANSWER IS THAT NOT A REQUIREMENT IN THE EA PROCESS

" DRAINAGE OUTLET " OR NO MORE WATER

30

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

Main Concern is that cost will be passed onto existing midhurst residents. Pass the cost onto the developers, and intern to the persons who wish to reside in midhurst in a new build. We have already paid for the current infrastructure. (ie. Septic etc.) already.
Primarily we do NOT want to hook into Sewer!
Please Do not add Sidewalks. we do not want them. They bring people closer to your house and things get damaged (we've seen this before).

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

Also, they rarely get maintained. In midhurst we can hear the crickets, and see the stars! We want to keep it this way. Don't buy into BIG CITY ideas!
We want a happy and healthy community for our children to grow up in.

Thx.

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

31

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

1) Against the Russel Rd 4 lane expansion. Why is it needed if there are no driveways Facing Russel Rd?

2) Why cant all traffic be sent through the new Craig Rd expansion.

3) Will Existing Residence be Forced to hook up to sewers? Will the existing cabins I guarantee we will not have to hook up to sewer

Please submit this Comment Sheet by **December 1, 2016** to: see over

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

Mr. Mark Archer, CET
Director of Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Fax: (705) 728-6957
Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

4) How will you maintain existing water ontop of new developmen

5) How are the developers doing as meeting the 150 EA requirements before development can begin?

6) What will be the annual cost of maintaining the waste water for example replacement of filters?
There is always an extensive cost of using the best technology

7) Having Poole and Green pine closed is a benefit to decrease traffic speeding problems.
It should be left as is.
The goal should be to reduce the traffic impact to existing midhurst residence not increase traffic flow problems.

32

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

AS PER TRANSPORATION.

I AM IN FAVOR OF OPTION #1 FOR FORBES RD EXTENSION CROSSING GILL RD IN A STRAIGHT LINE, AS IT IS THE MOST DIRECT ROUTE & KEEPS TRAFFIC AWAY FROM RESIDENCE'S. [redacted]

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #

[redacted]

Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

[redacted]

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

I have just witnessed a presentation that proposed traffic measures (turning lanes, traffic circles, road improvements (widening that speed and encourage increased traffic flow. At the same time they proposed traffic calming measures to be introduced by the townships. To slow and discourage traffic ichicanes and impediments have to be put in place. →

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

The sewage line is to be run ~~the~~ down Finlay Mill. This is the time to construct a street that encourages cycling / pedestrians and traffic slowing. Also impediments must be put in place at the top of Doran Rd. to discourage through traffic. This should apply to Doran, Russell, Mattice, St. Vincent ~~etc~~ Poole's and Sill Rd.

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

34

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

(1) Russell Rd - Doran Rd roundabout - unacceptible too much impact on existing residence at location
(2) Intersection 26 and 27 must be signal lights - NO roundabout.
(3) NO forced main on Doran (27 to Finley Mill Rd)
(4) Tertiary sewage treatment does not remove drug residues (no safe level known); toxins such as nano silver, copper and other continuously developed new "products". Once disposed of by residents they combine to form new toxins. [Lee U of Waterloo, Groundwater Institute and Civil Engineering Dept.

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

I believe the Minesing Wetland (an international RAMSAR site) cannot tolerate both the quantity of discharge from the proposed plant or the toxins which pass through even this technology untouched. Species there are dependant on specific seasonal water levels (both up + down), fairly pristine water quality except for phosphorus and specific temperatures. Whereas phosphorus is a fertilizer things like zinc silver, boron pesticides, etc are poisons. So is the question how much poison do we want to feed to not only these species but all other children, seniors, and others living downstream?

35

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

My name is [redacted].
I live at [redacted]. I am pleased to see that CRAIG RD will be extended to HWY 27. This should be done at the very start of construction From the very beginning we were assured that the essential nature of MIDHURST should be preserved. The above plan would be a start. FINLAY MILL is already heavily used by cyclists from FOREST HILL SCHOOL and even cycling groups from Barrie and Toronto

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

These cycling routes should be marked by safety barriers, not painted lines. This can be achieved by narrowing Finlay Mill, which would have the added advantage of slowing traffic. Chicanes and other impediments can be added to discourage through traffic. This should be done when the sewage line goes through.

The proposed commercial strip development along Hwy 27 and the start of Finlay Mill must be stopped!!! There is no room for a parallel access ~~road~~ road. Bayfield St is already a disaster

STRIP developments are ugly dangerous, and in this case an impediment on a THROUGH HIGHWAY.

Sincerely, Yours Truly

[redacted]

36

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

I am very concerned with the impact of the MSP on the wetlands.
Phosphorus levels are already on the high side and the effluent will continue to add to the levels. Even though the concentrations are 0.05mg/L Phase 1 and 0.03mg/L at Phase 2. The effluent is still adding additional P that would not otherwise be in the creek. Effluent Concentrations might be the same level but we are still adding more flow + more P to the creek.
On one of the boards, there is a statement that says that the effluent " will not alter the ⇒

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref # _____

[redacted]

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

nutrient status of the Willow." That comment is quite definative. What if you are wrong down the road? There are also other chemicals that will be discharged. How will these PCPP affect the flora and fauna? What will be done to minimize the chemicals? Most WWTP discharge into larger bodies of water not a creek.

Natural ecosystems cycle with seasons, the steady flow will alter the natural flow of the Willow. ~~and will affect Does anyone know the impact of the cha~~

How will this affect the Minesings ecosystem?

What will happened if there is an overflow problem? Who is responsible and who will pay?

Give the Minesing Wetlands a Voice.
Speak up for the Minesing Wetlands before it is too late!

Large scale Wastewater Treatment Plant planned for MSP which will discharge 10 000 L+ of effluent into our Internationally recognized Wetlands.

I am losing faith in government's ability to protect OUR environment.
What is the purpose of government policies if they have no clought or if the government doesn't stand up to big business and say enough is enough? They say It's all about growing the economy, but at what costs? Usually it is our natural environment that comes out the short end for short term economic gains.

The Minesing Wetlands unfortunately does not seem to have a voice in what is going on with the Midhurst Secondary Plan (MSP). Most people are aware that wetlands play an important part of our ecosystem and that over 70% has been lost already in settlement areas in Ontario alone. There are numerous flora and fauna which have endangered, threatened, at risk designations who call the Minesing home as well as local communities that depend on it for flood control. What does an endangered, threatened, at risk designation mean anyway? It seems to me.....nothing since Developers money can entice some to turn a blind eye or pull strings, and bulldoze through sensitive environments and communities that do not want them there.

The Minesing Wetlands is one of the largest intact wetlands in Canada and has an international designation. The world recognizes the unique biodiversity of the Wetlands but not our own governments? Why is the Ministry of Natural Resources and Ministry of the Environment not following through on their policies to stop this development? The Midhurst Ratepayers and AWARE are groups that are advocating for the Wetlands and I also know that many of the staff of the Nottawasaga Valley Conservation Authority (NVCA) also recognize that the Wetlands have to be protected but unfortunately there are members of the Board that do not see that protecting the Wetlands is more important and are allowing the process to proceed.

What does it take to stand up to Developers who do not consider the long term negative impact their developments will have on the health of the wetlands and surrounding lands? Unfortunately the litigation requires lots of $$$$ to fight which most local groups do not have. This has been the case with the MSP being reviewed by the Ontario Municipal Board on many occasions over the past few years and how ironic that the OMB is currently under investigation for overruling many decisions made by municipalities in favour of the developers.

I have made presentations to Springwater Township as well as the NVCA Board stressing the significance of the protecting the Minesing from the MSP but have come to deaf ears.
The Open House for the class 3 and 4 environmental assessment is on happening on Oct. 18 and the developers will put on a good front on how they will take care of everything and be able to mitigate any concerns but can they guarantee no harm will come when that Wastewater Treatment Plant starts discharging the 10 000+ litres of effluent daily into the sensitive Willow Creek which feeds into the Minesing Wetlands? The following are some of my main concerns.

Water supply

Consultants were hired by the developers to carry out studies on the feasibility of water supply from the local aquifers.

1. Who verifies the accuracy of these findings of these studies?
2. How can they guarantee that it will not affect the wells of farmers and other land owners who share the aquifer? One report comments that the water supply " is not expected to adversely affect existing water systems."

Wastewater Treatment Plant

The discharge location is into Willow Creek which is usually slow flowing for most of the year and around 20 feet across and not very deep. The discharge area does not have the luxury of a large body of water to dilute the discharge.

1. A looming question by existing residents is will we have to hook up? The previous mayor said residents will not have to hook up however wording in reports imply that they will. "Effluent discharge rates..... including flows from existing development..."; "Effluent discharge pipe from plant to Willow Creek sized to service the entire Secondary Plan area including existing Midhurst."(Ainley)
2. I accept the fact that they can treat and filter out Nitrogen and Phosphorus but how will they filter out Personal Care Products and Pharmaceuticals and other nanoparticles?
3. What evidence do they have of another WasteWater plant to compare with that discharges into such a small creek and the short and long term effects on the ecosystem?
4. How can they guarantee that the increase sustained flow rate will not change the natural ecological cycle of the Minesing wetlands?
5. How can they guarantee that there will no overflow or spillage? And who will pay and be responsible for the clean up if the plant is built and an accident happens?

The proposed population of 35000 MSP does not make sense.

It is not too late to SAVE the MINESING.
SAY NO TO THE WASTEWATER TREATMENT PLANT.

[redacted]
Midhurst Resident

37

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

1. The proposed road infastructure for Pooles Rd is inadequate. A minimum of 4 lanes would be needed for the thousands of new cars which will be using Pooles Rd to St. Vincent Rd to get to Barrie. A sidewalk would need to be constructed for the safety of the residents.
2. Increased traffic along St. Vincent, it also will need 4 lanes and sidewalks.
3. Who will pay for the expansion of St. Vincent from Midhurst to Barrie
* 4. How will you protect the annual migration of turtles across St. Vincent? OR will they just be diminated by traffic!
5. Has Barrie been informed of the possible upgrades

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng. President & CEO Ainley & Associates Limited 280 Pretty River Parkway Collingwood, ON, L9Y 4J5 Fax: (705) 445-0968 Email: midhurst.classea@ainleygroup.com	Mr. Mark Archer, CET Director of Public Works Township of Springwater 2231 Nursery Road, Minesing, ON, L0L 1Y2 Fax: (705) 728-6957 Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

[redacted]

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

needed for Livingstone and Hamner Roads for the increased traffic.

6. How will residents on the streets between Pooles Road and Jodie's Lane get on to St. Vincent with the increased traffic? Left turns are already difficult in the evening. With thousands of new cars you will have to totally rework St. Vincent

7. There needs to be a second sewage pipe (a back up) in case there is a leak and failure in the primary pipe.

8. Your assumption that the new residence will use Forbes Road to the 400 highway to go to Barrie is incorrect. The residents will go down Pooles Road across St. Vincent to go to the malls for shopping. As previously stated, this will cause a major congestion of vehicles on Pooles and St. Vincent, along with Hamner and Livingstone in Barrie.

38

From: [redacted]
To: Joe Mullan
Subject: [redacted]
Date: Tuesday, October 25, 2016 8:10:45 PM
Attachments: Midhurst Class EA Phase 3-4 PIC - 20161018 - Midhurst Class EA - Phase 3 and 4 PIC Display Boards.pdf

Good morning Joe,
The display Board used last night showed 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.

[redacted]

Russell Road & Doran Road

Signalized Intersection

Roundabout

The Recommended solution is the Signalized Intersection

39

From: [redacted]
To: midhurst.classea@ainleygroup.com; midhurst.classea@springwater.ca
Subject: class ea concerns
Date: Tuesday, November 29, 2016 3:57:42 PM
Attachments: Comment Sheet 001.pdf
Comment Sheet 002.pdf

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

See pg 2 for my concerns

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

Mr. Mark Archer, CET
Director of Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Fax: (705) 728-6957
Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

Ref #

[redacted]

Comments and Information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

As a long-time resident of Springwater, I am very concerned with its future.
I have three main concerns:

The first concern is water. Whatever else as a species, we cannot survive without it. No matter where it is coming from, water is a finite resource and when large quantities are being drawn from one of the aquifers, the others will be affected. Currently, North America has a lake shrinking as a result of large quantities of water being drawn from an aquifer. We must be careful how we handle this precious resource.

The second concern is waste water. 380 litres per person per day will inundate Willow Creek, the Minesing Swamp and the connecting water shed beyond its current capacity. This will have tremendous impact on the flora and fauna of this important, world class wet lands. Further effects on this water shed will be the toxins still in the waste water and the increase in temperature that will go along with this waste.

The third concern is transportation. A comprehensive and up to date study needs to be done. The 2013 study is not good enough. This study did not look at the traffic going through the Midhurst area over all weekends in the summer. Cottagers trying to avoid the Barrie bottle-neck clog the roads around Midhurst.
The reasons for the changes to the Forbes 400 exit and the expansion of the Craig Side Road were given as a way for new residents to get to Barrie. These residents won't be using the 400 to get to Barrie. They will go through Midhurst to reach Bayfield Street. The proposed Craig Side Road routes will cost much more than stated, as most of the terrain west of Gill Road is not only very treed but rugged. I know because I have walked the area but anyone looking at the contours on the map should know this.

40

From: [redacted]
To: Midhurst.classea@Springwater.ca; Midhurst.classea@ainleygroup.com
Subject: [redacted]
Date: Thursday, October 20, 2016 11:01:53 AM

Dear Midhurst Class EA,

Thank you for the presentation given at Snow Valley Ski Resort on Tuesday.

We would like to recommend that an opaque fence of significant height and sound-attenuating/deflecting ability be erected along the rear lot line of the industrial properties on Snow Valley Road, from about 1471 Snow Valley Road (Algonquin Bridge) to 1533 Snow Valley Road (Springwater Woodcraft).

Ideally, an additional green-space buffer with trees would be appropriate, but as explained by Mr. Mullen on Tuesday night, the Mick's lots' depths may have unfortunately been already been established. However, those lots are very long and narrow, so perhaps this oversight can and should be corrected, so conformance to the Official Plan can be achieved, and a more harmonious community realized?

We fear noise complaints from the many new high-density residential neighbours, against the long-established industrial lots working zone.

Better to do this now, than to live with it for the next 100 years.

Thank you

Please acknowledge receipt so I know you received this - Thanks.

41

From: [redacted]
To: midhurst.classea@springwater.ca; midhurst.classea@ainleygroup.com
Cc: Bill French; Don Allen; councillor jackhanna; <perry.ritchie@springwater.ca>; Sandy McConkey; Katy Austin; Jennifer Coughlin; Brent Spagnol
Subject: Comments regarding EA 3 & 4
Date: Wednesday, November 30, 2016 10:43:01 PM
Attachments: 2016 EA 3&4 comments - Strachan.pdf
Finlay Mill Traffic.mp4
Ag Plan Front & Conclusions.pdf

Thank you for the opportunity to comment on the Environmental Assessment 3 & 4 of the Midhurst Secondary Plan, as presented by Mr. Joe Mullan of Ainley and Associates Ltd. on October 18, 2016 at Snow Valley Resort.

Please find my three comment files attached. (Complete versions of most MSP material can be supplied on request).

Kind regards

[redacted]

Comments on EA 3 & 4 of the Midhurst Secondary Plan

Thank you for the opportunity to comment on the Environmental Assessment 3 & 4 for the Midhurst Secondary Plan as presented by Mr. Joe Mullan of Ainley and Associates Ltd. on October 18, 2016 at Snow Valley Resort.

The presentation was well delivered and appears to be in compliance with provincial regulations for a Public Information Centre. Nevertheless there remain serious doubts as to the credibility of some of the facts as presented.

A complete review of all material is beyond the scope of a public comment, but a few examples are provided to illustrate what seems to be the most glaring errors. These are referenced to the numbers on the PIC display boards as posted on the Township web site and referred to here as "slide numbers".

Waste Water (Slide 20)
The last bullet refers to Total Phosphorus concentrations as follows:

- **Phase 2 effluent will reduce the TP concentrations within Willow Creek from the present day values of 0.031mg/L**

This is hard to believe and warrants a closer look.

From other data provided we learn that the 7Q20 low water average for Willow Creek is 430L/s, with a phosphorus content of 0.031mg/L.

Phase 1 will add 74.65L/S with a phosphorus content of 0.05mg/L and Phase 2 by deduction, will add 67.87L/s (142.53-74.65) with a phosphorus concentration of 0.03 mg/L.

This means that at the conclusion of Phase 1, the TP concentration will become 9% higher than it is at the present day, but that by adding Phase 2 water (a smaller volume) with a phosphorus concentration of only

marginally less than today's level, the TP is somehow magically reduced to below present day values.

The attached spreadsheet[1] indicates that after Phase 2, the TP will be more like 8% higher than it is today. Hardly surprising when the same Ainley slide acknowledges that Phase 1 will add 118 Kg/year of new phosphorus loading to Willow Creek and Phase 2 will add 134Kg/year. The slide appears to cleverly mislead the reader onto believing that the development is somehow beneficial to the water quality of Willow Creek, when clearly this is not true.

Transportation (Slides 39 - 53)
Regardless of the studies upon which the PIC information is based, common sense and observations reveal the following:

- For the 1,200 existing homes in Midhurst, there must be some 2,000 vehicles.

- Full build-out is likely to bring the Midhurst vehicle count to well over 12,000. This is an increase of at least 6x.

- Slide 39 shows the proposed Forbes Road upgrade, intended to facilitate new residents accessing to Highway 400. But in reality the highway around Barrie is already severely stressed at rush hours. On long weekends in the summer, tourists frequently exit the 400 and take a detour though Midhurst village to avoid highway traffic. The attached video shows traffic on Finlay Mill Road on a long summer weekend[2].

- Other routes south are St. Vincent, Bayfield Street, Anne Street and Wilson Avenue. The most significant of these, Bayfield Street, is according to Barrie Mayor Jeff Lehman, "at capacity now".

- The Midhurst Landowners Group has offered to pay for the roads associated with the development, **but has not offered to pay for even one new arterial road.** (The burden of funding for the new Craig Road by-pass is left for the Township to pay out of DCs to be collected over time as the development proceeds).

The present transportation plan with no new arterial roads or village by-passes, seems to be totally inadequate for the anticipated volume of traffic. If you ask local residents why they moved to Midhurst, many will tell you that they moved here to escape the traffic congestion of the GTA. **How can it be appropriate to route 6 times the volume of traffic through existing streets in a charming rural village and then charge Springwater residents for a new road and road upgrades?** How is this in the public interest?

Agriculture

There are no new slides addressing agricultural issues, presumably because this is deemed to have been covered in EA 1 & 2.

According to Canada Land Inventory charts, the proposed developments are planed on class 1 and 2 farmland. Local farmers advise that the quality of soils on these lands, especially in the Doran Road area, are mostly of vasey loam; a soil with particularly desirable properties for absorbing and retaining moisture and nutrients. Farms on these lands have for generations produced crops as good as you can grow anywhere in Southern Ontario.

As part of EA 1 & 2 in 2008, AgPlan Limited prepared a report for Midhurst Development Doran Road Inc. and Midhurst Development Carson Road Inc. The front page and the Conclusions of this report are attached[3]. **Are these Springwater farmlands truly "a reasonable choice for the location of urban development"** as concluded in the report?

Summary

All EA studies have been funded by developers. Does it seem likely that in the preparation of their reports, the consultants would have been mindful of desired outcomes?

Three examples are provided above, but questionable results are evident in most of the reports I have read. Hopefully these examples will serve as an endorsement for council's unanimous vote to seek impartial peer reviews of the Midhurst Secondary Plan EA reports.

	513,083	L/hour	268,750	L/hour	244,333	L/hour
	8,551	L/min	4,479	L/min	4,072	L/min
	142.5	L/sec	74.65	L/sec	67.87	L/sec
	Willow Creek 7Q20 low level water flow	430	L/s			
	Phase 1 adds	74.65	L/s			
	Total water flow after Phase 1	504.65	L/s			
	Phase 2 adds	67.87	L/s			
	Total water flow after Phase 2	572.52	L/s	(33% increase in water flow from today's low water le		
	Willow creek currently contains	0.031	mg/L	13.33	mg/430L at low vol	
	Phase 1 WWTP adds	0.05	mg/L	3.73	mg/74.65L	
	Total mg/L after Phase 1			17.06	mg/504.65L	
1	Therefore mg/L after Phase 1			0.0338	mg/L	(9% more thar
						New Phosp
	Willow creek currently contains	0.031	mg/L	13.33	mg/430L	
	Phase 1 WWTP adds	0.05	mg/L	3.73	mg/74.65L	
	Phase 2 WWTP adds	0.03	mg/L	2.0361	mg/67.87L	
	Total mg after Phase 1			17.06	mg/504.65L	
	Total mg after Phase 2			19.10	mg/572.52L	
	Therefore mg/L after Phase 1 & 2			**0.0334**	**mg/L**	(7.75% more t
	The EA boards state; "Phase 2 effluent will reduce TP concentrations within Willow Creek from the present day values of 0.031m					
	- According to the above calculations, although the Phase 2 effluent is predicted to contain 0.03mg/L TP, the net effect at full bu nevertheless ***increase*** TP concentrations from present day values by almost 8%. How does Ainley explain the claimed reduction					

AGRICULTURAL ASSESSMENT REPORT
FOR THE SECONDARY PLAN STUDY AND OFFICIAL PLAN REVIEW OF THE MIDHURST SETTLEMENT AREA IN THE TOWNSHIP OF SPRINGWATER, COUNTY OF SIMCOE

Prepared for:
Midhurst Development Doran Road Inc. and
Midhurst Development Carson Road Inc.

By:
AgPlan Limited

May, 2008.

neighbourhood reports for characteristics of soil capability for common field crops, soil potentials for specialty crops, Minimum Distance Separation and feasible agricultural mitigation.

In conclusion, given the aforementioned agricultural characteristics described and analyzed, Springwater Township has better agricultural lands than those found within 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.

AgPlan Limited

Michael K. Hoffman
Agriculture Analyst

42

From: [redacted]
To: midhurst.classea@ainleygroup.com
Subject: Feedback on Midhurst Class EA
Date: Monday, November 28, 2016 8:20:40 PM

I was at the dump in Oro today and it made me think about the building occurring in Midhurst. Our dump has a limit to the number of years it is feasible. Has this been discussed with regard to the plans. 3000 more homes means a tremendous strain on our facility. I know the new place on horseshoe Valley road will help, but is our garbage costs going to skyrocket. Will we have to ship garbage plus building materials to other areas and at what cost. I didn't see anything in the plans with regard to dump facilities. [redacted]

43

From: [redacted]
To: midhurst.classea@springwater.ca; midhurst.classea@ainleygroup.com
Subject: Fw: Midhurst Secondary Plan - Class Environmental Assessment - Comment - Minesing Wetlands - Elevated Assessment - Aboriginal Consultation
Date: Sunday, November 6, 2016 7:59:04 PM

This is a comment arising from the Public Information Presentation held on October 18, 2016.

A representative of Ainley and Associates 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.

The Minesing Wetlands is a 6,000 hectare natural treasure situated in Springwater Township and two neighbouring townships. "Minesing" comes from an Ojibway word meaning "island" – referring to an island located in the middle of the Wetlands. The Wetlands is an historically significant fish habitat and sustaining refuge for migratory birds and many other types of wildlife.

The Minesing Wetlands has been designated as a Provincially Significant Wetlands (PSW) and a provincially significant Life Science Area of Natural and Scientific Interest (ANSI) by the Ontario Ministry of Natural Resources and Forestry (MNRF). The Wetlands consists of forested swamps, thicket swamps, marshes and fens. The Mad River and Willow Creek meet the Nottawasaga River in the core of the Wetlands. Provincially rare birds indigenous to the Wetlands include several warblers and the blue-grey gnatcatcher. Extensive spring flooding throughout the Wetlands provides provincially significant stopover habitat for migrating waterfowl, such as the Sandhill crane, as well as shorebirds. The large marshes support many species of breeding marsh birds. The Wetlands provides habitat for a wide array of reptiles and amphibians. Thirty species of fish can be found in the Wetlands. The Wetlands also provides habitat for a rich variety of dragonflies and butterflies. Monarch butterflies are found in the meadow marshes and fields. The Wetlands is home to the globally endangered Hine's Emerald Dragonfly – the only known location in Canada.

Yet, Springwater Township is engaged in a Class environmental assessment process rather that the more stringent Individual environmental assessment process also permitted under Ontario's Environmental Assessment Act. The Class process is available because sewage plants are a class of project that is common in the province and, therefore, permitted to be assessed by the streamlined Class procedure. But other sewage treatment plants do not empty into an environment that is as unique and potentially vulnerable to chemical pollutants as the Minesing Wetlands. While the Wetlands receives water from various sources, the Class assessment estimates that about 11 percent of the Wetlands' water comes from Willow Creek. That is a very significant percentage, particularly given that no studies have considered the potential effect of post-treatment pharmaceutical and household chemical pollutants on the Wetlands, where water moves much more slowly than in Willow Creek, and where many plants and resident and transient birds and animals live in and take nourishment from water originating from Willow Creek.

Many questions remain unanswered – apparently even unasked – by the Class environmental assessment. For example, given that many 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, fish, and other animals? 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 into the Wetlands – if so, where, over what area, and with what effect?

Shouldn't the potential effect of pharmaceuticals and household chemicals in the effluent upon the Wetlands and its wildlife be studied carefully before permitting these chemicals to be introduced into the Wetlands on a continual daily basis? Shouldn't the township exercise extreme caution before permitting the introduction of these potentially very damaging pollutants into the Minesing Wetlands? The representative of Ainley and Associates told me that there are no provincial or federal regulations governing pharmaceuticals in post-treatment sewage effluent. Isn't that a good reason to raise this issue directly with those governments in an effort to protect the Minesing Wetlands?

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? While the Individual provincial process and the federal CEAA process may focus on projects that have potential to cause significant harm to the environment– sometimes due to the size of the project and sometimes due to the nature of the project – the Minesing Wetlands is significant for Springwater Township, neighbouring townships, Ontario (PSW and an ANSI), and Canada (fish and migratory bird habitat).

A second concern is that it was not clear whether consultations have taken place with all aboriginal groups affected by the possible effects upon the Wetlands of pharmaceuticals and household chemicals in the effluent.

Thank you for considering my comments.

44

From: [redacted]
To: midhurst.classea@ainleygroup.com
Subject: left turn lane and bike lanes for Mills Circle
Date: Monday, December 5, 2016 9:42:36 PM

Dear Mr. Joe Mullen,

I join my fellow residents at Mills circle to express concern about the lack of a left turn lane coming into Mills Circle. Many times I have had close encounters as I watched in my rear view mirror cars and trucks speeding up behind me then swerving into the driveway opposite Mills circle to pass me. I would like to suggest that the creation of the new Craig Road would be the ideal time to add a left turn lane and bike lanes to Hwy 27. The increased traffic on Hwy 27 will cause more frequent dangerous turns for those of us just trying to get home. I am in the habit of putting on my left turn signal as soon as I reach the railway overpass, I also slow my speed and press my brake so that vehicles behind me have lots of time to see my intentions and slow down. Most drivers have proven to be very impatient in this scenario and resort to sudden braking or swerving in to the driveway mentioned previously to avoid a collision. We have lived on Mills circle for 17 years and in the past few years we have noticed a marked increase in traffic travelling along Hwy 27 coming to and from Barrie. The lack of a left turn lane into Mills Circle and bike lanes along Hwy 27 into Midhurst is very dangerous and may result in fatalities.

I am the mother of 3 boys. Two of them are out of the house now but when they were teenagers before they got their driver's license they often wanted to bike into Midhurst to see their friends. This was a dangerous undertaking as there are no bike lanes and traffic is quite heavy along Hwy 27. Our neighbourhood has undergone a transition and we now have many families with young children who will become teenagers wanting a little freedom to bike into Midhurst proper to visit friends or go to the Macs for snacks. Bike lanes would serve to keep them safer on their journeys.

Thank you for taking the time to consider my thoughts. I hope to see a left turn lane and bike lanes in our near future.

Regards,

[redacted]

45

From: [redacted]
To: midhurst.classea@springwater.ca; midhurst.classea@ainleygroup.com; bob.burns
Subject: Midhurst Development Plan
Date: Sunday, November 20, 2016 12:37:00 PM

I have listened to the video presentation from Oct. 18 and I was at the council meeting last Wed. I have a concern that I brought up many years ago. The very original idea was for each development to have their own sewage plant which I was told would happen. This does not appear to be in the working plan. I live on Finlay Mill road where in the past 10 years? we have had the road redone and the bridge refurbished. According to the plans I am seeing it appears the road will require a lot more work as the sewage line, water? and much more traffic are indicated. Cars already have trouble getting out of their driveways and this will get worse with the increased density. If an accident occurs whose responsibility is it, especially when cars come over the hill.

Also my second point is that Craig road should of been the priority in all these decisions for the Doran development. There would be a lot less impact on the community. All the infrastructure with sewage lines, gas lines, hydro, water lines etc. could of been placed in ahead of time without destroying , repairing and rebuilding our current roads. The sewage could be rerouted with the pumping stations that are planned. This area is not built up and anyone who chose to build along here would understand the circumstances. Hwy. 26 & 27 will already have to be overhauled so why do double the work. The bridge on 27 was recently updated, why couldn't the sewage pipe line go under there where no one lives?

46

From: [redacted]
To: midhurst.classea@springwater.ca; midhurst.classea@ainleygroup.com
Subject: Midhurst EA Comments
Date: Tuesday, November 29, 2016 3:35:09 PM
Attachments: Comment Sheet 1.pdf
Comment Sheet 2.pdf

TOWNSHIP OF SPRINGWATER

MIDHURST WATER, WASTEWATER & TRANSPORTATION CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)

Public Information Centre – October 18, 2016

4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

PLEASE SEE PAGE 2 FOR COMMENTS AND QUESTIONS

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

Mr. Mark Archer, CET
Director of Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Fax: (705) 728-6957
Email: midhurst.classea@springwater.ca

For Official Use.
Do not fill out
Ref #_____

Ref #_____

[redacted]

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

Transportation:

I think a more through and updated transportation study is needed. It appears present traffic flows are based on a study done in 2013 which only considered one hour am and pm on weekdays. The heaviest traffic through the village is on weekends, particularly Sunday, when south bound cottage traffic exits Highway 400 and diverts through Midhurst.

How was it determined that nearly half of future southbound traffic from the proposed Doran Road developments would choose the Highway 400 option? Were there any destination studies done on existing traffic? How many trips are destined for Highway 400 south of Bayfield Street versus the northern Bayfield Street shopping area?

Concerning the Craig Road extension, why would it not be placed within the existing approved development lands to the South of Alternative 3, instead of on farm land not yet approved for development? After all, construction of this road is necessary because of the new development. Of the Alternatives offered, Number 3 would have the least effect on still farmable land and existing forest areas.

Waste Water:

We have been told that the treatment plant on Snow Valley Road will be state of the art. Have any identical plants been built and, if so, what is their record of mishaps? If not, is the proposed plant an untested version? Any future malfunction at this plant will result in an environmental disaster for the Minesing Wetlands

Water:

Because of lack of water supply, there have been many news stories of deep aquifer wells in the USA being drilled deeper which in turn affects shallower wells. Were studies and modelling undertaken to evaluate the long term effects on local existing wells? If so, what are the results?

47

From: [redacted]
To: midhurst.classea@ainleygroup.com; midhurst.classea@springwater.ca
Subject: Midhurst Water Wastewater Transport Comment Sheet
Date: Tuesday, November 22, 2016 9:46:51 AM
Attachments: 8A1D4439-B178-4F1E-A61A-18F7C8A2085E.png
Midhurst Water Comment Sheet.pdf

Good Morning,
I live in Midhurst at [redacted]
I've attached and am returning the Comment Sheet, which was given to me by a woman who was able to attend the evening on Oct. 18th.

Might I suggest that these could have been mailed to people in the village, at the same time you sent out the notification about the meeting.

Regards,

[redacted]

TOWNSHIP OF SPRINGWATER
MIDHURST WATER, WASTEWATER & TRANSPORTATION
CLASS ENVIRONMENTAL ASSESSMENT (PHASE 3 & 4)
Public Information Centre – October 18, 2016
4:30 p.m. to 9:00 p.m. – Snow Valley Resort (2632 Vespra Valley Road)

COMMENT SHEET – PLEASE PRINT

Please print all responses. Use back of page if necessary.

I AM HAPPY I MENTIONED to a friend how much I HATE the fact that you hold ONLY ONE MEETING opportunity for something SO IMPORTANT. On October 19th I had to work from 9am to 7pm AND then go help my son who was recovering from surgery AND it happened to be my husband's birthday. And so I was interested to find out how these changes will affect us as residents in the village of Midhurst. We live in this village for The Quiet. We are worried about increase in traffic / noise / air pollution. We are concerned about the runoff / drainage

Please submit this Comment Sheet by **December 1, 2016** to:

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

Mr. Mark Archer, CET
Director of Public Works
Township of Springwater
2231 Nursery Road,
Minesing, ON, L0L 1Y2
Fax: (705) 728-6957
Email: midhurst.classea@springwater.ca

For Official Use
Do not fill out
Ref #_____

[redacted]

issues that WILL have an effect on ALL of the water sources in this water-rich area. Specifically Willow Creek – Minesing Swamp – Little Lake. Not to mention the impact on rural wells if you upset the water table with all that excavation.

Another BIG concern: sewer system.

It is perfectly understandable that such a system should be part of NEW communities. But what about EXISTING infrastructure? Belmont Crescent was JUST UPGRADED 2 years ago. Will it be ripped up again to put in sewers? I do not want, and should not have to be financially responsible for sewer hook-up to my home. My septic system works very well. If developers want to take advantage of our communities and cheap land transfer taxes, etc then they can afford to pay for the sewers. We cannot. I really wish information could be passed along by more than just word of mouth or meetings we cannot attend because we both work evenings. Or by propaganda put out by the developer in the form of "friendly" newsletters.

Sincerely

[redacted]

48

From: [redacted]
To: Joe Mullan P.Eng.; Mark Archer, CET
Cc: [redacted]
Subject: Midhurst Water, Wastewater & Transportation Class EA
Date: Thursday, December 1, 2016 9:04:27 PM

Mr. Mark Archer, CET
Director of Public Works
Township of Springwater

And

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited

Dear Sirs:

This submission is made on behalf of the Brereton Field Naturalists' Club, located in Barrie and Simcoe County. The aims of our organization are to acquire and share knowledge of natural history, to protect wildlife, and to stimulate public interest in nature and its' preservation.

Over several decades, our club members have worked with the Nottawasaga Valley Conservation Authority on Management Plans for the Minesing Wetlands, including assisting with field studies and inventories of the flora and fauna of the wetlands. We have conducted numerous canoe trips and annual field trips through and around the wetlands to introduce club members and others to this remarkable natural area.

The Minesing Wetlands is well documented as both a Provincially Significant Wetland and Area of Natural and Scientific Interest, as well as being an internationally recognized Ramsar Site. The Minesing Wetlands includes unique types of wetlands, supporting rare Carolinian plant species, rare animals and insects (e.g. Hines Emerald dragonfly), etc. as part of an intricate web of life.

Clearly, no one and especially no level of government would want to undertake any project, particularly on the scale of this Midhurst servicing proposal, which would or could in any way have any harmful impact on the ecological features and functions of this massive wetland complex or on the flora and fauna which make it their home.

A number of aspects of this project lead to substantive questions, including the following (although this is by no means an exhaustive list):

1. How will the Township of Springwater and the Ministry of the Environment and Climate Change apply the Precautionary Principle to this assessment process? That is: Do no harm, and if you do not know what impact may result, do not proceed until it can be thoroughly proven that there is no harmful impact!

2. Can the Minesing Wetlands maintain or improve its' ecological features and functions with the current level of Phosphorus loading, or does this need to be reduced from the existing levels, rather than adding a new source of Phosphorus from the proposed Wastewater Treatment Plant (WTP)?

3. How are the impacts of Climate Change, including changes in annual rainfall amounts and in the frequency, severity and duration of storm events, properly assessed for the impacts of this project on the Minesing Wetlands?

4. What are the impacts of an increase in total flow in the Willow Creek of about 1/3 on the physical nature of the creek channel, on erosion and on downstream siltation, which is a long time issue for the creek and the downstream wetlands?

5. What are the impacts of the warmer temperature of the effluent from the WTP on the base flow of the Willow Creek and Minesing Wetlands and the creatures that live in this wetland complex?

6. How can the project ensure that there will be no downstream impacts from contaminant discharges, including all exotic chemicals, pharmaceuticals, hormones, heavy metals, microbeads, other commercial or household chemicals, etc. either from sewage or storm runoff?

7. How and where will the biosolids from the WTP be managed to ensure no downstream impacts from contaminants on the Willow Creek and Minesing Wetlands, and no impact on the health of flora or fauna who may come in contact with them when these biosolids are ultimately spread on the land or otherwise disposed of?

8. How can the engineering of this project demonstrate that there will be a reduction rather than an increase in the amount of wildlife mortality with the additional roads and increased traffic and widening of existing roads? What measures will be taken to achieve this?

9. How will greatly increased traffic on St. Vincent St. impact the Little Lake/Willow Creek Provincially Significant Wetland and movement of wildlife through this corridor and what measures will be taken to reduce wildlife mortality? What consideration has been given to the impact of traffic on the safety of cycling along St. Vincent St. into Barrie, as well as the impact of much heavier traffic along the St. Vincent St. corridor on the residents of Barrie. These questions should be answered with regard to the other north/south corridors linking Midhurst to Barrie.

10. How have other alternatives been considered and evaluated, including less growth and alternative locations for growth which would have a lesser or no impact on the Minesing Wetlands and Willow Creek?

We trust that we will be provided a full and satisfactory response to these concerns before this project proceeds any further.

Yours sincerely,

49

From: [redacted]
To: midhurst.classea@ainleygroup.com
Cc: midhurst.classea@springwater.ca
Subject: MSP Environmental Assessment- Feedback
Date: Tuesday, November 29, 2016 9:48:00 PM

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

Dear Mr. Mullan,

As long time residents of Mills Circle, we have concerns regarding the Craig Road extension. With the proposed Midhurst Development and the recent approval
of the Environmental Resource Recovery Centre located on Horseshoe Valley Road, we feel that the increased traffic volume will compromise the safety of the residence of this subdivision.

We are writing, to bring to your attention the danger of making a left hand turn into this subdivision and the lack of bike lanes on a busy highway.
Even with adequate signalling, there have been very stressful and close call situations with traffic driving too quickly and passing from the right (onto the shoulder/driveway)
and also passing from the left as well (thank goodness for those side mirrors!) We feel that this is the ideal time to assess and include a left hand turn lane to any future recommendations and
road plans to insure the safety of the residence of Mills Circle and Springwater Township.

We love our community and would all like to arrive alive.

Kindest regards,

[redacted]

50

From: [redacted]
To: Robert Brindley; Council Members
Cc: Joe Mullan; Mark Archer
Subject: RE: Midhurst Environmental Assessment
Date: Tuesday, November 22, 2016 1:49:24 PM
Attachments: Comments in support of the Allen Motion Nov 2016.docx

My comments are including in the attached statement I made in support of DM Allen's motion at last Council Meeting. Concern on the accuracy or degree of studies for Traffic and downstream impact of Willow, Nottawasga and Georgian Bay by unregulated materials in the effluent from the Wastewater facility and question if any additional Ph or steam volume increases to the system can be verified as having no effect.

Thanks

[redacted]

[redacted]

From: [redacted]
Sent: November 22, 2016 1:41 PM
To: Council Members
Cc: 'mullan@ainleygroup.com'; Mark Archer
Subject: Midhurst Environmental Assessment

Can you please submit any comments or questions you may have on any aspect of the Environmental Assessment so that they can be considered as part of the process?

Comments are due on December 1ST and can be sent to either Mark Archer or Joe Mullan. The process timelines, as recommended by Council, will have Mr. Mullan present to Council in February with a review of the questions submitted as part of this process.

Robert Brindley
Chief Administrative Officer
Township of Springwater
2231 Nursery Road

Minesing, ON L0L 1Y2
P. 705-728-4784 ext 2041
F. 705-728-6957
robert.brindley@springwater.ca

Comments in support of the Allen Motion

1. Based on comments at the recent PIC for EA 3 and 4 of the MSP, there are concerns with traffic flow through Midhurst as development progresses. I also understand a number of questions have been raised at the Resident Liaison Group meetings and the answers have lacked clarity or have not fully addressed concerns of the residents.
2. With an improved intersection at 400 and Forbes as part of the transportation improvements, that may attract more bypass traffic which at the present time sees traffic on weekends backed up on Findlay Mill Road from Bayfield to Doran Road. There needs to be a peer review of the traffic study as I understand the study did not take into consideration the offloading of non-resident or transient traffic from 400. It is my understanding that the traffic studies modelled most of the traffic from the new developments going to 400 and made some assumptions that most traffic would use that route. The models used for the traffic studies were based on existing urban centre buildout behavior. The expansion in Midhurst is in a rural centre effectively building an entire greenfield city. I am not convinced that the study was able to fully grasp that there are no walking amenities such as shopping, recreation, local shops of any note in the new communities, no significant local jobs resulting in most people making multiple trips a day using automobiles as there is no transit of any kind and when and if it does come, is probably another decade away causing more traffic congestion. My discussions with people suggests that there is more likelihood that traffic would migrate to Bayfield Street and St Vincent Street rather than the 400 corridor as that is where the shopping is for this new residential area. They may use the 400 corridor to travel to work in Toronto but the rest of the traffic will more likely migrate to the internal routs. There has also been a significant change in our landscape in Barrie. Since the original Traffic studies were done there has been a major shift in the East end of Barrie. What had originally been planned to be a mixed use area in the Duckworth and Cundles Road area, with multiple condos and small shops is now a full blown shopping plaza with a large Cinema, Supermarket, restaurants and a variety of shops. I believe this will drive traffic from the new developments to St. Vincent rather than the modelled 400 corridor. I need more proof that the modelling which may be outdated is correct. It may require a new independent study. Traffic is a huge issue and must be reviewed with different eyes and more current information.
3. I am very concerned that the effluent into a shallow and narrow area of Willow Creek at HWY 26 is focused on Phosphorous and Nitrate loading as the main criteria which appears to be the MOE standard. I am also concerned that in a low flow situation the effluent itself could represent around 25% of the stream flow. I need proof that adding 143 kg of phosphorus which can generate an extra 71,500 kg of algae or the equivalent of 7 triaxle dump trucks of algae a year is OK. The EA studies and technical modelling of the new facility may meet the Nitrate and PH MOE requirements but the other unclassified and unmeasured ingredients such as pharmaceuticals, nano silver and other micro organisms and such ingredients may very well exceed the current water system assimilative capacity. The Steelheaders, a conservation organization that preserve and restock some of our water systems, report changes in the number and size of the local watershed fish species.

4. At first I had some comfort when the engineer at the PIC commented that with the programs now operated by drug chains capturing unused medication, less is being flushed down toilets. On further discussion with a pharmacist this unused medication is but a small portion of the actual pharmaceuticals prescribed and entering the system. Most pharmaceuticals are deposited in the sewage itself when we use the toilet. One local resident, on a well maintained septic system, reported that his system is not functioning as well as he is under cancer treatment with a variety of chemicals in his body but the biggest offender seems to be the antibiotics as they impact the natural bacteria in the system. What will be the impact of another 30,000 people have on the natural eco system of the Minesing Wetlands. The MOE needs to establish more criteria for a greater range of materials in the effluent being put into fresh water systems much the same as we have seen changes in the Source Water Protection Act where the developers in Midhurst had to rethink their fresh water servicing approach. Possibly the Township could engage either Georgian College or Lakehead Universities environmental studies to undertake a study and report what the long term impact may be on the super bio diverse Minesing Wetlands. I understand the wastewater Treatment facility is of a very new and high standard and one of a kind with extra processing and filtration but I am quite concerned that an experiment on such a sensitive area may not work and we would not only affect the Willow, but also the Minesing Wetlands, Nottawasaga and Georgian Bay. Lots of things work well on paper or in simulation or modelling but sometimes the real time behavior is quite different. We have had lots of engineering designs that have failed such as two space shuttles and more recently the Galaxy Note7 which on paper worked perfectly. Can you imagine with a negative shift in the local water system that we start closing Wasaga Beach because of the impact to the system upstream. Who will pay for that loss to the economy? I need more assurances.
5. The EA, to be acceptable, must address all aspects of a protecting and improving a truly sustainable system which means responding and confirming that the Economic, Environmental and Social Wellbeing of all of us is protected. The servicing of the MSP is a new deal and we must get it right.
6. I fully support staff providing a report and requesting independent studies from other agencies to ensure that we are not undertaking a venture that will have long term irreversible negative impact on the world renowned Minesing Wetlands.
7. I am not being critical of the Ainley Report as the Project Manager but I think we need more specific information to address my concerns to make sure we get it right.
8. If we can narrow the scope of the things that require review, I will be supporting Deputy Mayor Allen's motion.

51

From: Liu, Chunmei (MOECC)
To: Joe Mullan
Cc: Martin, Paul (MOECC)
Subject: PIC for Midhurst W, WW, and Transportation Class EA
Date: Thursday, September 22, 2016 9:44:10 AM

Hi Joe,

Thanks you for your letter dated September 19, 2016 regarding the above-noted Class EA project. I understand that your project team is planning to wrap up the ESR in January/February 2017. As requested in our initial comments dated May 13, 2013, we would like to review the draft ESR to resolve any potential issues before the Class EA report is finalized. Look forward to receive the draft ESR when it is ready.

Thanks,
Chunmei

From: Liu, Chunmei (MOECC)
To: Joe Mullan
Subject: RE: PIC for Midhurst W, WW, and Transportation Class EA
Date: Monday, September 26, 2016 9:33:15 AM

Thanks for updates, Joe.

From: Joe Mullan [mailto:mullan@ainleygroup.com]
Sent: September-25-16 2:34 PM
To: Liu, Chunmei (MOECC)
Cc: Martin, Paul (MOECC)
Subject: RE: PIC for Midhurst W, WW, and Transportation Class EA

Hi Chunmei:

Thanks for the response and yes we are aware that the Ministry would like to review a Draft of the ESR before it is formally published for the 30-day Public Review period.

With regard to the overall schedule due to Council recently pushing the PIC back to Oct 18 and extending the comment period associated with the PIC, we anticipate that the ESR wont be wrapped up until the spring of 2017.

Regards,

J. A. Mullan, P.Eng.
President & CEO
Ainley
www.ainleygroup.com
Tel: (705) 445-3451 Ext. 126
Cell. (705) 718-7230

From: Liu, Chunmei (MOECC) [mailto:Chunmei.Liu@ontario.ca]
Sent: September 22, 2016 9:44 AM
To: Joe Mullan <mullan@ainleygroup.com>
Cc: Martin, Paul (MOECC) <Paul.D.Martin@ontario.ca>
Subject: PIC for Midhurst W, WW, and Transportation Class EA

Hi Joe,

Thanks you for your letter dated September 19, 2016 regarding the above-noted Class EA project. I understand that your project team is planning to wrap up the ESR in January/February 2017. As requested in our initial comments dated May 13, 2013, we would like to review the draft ESR to resolve any potential issues before the Class EA report is

finalized. Look forward to receive the draft ESR when it is ready.

Thanks,
Chunmei

52

From: General
To: Joe Mullan
Subject: FW: Midhurst Water, Wastewater & Transportation EA
Date: Friday, September 23, 2016 2:55:34 PM
Attachments: [redacted]

From: [redacted]
Sent: September 23, 2016 1:56 PM
To: collingwood@ainleygroup.com
Cc: [redacted]
Subject: Midhurst Water, Wastewater & Transportation EA

Hello,

My e-mail is addressed to M. Mullan.

First of all we would like to thank you for your letter dated September 19th on the Midhurst Water, Wastewater and Transportation EA.
The Huron-Wendat Nation is pleased to be involved in this important process.

Before providing you any feedback on the project we would like to ask for the shpefiles of the study zone.
Is that something you could please provide us.

Don't hesitate if you have any question,

[redacted]

[redacted]

MV

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

CONSULTING ENGINEERS PLANNERS

September 19, 2016

File No. 113027

[redacted]

Ref: **Township of Springwater**
Class Environmental Assessment (Phase 3)
Midhurst Water, Wastewater and Transportation
Notice of Public Information Centre (PIC)

Dear Sir or Madam:

Further to Notice of Study Commencement issued April 25, 2013, the Township of Springwater is proceeding with a Class Environmental Assessment planning process to identify and assess servicing options (water, wastewater and transportation) for the Midhurst Secondary Plan.

A Public Information Centre (PIC) will be held on Tuesday, October 18, 2016. Please find enclosed a copy of the Notice of PIC, which will be advertised in the local newspaper.

Should you have any questions or comments in reviewing the Notice, please do not hesitate to contact the undersigned.

Sincerely,

AINLEY & ASSOCIATES LIMITED

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

Encl.
c.c Mark Archer, CET, Director of Public Works, Township of Springwater

S:\113027\Communication Plan\2016 09 19 - Notice of PIC (letterhead).docx

The Township of Springwater

Midhurst Water, Wastewater & Transportation

Class Environmental Assessment (Phases 3 & 4)

Notice of Public Information Centre

The Township of Springwater is continuing with Phases 3 & 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, identified the infrastructure that will be required and also concluded that Phases 3 and 4 of the Class EA process needed to be completed.

Phases 3 & 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. In particular Phases 3 & 4 of the Class EA process will focus on the following Water, Wastewater & Transportation infrastructure:

- 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;
- Upgrading of the Forbes Road and Highway 400 Interchange;

Public Information Centre

As part of the Class EA, a Public Information Centre (PIC) has been arranged for **4:30 pm to 9:00 pm on Tuesday, October 18, 2016 at Snow Valley Resort** (2632 Vespra Valley Road). At this PIC detailed material will be available relating to the proposed Water, Wastewater & Transportation Infrastructure. Additionally, the Display Boards will be posted on the Township's website.

This Open House will predominantly be an informal drop in format, during which time the applicable Display Boards will be available. Representatives of the Project Team will be available to answer individual questions in a one-on-one format, relating to Phases 3 & 4 Class EA Process. A formal presentation will be made between **7:00 pm to 8:00 pm** followed by a brief 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.

Feedback

Public consultation is vital and key to the success of this study and the Township wants to ensure that anyone interested in this study has the opportunity to get involved and provide input. Therefore, you are encouraged to either attend the PIC or review the materials that will be available on-line and provide your comments to the project team so that they may be included in the study. Public input and comments on the project will be received until December 1, 2016 and can be sent to either of the Contacts listed below.

Mr. Mark Archer, CET
Director of Public Works
Township of Springwater
2231 Nursery Road,
Minesing ON, L0L 1Y2
Fax: (705) 728-6957
Email: midhurst.classea@springwater.ca

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5
Fax: (705) 445-0968
Email: midhurst.classea@ainleygroup.com

Subject to comments received as a result of this Notice, the Township plans to proceed with the completion of the Class EA for this project and an Environmental Study Report will be prepared and placed on the public record for a minimum of 30 days.

This notice issued September 19, 2016.

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become a part of the public record.

53

From: [redacted]
To: Midhurst Class EA
Subject: Midhurst Water, Wastewater & Transportation EA
Date: Thursday, September 29, 2016 8:45:16 AM
Attachments: [redacted]

Hello,

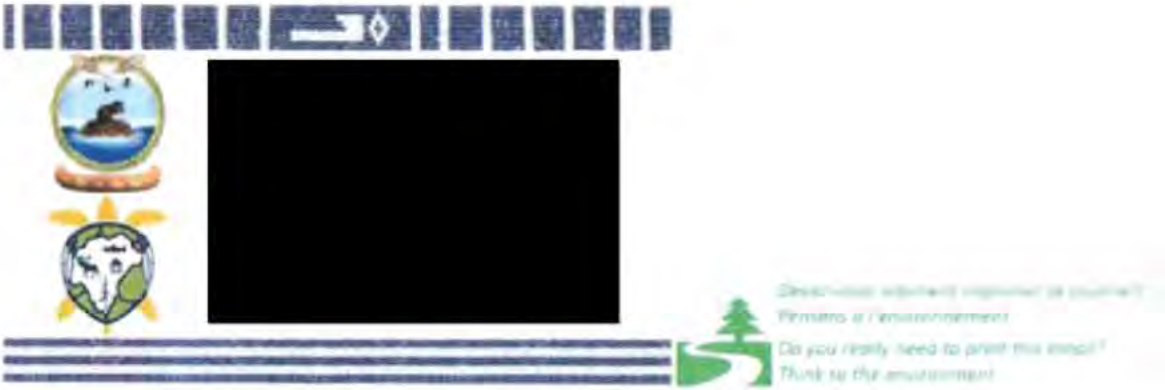
My e-mail is addressed to M. Archer.

First of all we would like to thank you for your letter dated September 19th on the Midhurst Water, Wastewater and Transportation EA.
The Huron-Wendat Nation is pleased to be involved in this important process.

Before providing you any feedback on the project we would like to ask for the shpefiles of the study zone.
Is that something you could please provide us.

Don't hesitate if you have any question,

[redacted]



54

From: [redacted]
To: "midhurst.classee@ainleygroup.com"
Subject: Midhurst Water, Wastewater, and Transportation Project
Date: Friday, September 23, 2016 10:46:34 AM
Attachments: [redacted]

Good morning Mr. Mullan,

Please find attached the response letter from Hiawatha First Nation regarding the above mentioned project. f you have any questions or further comments concerning the project, please don't hesitate to contact me.

Regards,

[redacted]

We , the Mississaugi of Hiawatha First Nation, are a vibrant, proud, independent, and healthy people blananced in the richness of our culture and traditional way of life.

HIAWATHA FIRST NATION
123 Paudash Street
Hiawatha, ON K9J 0E6

September 23, 2016

Dear Mr. Mullan:

Thank you for the information you sent to Hiawatha First Nation regarding the Midhurst Water, Wastewater, and Transportation Project which is being proposed within Hiawatha First Nation's Traditional and Treaty Territories. Hiawatha First Nation appreciates that the Township of Springwater and Ainley Consulting recognize the importance of First Nations Consultation and that your office is conforming to the requirements within the Duty to Consult Process. The correspondence Hiawatha First Nation has received is not considered meaningful consultation but rather information sharing.

As per the Hiawatha First Nation Consultation Protocol, your proposed project is deemed to have little, if any, impact on Hiawatha First Nation's traditional territory and/or rights. Hiawatha First Nation requests you contact us if archaeological artifacts are found as we require our trained archaeological liaisons be present at the archaeological sites during the assessments. We also ask that you forward any archaeological reports to Hiawatha First Nation as they are completed. Any maps pertaining to the project should be sent to Hiawatha First Nation in a shape file.

Hiawatha First Nation reserves the right to provide additional comment should further development result in additional potential impact on our traditional territory and rights. Please be aware that while we request to be kept appraised throughout all phases of this project, we may not always have representation at all stakeholders meetings.

Further correspondence may be directed to my attention at the mailing address above or the e-mail address below.

Sincerely,

[redacted]

55

From: [redacted]
To: Midhurst Class EA; midhurst.classea@ainleygroup.com
Cc: [redacted]
Subject: re: Township of Springwater – Class Environmental Assessment (Phase 3) – Midhurst Water, Wastewater and Transportation – Notice of Public Information Centre
Date: Wednesday, September 28, 2016 10:39:29 AM

Dear Mark & Joe;

Thank you for your letter re: Township of Springwater – Class Environmental Assessment (Phase 3) – Midhurst Water, Wastewater and Transportation – Notice of Public Information Centre.

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,

[redacted]

[redacted]

57

From: [redacted]
To: midhurst.classea@springwater.ca; midhurst.classea@ainleygroup.com
Cc: Sandy Buxton; Margaret Prophet; David Strachan; Bill French
Subject: Township of Springwater MSP Phase 3 & 4 Class Environmental Assessment comments
Date: Wednesday, November 30, 2016 1:22:43 PM

2016-11-30

Dear Mr. Archer and Mr. Mullan,

I am writing you with my comments on the MSP Class EA Phase 3 & 4.

I am gravely concerned regarding the potential impacts which the water, wastewater and transportation infrastructure this project proposes will have on our drinking water, air quality, farmland and the environment. I understand the plans intend to meet the measurable regulatory requirements. I contend that the measurable regulatory requirements are incapable of adequately protecting our drinking water, air quality, farmland and the environment. I base my contention on the evidence of the ongoing, cumulative devastating negative impacts of our existing water, wastewater and transportation infrastructure on our drinking water and the environment, which all met or meet measurable regulatory requirements.

The evidence I cite follows:

1. **NVCA Staff Report: "60 years of forest change in the Minesing Wetlands (1953-2013): Causal factors, ecological implications and recommendations for reforestation":** This document clearly describes how human development and introduced diseases and invasive species are the major causal factors for the negative ecological changes in the Minesing Wetlands, and these changes continue. I demand that this MSP Class EA Phase 3 & 4 must prove that there will be no negative impacts on the agricultural, hydrological and ecological systems in The Township of Springwater. Note, I am demanding that there be zero negative impacts to these vital systems. I request that, given the existing negative impacts our present and in progress human developments are causing and have caused to the ecological and agricultural function of our Township, that all new development should create a net improvement to all of these systems up to restoring the pre settlement function of these natural systems.
2. **2013-01-11 Hine's Emerald (Somatochlora hineana) in Ontario - Ontario Recovery Strategy Series stdprod_099155**: The Township of Springwater is home to many Endangered Species and Species At Risk. Most notably, the Hine's Emerald dragonfly, *Somatochlora hineana*, is Endangered and the only place in Canada where it can be found is the Minesing Wetlands in the Township of Springwater. The Hine's Emerald has been extirpated from the rest of southern Ontario, including other areas of Springwater Township, due to the impacts of human development. Human development threatens to extirpate the Hine's Emerald from the Minesing Wetlands by human development impacts on the springwater fed fens. Science does not yet know any measurable acceptable limits to changes in the Hine's Emerald's groundwater sources. Thus, we cannot accept any potential human impact on those sources. Thus, the taking of groundwater from the aquifers and dumping of wastewater effluent and stormwater into the surfacewater systems in the Township of Springwater must not be tolerated until the science is developed to measure and assess the impacts of those changes on the springwater sources of the

existing and potential Hine's Emerald habitats. This measure is also necessary to protect our own water supply. We do not fully understand the impact of our taking of groundwater and disturbing of the aquifer recharge and surface water systems. i.e. new human development in the Township of Springwater must not take place until the proponents can prove they will not negatively impact the springwater sources of the Hine's Emerald within the Township.

For the protection of our own drinking water, we must require comprehensive analysis of the surfacewater and groundwater impacts of development beyond the standard regulations. I demand that the post development quality and quantity of groundwater recharge and of stormwater and wastewater discharge from the area being developed will be proven to be restored to that of pre human development. e.g. if 100 acres of farmland is developed, the post development surfacewater and groundwater impacts of that development, including supporting infrastructure, drinking water, wastewater, etc., shall restore the contributions of those 100 acres to that of pre human development native forest and wetlands. This includes, but is not limited to:

1. water purification and recharge of aquifer functions must be restored to pre human settlement levels and net groundwater and surfacewater usage must be balanced
2. Surface water ecology must be restored to pre human settlement conditions. e.g. taking water from Willow Creek groundwater sources and dumping it back in at a single point drastically disturbs the ecological function of the creek and must not be tolerated.
3. While agricultural land use does not provide the water and air purification and oxygen production/carbon dioxide reduction of natural forests and wetlands, urban development of farmland must create forests and wetlands which re-create these pre human development natural functions.

If there is such a thing as smart growth, it must meet these standards or the term smart growth are simply empty words. The decline of Springwater Township under the deluded guise of "growth and prosperity" must be reversed. We must turn the tide and create a healthy, vibrant, balanced, sustainable rural community with restored and reconnected ecosystems, pure drinking water and species at risk recovered to not at risk status. We have the resources and opportunity to be a such model sustainable community. Developers Township staff have the skills and expertise to help us remediate our destructive infrastructure. Let us start the trend toward recovery and sustainability.

Sincerely,

57

From: [redacted]
To: midhurst.classea@springwater.ca; midhurst.classea@ainleygroup.com
Cc: [redacted]
Subject: Midhurst Ratepayers' Association response to EA Phase 3 PIC
Date: Monday, November 28, 2016 9:27:02 PM

Dear Mark and Joe,

Attached is our submission outlining our concerns and questions arising from the published EA studies/reports and the Phase 3 PIC held on October 19th.

We look forward to hearing from you in due course.

Kind regards,

[redacted]

MRA RESPONSE to PHASE 3 PIC - Nov. 28, 2016.doc

"Supporting and Preserving Our Rural Community"

November 28, 2016

Mr. Mark Archer, CET
Director of Public Works
Township of Springwater
2231 Nursery Road
Minesing, ON
L0L 1Y2
Email: midhurst.classea@springwater.ca

Mr. Joe Mullan, P. Eng.
President & CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON
L9Y 4J5
Email: midhurst.classea@ainleygroup.com

Dear Mr. Archer and Mr. Mullan:

Re: Comments on Midhurst Class Environmental Assessment Public Information Centre

Having reviewed all the public EA studies and attended the Phase 3 PIC on October 19th 2016, the Midhurst Ratepayers' Association (MRA) wishes to present its key concern:

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?

In our opinion, these studies fail to address the **complete big picture** of current and proposed water-taking. Accordingly, we are submitting the following questions organised under ten (10) topics. It is our view that they must be answered before anyone can fully address the key concern we have expressed.

1. **Existing water uses in Midhurst** - Where in these reports is there a list of all existing water uses and the current amount of water being taken by our community? How did the studies measure that amount? How many private well users live within the area that might be affected

[redacted]

by the proposed new wells? Have their wells been tested to be sure that their supply is not disrupted?

2. Barrie water - Barrie is a growing community which also relies on groundwater. Does Barrie take its water from the same or related aquifers as does Midhurst? If yes, where do the new studies address the existing quantity of groundwater taken by Barrie? Where do the new studies consider any current approval Barrie has to take more water in the future?

3. Water capacity - 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?

4. Reliance on old modeling - 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? 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?

5. Worst-case scenarios - The Environmental Commissioner has heavily criticised the way Ontario deals with water extraction, including its failure to take into account worst-case groundwater extraction (the "maximum permitted taking" of water under a provincial permit). 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?

6. Ecological needs - Will the proposed groundwater extractions take water from the same aquifers which supply the Minesing Wetland and related water courses? How do the studies assess their existing groundwater needs? Do the studies predict a loss of groundwater for these features? If so, how much?

7. Fisheries - Will the proposed groundwater extractions be from the same aquifer(s) which supplies local coldwater fisheries such as Willow Creek? 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? What seasonal variation has been considered since groundwater can be very significant during hot, dry summer months?

8. Water quality and temperature: 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? Will there be any change in temperature to the water supporting coldwater fisheries?

9. Rare, sensitive and endangered species: 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?

10. **Water treatment needs:** There are substantial requirements for treatment of the proposed new groundwater supply sources. One of the pollutants is nitrate which is a health related contaminant. Is the level of nitrate in the aquifers stable or is there a risk that it will increase 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?

Growth is not simply change; it is **permanent** change. Once people move into our great community, the water needs of Midhurst will change forever. There will be no going backwards.

We therefore ask you to do everything possible to fully understand present water needs and, as accurately as possible, predict the future water needs and uses for our community - its people, flora, fauna and significant natural features - all of which depend on the same groundwater.

We look forward to receiving your answers to our big question and the many related questions set out in this letter.

Sincerely,

[redacted]

[redacted]

58

From: [redacted]
To: Joe Mullan
Subject: Well Decommission
Date: Wednesday, October 19, 2016 7:42:05 PM

Hello

I am emailing you on behalf of [redacted] in regards of the water well at the corner of Russell rd and Storey rd in Midhurst that has not been caped or decommissioned. If you could email us with updates regarding this issue that would be great.

[redacted]

59

From: [redacted]
To: midhurst.classea@amleygroup.com; midhurst.classea@springwater.ca
Cc: [redacted]
Subject: Midhurst Secondary Plan Phase 3 & 4 EA - Comments (Midhurst Heights Development) [CFCA: 845-3675]
Date: Thursday, December 1, 2016 1:30:23 PM
Attachments: Midhurst EA - Transportation Comments (Midhurst Heights Development).pdf

Good Afternoon Joe and Mark,

Please find attached our comments for consideration regarding the ongoing Midhurst Secondary Plan Phase 3 & 4 EA, for Midhurst Heights Development on behalf of Midhurst Rose Alliance Inc.

Thank You & Best Regards,

[redacted]

CROZIER & ASSOCIATES
Consulting Engineers
Land development engineering, from the ground up.
Water Resources · Transportation · Structural · Mechanical · Electrical · Building Science

NOVEMBER 30, 2016

PROJECT NO: 845-3675

Ainley Group
280 Pretty River Parkway
Collingwood, ON
L9Y 4J5

Attention: **Mr. Joe Mullan, P.Eng.**

RE: **TRANSPORTATION COMMENTS**
MIDHURST WATER, WASTEWATER AND TRANSPORTATION
CLASS ENVINTONMENTAL ASSESSMENT (PHASE 3)
TOWNSHIP OF SPRINGWATER

Dear Joe,

This letter has been prepared on behalf of Midhurst Rose Alliance Inc. pursuant to concerns raised regarding the Midhurst Water, Wastewater and Transportation Class Environmental Assessment (Phase 3). In particular, the comments and concerns raised herein relate to the Midhurst Secondary Plan Class Environmental Assessment Draft Traffic Operational Analysis, (Ainley, August 2016).

For brevity, only major concerns with potential to impact study conclusions and recommendations are discussed at length.

1.0 Study Assumptions

1.1 Growth Rates

Background growth rates contributing to future background traffic volumes appear reasonable and general consistent with studies conducted in the area.

1.2 Trip Generation & Trip Distribution

Trip generation and site generated trip distribution patterns appear reosonoble and generally consistent with Transportation Tomorrow Survey data, County of Simcoe's Transportation Master Plan (August, 2014) and recently completed studies in the area.

Total traffic volumes were applied as proposed and consistent through the horizon years. However, we raise a concern regarding the influence of Craig Road Extension on background trip distributions. A review of the future total traffic volumes indicates that only site generated traffic is assumed to utilize Craig Road upon its completion. This is considered unrealistic and does not account for the anticipated diverted traffic that would travel along Craig Road as a more convenient route to, from and through the existing community. Increasing roadway capacity typically induces demand, particularly with the implementation of alternate bypass routes.

Currently, road users travelling from Highway 400 to destinations within Midhurst and west of Midhurst via Highway 26 are required to do so via Forbes Road, Russell Road and Doran Road. As Craig Road is projected to connect Forbes Road to County Road 27, an alternate bypass route is created. It is thus reasonable to assume that local and thoroughfare traffic that would otherwise infiltrate through the Midhurst community will utilize the new Craig Road connection, resulting in reduced traffic volumes on Russell Road and Doran Road. As these effects have not been accounted for in the study, there is potential for capacity constraints and accompanying recommendations for roadways and intersections with Russell Road, Finlay Mill Road and Doran Road to be overstated. It is therefore recommended that the infiltrated traffic be accounted for in the analysis and revise recommendations where required.

1.3 Traffic Redistribution

As the effect of the redistributed traffic may reduce future total traffic volume projections at intersections; operational analyses should be revised accordingly, in order to attain more accurate assessment of operations and recommendations for improvement.

2.0 Class EA Recommendations

The following comments identify the concerns related to the recommended roadway improvements as highlighted in the EA Report. As noted in Section 1.2, implementation of Craig Road Extension may result in diverted trips which may result in reduced turning movements and operations.

2.1 Forbes Road

Forbes Road is approximately 2.0 km and currently has a rurol cross-section. This roadway has been recently reconstructed in 2014 and works consisted of asphalt overlay with 3.5 metre travel lanes and 1.0 metre paved shoulders per direction, and stormwater management is facilitated via vegetated ditches.

The Traffic Operations Analysis recommends a widening of Forbes Road (from Highway 400 to Russell Road) to an urbanized four-lane cross section by or before 2041. The addition of one lane per direction is proposed to address anticipated capacity constraints. It is noted that Forbes Road is proposed for staged implementation with a two-lane urban cross section by 2031 and four-lane urban crass section by 2041.

It should be noted that supplementary analysis conducted by AECOM "Highway 400/Forbes Road Interchange Operations Traffic Analysis" found that the Forbes Road widening to four lanes can be delayed until the 2041 horizon year.

The function of the recommended improvements is ta provide sufficient vehicle capacity and promote active transportation as a feasible alternative to single-occupant vehicle trips. A review of the recommended sections indicates that urbanization of Forbes Road will pravide no benefit from a link capacity perspective, but rather impact the community character and disturb existing residents at increased costs compared to a rural cross section. Implementing a rural cross section as a reasonable alternative can meet capacity requirements, while maintaining the rural character af the community and meeting stormwater management requirements as well as active transportation goals; and should be considered. Attachment 1 includes details regarding alternate cross sections as prapased by the Midhurst Land Owners Group for consideration.

2.2 Russell Road

Russell Road is recommended for widening to four lanes and urbanization between Forbes Road and Pooles Road. These works are scheduled to be completed in Phase 1 – Stage 5. It is noted that Phase 1 represents 2031 horizon year; however, Section 6.0 of the Class EA report recommends that widening of Russell Road to four lanes from south of Doran Road to Forbes Road should be completed by or before the 2041 horizon. The proposed phasing should be clarified. Nonetheless, analysis completed by AECOM found that widening of Russell Road can be deferred until the 2041 horizon year as there is no need to widen the roadway by the 2031 horizon year. It is important to note that the reduction in traffic volumes anticipated as a result of the Craig Road Extension may result in differing conclusions. It is recommended that the effects of the Craig Road Extension on Russell Road traffic operations be taken into consideration, and revise recommendations for improvements where warranted.

It is also noted that development is proposed primarily on the west side of Russell Road. In this regard, full urbanization of the roadway is not considered to result in material capacity benefit compared to an alternative rural cross section. As improvement recommendations were made on the basis of increasing roadway capacity, alternative roadway configurations can adequately address forecasted capacity constraints while providing active transportation connectivity to the proposed developments. Moreover, no development is proposed to the east side of Russell Road, therefore any implementation of active transportation connections on the east side of Russell Street is anticipated to be underutilized. No material benefit is anticipated by fully urbanizing this segment of roadway as compared to maintaining rural cross section. Attachment 1 includes details regarding alternate cross sections as proposed by the Midhurst Land Owners Group for consideration, in which a rural two-lane cross section with walkway on one side is proposed; however, should a four lane cross section be warranted from a capacity perspective urbanization is recommended per Attachment 1.

2.3 Craig Road Extension

The Class EA recommends Craig Road Extension be constructed from Forbes Road to County Road 27 with fully urbanized cross section. Similar to Forbes Road, it is not anticipated that full urbanization is required to meet capacity and active transportation needs.

No development exists or is being proposed on either side of Craig Road; particularly west of Gill Road. As a result, providing significant active transportation connection is anticipated to have limited benefit to existing and proposed developments in the area. Moreover, as no destinations exist to the west, a fully urbanized cross section is anticipated to be underutilized.

Craig Road is recommended for completion by the 2025 horizon. Per the EA's Road improvement Phasing Plan, Craig Road is proposed for completion in two phases with the first phase from Forbes Road to Gill Road and the second phase from Gill Road to County Road 27. This proposed phasing was intended to coincide with Stages 2 and 3 of the first phase of development buildout. However, the proposed phasing does not provide material benefit to the proposed development and existing road users in the interim stages. The development north of Doran Road proposes an east-west collector connecting Russell Road and Gill Road. As construction of this roadway must occur to facilitate development of the Doran Road north lands (scheduled for Phase 1), constructing Craig Road from Russell Road to Gill Road will be redundant and is anticipated to be underutilized due to its terminus at Gill Road. In addition, as mentioned

in Section 1.0, analysis only considers development driven traffic to utilize Craig Road. As the network analysis indicates efficiently functioning intersections and links through the 2041 horizon year, adequate capacity may exist to reasonably accommodate traffic on the road network that would otherwise utilize Craig Road. Should this be confirmed in a sensitivity analysis, Craig Road construction may be deferred to Stage 3, to be constructed as one phase. It is recommended that construction phasing be revisited following updated network analysis accounting for redistributed traffic due to Craig Road bypass traffic.

2.4 Walt Road

The study also proposes Walt Road to be reconstructed to an urban two lane standard. All development is proposed south of Walt Road and thus fully urbanizing the roadway does not provide material benefit compared to facilitating connectivity to the south side of the roadway. Accordingly, semi-urban feature can reasonably serve all purposes while preserving as much rural character as possible and retaining maximum natural drainage features. Alternative cross sections should be considered. Attachment 1 includes details regarding alternate cross sections as proposed by the Midhurst Land Owners Group for consideration.

2.5 Alternative Cross Sections

Midhurst Landowners Group has prepared a memo with accompanying rationale for a number of alternative roadway configurations. Per the Class EA Transportation Study, full urbanization is proposed for all recommended roadway improvements. It is noted that some recommendations do not result in improved capacity; and as such a reasonable rural alternative providing similar benefits with reduced impact to existing users should be considered. Attachment 1 details alternate cross sections and recommended segments for implementation as proposed by the Midhurst Land Owners Group.

2.6 Summary

Widespread urbanization is not considered to provide significant material benefit compared to alternative sections proposed. In particular, excessive urbanization will require accompanying stormwater management infrastructure and will contribute to altering the existing rural character of the Midhurst community. It is acknowledged that some road segments surrounded by dense communities will better meet active transportation needs with full urbanization; however, it is suggested that alternative section be considered for greater overall benefit and less impact to existing residents.

3.0 Active Transportation

The Class EA proposes several improvements to facilitate active transportation implementation within the existing and proposed developments. Effective implementation of active transportation infrastructure may increase mode share for active transportation modes such as walking and cycling and contributes to more compact, walkable communities. A fundamental consideration in design of such facilities is the exposure to the intended users, with distance-to-destination being a critical consideration for practical implementation.

For instance, a four-lane urbanized cross section is recommended for Forbes Road by 2041 horizon year. Agricultural lands exist on the north and south sides of Forbes Road and based on current knowledge

there are no future plans to develop these lands. Per the Class EA recommendation, sidewalks are proposed for a 2.0 kilometre distance with no intermediate destinations, terminating at Highway 400. This is not considered practical as it is expected that few pedestrians, if any, would utilize such a connection on a typical basis. To further investigate active transportation demand in the community of Midhurst, Transportation Tomorrow Survey (TTS) data was consulted to determine the existing mode splits for trips made in the community. TTS data indicates that less than one percent of trips are made by pedestrians. While cyclist data was not available, conservatively assuming that "Other" referred to cyclists, less than one percent of trips would also have been made by cyclists. These figures indicate very little existing demand for active transportation. It is therefore possible that expansive active transportation infrastructure may be underutilized, particularly when implemented beyond typical walking distances. Refer to the attached TTS data for modal split details.

Nonetheless, should Forbes Road be utilized as an active transportation corridor, it is expected to primarily serve experienced cyclists due to the 80 km/h posted speed limit and lack of destinations. Per Table 3.8 of Ontario Traffic Manual Book 18, experienced cyclists typically prefer direct, continuous facilitates with minimal delay. In addition, per the Desired Cycling Facility nomograph, designated cycling space such as paved shoulders are recommended for roadways such as Forbes Road. In this regard, a rural cross section with bike lane provisions is an acceptable configuration in meeting anticipated active transportation needs. Moreover, providing the urban configuration is not anticipated to offer discernable benefit in facilitating or inducing increased active transportation use compared to implementation of the rural cross section with bike lanes. Refer to relevant excerpts of OTM Book 18.

The above rationale can be extended to roadway segments initially proposed for urbanization in areas with impractical distance-to-destination for pedestrians, and little to no surrounding development density. Additional roadway segments may benefit from revised cross sections, while meeting active transportation needs. Examples include Craig Road, Snow Valley Road, St. Vincent Street south of the built boundary, Wilson Drive, Carson Road west of the build boundary and Pooles Road outside of the built boundaries In this regard, it can be surmised that overall pedestrian demand is low; and no discernable benefit to the community are anticipated from urbanizing the roadways compared to implementing an alternate rural cross section. Accordingly, the rural cross section can provide equivalent active transportation benefits on these sections of roadway.

It is also noted that development density is not equally distributed on both sides of the roadways. Accordingly providing active transportation infrastructure on both sides of the roadway does not provide material benefit compared to providing facilities adjacent to existing and proposed development. As a result, a number of roadway segments can feasibly achieve active transportation goals without complete urbanization of the roadways. Alternative sections can provide adequate vehicle capacity while meeting active transportation needs and retaining the rural character of the community and should be considered where appropriate. Refer to Attachment 1 detailing proposed cross sections and recommended locations.

4.0 Benefit to Existing Users

Implementation of active transportation infrastructure will not only benefit the proposed development, but provide significant benefits to existing Midhurst residents. In particular, roadways such as Finlay Mill Road and St. Vincent Street are major roadways within the existing community. Per the Class EA, full urbanization including on-street bike lanes is proposed on both sides of Finlay Mill Road. It is recognized that

implementation of this active transportation infrastructure will provide linkage between the proposed and existing developments. However, it should be acknowledged that the existing residents will be the major beneficiary of such proposed improvements – none of which provide capacity improvements but rather improve the quality of life via renewed infrastructure. Moreover, assuming an upper bound pedestrian commute time of 20 minutes and an average walking speed of 1.2 metres per second, a reasonable upper-bound pedestrian commute distance of 1.4 kilometres can be assumed. Accordingly, the Class EA proposes pedestrian infrastructure beyond typical walking distances with relation to the communities they are intended to link and should not be borne by the Developer. Moreover as such improvements are not warranted for reasons of capacity and not solely attributable to the Developers, consideration should be made with regards to considering these elements wholly "Developer Driven".

Craig Road Extension is also anticipated to provide greater benefit to existing users compared to that of proposed developments. Per the Township of Springwater Midhurst Master Plan Phase 1 and 2 Report, the Craig Road extension is recommended to improve east-west connectivity for Daran neighbourhood traffic with sidewalks. This roadway will provide a more convenient major linkage between Highway 400 and County Road 27. However, an east-west collector between Russell Road and Gill Road is proposed to further connect the neighbourhood to the surrounding road network. In this regard, the Doran neighbourhood collector will serve the purpose of increasing east-west connectivity, making Craig Road redundant from a development-driven utilization perspective.

While Craig Road will be utilized by the praposed developments, it is anticipated that traffic that would otherwise travel through the existing Midhurst community to and from Highway 400 would utilize Craig Road as a more convenient bypass route. As a result, a large proportion of Craig Road traffic volumes are anticipated to be a result of diverted traffic that would have otherwise utilized Russell Road, Finlay Mill Road and Doran Road. This roadway is thus anticipated to be of greater benefit to existing users (Midhurst residents and thoroughfare traffic) as compared to those generated by the proposed developments. While Craig Road is categorized as a Development Charge infrastructure, the aforementioned should be taken into consideration upon implementation.

5.0 Conclusions

The Traffic Operations Analysis was reviewed and a number of concerns arose as follows:

- The effects of diverted bypass traffic through the community of Midhurst due to Craig Road implementation were not taken into account in the traffic analysis. It is anticipated that a reduction in traffic volumes on the existing road network would occur, which may affect recommendations made for road widening and intersection improvements.

- Several roadways were proposed for full urbanization and reconstruction throughout the horizon timeline. It is recommended that alternative cross sections with reduced impact to the existing community be considered. In particular, rural cross-sectians can be implemented while achieving capacity and active transportation objectives.

- Active transportation objectives can be achieved without requiring full urbanization of roadways. In particular, distance-to-destination should be considered for implementation of pedestrian facilities and target cyclist demand. Widespread urbanization of roadways will also decrease the rural character of the Midhurst community, particularly if a rural alternative can be implemented while meeting comparable transportation engineering alternatives. Accordingly, alternative cross sections should be considered for roadways such as Craig Road, Forbes Road, Russell Road, St. Vincent Street and segments of roadways outside of the built boundaries lacking destinations within reasonable travel distance for pedestrians and cyclists.

- The benefits of the Craig Road Extension to existing users should be considered in its implementation. In addition, the benefit of active transportation infrastructure implementation on Finlay Mill Road should also be considered. These roadworks will provide greater benefits to existing users and residents as compared to those of the proposed development. Accordingly this should be considered when evaluating shared costs and improvement to existing community.

We trust that this review satisfies any transportation concerns associated the proposed development. Should you have any questions or require any further information, please do not hesitate to contact the undersigned.

Yours truly,

C.F. CROZIER & ASSOCIATES INC. **C.F. CROZIER & ASSOCIATES INC.**

[redacted]

Attachments

J:\800\845 - Midhurst Rose Alliance Inc\3675 Midhurst Heights Development\Letters\Individual EA Response\2016.11.29 - Transportation Review.docx

ATTACHMENT 1

File #: 1212
Date: November 29, 2016

Mr. Joe Mullan
Ainley Group
280 Pretty River Parkway
Collingwood, Ontario
L9Y 4J5

Dear Mr. Mullan:

Re: **Midhurst Landowners Group Comments on Midhurst Water, Wastewater and Transportation Class Environmental Assessment (Phase 3) Township of Springwater**

We are writing on behalf of the Midhurst Landowners Group and in follow-up to our letter of October 18, 2016 with respect to our questions and comments on the Phase 3 portion of the Transportation component of the Class EA being completed for the Midhurst Community.

As noted in our October 18, 2916 letter the roads related costs have increased approximately $60 million from the estimates included in the Phase 1 & 2 Report, prepared in July 2009.

Our consulting team has prepared the following comments and questions for further clarification and discussion. We understand the Class EA Phase 3&4 comment period submission deadline date is December 1st, 2016.

PROPOSED ROAD CROSS SECTIONS FOR CONSIDERATION

Recently the Midhurst Secondary Plan Phase 3 & 4 EA- Draft Transportation Operational Analysis Report has been prepared by Ainley Group (Ainley) and was provided on August 30, 2016 for review. This report outlined a full urbanization of all roads within the scope of the transportation improvements. An analysis has been undertaken to explore the justification for full urbanization and to present alternate road cross sections, as opposed to full urbanization on select streets, for consideration.

In the Phase 1 & 2 EA (Ainley, 2009), many of the road sections were identified as a rural cross section such as portions of Pooles Road, Forbes Road, Craig Road, St. Vincent Road, Anne Street and Wilson Drive. The Phase 1 & 2 report identified all of the roads that would require improvements. Since that time, many of the roads have been reconstructed by the municipality (Forbes Road in 2012, St. Vincent Road in 2013, Doran Road in 2013 and Pooles Road in 2016). These projects addressed structural improvements, drainage improvements and active transportation. These improvements did not involve the urbanization of the streets; rather the roads were improved while maintaining the existing rural character of the community.

The Phase 3 & 4 EA draft report proposes all roads slated for improvement to consist of full urbanization (there are only two exceptions to this being portions of Craig Road and Wilson Drive). This consists of over 30 km of existing roads located within Midhurst. We believe there to be compelling rationale to reconsider the full urbanization of 100% of these roads, acknowledging none the less that there are in fact many streets which are most suitable to be fully urbanized.

It is acknowledged that the Township standard for new road construction is a fully urbanized cross section (Engineering Design Standard Specifications and Engineering Design Standard Drawings, May 2008). We are implementing such a road section in the respective Geranium and Alliance-Rose subdivisions. However, other road cross sections should be considered when it comes to existing road reconstruction projects that have been identified. The Municipality has in fact followed this tendency with the reconstruction of the aforementioned roads since 2009. Renderings of sample proposed cross sections on existing roads are attached to this report for illustration (**Attachment 1**).

We opine that implementing variations of rural cross sections on select streets offers many advantages over the full urbanization alternative. Some of these reasons include:

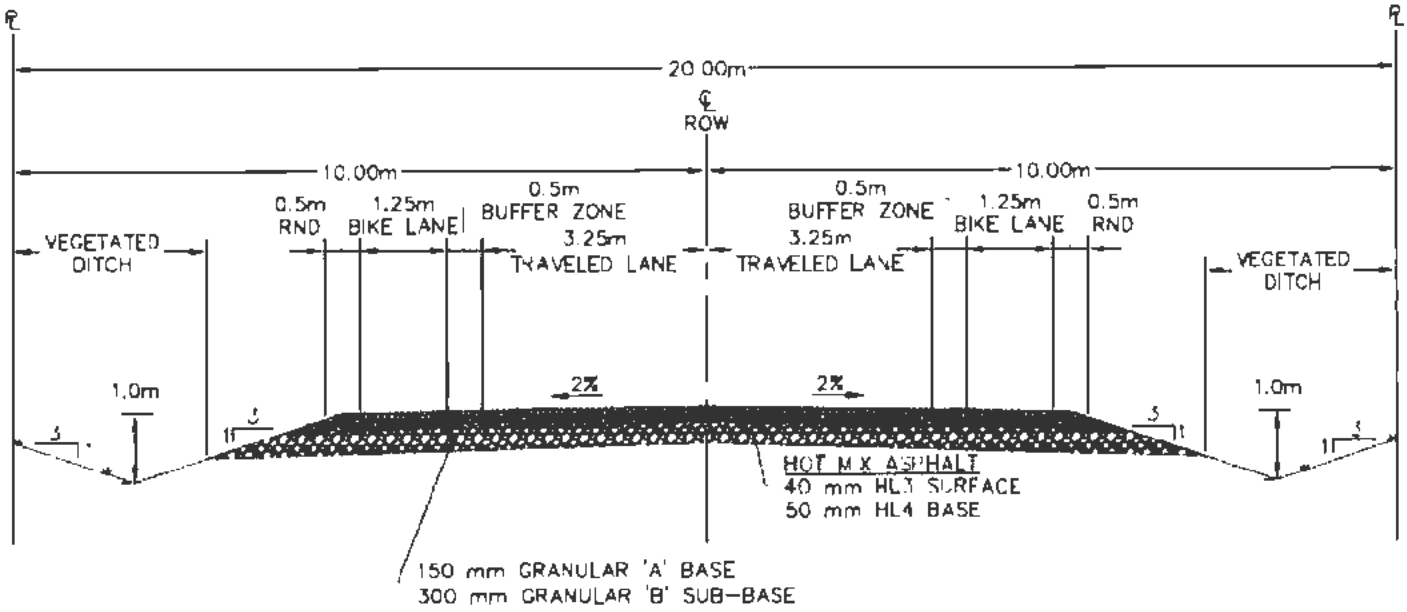
- Preserves adjacent vegetation including existing wetland and forest/woodland area;
- Minimizes impact to existing residents' property frontage;
- Maintains rural community feel and nature of the existing community of Midhurst;
- Addresses existing residents' concerns expressed as part of Phase 1 and 2 EA, as well as recent Phase 3 and 4 PIC;
    - Concerns from resident on Russell Road during Midhurst EA PIC (October 18, 2016) including "Why are we constantly urbanizing a rural community" and "Funneling traffic through Midhurst by widening and urbanizing Russell Road".
    - Concerns documented in the Phase 1 and 2 EA including notes from members of community regarding decrease in quality of life, and loss of current nature of Midhurst community.
- Shortens duration of construction time;
- Minimizes utility relocation requirements;
- Represents a more cost-effective solution;
- Conforms with Provincial Policy objectives currently being implemented within Ontario to increase infiltration and the implement Low Impact Development (LID) techniques (these principals are also being applied to the new developments).
- Conforms to the rural active transportation cross sections presented in the Ainley PIC (refer to **Attachment 2**).

We now present several alternative road cross section recommendations on select roads for consideration. This can be cross referenced to a map of Midhurst (**Figure 1**), attached.

Cross Section 1: Rural Cross Section with Bike Lanes:

A rural cross section has been investigated as a means to implement active transportation to road segments located primarily outside the existing or proposed residential neighbourhoods while maintaining the current rural nature of the community and addressing the concerns of existing residents.

This cross section is being proposed for roads in areas typically beyond the urban boundary with few driveway accesses such as **Forbes Road, Craig Road, and Snow Valley Road**. Additionally, this section is proposed along a portion of **Gill Road, St. Vincent Street, Pooles Road, Anne Street and Carson Road** beyond the built-out community limits.



CROSS SECTION 1
RURAL CROSS SECTION
WITH BIKE LANES

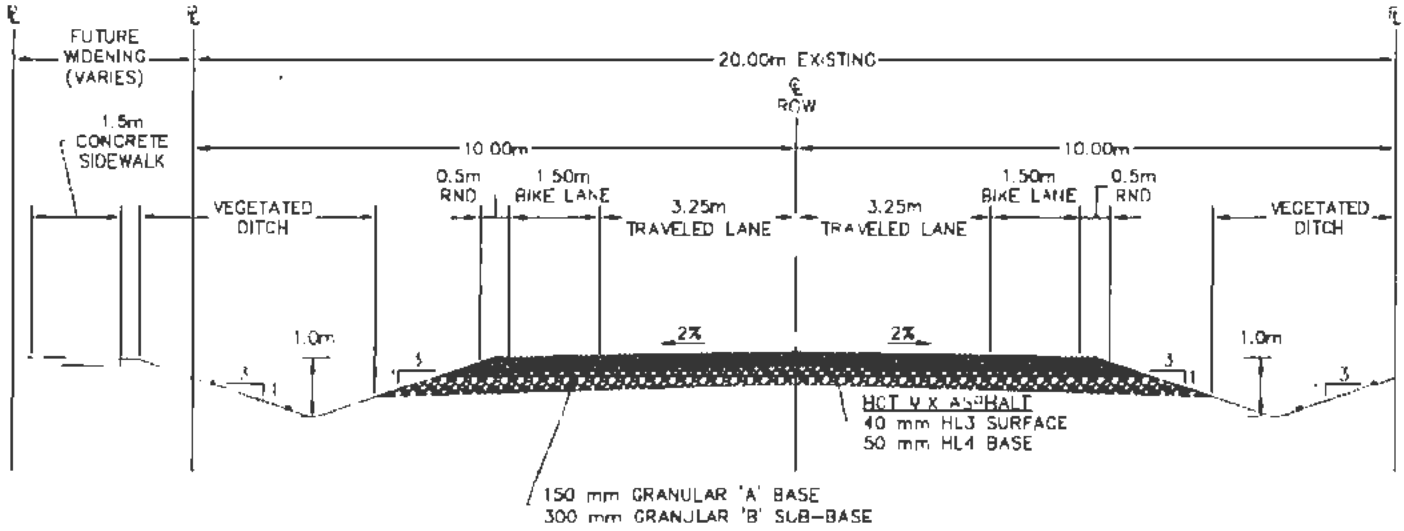
As illustrated, the rural cross section accommodates vehicular and bicycle movements. This cross section would provide an active transportation connection to surrounding communities. Pedestrian traffic is anticipated to be lower on these segments due to limited points of interest along the routes.

Many of these road segments are beyond the urban limits of the community and thus, are bordering low density rural residential and agricultural land uses suited to a rural cross section. The existing residents have expressed that their draw to Midhurst has been due to the nature of the community and maintaining this setting is important. Further, the agricultural areas have limited access connections and ditch systems already in place making them ideal for a rural cross section.

Some of these road segments cover greater distances. The overall change in storm runoff volumes could have an impact on natural features. Further, consideration should be given to the outlets that would be required for the collected stormwater from the urbanized cross section.

Cross Section 2: Rural Cross Section with Bike Lanes- Expanded:

The Rural Cross Section with bike lanes (Cross section 1) can be further modified to provide an off-road pedestrian sidewalk where a ROW widening is anticipated as part of the new neighbourhoods. This section is recommended along **Russell Road** to provide an off-road connection for pedestrians along the development property frontage. This section provides the same benefits as Section 1, as well as a pedestrian connection between subdivisions for local residents.

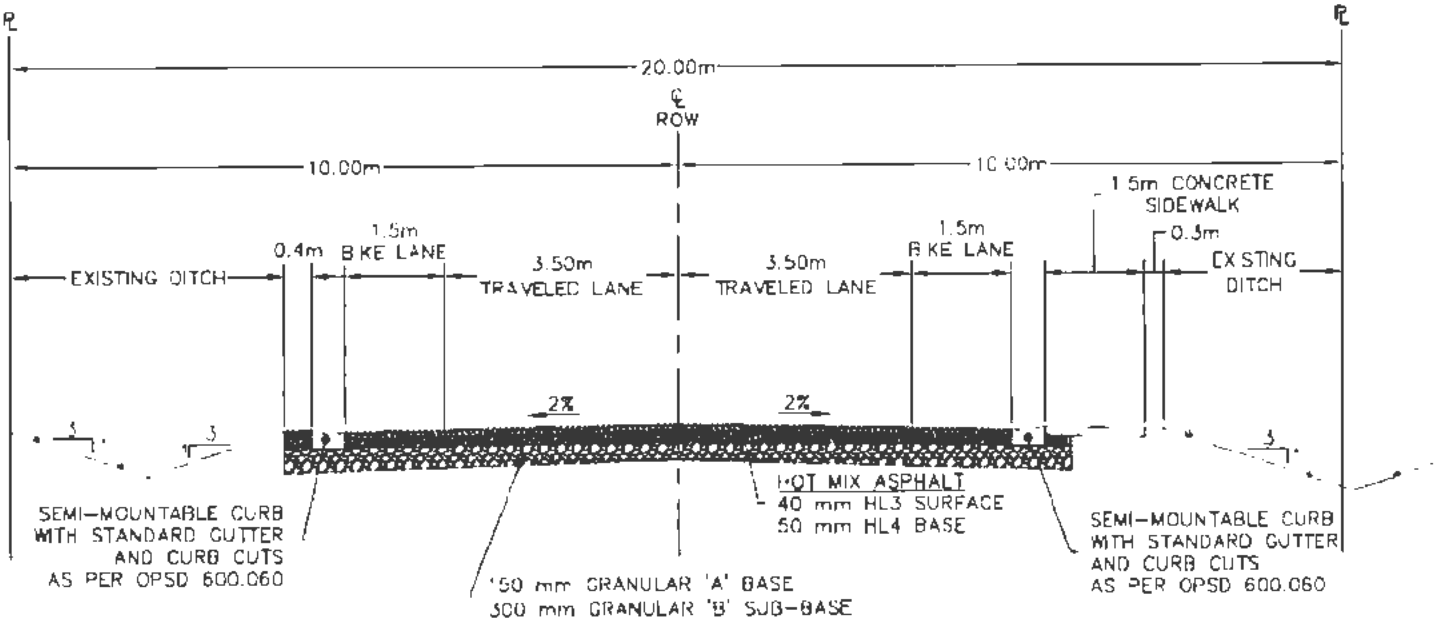


CROSS SECTION 2
RURAL CROSS SECTION WITH BIKE LANES – EXPANDED

It is acknowledged that in the long term, Russell Road is proposed as a 4-lane arterial roadway. Should traffic monitoring support this requirement, it is likely that Russell Road would be reconstructed to a 4-lane fully urbanized cross section at that time.

Cross Section 3: Rural Cross Section with Sidewalks:

It is acknowledged that some existing road sections located within the development boundary will require additional active transportation components than the previously discussed rural cross sections with bike lanes (Section 1) to facilitate pedestrian movements. These sections are located primarily within the existing residential areas in the Community of Midhurst such as **St. Vincent Street and Pooles Road**. Both of these streets currently consist of rural cross sections with little pedestrian and/or dedicated bike lane features.



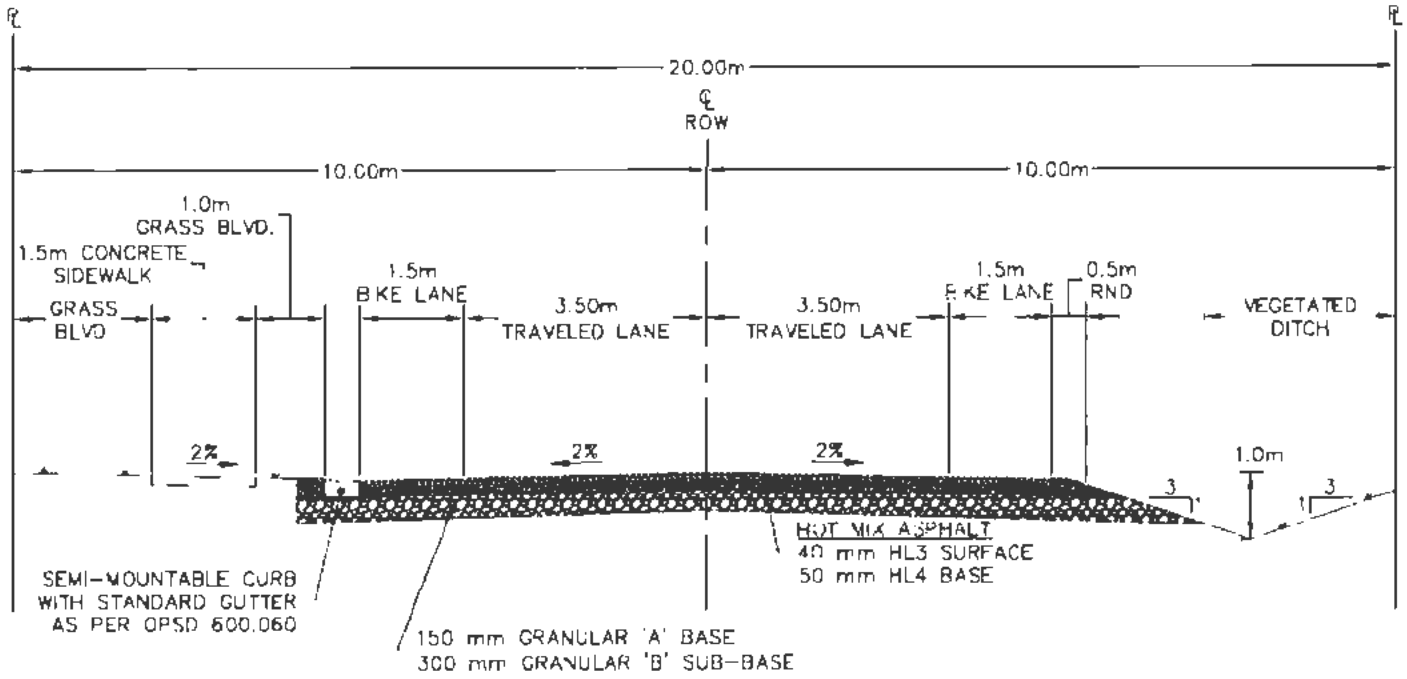
CROSS SECTION 3
RURAL CROSS SECTION
WITH SIDEWALK

As illustrated, the proposed section contains two through lanes, two bike lanes and one sidewalk. The single sidewalk has been designed to minimize property impacts and is separated from the through lanes by the bike lane and semi-mountable curb. Road drainage would reach the side ditches by way of periodic curb cuts. Sidewalks adjacent to the road are not uncommon in residential areas in Simcoe and Grey County.

Although many new residents in the area may use the active transportation facilities provided, the pedestrian sidewalks in these areas will service primarily existing residents along these roads. As such, the existing resident concerns should be considered heavily in the design of these road cross sections. This section may require easements on private property to achieve grading of roadside ditches.

Cross Section 4: Hybrid Urban Transition Zone Cross Section:

A Hybrid Urban Transition Zone is proposed in areas where the existing rural residential areas exist on one side of the road, and the new higher density neighbourhood is proposed across the road. The Hybrid Urban Transition Zone Cross Section consists of a fully urban road (i.e. curb and gutter and storm sewer) on the frontage of the new residential subdivisions, while maintaining the rural open ditch drainage system on the existing rural estate properties and agricultural lands. This cross section is applicable along **Gill Road from the Doran north development to Doran Road and portions of Carson Road**. Consideration could also be given to **Walt Road and Old Second Road South** in Phase 2 of the development.

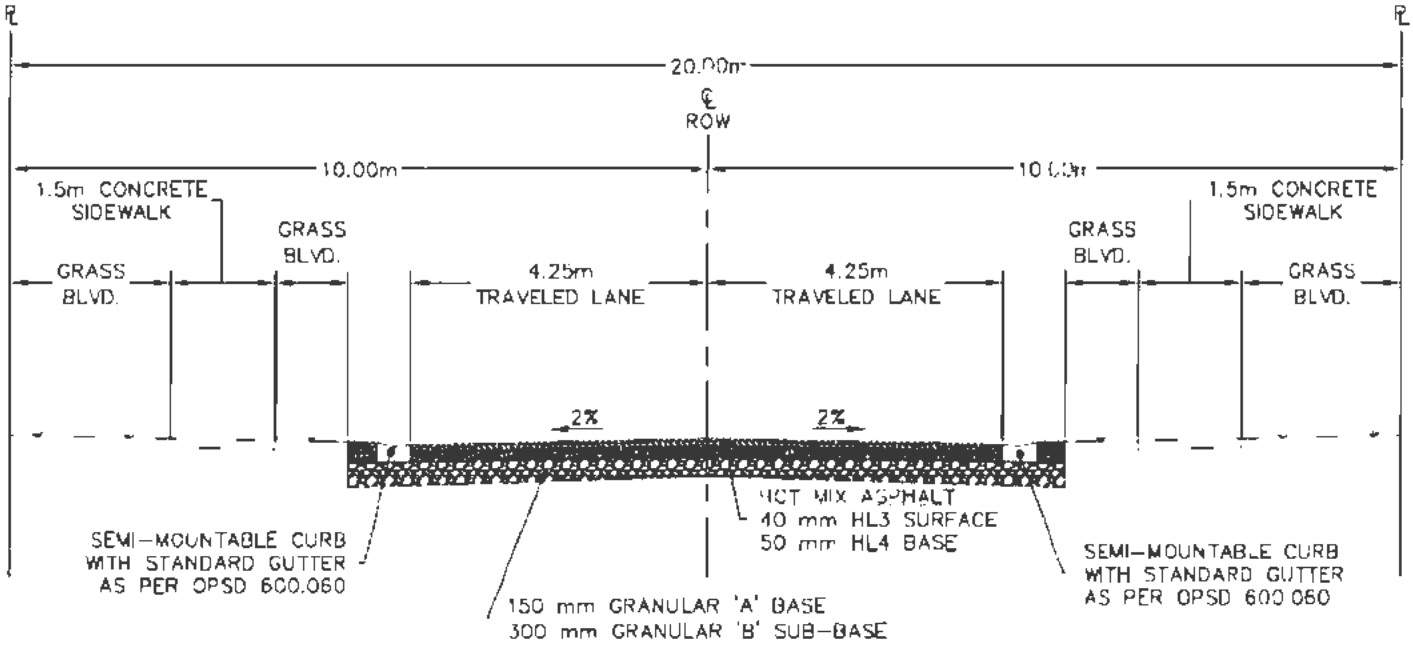


CROSS SECTION 4
HYBRID URBAN TRANSITION
ZONE CROSS SECTION

Cross Section 5: Urban Cross Section (Town Standard):

The Township standard urban cross section specified in the EA is recommended on all new roads within the new communities, as well as existing roads that the new subdivisions will front on. The implementation of full active transportation features such as bike lanes and sidewalks will be beneficial. As such, urbanization consistent with the recommendations of the EA along **Doran Road, Findlay Mill Road, portions of Pooles Road, portions of Anne Street and portions of Carson Road** within the new community is recommended.

It is acknowledged that although the existing community is rural, some roads will require urbanization due to the intensification of the proposed developments and the existing geographical constraints in the area. The Town Standard urban cross section is illustrated below. This section would be subject to modifications as necessary in the detailed design phase to accommodate different ROW widths and active transportation requirements.



CROSS SECTION 5
URBAN CROSS SECTION
(TOWN STANDARD)

REVIEW OF ACTIVE TRANSPORTATION PLAN

This section reviews the proposed Active Transportation Plan outlined in the preliminary EA materials. Our comments are outlined below.

1. All arterial roads within the study area are planned to have some type of active transportation facility. We note that the active transportation plan consists mainly of bicycle lanes on urbanized roads. In some cases a multi-use trail is proposed (Craig Road / Russell Road).

2. We note that it appears that the introduction of active transportation lanes and sidewalks appears to be the rationalization for urbanizing many of the existing roads within Midhurst. While this may be the case for some roads, there are other roads where active transportation could be implemented within a rural cross section. Some flexibility in how active transportation lanes be accommodated should be made in the EA materials. Specifically, arterial roads not adjacent to development areas or driveways (i.e. in rural areas) should include bicycle lanes or buffered bicycle lanes as part of a paved shoulder instead of being within an urban cross section.

3. Similarly, separate sidewalks should be provided in areas adjacent to development in order to accommodate walking through residential areas within neighbourhoods. However, on rural roads that are not adjacent to development and far beyond a typical walking route, sidewalks should not be required. In these areas, any pedestrian / jogging activity would be accommodated by the paved active transportation lanes that would be provided in a paved shoulder in the rural cross section.

4. We note that the Ontario Traffic Manual Book 18 for choosing appropriate bicycle / pedestrian facilities allows for a variety of design typologies for incorporating active transportation and cycling within both urban and rural roads. The design typology depends on both the volume of vehicle traffic and the design speed of the roadway. The figure below illustrates the relationship between traffic volume and design speed (urban context).

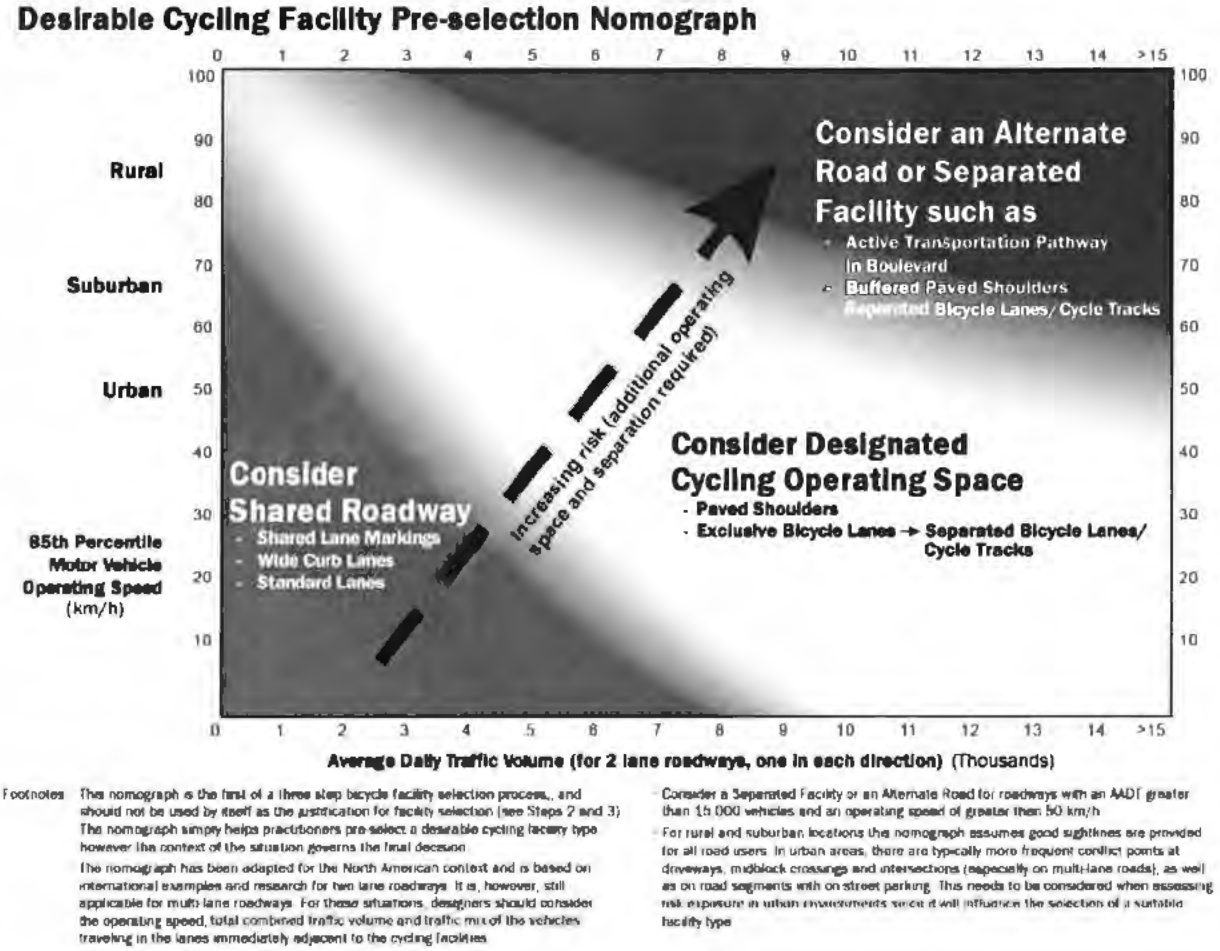


Figure 3.3 – Desirable Bicycle Facility Pre-Selection Nomograph

5. Based on a review of OTM Book 18, we suggest the following:
    - Where roads are outside of development areas or the existing community (e.g. Forbes Road, Craig Road, and St. Vincent Street south of the developed area) a rural cross section should be considered with active transportation accommodated within a paved shoulder. Separate sidewalks would not be required in these areas as these roads are not adjacent to development. As noted above, where rural roads have a higher speed limit, a buffered active transportation lane in the paved shoulder may be appropriate.
    - Where roads are within the development area or within the existing community, active transportation lanes could be accommodated within cycling lanes either within a paved shoulder, or within a lane in an urban cross section. In these areas separate sidewalks should be provided to accommodate pedestrians.
    - Where roads pass through transitional areas where new development is located on only one side of the road (e.g. Gill Road) a combination of paved shoulders and urban cross section (or partial urbanized) should be considered in order to provide flexibility.

REVIEW OF EA TRAFFIC ANALYSIS AND ASSUMPTIONS

BA Group has reviewed the following transportation studies that were prepared in support of the Phase 3-4 EA materials:

1. "*Township of Springwater Midhurst Secondary Plan Class Environmental Assessment, Draft Traffic Operational Analysis*" (dated August 2016); and
2. "*Highway 400 / Forbes Road Interchange Operations Traffic Analysis*" (dated April 26, 2016) prepared by AECOM.

General comments related to AECOM traffic volumes at the Forbes Road / Hwy. 400 interchange:

Based upon our review of these two studies it appears that the AECOM traffic volumes were used as the basis of analyzing traffic operations at the Forbes Road interchange with Highway 400. We note the following:

1. The traffic volumes illustrated as part of the AECOM Memorandum (Exhibit 13) that are inconsistent with the volumes developed in the August 2016 Ainley Group memorandum. Specifically, forecast 2031 traffic volumes oriented to the east of the Forbes Road interchange are significantly higher than those forecast by Ainley Group, and subsequently, results in higher traffic volumes conducting a westbound left-turn onto Hwy. 400 southbound on-ramp during the weekday morning peak hour, and southbound left-turn from the Hwy. 400 northbound off-ramp during the weekday afternoon peak hour. This contrasts with existing westbound volumes which are relatively low which suggests that AECOM expects significant growth east of Highway 400 along Forbes Road. Based on our review of AECOM's materials it is difficult to ascertain whether this is the case however and we are unaware of any significant new developments which would result in the growth in the westbound peak hour volumes expected in AECOM's analysis. By way of comparison, the AECOM analysis forecasts traffic volumes that are 3 to 4.5 times higher than the highest volumes forecast by either Ainley Group or what our analysis suggests.

2. Similar to the above, the traffic volumes illustrated as part of the AECOM Memorandum for the 2041 planning horizon (Exhibit 16) illustrate lower traffic volumes east of the Forbes Road / Hwy. 400 interchange relative to the 2031 forecast. These traffic volumes are inconsistent with the 2031 forecast traffic volumes and would generally be expected to be higher than the 2031 forecasts. As such we recommend that the 2031 and 2041 AECOM vehicle forecasts for the Forbes Road interchange be re-confirmed.

General comments related to the "*Township of Springwater Midhurst Secondary Plan Class Environmental Assessment, Draft Traffic Operational Analysis*", prepared by Ainley Group in August 2016:

1. Corridor growth assumptions adopted by Ainley Group, although different than those adopted by BA Group as part of original applications (submitted in 2009), have been updated to account for additional information provided through regional modelling, and are reasonable.

2. Traffic volume forecasts prepared by Ainley Group are generally consistent with those prepared by BA Group, as they relate to forecast traffic generation and traffic assignment.

3. Traffic volumes on the Craig Road extension (from Forbes Road to Hwy. 27) are not discussed in a future background traffic context (i.e. Ainley did not estimate how much traffic would divert to Craig Road independent of the development traffic). In this regard it appears the analysis currently suggests that only new development traffic will utilize Craig Road without any redistribution of existing traffic to Craig Road. Recognizing that existing traffic (both local trips and cut-through traffic from Highway 400) will benefit from Craig Road, an analysis of this should be included to confirm the benefit of the Craig Road extension for existing and future motorists in the Midhurst area, separate from those that would result from proposed developments. Recognizing existing traffic utilizing Craig Road is also important as the rebalancing of existing volumes may have an impact on the conclusions / level of improvement planned for Russell Road in the 2031 horizon; specifically any justification to widen Russell Road to 4 lanes before 2031 could be further reduced given that existing cut-through traffic travelling between Highway 400 and County Road 27 is likely to reroute from Russell Road / Doran Road to the new Craig Road extension.

4. For reference purposes, we note that BA Group has prepared a separate memorandum related to the benefits of the Craig Road extension for existing motorists ("Summary of Benefits of Craig Road Extension", November 2016), which is attached as **Attachment 3** for reference.

COMMENTS ON PHASING / TRANSPORTATION ANALYSIS IMPLICATIONS

Based on our review of the transportation Ainley and AECOM analysis set out above, we note the following comments with respect to the proposed transportation improvements highlighted in the EA:

1. AECOM's 2031 traffic projections for westbound left turns from Forbes Road onto southbound Highway 400 are 3.5-4 times higher than the traffic projections provided in Ainley's August Traffic Operational Analysis.

2. Synchro analysis of the Forbes Road / Hwy. 400 West Ramp interchange, indicates that the differences in traffic volumes (between the AECOM and Ainley Group analyses) impacts the conclusions as they relate to the need for improvements at this interchange. Based on the AECOM 2031 traffic forecasts, a westbound left-turn lane on Forbes Road at the southbound Highway 400 on-ramp would be required whether the intersection was signalized or left unsignalized. This left-turn lane would be required to accommodate queues in the order of 100 metres if the intersection were to be signalized, and 85 to 90 metres if the intersection was left unsignalized. Comparatively, utilizing traffic volumes devised by Ainley Group, analysis results indicate that a left-turn lane in the order of 10 to 30 metres could accommodate 95th percentile queue lengths whether the intersection was signalized or unsignalized by 2031. Furthermore, the analysis indicates that the westbound movement could operate acceptably without a left-turn lane (LOS A; v/c ratio of 0.15) if the intersection were left unsignalized.

3. The difference between the required westbound left turn storage on Forbes Road between the AECOM forecasts and the Ainley forecasts likely has a significant impact on the cost and level of impact to the Forbes Road interchange. Specifically, a shorter westbound left turn lane can likely be accommodated without any impact to the existing Highway 400 bridge structures over Forbes Road.

4. Recognizing that BA Group's analysis aligns more closely with Ainley's forecasts, and recognizing the discrepancies in the AECOM forecasts between the 2031 and 2041 forecasts, we recommend that the Ainley forecasts be utilized to review traffic operations at the Forbes Road interchange and that the current planned improvements outlined in the EA, and the corresponding cost estimates, be revisited on that basis.

5. Forbes Road / Hwy. 400 west ramps. The requirement for an eastbound right-turn lane and westbound left-turn lane are a product of signalization of the intersection, and are otherwise anticipated to be required during Phase 1 of development (without signalization), and may be more appropriately configured as part of the Forbes Road widening and urbanization during Phase 2 of development.

6. At the intersection of St. Vincent Street / Pooles Road / Green Pine Avenue a separate eastbound left-turn lane from Green Pine Avenue is specified to be completed within Phase 1 of development. Based on the traffic volume forecasts prepared for this intersection by Ainley Group and BA Group, separate turn lanes would not be required for either the westbound or eastbound approaches to this intersection, assuming signalization.

7. In AECOM's April 2016 memorandum to Ainley, AECOM concluded that there was no need to widen Forbes Road or Russell Road during by the 2031 Phase 1 horizon year. As such it is unclear why the proposed phasing in the EA indicates that Russell Road is to be widened to four lanes within the 2031 time horizon (Stage 5, Phase 1). Given that the four lanes on Russell Road do not provide any benefit until the 2041 per AECOM's analysis, it is recommended that the widening of Russell Road to 4 lanes be deferred into Phase 2.

8. Snow Valley Road is proposed to be urbanized and upgraded to include active transportation lanes as part of Stage 1 of Phase 1. Given that the proposed improvement would retain 2 lanes on Snow Valley Road, this improvement will not add any vehicle capacity and as such it is unclear why this improvement is required in Stage 1. Based on the preliminary Traffic Operational Analysis submitted by Ainley for the Phase 3-4 EA, the majority of traffic growth on Snow Valley Road will be due to the new employment uses that are expected along Snow valley Road. As such it is recommended that the timing of any improvement to Snow Valley Road be tied to the development of the employment lands and not Stage 1 of the residential lands as implied in the EA material.

9. The connection of Craig Road from Forbes Road to County Road 27 is currently proposed to occur in two stages with the westerly phase (between Gill and Forbes) in Stage 2, and the easterly phase in Stage 3.Given that the Doran North neighbourhood will have a parallel east-west collector street that connects to Russell Road, and also that the Doran North neighbourhood will not have a direct connection to Craig Road, it is our opinion that there would be minimal benefit of staging the construction of Craig Road between Gill Road and Russell Road. As such we recommend that the entirety of Craig Road be included in one stage.

10. Wilson Drive is a County of Simcoe road and the four lanes proposed by the County, which is currently anticipated to occur between 2021 and 2023, is not required to accommodate development in the Midhurst area. Given that the timing of this improvement is independent of the EA, we recommend that Wilson Drive be shown as a separate project in the Phase 3-4 EA as it would likely undergo its own EA process once the County chooses to initiate construction.

CRAIG ROAD & FORBES ROAD (CONNECTION BETWEEN CR 27 & HWY 400):

It has been identified through the Midhurst Phase 3 & 4 Class Environmental Assessment that the Craig Road Improvements, from Gill Rd to Russel Rd., are required once the community reaches the Phase 1 Stage 2 development phasing thresholds, and that the new construction of Craig Road from Gill Rd to CR 27 occur within the Phase 1 Stage 3 phases of development. Once the works are complete Craig Road in conjunction with Forbes Road will function as a connection between Hwy 400, a provincial highway and County Road 27.

It is our opinion that by providing the connection between a provincial highway and a county road that these roads are providing a greater benefits to the overall Township and County beyond a local road requirement generated by the Midhurst Secondary Plan Area.

To assist us in evaluating if the works on Craig Road and Forbes Road justify being considered eligible for County Road status we reviewed the local service policy within the County of Simcoe Development Charge Background Study, dated April 5, 2016, and prepared by Hemson Consulting Limited.

The definition of a "*local service*" with respect to a County road is as follows:

- *The improvement is designated as required for traffic flow improvement for a greater area than the development, is defined as a road improvement required by the County, and is identified through the Class Environmental Assessment process or the County Transportation Master Plan. Such an improvement would be listed in the development charge study;*

- *The improvement is designated as required by County of Simcoe Staff to serve a greater than the development and is identified in the capital works forecast or similar County financial documents and is listed in the development charges study.*

As the requirement for the improvements is just now being evaluated through the Midhurst EA Process, the works would not currently be identified in any of the County's Master Plan for DC documents. The works do however, improve traffic flow for a greater area than the development and warrant consideration as a County Road through this EA Process.

We are requesting that the Township of Springwater consider approaching the County of Simcoe to initiate the process in evaluating the benefit of adding Craig & Forbes Road and the appropriate upgrades to these roads to the County's Capital Roads Program.

Please contact the undersigned if you have any questions or require any additional information.

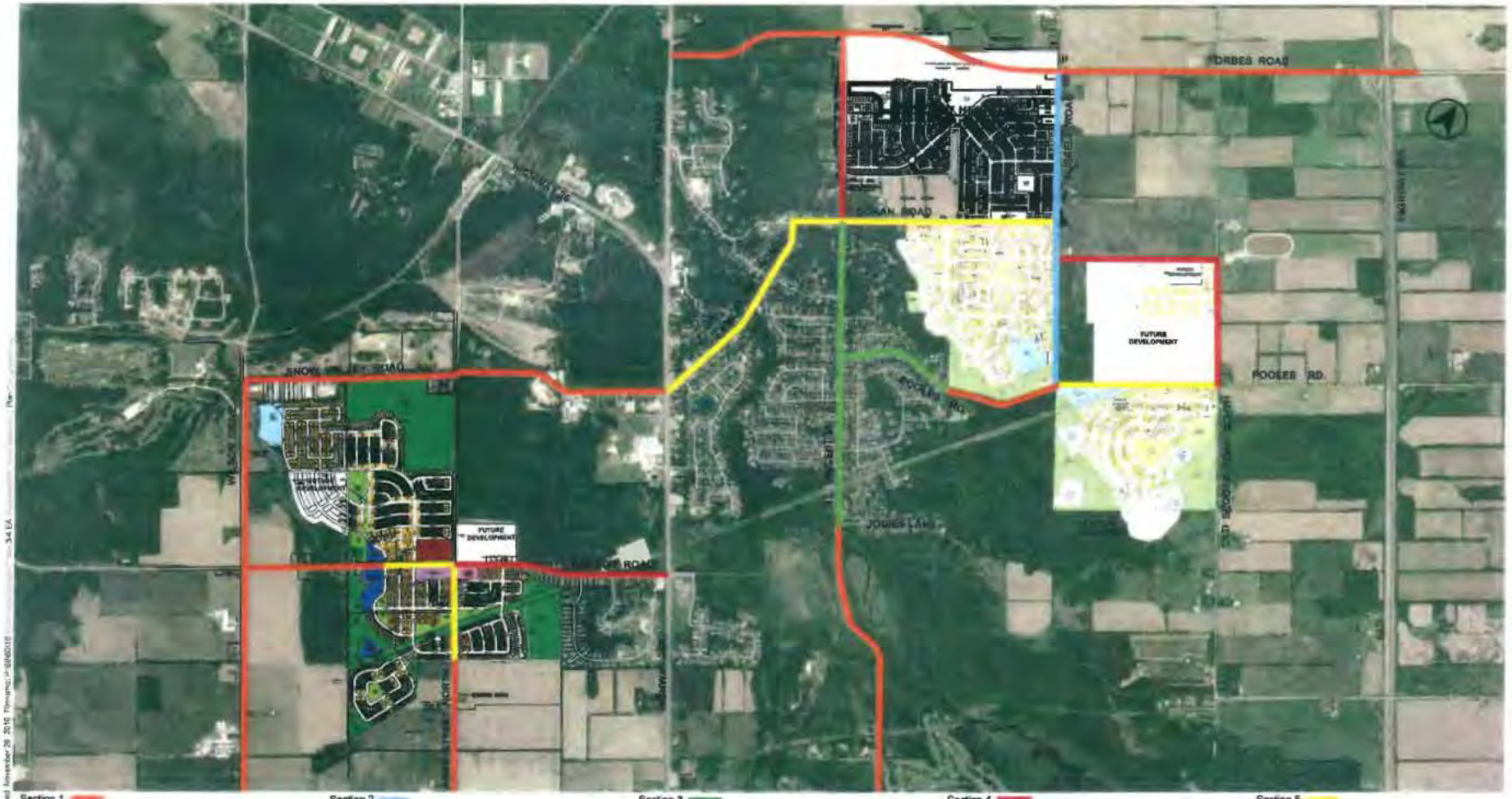
Sincerely,

Midhurst Landowners Group

Attachments: Figure 1 – Proposed Adjustments to Midhurst Phase 3-4 Roads Plan
Attachment 1 – Cross Section Overlay (various)
Attachment 2 – Ainley Active Transportation Slide
Attachment 3 – Memo Re: Summary of Benefits of Craig Road Extension, June 2015

c. [Mr./Ms. First Initial. Lastname, Company]

P:\1212 Midhurst Growth Study\Sent\Geranium\2016 11(Nov) 29 - Roads Comments Phase 3-4 EA\Ainley-jlb-Phase 3 & 4 EA Comments-29Nov16.docx



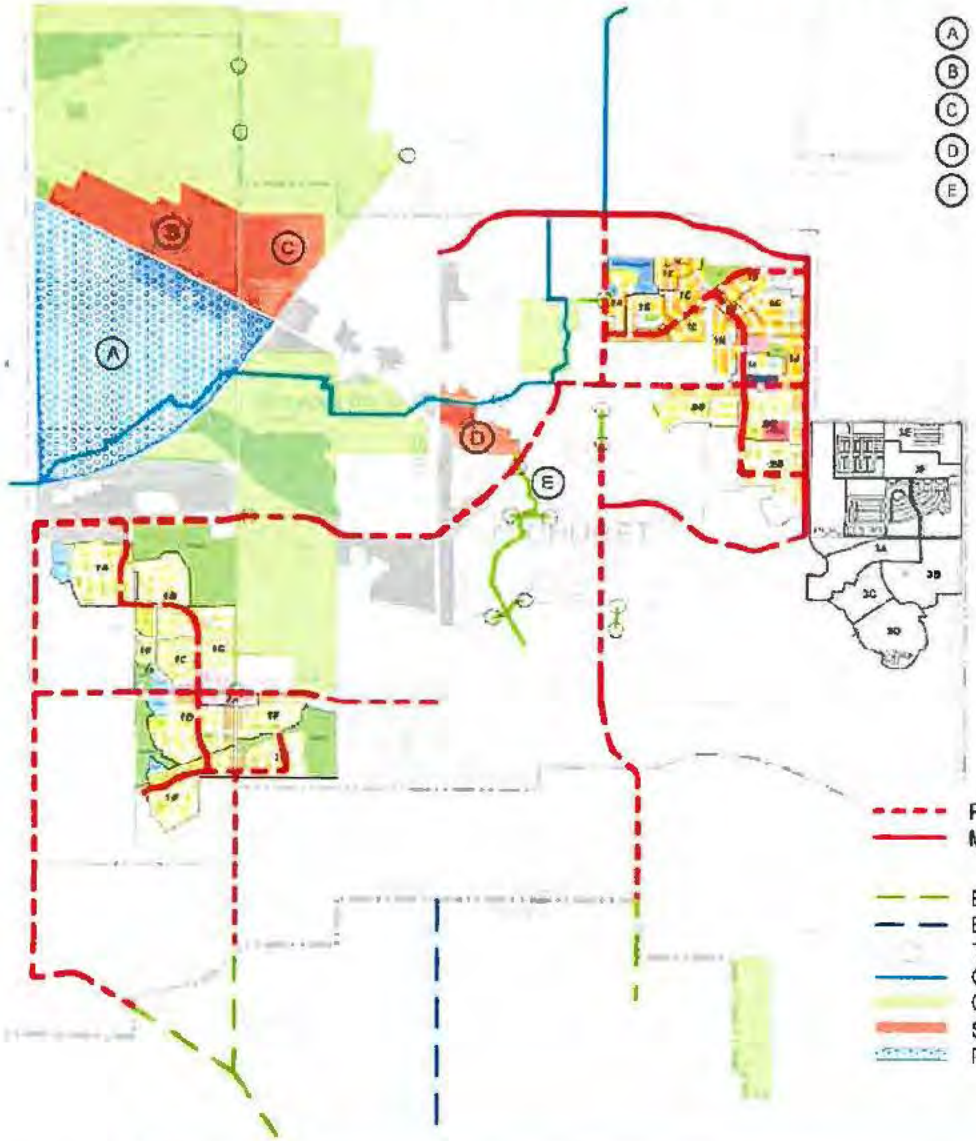
PROPOSED ADJUSTMENTS TO MIDHURST PHASE 3-4 ROADS PLAN

BA Group

Midhurst
6860-10 November 2016

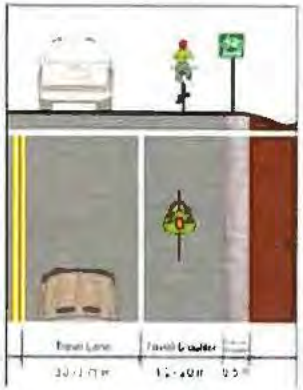
Figure 1

Active Transportation Routes/Links



No Dedicated Bicycle Lane

Bicycle Lane



Buffered Bicycle Lane

RUSSELL ROAD

FORBES ROAD

DRAFT

MIDHURST HEIGHTS DEVELOPMENT
TOWNSHIP OF SPRINGWATER

CROSS SECTION OVERLAY

CROZIER & ASSOCIATES Consulting Engineers

845-3675

FIG. 01

J:\800\845 - Midhurst Rose Alliance Inc\3675 - Midhurst Heights Development\CAD\CIVIL\15HEET\3675-000 - RD SECTIONS.dwg, FIG. 01, 11/1/2016 1:36:36 PM, dfuller

CRAIG ROAD

GILL ROAD

DRAFT

MIDHURST HEIGHTS DEVELOPMENT
TOWNSHIP OF SPRINGWATER

CROSS SECTION OVERLAY

CROZIER & ASSOCIATES Consulting Engineers

845-3675

FIG. 02

J:\800\845 - Midhurst Rose Alliance Inc\3675 - Midhurst Heights Development\CAD\CIVIL\1SHEET\3675-000 - RD SECTIONS.dwg, FIG. 02, 11/1/2016 1:37:43 PM, dfuller

DRAFT

MIDHURST HEIGHTS DEVELOPMENT
TOWNSHIP OF SPRINGWATER

CROSS SECTION OVERLAY

CROZIER & ASSOCIATES Consulting Engineers

845-3675
FIG. 03

J:\800\845 - Midhurst Rose Alliance Inc\3675 - Midhurst Heights Development\CAD\CIVIL\1SHEET\3675-000 - RD SECTIONS.dwg, FIG. 03, 11/1/2016 1:38:20 PM, dfuller

Memorandum

TO:
J. A. Mullan, P.Eng.
President & CEO
Ainley Group
550 Wellham Road
Barrie, ON
L4N 8Z7

FROM: [redacted]

PROJECT:
6860-10
Midhurst Development Plan

DATE:
Nov 11, 2016

SUBJECT: SUMMARY OF BENEFITS OF CRAIG ROAD EXTENSION

Introduction

The Midhurst Class Environmental Assessment includes the provision of a new east-west road at the north-end of Midhurst which is referred to as the Craig Road Extension.

The planned Craig Road Extension will link the existing Forbes Road and Highway 400 interchange in the east with County Road 27 in the west, providing a direct route between Highways 400 and County Road 27. By providing this link, traffic (including truck traffic) travelling between these two north-south corridors will have a more direct route available and will no longer need to travel through the established areas of Midhurst, namely along Doran Road and Findlay Mill Road.

This memorandum summarizes the estimated volumes that will utilize the Craig Road extension and the benefits it will have for various user groups (i.e. for existing traffic routing through the Midhurst community, for accommodating future regional traffic growth, and for traffic from new development within Midhurst).

Existing Traffic

Non-local through traffic travelling between Highway 400 and Highway 26 represents the largest component of existing traffic volumes that utilize Russell Road, Doran Road and Findlay Mill Road. Given the improved connection that Craig Road would provide, the existing Midhurst residents in the vicinity of Doran Road, Finlay Mill Road, and Russell Road would benefit from a reduction in traffic in the area as the non-local traffic would divert to the Craig Road extension. Existing through traffic volumes that would divert to Craig Road are estimated and summarized in Table 1.

TABLE 1 ESTIMATED EXISTING NON-LOCAL TRAFFIC THAT WILL UTILIZE CRAIG ROAD

	Estimated Through Traffic (Weekday AM Peak Hour)	Estimated Through Traffic (Weekday PM Peak Hour)
Through Traffic Volumes	165 vehicles	215 vehicles

It is estimated that in the order of 165 vehicles during the weekday AM peak hour and 215 vehicles during the weekday PM peak hour would reroute and utilize the planned Craig Road Extension. These vehicles represent existing traffic volumes that would benefit from the planned roadway, and would include existing heavy vehicle and truck traffic volumes.

Future Regional Traffic Growth

The Craig Road extension will provide a direct, convenient, connection between several Provincial Highways that are regionally significant north-south traffic corridors. These include:

- Highway 400;
- Highway 26/County Road 27; and
- Highway 93 / Penetanguishine Road.

Because of its connections to the above corridors, Craig Road will become a key link in the area transportation system and will provide an important distributor function for regional traffic. As such the Craig Road extension will assist in accommodating future planned growth in regional traffic volumes that have been forecast. It is estimated that regional growth could contribute an additional 100-200 additional peak hour trips to Craig Road by 2041.

Forecast Midhurst Development Traffic

Transportation Studies undertaken by BA Group as part of the Draft Plan of Subdivision applications indicate that the majority of traffic generated by new development in Midhurst will be arrive and depart to/from the south (i.e. towards Barrie). Given that all of the new development areas in Midhurst are located south of future Craig Road extension, traffic from Midhurst would therefore have to travel north away from their destination to utilize the Craig Road extension before back-tracking south towards their destination. As a result it is estimated that only a small percentage of traffic from the development lands will utilize the Craig Road extension. By way of example, development located in the Carson Neighbourhood is not expected to have any traffic utilize Craig Road and only 6% of trips associated with the lands south of Doran Road are expected to use the new connection. Only the areas located north of Doran Road, which are in closest proximity to the new connection, are estimated to utilize the proposed road to a greater degree – whereby 15 to 20 percent of trips from this development area are estimated to use the Craig Road extension.

A summary of Craig Road utilization for each of these development areas is shown in Table 2.

TABLE 2 ESTIMATED MIDHURST DEVELOPMENT UTILIZATION OF CRAIG ROAD EXTENSION

Development Area	Craig Road Extension Utilization	Two-way Vehicle Trips / Hour (Weekday AM Peak Hour)		Two-way Vehicle Trips / Hour (Weekday PM Peak Hour)	
Horizon Year		**2031**	**2041**	**2031**	**2041**
Carson Neighbourhood	0%	0	0	0	0
Doran Neighbourhood (South of Doran Rd.)	6%	25	110	35	120
Alliance Neighbourhood (North of Doran Rd.)	15% to 20 %	165-205	225-300	165-220	245-330
Total Vehicle Trips		***190-230***	***335-410***	***200-255***	***365-450***

Compared to the total 2-way traffic volumes generated by new development in Midhurst, Craig Road would be utilized by 6.5% to 8.5% of all traffic generated by this development. Conversely, 90% to 95% of build-out traffic is not anticipated to utilize the proposed Craig Road Extension.

Capacity analysis for the 2031 horizon year also suggests that there is sufficient capacity in the existing road network to accommodate new development traffic that would use Craig Road. The currently approved development within Midhurst, which is estimated to be built-out by 2031, can therefore be accommodated without The Craig Road Extension.

Summary

- The Craig Road extension will provide a more direct connection between Highway 400 and County Road 27 which will reduce or eliminate the approximately 200 peak hour vehicles that currently cut through the existing routes within Midhurst (e.g. Finlay Mill Road, Doran Road) to access Highway 400. This includes eliminating existing non-local truck traffic that passes through the community.

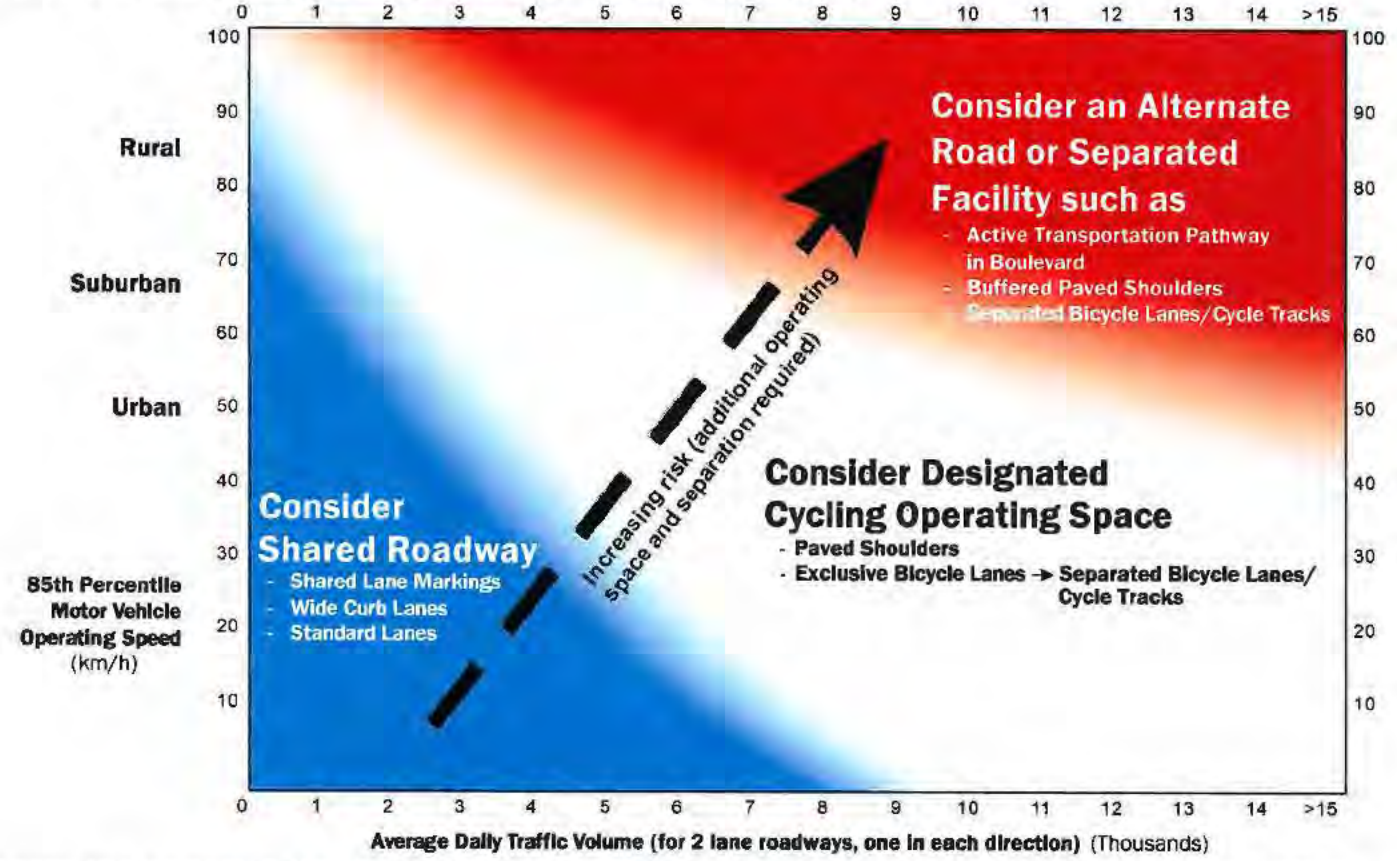
- As a direct connection between two regionally significant north-south traffic corridors (i.e. Highway 400 and Highway 26/County Road 27), the Craig Road extension will act as a regionally-significant link in the area transportation system. In this regard Craig Road will serve to accommodate future growth expected in regional traffic (i.e. from outside of Midhurst) by providing a key distributor role between the key transportation corridors in the area, namely County Road 27, Highway 400, and Highway 93.

- The planned Craig Road Extension would primarily be utilized by residents of the Doran North community which represent a relatively small proportion of future residents of the planned Midhurst Secondary Plan. We estimate that in the order of 90 to 95 percent of future residential development related traffic volumes generated by the Secondary Plan development would not utilize the planned roadway. This is due to the location of the Craig Road extension being located at the northern end of the community whereas the primary traffic routing for the new development will be to/from the south.

Source: MMM, 2013

STEP 1 of 3

Desirable Cycling Facility Pre-selection Nomograph



Footnotes:
- This nomograph is the **first of a three step bicycle facility selection process**., and should not be used by itself as the justification for facility selection (see Steps 2 and 3). The nomograph simply helps practitioners pre-select a desirable cycling facility type, however the context of the situation governs the final decision.
- The nomograph has been adapted for the North American context and is based on international examples and research for two lane roadways. It is, however, still applicable for multi-lane roadways. For these situations, designers should consider the operating speed, total combined traffic volume and traffic mix of the vehicles traveling in the lanes immediately adjacent to the cycling facilities.
- Consider a Separated Facility or an Alternate Road for roadways with an AADT greater than 15,000 vehicles and an operating speed of greater then 50 km/h.
- For rural and suburban locations this nomograph assumes good sightlines are provided for all road users. In urban areas, there are typically more frequent conflict points at driveways, midblock crossings and intersections (especially on multi-lane roads), as well as on road segments with on-street parking. This needs to be considered when assessing risk exposure in urban environments since it will influence the selection of a suitable facility type.

Figure 3.3 – Desirable Bicycle Facility Pre-Selection Nomograph

TTS DATA

USER : Alexander Fleming - CF Crozier and Associates
DATE : Nov 29 2016 (09:14:21)
DATA : 2011 TTS V1.0 Trips
FILTER 1 : gta06_hhld => 8642 8643 8644
ROW : mode_prime
COLUMN : trip_purp

Mode	Total
Walk	69
Other	17
Auto passenger	1317
Schoolbus	265
Auto driver	6887

Row Labels	**Sum of Total**
Auto driver	80.50%
Auto passenger	15.39%
Other	0.20%
Schoolbus	3.10%
Walk	0.81%
Grand Total	**100.00%**

60

From: [redacted]
To: Mark Archer [Mark.Archer@springwater.ca]; Joe Mullan
Cc: midhurst.classea@springwater.ca; midhurst.classea@ainleygroup.com; Glenn Switzer; Dave Featherstone
Subject: *Notice of Public Information Centre, Midhurst Water, Waste Water and Transportation, Township of Springwater*
Date: Wednesday, November 2, 2016 9:14:06 AM
Attachments: [redacted]

Dear Mr. Archer (Mark) and Mr. Mullan (Joe):

Thank you for circulating the Notice of Public Information Centre (PIC) advising on the October 18, 2016 PIC and requesting comments prior to December 1, 2016. In this regard, NVCA continues to have interest in this project and receipt of any new information including the draft Environmental Study Report when it is available. As per our recent phone discussion, NVCA provided comments in May 2013 (see attached) and we would be interested in meeting with Township representatives to understand how the comments noted in our letter have or will be addressed through Environmental Assessment process.

Please feel free to contact the undersigned to further discuss or if you have any questions on the above comments.

Regards,

[redacted]

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?

NOTTAWASAGA VALLEY CONSERVATION AUTHORITY Centre for Conservation
John Hix Conservation Administration Centre Tiffin Conservation Area 8195 8th Line Utopia, On L0M 1T0
Telephone: 705.424.1479 Fax: 705.424.2115 Web: www.nvca.on.ca Email: admin@nvca.on.ca

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,

[redacted]

FD/DF/GS/PY

c: [redacted]

61

From: Mark Archer
To: "midhurst.classea@ainleygroup.com"
Subject: MSP EA
Date: Friday, September 23, 2016 8:25:20 AM
Attachments: Notice of PIC.msg

Please see the attached as received yesterday.
Thanks

Mark Archer CET
Director of Public Works
Township of Springwater
2231 Nursery Road
Minesing, ON L0L 1Y2
P. 705-728-4784 ext 2014
F. 705-728-6957
mark.archer@springwater.ca

Springwater Customer Service Survey!

Notice of Collection/Use/Disclosure: All information submitted through the Clerk's Office in support of meetings of Council is collected in accordance with the *Municipal Act, 2001*, s.8 and 239(1) and may be used in Council deliberations, and disclosed in full, including email, names and addresses to persons requesting access to records of Council. All information submitted to the municipality is subject to disclosure under the *Municipal Freedom of Information Act* (MFIPPA). Questions about this notice of collection should be directed to the Clerk's Office 705-728-4784 Ext. 2026.

Joe Mullan

From: [redacted]
Sent: Thursday, September 22, 2016 3:24 PM
To: Midhurst Class EA
Subject: Notice of PIC

I received the notification regarding the upcoming PIC. Please note my change of address to **Suite 300.**

[redacted]

[redacted]

62

From: [redacted]
To: Joe Mullan
Cc: Barney Kussner; Mark Archer; Brent Suavnol; Jay Feehely; Mario Giannetti; Alex Tropa
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,

[redacted]

63

From: [redacted]
To: Joe Mullan
Cc: [redacted]

Subject: Midhurst Landowners Group Comments on Midhurst Class EA (701912)
Date: Thursday, December 1, 2016 12:38:10 PM
Attachments: MLG - Phase 3 and 4 EA Comments - December 1, 2016 (00835027xCDE1C).pdf
Figure 1 – Proposed Adjustments to Midhurst Phase 3-4 Roads Plan.pdf
Attachment 3 – Memo Re Summary of Benefits of Craig Road Extension, Nove....pdf
Attachment 1 - Cross Section Overlay (Various).pdf
MLG - Phase 3 and 4 EA Comments - December 1, 2016 (00835027xCDE1C).pdf

---

Good afternoon,

Please see the attached correspondence from the Midhurst Landowners Group.

[redacted]

Davies Howe Partners LLP

Midhurst Landowners Group

File #: 1212
Date: December 1, 2016

Mr. Joe Mullan
Ainley Group
280 Pretty River Parkway
Collingwood, Ontario
L9Y 4J5

Dear Mr. Mullan:

Re: **Midhurst Landowners Group Comments on Midhurst Water, Wastewater and Transportation Class Environmental Assessment (Phase 3) Township of Springwater**

We are writing on behalf of the Midhurst Landowners Group and in follow-up to our letter of October 18, 2016 with respect to our questions and comments on the Phase 3 portion of the Transportation component of the Class EA being completed for the Midhurst Community.

As noted in our October 18, 2016 letter the roads related costs have increased approximately $60 million from the estimates included in the Phase 1 & 2 Report, prepared in July 2009.

Our consulting team has prepared the following comments and questions for further clarification and discussion. We understand the Class EA Phase 3 & 4 comment period submission deadline date is December 1, 2016.

PROPOSED ROAD CROSS SECTIONS FOR CONSIDERATION

The Midhurst Secondary Plan Phase 3 & 4 EA- Draft Transportation Operational Analysis Report has recently been prepared by Ainley Group (Ainley) and was provided on August 30, 2016 for review. This report outlined a full urbanization of all roads within the scope of the transportation improvements. An analysis has been undertaken to explore the justification for full urbanization and to present alternate road cross sections, as opposed to full urbanization on select streets, for consideration.

In the Phase 1 & 2 EA (Ainley, 2009), many of the road sections were identified as a rural cross section such as portions of Pooles Road, Forbes Road, Craig Road, St. Vincent Road, Anne Street and Wilson Drive. The Phase 1 & 2 report identified all of the roads that would require improvements. Since that time, many of the roads have been reconstructed by the municipality (Forbes Road in 2012, St. Vincent Road in 2013, Doran Road in 2013 and Pooles Road in 2016). These projects addressed structural improvements, drainage improvements and active transportation. These improvements did not involve the urbanization of the streets; rather the roads were improved while maintaining the existing rural character of the community.

The Phase 3 & 4 EA draft report now proposes all roads slated for improvement to consist of full urbanization (there are only two exceptions to this being portions of Craig Road and Wilson Drive). This consists of over 30 km of existing roads located within Midhurst. We believe there to be compelling rationale to reconsider the full urbanization of 100% of these roads, acknowledging none the less that there are in fact many streets which are most suitable to be fully urbanized.

It is acknowledged that the Township standard for new road construction is a fully urbanized cross section (Engineering Design Standard Specifications and Engineering Design Standard Drawings, May 2008). We are implementing such a road section in the respective Geranium and Alliance-Rose subdivisions. However, other road cross sections should be considered when it comes to existing road reconstruction projects that have been identified. The Municipality has in fact followed this tendency with the reconstruction of the aforementioned roads since 2009. Renderings of sample proposed cross sections on existing roads are attached to this report for illustration (**Attachment 1**).

We opine that implementing variations of rural cross sections on select streets offers many advantages over the full urbanization alternative. Some of these reasons include:

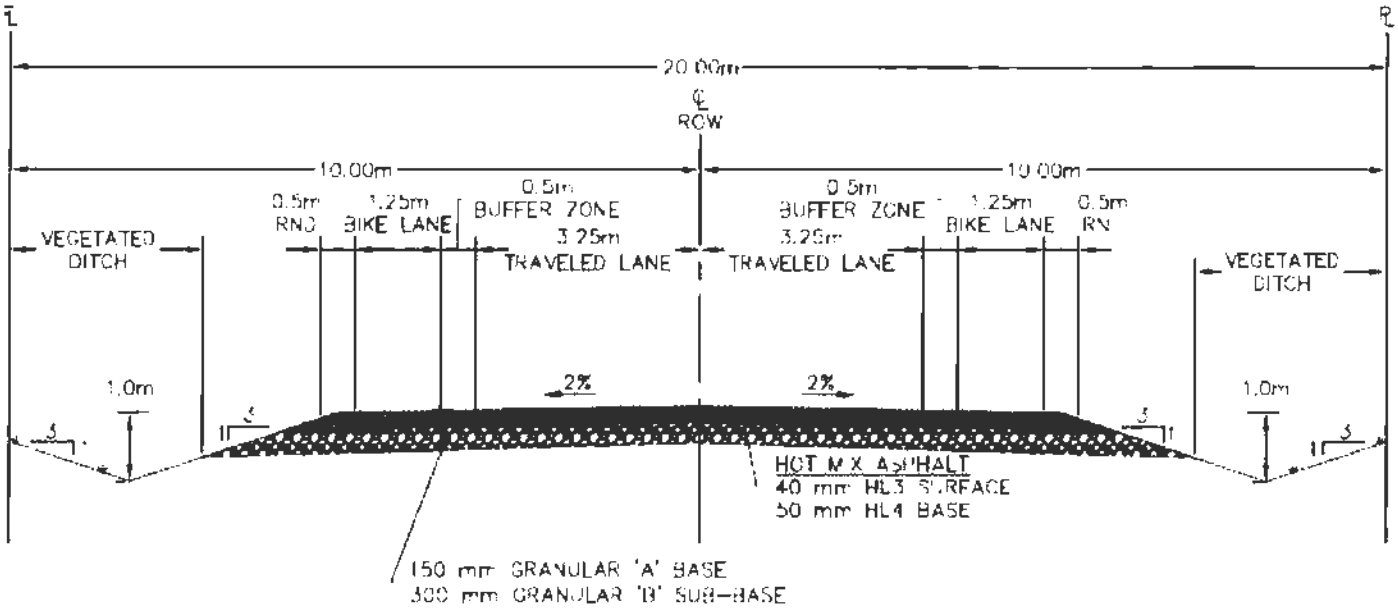
- Preserves adjacent vegetation including existing wetland and forest/woodland area;
- Minimizes impact to existing residents' property frontage;
- Maintains rural community feel and nature of the existing community of Midhurst;
- Addresses existing residents' concerns expressed as part of Phase 1 & 2 EA, as well as recent Phase 3 & 4 PIC;
    - Concerns from resident on Russell Road during Midhurst EA PIC (October 18, 2016) including "Why are we constantly urbanizing a rural community" and "Funneling traffic through Midhurst by widening and urbanizing Russell Road".
    - Concerns documented in the Phase 1 & 2 EA including notes from members of community regarding loss of current nature of Midhurst community.
- Shortens duration of construction time;
- Minimizes utility relocation requirements;
- Represents a more cost-effective solution;
- Conforms with Provincial Policy objectives currently being implemented within Ontario to increase infiltration and implement Low Impact Development (LID) techniques (these principals are also being applied to the new developments).
- Conforms to the rural active transportation cross sections presented in the Ainley PIC (refer to **Attachment 2**).

We now present several alternative road cross section recommendations on select roads for consideration. This can be cross referenced to a map of Midhurst (**Figure 1**), attached.

Cross Section 1: Rural Cross Section with Bike Lanes:

A rural cross section has been investigated as a means to implement active transportation to road segments located primarily outside the existing or proposed residential neighbourhoods while maintaining the current rural nature of the community and addressing the concerns of existing residents.

This cross section is being proposed for roads in areas typically beyond the urban boundary with few driveway accesses such as **Forbes Road, Craig Road, and Snow Valley Road.** Additionally, this section is proposed along a portion of **Gill Road, St. Vincent Street, Pooles Road, Anne Street and Carson Road** beyond the built-out community limits.



CROSS SECTION 1
RURAL CROSS SECTION
WITH BIKE LANES

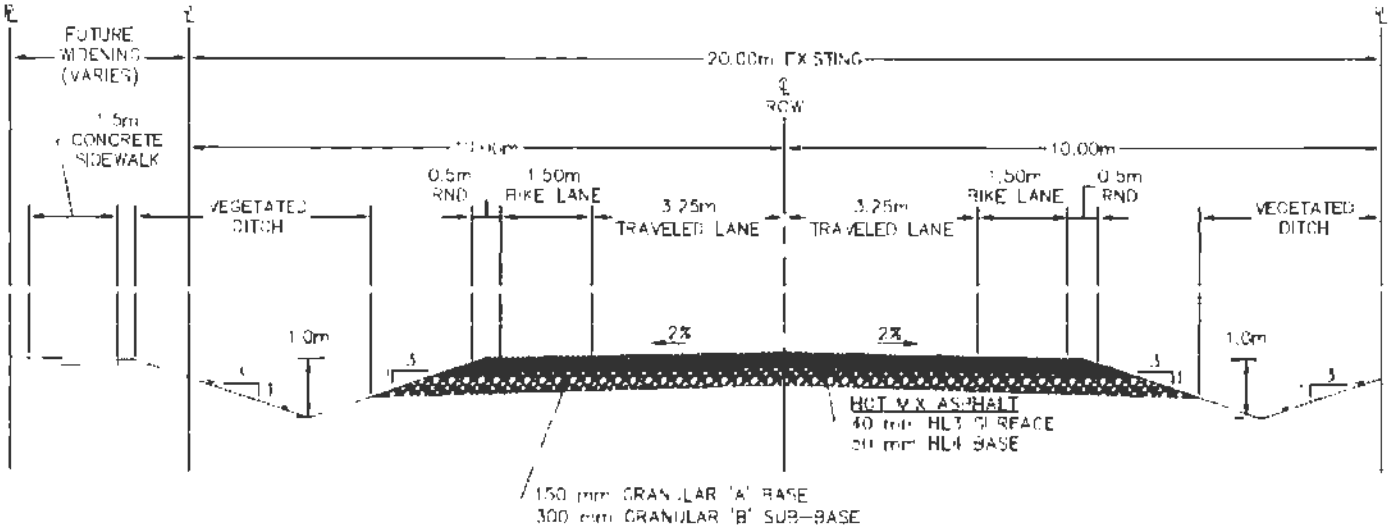
As illustrated, the rural cross section accommodates vehicular and bicycle movements. This cross section would provide an active transportation connection to surrounding communities. Pedestrian traffic is anticipated to be lower on these segments due to limited points of interest along the routes.

Many of these road segments are beyond the urban limits of the community and thus, are bordering low density rural residential and agricultural land uses suited to a rural cross section. The existing residents have expressed that their draw to Midhurst has been due to the nature of the community and maintaining this setting is important. Further, the agricultural areas have limited access connections and ditch systems already in place making them ideal for a rural cross section.

Some of these road segments cover greater distances. The overall change in storm runoff volumes could have an impact on natural features. Further, consideration should be given to the outlets that would be required for the collected stormwater from the urbanized cross section.

Cross Section 2: Rural Cross Section with Bike Lanes- Expanded:

The Rural Cross Section with bike lanes (Cross section 1) can be further modified to provide an off-road pedestrian sidewalk where a ROW widening is anticipated as part of the new neighbourhoods. This section is recommended along **Russell Road** to provide an off-road connection for pedestrians along the development property frontage. This section provides the same benefits as Section 1, as well as a pedestrian connection between subdivisions for local residents.

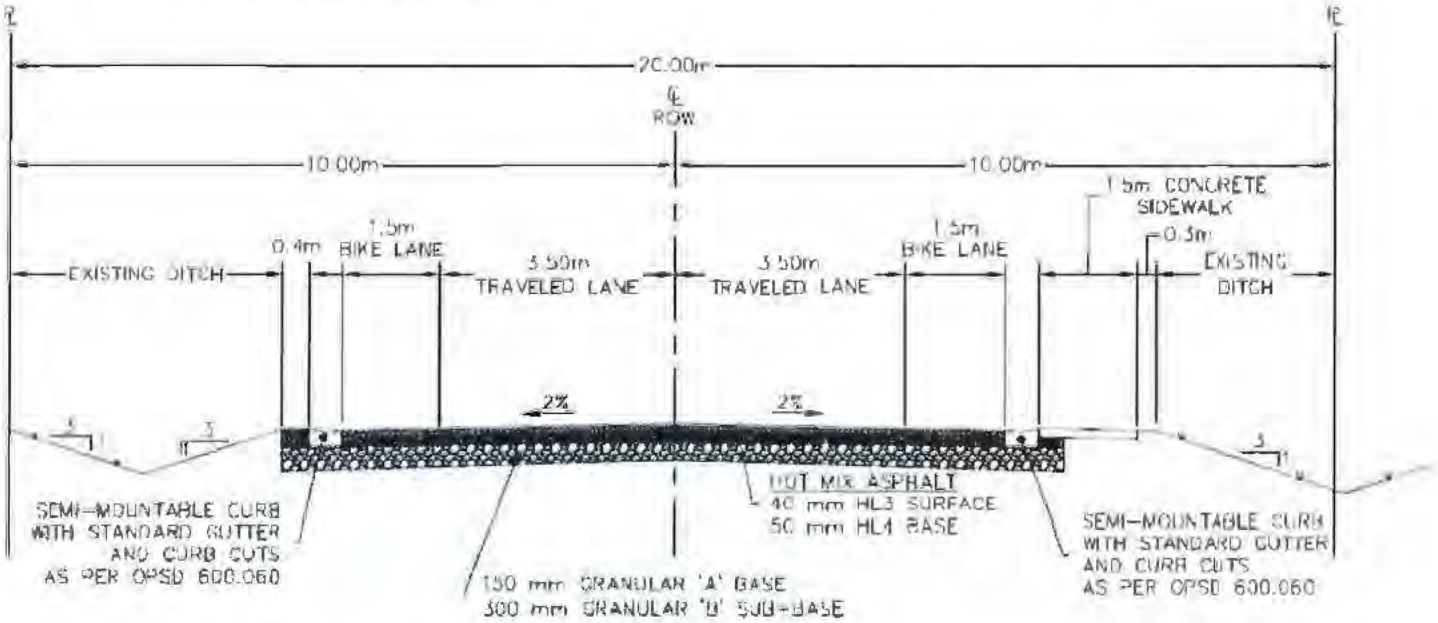


CROSS SECTION 2
RURAL CROSS SECTION WITH BIKE LANES – EXPANDED

It is acknowledged that in the long term, Russell Road is proposed as a 4-lane arterial roadway. Should traffic monitoring support this requirement, it is likely that Russell Road would be reconstructed to a 4-lane fully urbanized cross section at that time.

Cross Section 3: Rural Cross Section with Sidewalks:

It is acknowledged that some existing road sections located within the development boundary will require additional active transportation components than the previously discussed rural cross sections with bike lanes (Section 1) to facilitate pedestrian movements. These sections are located primarily within the existing residential areas in the Community of Midhurst such as **St. Vincent Street and Pooles Road.** Both of these streets currently consist of rural cross sections with little pedestrian and/or dedicated bike lane features.



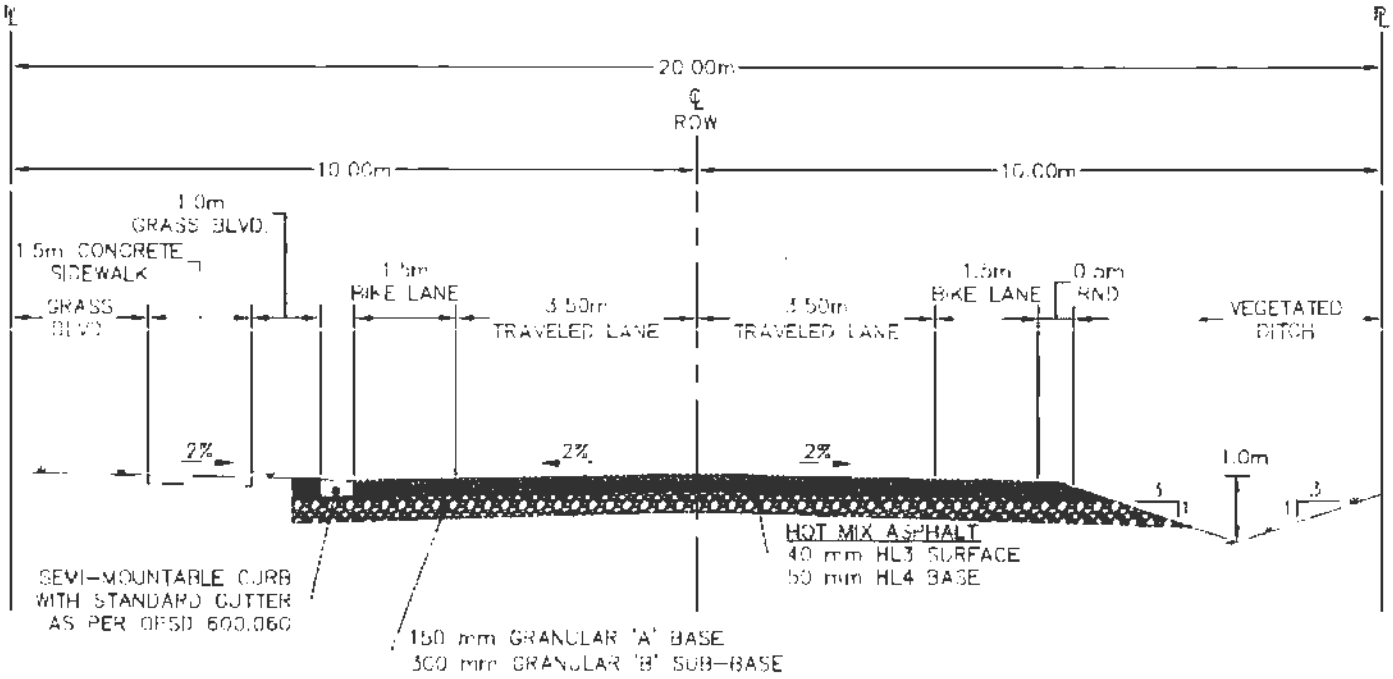
CROSS SECTION 3
RURAL CROSS SECTION
WITH SIDEWALK

As illustrated, the proposed section contains two through lanes, two bike lanes and one sidewalk. The single sidewalk has been designed to minimize property impacts and is separated from the through lanes by the bike lane and semi-mountable curb. Road drainage would reach the side ditches by way of periodic curb cuts. Sidewalks adjacent to the road are not uncommon in residential areas in Simcoe and Grey County.

Although many new residents in the area may use the active transportation facilities provided, the pedestrian sidewalks in these areas will service primarily existing residents along these roads. The cross sections proposed take into account some of the existing residents' concerns. This section may require easements on private property to achieve grading of roadside ditches.

Cross Section 4: Hybrid Urban Transition Zone Cross Section:

A Hybrid Urban Transition Zone is proposed in areas where the existing rural residential areas exist on one side of the road, and the new higher density neighbourhood is proposed across the road. The Hybrid Urban Transition Zone Cross Section consists of a fully urban road (i.e. curb and gutter and storm sewer) on the frontage of the new residential subdivisions, while maintaining the rural open ditch drainage system on the existing rural estate properties and agricultural lands. This cross section is applicable along **Gill Road from the Doran north development to Doran Road and portions of Carson Road**. Consideration could also be given to **Walt Road and Old Second Road South** in Phase 2 of the development.

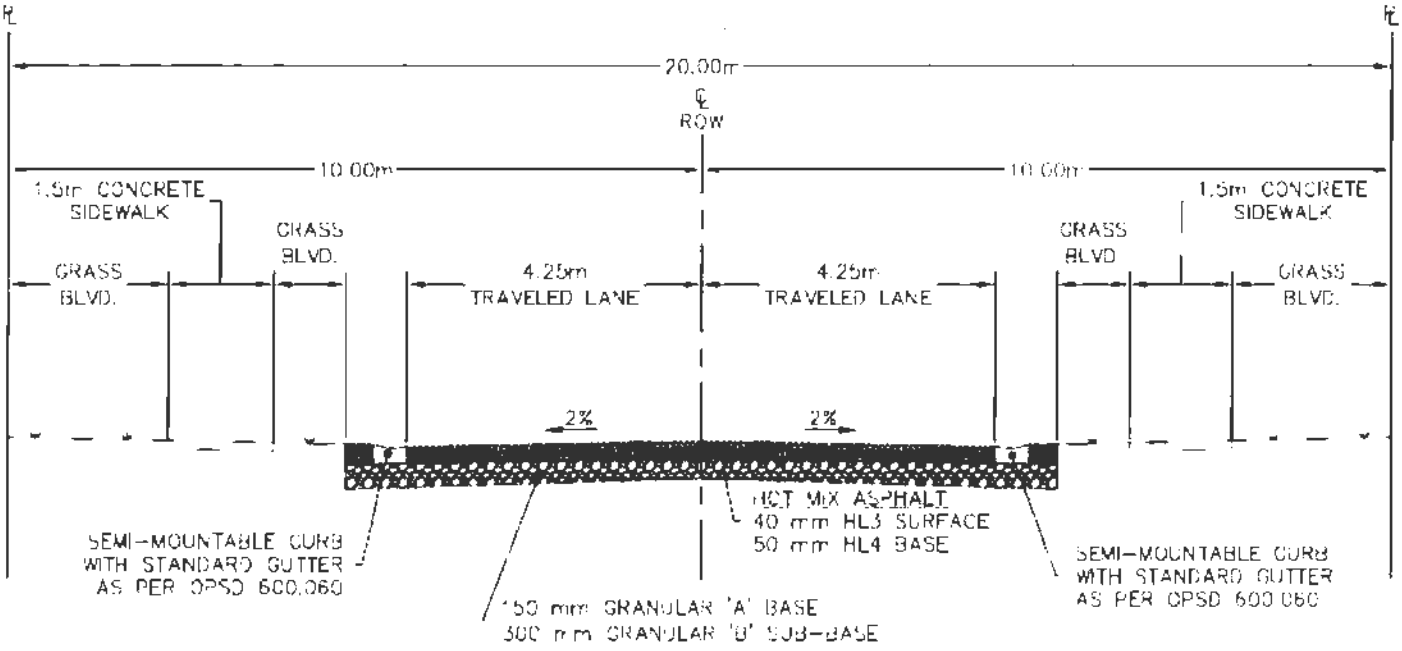


CROSS SECTION 4
HYBRID URBAN TRANSITION ZONE CROSS SECTION

Cross Section 5: Urban Cross Section (Town Standard):

The Township standard urban cross section specified in the EA is recommended on all new roads within the new communities, as well as existing roads that the new subdivisions will front on. The implementation of full active transportation features such as bike lanes and sidewalks will be beneficial. As such, urbanization consistent with the recommendations of the EA along **Doran Road, Findlay Mill Road, portions of Pooles Road, portions of Anne Street and portions of Carson Road** within the new community is recommended.

It is acknowledged that although the existing community is rural, some roads will require urbanization due to the intensification of the proposed developments and the existing geographical constraints in the area. The Town Standard urban cross section is illustrated below. This section would be subject to modifications as necessary in the detailed design phase to accommodate different ROW widths and active transportation requirements.



CROSS SECTION 5
URBAN CROSS SECTION
(TOWN STANDARD)

REVIEW OF ACTIVE TRANSPORTATION PLAN

This section reviews the proposed Active Transportation Plan outlined in the preliminary EA materials. Our comments are outlined below.

1. All arterial roads within the study area are planned to have some type of active transportation facility. We note that the active transportation plan consists mainly of bicycle lanes on urbanized roads. In some cases a multi-use trail is proposed (Craig Road / Russell Road).

2. We note that it appears that the introduction of active transportation lanes and sidewalks appears to be the rationalization for urbanizing many of the existing roads within Midhurst. While this may be the case for some roads, there are other roads where active transportation could be implemented within a rural cross section. Some flexibility in how active transportation lanes be accommodated should be made in the EA materials. Specifically, arterial roads not adjacent to development areas or driveways (i.e. in rural areas) should include bicycle lanes or buffered bicycle lanes as part of a paved shoulder instead of being within an urban cross section.

3. Similarly, separate sidewalks should be provided in areas adjacent to development in order to accommodate walking through residential areas within neighbourhoods. However, on rural roads that are not adjacent to development and far beyond a typical walking route, sidewalks should not be required. In these areas, any pedestrian / jogging activity would be accommodated by the paved active transportation lanes that would be provided in a paved shoulder in the rural cross section.

4. We note that the Ontario Traffic Manual Book 18 for choosing appropriate bicycle / pedestrian facilities allows for a variety of design typologies for incorporating active transportation and cycling within both urban and rural roads. The design typology depends on both the volume of vehicle traffic and the design speed of the roadway. The figure below illustrates the relationship between traffic volume and design speed (urban context).

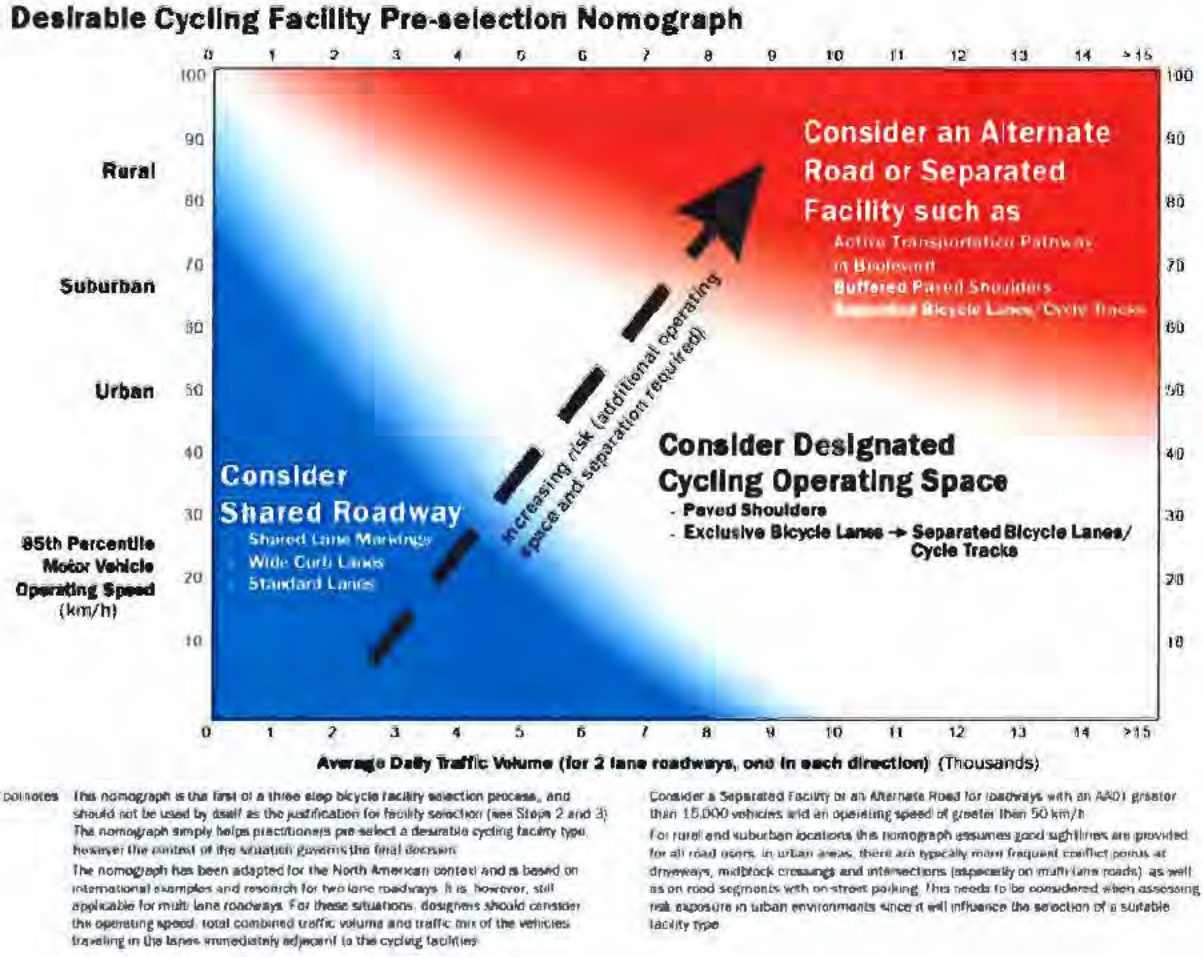


Figure 3.3 – Desirable Bicycle Facility Pre-Selection Nomograph

Footnotes: This nomograph is the first of a three step bicycle facility selection process, and should not be used by itself as the justification for facility selection (see Steps 2 and 3). The nomograph simply helps practitioners pre-select a desirable cycling facility type, however the context of the situation governs the final decision.

The nomograph has been adapted for the North American context and is based on international examples and research for two lane roadways. It is, however, still applicable for multi lane roadways. For these situations, designers should consider the operating speed, total combined traffic volume and traffic mix of the vehicles traveling in the lanes immediately adjacent to the cycling facilities.

Consider a Separated Facility or an Alternate Road for roadways with an AADT greater than 15,000 vehicles and an operating speed of greater than 50 km/h.

For rural and suburban locations this nomograph assumes good sightlines are provided for all road users. In urban areas, there are typically more frequent conflict points at driveways, midblock crossings and intersections (especially on multi-lane roads), as well as on road segments with on-street parking. This needs to be considered when assessing risk exposure in urban environments since it will influence the selection of a suitable facility type.

5. Based on a review of OTM Book 18, we suggest the following:

- Where roads are outside of development areas or the existing community (e.g. Forbes Road, Craig Road, and St. Vincent Street south of the developed area) a rural cross section should be considered with active transportation accommodated within a paved shoulder. Separate sidewalks would not be required in these areas as these roads are not adjacent to development. As noted above, where rural roads have a higher speed limit, a buffered active transportation lane in the paved shoulder may be appropriate.
- Where roads are within the development area or within the existing community, active transportation lanes could be accommodated within cycling lanes either within a paved shoulder, or within a lane in an urban cross section. In these areas separate sidewalks should be provided to accommodate pedestrians.
- Where roads pass through transitional areas where new development is located on only one side of the road (e.g. Gill Road) a combination of paved shoulders and urban cross section (or partial urbanized) should be considered in order to provide flexibility.

COMMENTS ON EA TRAFFIC ANALYSIS AND ASSUMPTIONS

BA Group has reviewed the following transportation studies that were prepared in support of the Phase 3-4 EA materials:

1. "*Township of Springwater Midhurst Secondary Plan Class Environmental Assessment, Draft Traffic Operational Analysis*" (dated August 2016); and
2. "*Highway 400 / Forbes Road Interchange Operations Traffic Analysis*" (dated April 26, 2016) prepared by AECOM.

General comments related to AECOM traffic volumes at the Forbes Road / Hwy. 400 interchange:

Based upon our review of these two studies it appears that the AECOM traffic volumes were used as the basis of analyzing traffic operations at the Forbes Road interchange with Highway 400. We note the following:

1. The traffic volumes illustrated as part of the AECOM Memorandum (Exhibit 13) that are inconsistent with the volumes developed in the August 2016 Ainley Group memorandum. Specifically, forecast 2031 traffic volumes oriented to the east of the Forbes Road interchange are significantly higher than those forecast by Ainley Group, which results in higher traffic volumes conducting a westbound left-turn onto Hwy. 400 southbound on-ramp during the weekday morning peak hour, and southbound left-turn from the Hwy. 400 northbound off-ramp during the weekday afternoon peak hour. This contrasts with existing westbound volumes which are relatively low which suggests that AECOM expects significant growth east of Highway 400 along Forbes Road. Based on our review of AECOM's materials it is difficult to ascertain whether this is the case however and we are unaware of any significant new developments which would result in the growth in the westbound peak hour volumes expected in AECOM's analysis. By way of comparison, the AECOM analysis forecasts traffic volumes that are 3 to 4.5 times higher than the highest volumes forecast by either Ainley Group or what our analysis suggests.

2. Similar to the above, the traffic volumes illustrated as part of the AECOM Memorandum for the 2041 planning horizon (Exhibit 16) illustrate lower traffic volumes east of the Forbes Road / Hwy. 400 interchange relative to the 2031 forecast. These traffic volumes are inconsistent with the 2031 forecast traffic volumes and would generally be expected to be higher than the 2031 forecasts. As such we recommend that the 2031 and 2041 AECOM vehicle forecasts for the Forbes Road interchange be re-confirmed.

General comments related to the "*Township of Springwater Midhurst Secondary Plan Class Environmental Assessment, Draft Traffic Operational Analysis*", prepared by Ainley Group in August 2016:

1. Corridor growth assumptions adopted by Ainley Group, although different than those adopted by BA Group as part of original applications (submitted in 2009), have been updated to account for additional information provided through regional modelling and are reasonable.

2. Traffic volume forecasts prepared by Ainley Group are generally consistent with those prepared by BA Group, as they relate to forecast traffic generation and traffic assignment.

3. Traffic volumes on the Craig Road extension (from Forbes Road to Hwy. 27) are not discussed in a future background traffic context (i.e. Ainley did not estimate how much traffic would divert to Craig Road independent of the development traffic). In this regard it appears the analysis currently suggests that only new development traffic will utilize Craig Road without any redistribution of existing traffic to Craig Road. Recognizing that existing traffic (both local trips and cut-through traffic from Highway 400) will benefit from Craig Road, an analysis of this should be included to confirm the benefit of the Craig Road extension for existing and future motorists in the Midhurst area, separate from those that would result from proposed developments. Recognizing existing traffic utilizing Craig Road is also important as the rebalancing of existing volumes may have an impact on the conclusions / level of improvement planned for Russell Road in the 2031 horizon; specifically any justification to widen Russell Road to 4 lanes before 2031 could be further reduced given that existing cut-through traffic travelling between Highway 400 and County Road 27 is likely to reroute from Russell Road / Doran Road to the new Craig Road extension.

4. For reference purposes, we note that BA Group has prepared a separate memorandum related to the benefits of the Craig Road extension for existing motorists ("Summary of Benefits of Craig Road Extension", November 2016), which is attached as **Attachment 3** for reference.

COMMENTS ON PHASING / TRANSPORTATION ANALYSIS IMPLICATIONS

Based on our review of the transportation Ainley and AECOM analysis set out above, we note the following comments with respect to the proposed transportation improvements highlighted in the EA:

1. AECOM's 2031 traffic projections for westbound left turns from Forbes Road onto southbound Highway 400 are 3.5-4 times higher than the traffic projections provided in Ainley's August Traffic Operational Analysis.

2. Synchro analysis of the Forbes Road / Hwy. 400 West Ramp interchange, indicates that the differences in traffic volumes (between the AECOM and Ainley Group analyses) impacts the conclusions as they relate to the need for improvements at this interchange. Based on the AECOM 2031 traffic forecasts, a westbound left-turn lane on Forbes Road at the southbound Highway 400 on-ramp would be required whether the intersection was signalized or left unsignalized. This left-turn lane would be required to accommodate queues in the order of 100 metres if the intersection were to be signalized, and 85 to 90 metres if the intersection was left unsignalized. Comparatively, utilizing traffic volumes devised by Ainley Group, analysis results indicate that a left-turn lane in the order of 10 to 30 metres could accommodate 95th percentile queue lengths whether the intersection was signalized or unsignalized by 2031. Furthermore, the analysis indicates that the westbound movement could operate acceptably without a left-turn lane (LOS A; v/c ratio of 0.15) if the intersection were left unsignalized.

3. The difference between the required westbound left turn storage on Forbes Road between the AECOM forecasts and the Ainley forecasts likely has a significant impact on the cost and level of impact to the Forbes Road interchange. Specifically, a shorter westbound left turn lane can likely be accommodated without any impact to the existing Highway 400 bridge structures over Forbes Road.

4. Recognizing that BA Group's analysis aligns more closely with Ainley's forecasts, and recognizing the discrepancies in the AECOM forecasts between the 2031 and 2041 forecasts, we recommend that the Ainley forecasts be utilized to review traffic operations at the Forbes Road interchange and that the current planned improvements outlined in the EA, and the corresponding cost estimates, be revisited on that basis.

5. Forbes Road / Hwy. 400 west ramps. The requirement for an eastbound right-turn lane and westbound left-turn lane are a product of signalization of the intersection, and are proposed to be required during Phase 1 of development (without signalization), and may be more appropriately configured as part of the Forbes Road widening and urbanization during Phase 2 of development.

6. At the intersection of St. Vincent Street / Pooles Road / Green Pine Avenue a separate eastbound left-turn lane from Green Pine Avenue is specified to be completed within Phase 1 of development. Based on the traffic volume forecasts prepared for this intersection by Ainley Group and BA Group, separate turn lanes would not be required for either the westbound or eastbound approaches to this intersection, assuming signalization.

7. In AECOM's April 2016 memorandum to Ainley, AECOM concluded that there was no need to widen Forbes Road or Russell Road during by the 2031 (Phase 1) horizon year. As such it is unclear why the proposed phasing in the EA indicates that Russell Road is to be widened to four lanes within the 2031 time horizon (Stage 5, Phase 1). Given that the four lanes on Russell Road do not provide any benefit until the 2041 per AECOM's analysis, it is recommended that the widening of Russell Road to 4 lanes be deferred into Phase 2.

8. Snow Valley Road is proposed to be urbanized and upgraded to include active transportation lanes as part of Stage 1 of Phase 1. Given that the proposed improvement would retain 2 lanes on Snow Valley Road, this improvement will not add any vehicle capacity and as such it is unclear why this improvement is required in Stage 1. Based on the preliminary Traffic Operational Analysis submitted by Ainley for the Phase 3 & 4 EA, the majority of traffic growth on Snow Valley Road will be due to the new employment uses that are expected along Snow valley Road. As such it is recommended that the timing of any improvement to Snow Valley Road be tied to the development of the employment lands and not Stage 1 of the residential lands as implied in the EA material.

9. The connection of Craig Road from Forbes Road to County Road 27 is currently proposed to occur in two stages with the westerly phase (between Gill and Forbes) in Stage 2, and the easterly phase in Stage 3.Given that the Doran North neighbourhood will have a parallel east-west collector street that connects to Russell Road, and also that the Doran North neighbourhood will not have a direct connection to Craig Road, it is our opinion that there would be minimal benefit of staging the construction of Craig Road between Gill Road and Russell Road. As such we recommend that the entirety of Craig Road be included in one stage.

10. Wilson Drive is a County of Simcoe road and the four lanes proposed by the County, which is currently anticipated to occur between 2021 and 2023, is not required to accommodate development in the Midhurst area. Given that the timing of this improvement is independent of the EA, we recommend that Wilson Drive be shown as a separate project in the Phase 3-4 EA as it would likely undergo its own EA process once the County chooses to initiate construction.

MLG c/o Group Trustee:
Ms. Kim Beckman, Davies Howe Partners LLP
kimb@davieshowe.com

99 Spadina Avenue
Toronto, Ontario M5V 3P8
t: 416-977-7088 □f: 416-977-8931

BROAD BENEFITS OF CRAIG ROAD & FORBES ROAD (CONNECTION BETWEEN CR 27 & HWY 400):

The Midhurst Phase 3 & 4 Class Environmental Assessment identifies that the Craig Road Improvements, from Gill Road to Russel Road, are required once the community reaches the Phase 1 Stage 2 development phasing thresholds, and that the new construction of Craig Road from Gill Road to County Road 27 occur within the Phase 1 Stage 3 phases of development. Once the works are complete Craig Road in conjunction with Forbes Road will function as a connection between Hwy 400, a provincial highway and County Road 27.

It is our opinion that this proposed connection between the provincial highway and County Road, provides a greater benefit to the overall Township and County beyond what would otherwise be a local road requirement generated by the Midhurst Secondary Plan Area.

To assist us in evaluating if the works on Craig Road and Forbes Road should be given County Road status, we reviewed the local service policy within the County of Simcoe Development Charge Background Study, dated April 5, 2016, prepared by Hemson Consulting Limited.

The definition of a "*local service*" with respect to a County road is as follows:

- *The improvement is designated as required for traffic flow improvement for a greater area than the development, is defined as a road improvement required by the County, and is identified through the Class Environmental Assessment process or the County Transportation Master Plan. Such an improvement would be listed in the development charge study;*

- *The improvement is designated as required by County of Simcoe Staff to serve a greater than the development and is identified in the capital works forecast or similar County financial documents and is listed in the development charges study.*

As the requirement for the improvements is just now being evaluated through the Midhurst EA Process, the works would not currently be identified in any of the County's Master Plan or DC documents. The works do however, improve traffic flow for a greater area than the development and warrant consideration as a County Road through this EA Process.

We are requesting that the Township of Springwater consider approaching the County of Simcoe to initiate the process in evaluating the benefit of adding Craig Road & Forbes Road and the appropriate upgrades to these roads to the County's Capital Roads Program.

Please contact the undersigned if you have any questions, require any additional information or if you require a meeting to discuss the forgoing.

Sincerely,

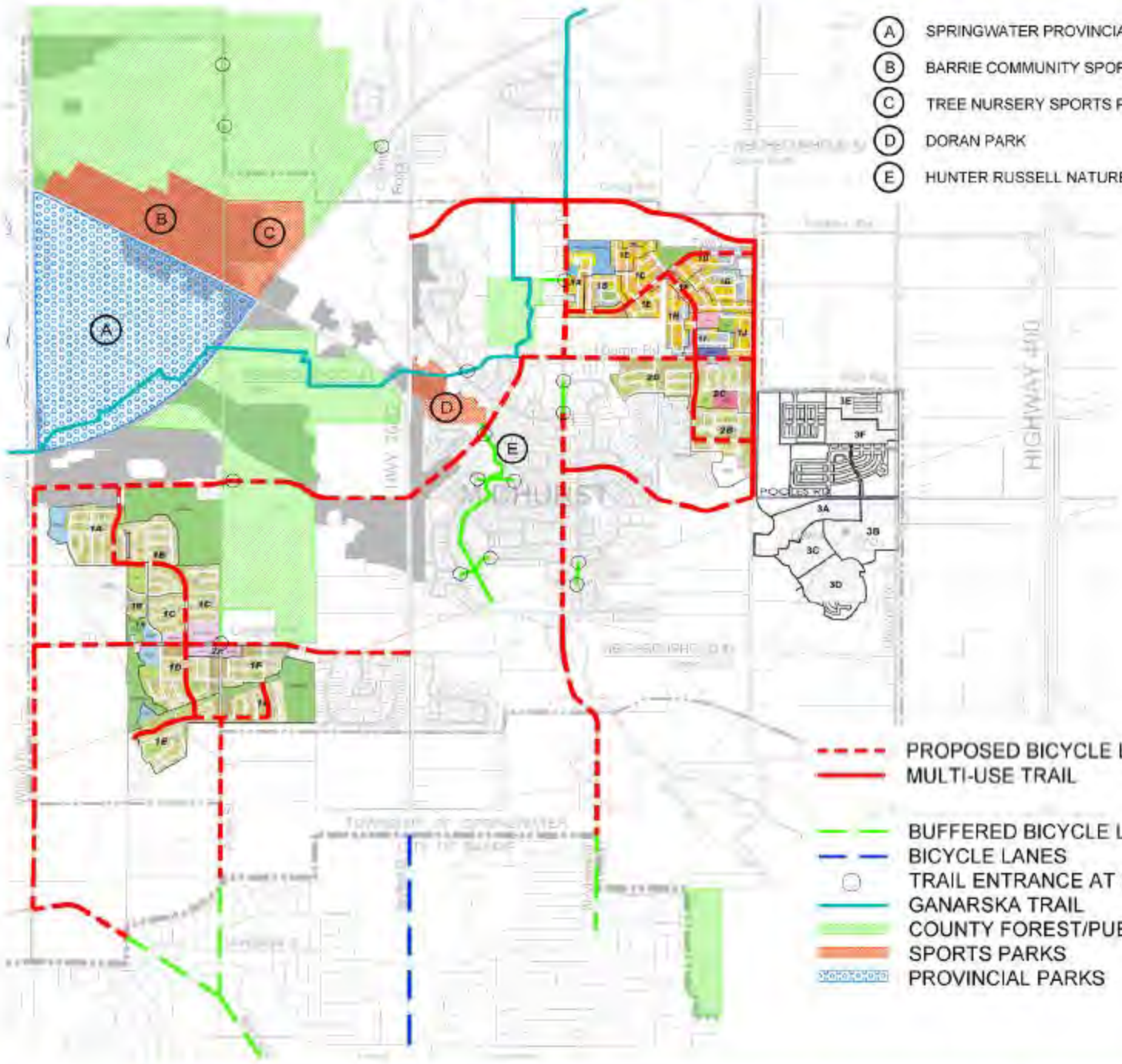
Midhurst Landowners Group

Attachments: Figure 1 – Proposed Adjustments to Midhurst Phase 3-4 Roads Plan
Attachment 1 – Cross Section Overlay (various)
Attachment 2 – Ainley Active Transportation Slide
Attachment 3 – Memo Re: Summary of Benefits of Craig Road Extension, June 2015

MLG c/o Group Trustee:
Ms. Kim Beckman, Davies Howe Partners LLP
kimb@davieshowe.com

99 Spadina Avenue
Toronto, Ontario M5V 3P8
t: 416-977-7088 f: 416-977-8931

Active Transportation Routes/Links



No Dedicated Bicycle Lane

Bicycle Lane

Buffered Bicycle Lane

RUSSELL ROAD

FORBES ROAD

DRAFT
FOR DISCUSSION PURPOSES ONLY

Project	MIDHURST HEIGHTS DEVELOPMENT TOWNSHIP OF SPRINGWATER
Drawing	CROSS SECTION OVERLAY

CROZIER & ASSOCIATES Consulting Engineers
The HarbourEdge Building,
40 Huron Street, Suite 301,
Collingwood, ON L9Y 4R3
705 446-3510 T
705 446-3520 F

Drawn By D.H.F	Design By	Project	845-3675
Scale 1:100	Date 10/18/2016	Check By	Drawing FIG. 01

J:\800\845 - Midhurst Rose Alliance Inc\3675 - Midhurst Heights Development\CAD\CIVIL\1SHEET\3675-000 - RD SECTIONS.dwg, FIG. 01, 11/1/2016 1:36:36 PM, dfuller

CRAIG ROAD

GILL ROAD

DRAFT
FOR DISCUSSION PURPOSES ONLY

Project
MIDHURST HEIGHTS DEVELOPMENT
TOWNSHIP OF SPRINGWATER

Drawing
CROSS SECTION OVERLAY

CROZIER & ASSOCIATES Consulting Engineers
The HarbourEdge Building,
40 Huron Street, Suite 301,
Collingwood, ON L9Y 4R3
705 446-3510 T
705 446-3520 F
www.crozierassoc.ca

Drawn By	D.H.F	Design By		Project	845-3675
Scale	1:100	Date	10/18/2016	Check By	Drawing FIG. 02

J:\800\845 - Midhurst Rose Alliance Inc\3675 - Midhurst Heights Development\CAD\CIVIL\1SHEET\3675-000 - RD SECTIONS.dwg, FIG. 02, 11/1/2016 1:37:43 PM, dfuller

DRAFT

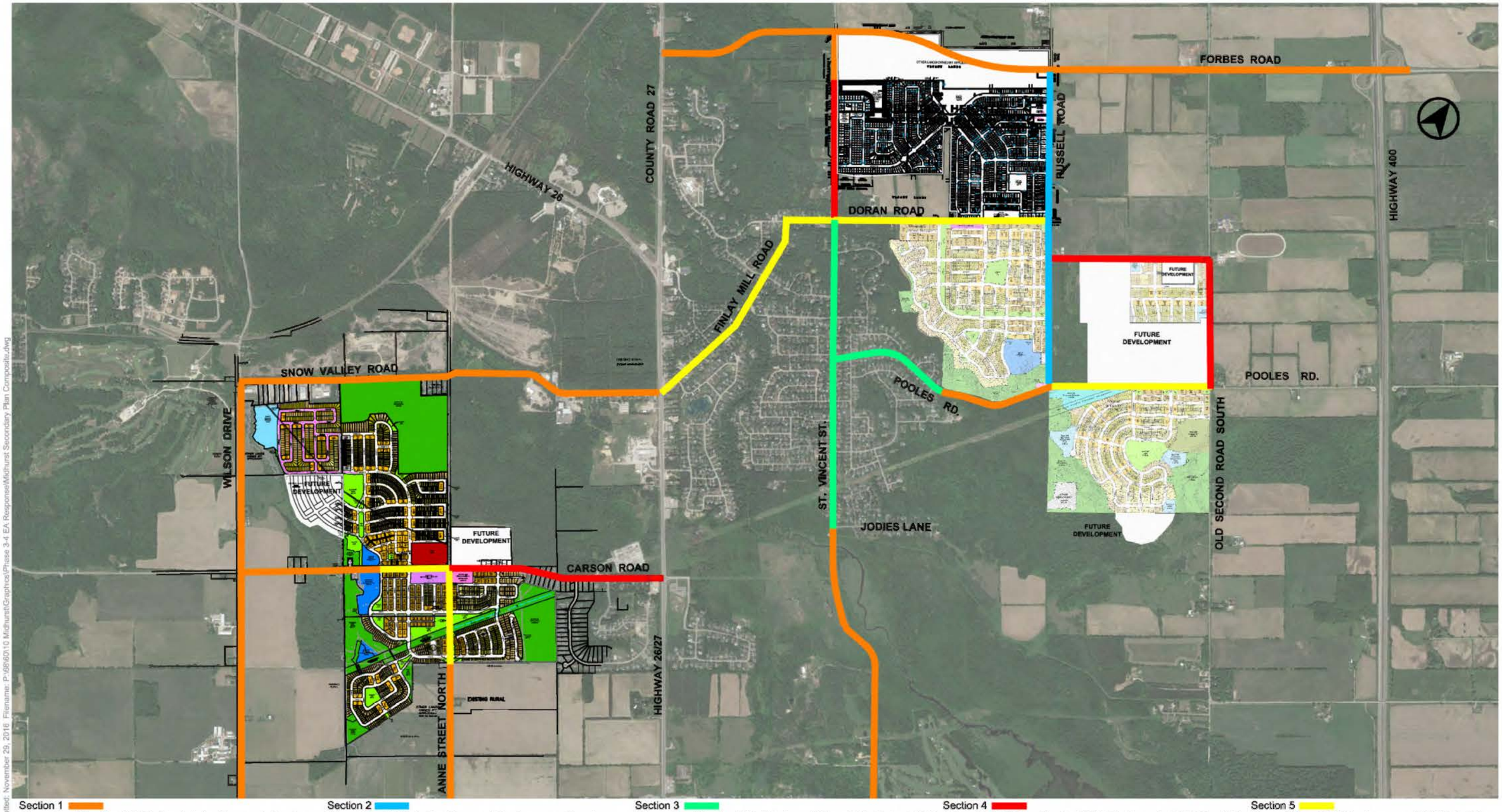
FOR DISCUSSION PURPOSES ONLY

MIDHURST HEIGHTS DEVELOPMENT
TOWNSHIP OF SPRINGWATER

CROSS SECTION OVERLAY

BMS-3675

FIG. 003



Section 1
2 Lane Rural Section With Buffered Active Transportation Lanes on Paved Shoulders

Section 2
2 Lane Rural With Active Transportation Lanes on Paved Shoulders And S/W One-Side

Section 3
2 Lane Rural Section With Bike Lane & Mountable Curbs & S/W One-Side

Section 4
2 Lane Hybrid Cross Section With Bike Lane And S/W One-Side

Section 5
2 Lane Urban With Bike Lanes and S/W Both Sides

PROPOSED ADJUSTMENTS TO MIDHURST PHASE 3-4 ROADS PLAN

BA Group

Midhurst
6860-10 November 2016

Figure 1

Memorandum

TO:
J. A. Mullan, P.Eng.
President & CEO
Ainley Group
550 Wellham Road
Barrie, ON
L4N 8Z7

FROM:
Ian F. Clark, B.A., M.SC.Pl.
Mark Jamieson

PROJECT:
6860-10
Midhurst Development Plan

DATE:
Nov 11, 2016

SUBJECT: SUMMARY OF BENEFITS OF CRAIG ROAD EXTENSION

Introduction

The Midhurst Class Environmental Assessment includes the provision of a new east-west road at the north-end of Midhurst which is referred to as the Craig Road Extension.

The planned Craig Road Extension will link the existing Forbes Road and Highway 400 interchange in the east with County Road 27 in the west, providing a direct route between Highways 400 and County Road 27. By providing this link, traffic (including truck traffic) travelling between these two north-south corridors will have a more direct route available and will no longer need to travel through the established areas of Midhurst, namely along Doran Road and Findlay Mill Road.

This memorandum summarizes the estimated volumes that will utilize the Craig Road extension and the benefits it will have for various user groups (i.e. for existing traffic routing through the Midhurst community, for accommodating future regional traffic growth, and for traffic from new development within Midhurst).

Existing Traffic

Non-local through traffic travelling between Highway 400 and Highway 26 represents the largest component of existing traffic volumes that utilize Russell Road, Doran Road and Findlay Mill Road. Given the improved connection that Craig Road would provide, the existing Midhurst residents in the vicinity of Doran Road, Finlay Mill Road, and Russell Road would benefit from a reduction in traffic in the area as the non-local traffic would divert to the Craig Road extension. Existing through traffic volumes that would divert to Craig Road are estimated and summarized in Table 1.

TABLE 1 ESTIMATED EXISTING NON-LOCAL TRAFFIC THAT WILL UTILIZE CRAIG ROAD

	Estimated Through Traffic (Weekday AM Peak Hour)	Estimated Through Traffic (Weekday PM Peak Hour)
Through Traffic Volumes	165 vehicles	215 vehicles

It is estimated that in the order of 165 vehicles during the weekday AM peak hour and 215 vehicles during the weekday PM peak hour would reroute and utilize the planned Craig Road Extension. These vehicles represent existing traffic volumes that would benefit from the planned roadway, and would include existing heavy vehicle and truck traffic volumes.

Future Regional Traffic Growth

The Craig Road extension will provide a direct, convenient, connection between several Provincial Highways that are regionally significant north-south traffic corridors. These include:

- Highway 400;
- Highway 26/County Road 27; and
- Highway 93 / Penetanguishine Road.

Because of its connections to the above corridors, Craig Road will become a key link in the area transportation system and will provide an important distributor function for regional traffic. As such the Craig Road extension will assist in accommodating future planned growth in regional traffic volumes that have been forecast. It is estimated that regional growth could contribute an additional 100-200 additional peak hour trips to Craig Road by 2041.

Forecast Midhurst Development Traffic

Transportation Studies undertaken by BA Group as part of the Draft Plan of Subdivision applications indicate that the majority of traffic generated by new development in Midhurst will be arrive and depart to/from the south (i.e. towards Barrie). Given that all of the new development areas in Midhurst are located south of future Craig Road extension, traffic from Midhurst would therefore have to travel north away from their destination to utilize the Craig Road extension before back-tracking south towards their destination. As a result it is estimated that only a small percentage of traffic from the development lands will utilize the Craig Road extension. By way of example, development located in the Carson Neighbourhood is not expected to have any traffic utilize Craig Road and only 6% of trips associated with the lands south of Doran Road are expected to use the new connection. Only the areas located north of Doran Road, which are in closest proximity to the new connection, are estimated to utilize the proposed road to a greater degree – whereby 15 to 20 percent of trips from this development area are estimated to use the Craig Road extension.

A summary of Craig Road utilization for each of these development areas is shown in Table 2.

TABLE 2 ESTIMATED MIDHURST DEVELOPMENT UTILIZATION OF CRAIG ROAD EXTENSION

Development Area	Craig Road Extension Utilization	Two-way Vehicle Trips / Hour (Weekday AM Peak Hour)		Two-way Vehicle Trips / Hour (Weekday PM Peak Hour)	
Horizon Year		2031	2041	2031	2041
Carson Neighbourhood	0%	0	0	0	0
Doran Neighbourhood (South of Doran Rd.)	6%	25	110	35	120
Alliance Neighbourhood (North of Doran Rd.)	15% to 20 %	165-205	225-300	165-220	245-330
Total Vehicle Trips		***190-230***	***335-410***	***200-255***	***365-450***

Compared to the total 2-way traffic volumes generated by new development in Midhurst, Craig Road would be utilized by 6.5% to 8.5% of all traffic generated by this development. Conversely, 90% to 95% of build-out traffic is not anticipated to utilize the proposed Craig Road Extension.

Capacity analysis for the 2031 horizon year also suggests that there is sufficient capacity in the existing road network to accommodate new development traffic that would use Craig Road. The currently approved development within Midhurst, which is estimated to be built-out by 2031, can therefore be accommodated without The Craig Road Extension.

Summary

- The Craig Road extension will provide a more direct connection between Highway 400 and County Road 27 which will reduce or eliminate the approximately 200 peak hour vehicles that currently cut through the existing routes within Midhurst (e.g. Finlay Mill Road, Doran Road) to access Highway 400. This includes eliminating existing non-local truck traffic that passes through the community.

- As a direct connection between two regionally significant north-south traffic corridors (i.e. Highway 400 and Highway 26/County Road 27), the Craig Road extension will act as a regionally-significant link in the area transportation system. In this regard Craig Road will serve to accommodate future growth expected in regional traffic (i.e. from outside of Midhurst) by providing a key distributor role between the key transportation corridors in the area, namely County Road 27, Highway 400, and Highway 93.

- The planned Craig Road Extension would primarily be utilized by residents of the Doran North community which represent a relatively small proportion of future residents of the planned Midhurst Secondary Plan. We estimate that in the order of 90 to 95 percent of future residential development related traffic volumes generated by the Secondary Plan development would not utilize the planned roadway. This is due to the location of the Craig Road extension being located at the northern end of the community whereas the primary traffic routing for the new development will be to/from the south.

CITY HALL
70 COLLIER STREET
TEL. (705) 739-4207
FAX. (705) 739-4247

The City of BARRIE

THE CORPORATION OF THE CITY OF BARRIE
Engineering Department
"Committed to Total Service Excellence"

P.O. BOX 400
BARRIE, ONTARIO
L4M 4T5

(64)

To Sean
JAM
FILE No

November 28, 2016

File: T05-MI

RECEIVED
NOV 30 2016
AINLEY & ASSOC. LTD.

Mr Joe Mullan, P.Eng.
President and CEO
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Re: Township of Springwater Midhurst Water, Waste Water & Transportation Class Environmental Assessment (Phase 3 & 4) Public information Center (PIC) – October 18th 2016.

City of Barrie staff have attended the PIC and reviewed the information on the Township web site www.springwater.ca/msp. This letter is to advise you of our comments regarding the proposed transportation options.

This PIC has identified the Doran Development (Area 1 & 2) and Carson Development Area (Area 3) within the Midhurst settlement plan. The City is requesting additional information/clarification with regards to the proposed future traffic generation associated with the expanding settlement area and its' impact upon existing City transportation corridors such as Ferndale Drive, Anne Street, Bayfield Street and St. Vincent Street. This information will also be assessed in the update of the City of Barrie Multi Modal Active Transportation Master Plan (MMATMP).

Please find the City's comments with regards to the PIC below:

1. The presentation boards at the PIC did not clearly illustrate the proposed timing for the transportation improvements.

2. The background Transportation Study Section 2.2. did not appear to account for traffic volumes on Anne Street. This road is a direct link into the City and is suspected to be a preferred route for the Carson Development Area. Please advise why this route is not being considered as a major transportation link in the proposed secondary Transportation Plan.

3. Please clarify why the Draft Traffic Operational Analysis selected only the Bayfield Street corridor to determine annual transportation growth rates for the overall secondary plan. The Forbes Road growth rate is indicated to be higher and is understood to be the primary traffic route for the Doran Development area.

4. Section 4.3.1 indicates that trips from the Carson development area will be routed through the residential area and not along boundary roads to the employment lands located along Snow Valley Road. The information provided on the PIC slides and presentation indicated that Anne Street will not be extended through to Snow Valley Road for vehicle transportation purposes. Please confirm that the development area will have a single local street access to the employment land area of Snow Valley Road and that there are no intentions of extending Anne Street north to Snow Valley Road

5. Section 4.3.2 Trip Distribution & Assignment indicates that 70% of the "to and from" traffic trips would be from the south of Midhurst. The report also indicates the Carson Road development area including employment lands will use Highway 26/Bayfield Street, Anne Street or Wilson Road as the prime routes with 20% of the trips expected to use Anne Street as a route both to and from. Table 4.3.1 reflects the proposed trip distribution; however the existing traffic assessment has not considered traffic growth on Anne Street.

6. Draft Traffic Operational Analysis has not accounted for Saturday trips. The proposed Midhurst Development appears to be planned with minimal retail shopping uses. The City of Barrie would be the nearest destination on weekends for family and home essentials. Anne, Bayfield and St. Vincent Street would all be impacted during peak travel periods. Please update the Operational Analysis to account for Saturday trips.

7. The PIC presentation slides did not accurately indicate what road improvements are planned for Anne or St. Vincent Street. Figure 13 indicates Anne and St. Vincent Streets to be reconstructed in Stage 3 but does not clearly indicate what is being constructed. Please clarify number of lanes, bike lanes, sidewalks etc.

8. Please provide clarification as to the estimated start time of Phase 1 - Stage 3.

9. Please clarify how the County of Simcoe Transportation Master Plan has been considered. There does not appear to be any consideration for transit or the expansion of municipal transit into the Community.

The City is pleased to see that the transportation plan has accounted for active transportation and that the proposed bicycle lanes identified will align with the City's future active transportation plan on the boundary roads of Ferndale Drive, Anne Street and St. Vincent Street.

Thank you for the opportunity to attend the Pubic Information Meeting and provide comments. Please continue to keep the City of Barrie informed of the Class EA project process.

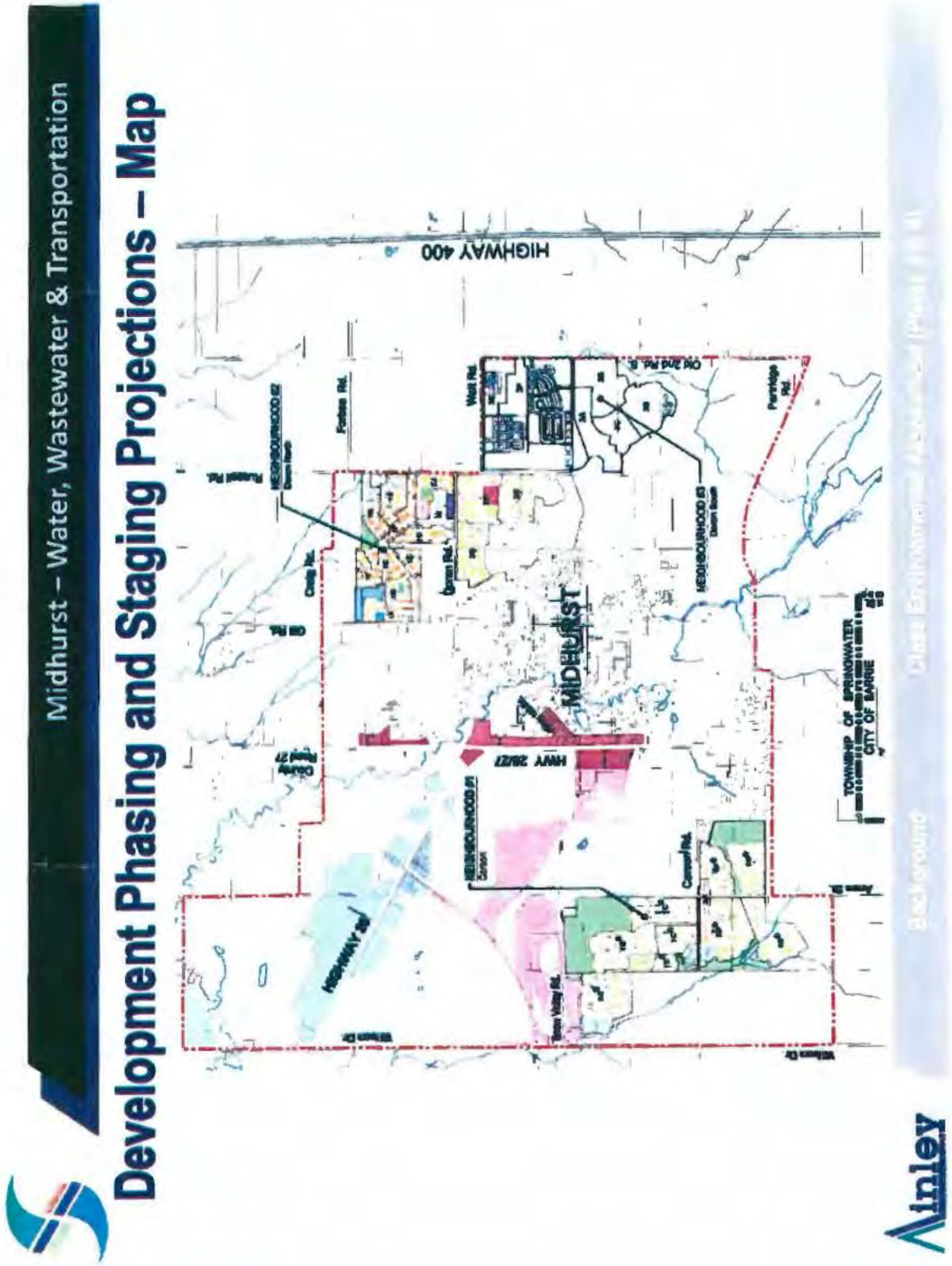
If you wish to discuss the comments, please feel free to contact Mr. Lorran Cooney at (705) 726-4242 or e-mail Lorran.Cooney@barrie.ca

[redacted]

LC/lh

[redacted]

Figure 1.


Midhurst – Water, Wastewater & Transportation
Development Phasing and Staging Projections – Map
HIGHWAY 400
MIDHURST
HWY 26/27
TOWNSHIP OF SPRINGWATER
CITY OF BARRIE
Background
Amley

65

Joe Mullan

Subject: FW: FW: Mills Circle road safety

From: [redacted]
Sent: Wednesday, December 07, 2016 9:43 AM
To: don.allen@springwater.ca; bill.french@springwater.ca; jennifer.coughlin@springwater.ca
Subject: Mills Circle road safety

Hello Mayor and councilors.

I understand you are proposing an extension of Craig Road to County Road 27. This will increase traffic volume to Hwy #27

I would like to ask that you consider and ensure the safety of Mills Circle residents. We have had accidents and many, many near misses of people passing us on both sides while attempting to make turns into our subdivision. It has always been a very dangerous turn and we would very much appreciate that is this proposal does go through, that you look at ways to increase our safety as well.

Also a bike lane has been discussed and would be utilized as well.

Thanking you for your time in consideration of this matter

[redacted]

66

Dated: November 16, 2016

To: Springwater Township Council

From: [redacted]

Regarding: EA 3 and 4 Midhurst Secondary Plan
Citizen Observations and Suggestions on Traffic Study and Its Implications

Dear Council Members,

I have two overriding concerns regarding the MSP and the traffic which will be generated by it.
First and foremost is the safety of our children and elderly.
The second is the financial impact on the borrowing ability of the Town and the realty tax increases that might be required to service these potential debts.

Observations

1. Council has not ensured that the Residents of Midhurst understand exactly how much traffic will increase along their primary and secondary roads in the village and what the implications of this potential traffic increase might be. (specifically its effect on law enforcement or the lack thereof, accidents, potential traffic delays, etc.) Inviting them to presentations will never fulfill the need to have **Informed Public Consent.** Once the following requested information and studies are complete, the full details should be mailed to each residence in Midhurst and then a referendum on the options outlined under Traffic Calming below should be held. The MSP EA 3 and 4 should not be voted on until that is complete.

2. The Town's Engineer Ainley, has been asked several times by members of the Liaison committee (since March 2016) to forward a summary sheet showing their estimates of how many vehicles will use each identified commuter road for each stage of each development in each neighbourhood. We also asked that the summary include the 2008 and the 2013 estimates for each roadway so we might determine what future traffic numbers might look like even if the Doran Road Development is never built.
   Ainley has provided estimated traffic numbers for each commuter roadway for 2013, 2031 and 2041 numbers in a very confusing hard to read chart.
   We must have the detailed figures so we can test their estimates against the actually traffic numbers going forward, because the phased in infrastructure recommendations are based on these staged in numbers. If traffic is heavier than estimated, then the infrastructure will need to be built by the developers sooner. Without these numbers, the developers will argue that infrastructure is based on the number of homes built, not how many new car trips are generated.
   We also need these estimates so we can make sure that the eight (8) probable trips per household that Ainley is assuming, will all be accounted for. (That's nearly 50,000 additional vehicles trips generated by the full MSP Phase 1 and 2 build out)
   Because of the discovery by Ainley that traffic flow through the village along the designated commuter routes has increased by an average of 124 % from 2008 to 2013, the chart should

also include estimates of new levels of traffic passing through the village from residents and businesses living north and south of Midhurst (not generated by the MSP) for each Stage of each Phase of each Development.
I believe that when these figures are factored in, we will discover that vehicle traffic along some of our commuter roadways will be above capacity before the MSP is ever completed.
It should also be noted that Ainley's estimates are just that. Two hour traffic counts were made in 2008 and 2013 at locations along commuter routes. Then Ministry of Transport (MOT) mathematical formulas were applied. This met all MOT guidelines. However, some unknown third party (be it Developers, County or Province) were concerned enough about the veracity of these traffic numbers that they conducted a 5 day traffic count (with traffic count meters) during the 2016 Victoria Day weekend, at 7 locations along St Vincent and then followed it up with a similar study along Finlay Mill Rd. The questions remain who and why and why were we not informed that these studies were taken place and then why didn't our engineers or town staff recommend that we conduct these same real time studies.

3. The Craig Road bypass will become an absolute necessity if the concerns expressed in point two come to pass. We must have hard and firm costs associated with the construction of this bypass, (in addition to peered reviewed estimates.) I would recommend that construction bids be requested for its construction, before any other construction associated with the MSP be allowed to commence.
   The Town will have to fund 100% of the borrowing costs for the Craig Road Bypass before any Development Charges can be collected. If the Town proceeds with plans to build the Bypass before any Doran Road homes are built, it is conceivable that a disruption to the economy could delay construction of homes , meaning tax revenue would have to be diverted to pay for the Bypass. Will there be enough revenue coming in to avoid a massive increase in the tax rate or destroy our borrowing ability for any of the other infrastructure or repairs required by the Township?

4. Any estimate on construction of the Craig Road bypass should contain a secondary quote to pre-build bridges to 4 lanes. If we don't plan for this eventuality the cost to do so in the future could be cost prohibitive. If combined organic traffic growth and MSP generated traffic growth exceed Ainley estimates and we cannot afford to expand the Bypass to 4 lanes, the traffic will find its way south and overwhelm the Village.

5. INFASTRUCTURE EXPENSE.
   For the Public Record, the citizens of Springwater have been told repeatedly since the beginning of the MSP conversations that the Developers would pay for the entire infrastructure associated with the MSP. During Liaison committee meetings it came to light that the Developers would not pay for the Craig Road bypass because Council, Town Staff and our Engineers of the day **FORGOT** to include it in the list of road ways required.
   It was also discovered that the Developers also felt that they should not be required to pay Development Charges associated with the Craig Road bypass, but as a matter of good will they agreed to have the Craig Road bypass included within. (note: they will only pay DC's if the housing projects are actually built)
   Completion of Traffic calming studies and referendum, along with firm costs associated with the four (4) lane Craig Road bypass would allow us to go into negotiations with the Developers during the cost sharing portion of this plan in a far stronger negotiating position.

As a sub note it should be noted that the Developers will not pay for improvement to our secondary roads in Midhurst. Waite, Park Trail, Silverwood, Frid, Green Pine Road and Spence might all require upgrades and sidewalks installed to accommodate traffic bypassing clogged primary roads.

6. TRAFFIC CALMING:
   I would like to point out that nearly 100% of the new traffic going through the Village of Midhurst will be generated by people who do not live here. They will not have a vested interest in our community and probably will not know any of its residents. We will become another place they just drive through, as quickly as possible, to get to work or shop or pick up or drop off their kids.
   They won't care about the safety of our residents and we will not have sufficient traffic enforcement to ensure compliance with traffic laws.
   Before the Town votes to accept or change the EA 3 and 4 Traffic plans associated with the MSP we should ask for one more study. What are the traffic implications and associated costs and/or savings involved in implementing a full traffic calming plan, (either slowing traffic down through the village, as a disincentive to use these roads by NON Midhurst traffic) or a full traffic diversion plan, (prohibiting traffic going southbound out of, or northbound into the new Doran Road MSP developments)

   Once the first Child is run over and killed in the village, the Town must be ready to respond. Or the Town can take pre-emptive action now and impose traffic calming before this tragedy occurs.

   Thank you for your consideration

67

Joe Mullan

From: [redacted]
Sent: Tuesday, October 18, 2016 10:28 AM
To: Midhurst Class EA
Subject: call ea-midhurst water/wastewater transportation

Follow Up Flag: Follow up
Flag Status: Flagged

Good Morning,

On behalf of the Chippewas of Georgina Island I would like to thank you for your notice on the Class EA on the Water Wastewater Transportation Midhurst Secondary Plan.

Although we could not attend the public open house we would like to receive any information you can provide on the project or if you could forward me some links where I can find the information online? The Chippewas of Georgina Island would like to review the project and assess the proposed project and its potential impacts on Lake Simcoe.

This information can be forwarded to: [redacted]
or by email @
or by phone @

Also, if any other First Nation you are in consultation with has an objection with these plans, we would like to be notified.

Thank you.

[redacted]
Chippewas of Georgina Island First Nation

GEORGINA ISLAND

Brief Summary of Comments Received & Responses

Midhurst Class EA (Phase 3 & 4) – Water, Wastewater & Transportation Infrastructure

Public Information Centre (PIC) - October 18, 2016

Mar 03, 2017

No.	Items of Concern and/or Comments	Proposed Responses
1	Concept of turning circle in front of his house is not acceptable. How much of their 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.
	Council & developers need to listen to the existing residents for their needs with regard to this development.	In addition, we do not anticipate the need for any property acquisition on the east side of Russel Road in front of your property.
2	How do you propose to keep chemo, estrogen and other pharmaceuticals out of Willow Creek, Minesing Wet Lands, the Nottawasaga and the "Blue" beaches of Wasaga?	Please refer to the attached Fact Sheet # 3 associated with Pharmaceuticals and Personal Care Products (PPCP's).
3	Re: Craig Rd. Extension. Like Alternative 3. To follow Craig Rd. takes access away from our farm tractors, too close to farmland.	Your preference for Alternative No. 3 is noted. Please refer to the attached Fact Sheet # 6 associated with Craig Road Extension.
4	What happens in event of power or mechanical failure impacting on this proposed "stage of the art" facility (facilities)? Barrie has quite recently added "state of the art" wastewater facility - in the event of prolonged power outage, the untreated effluent has gone directly into Lake Simcoe. Same scenario for Willow Creek. Bell Communications has extensive records on the marked increase in lightning strikes and power failures in our area.	All of the proposed water and wastewater facilities will be equipped with standby power units (diesel or gas generator sets) which would be automatically activated in the event of a power outage. These generators will be sized and equipped to provide extended backup power, in the event of an extended power outage. In addition, the treatment process units at each of the Water and Wastewater facilities will have redundancy to allow for mechanical failure.
5	Concerned with water, wastewater and transportation plans. First off regarding water and wastewater plans that are not wanted. Individual is worried about the land that is being consumed to house the facilities that are required to operate such plans	The proposed lands that have been identified for the Water and Wastewater facilities are in line with industry standards for similar sized facilities throughout Ontario. In addition, while endeavouring to minimize the overall size of the properties, it is essential that sufficient space be included for landscaping and buffer zones, especially at the Water and Wastewater Treatment Plants.
	Wants her own independent septic system.	It is the current Council's position that the existing residents of Midhurst will not be required to connect to the proposed Wastewater Treatment Plant.
	While living in Barrie lived close to transit stops that were unmaintained, noisy and congested, poorly laid out, planned out and not something Midhurst should consider. Consult Barrie. Barrie's system is flawed and extremely inadequate. Midhurst has been a community that is elite and people have and continue to pay a premium to live there. These suggested plans will be a huge negative and transit will trash up our area allowing students to move in. Not what we want!	The implementation of a transit system throughout the proposed Developments is not part of the Preferred transportation improvements outlined in this Class EA. However, the Class EA has reviewed and confirmed that should the Township wish to implement a Municipal Transit system at some point in the future, that the proposed road network could accommodate it.
6	Wants Craig Road - Alternative No. 3 to be chosen as the preferred location for the extension of Craig Road. New to the area and welcomes change but concerned about the safety of their young children, if Alternative 2B is chosen.	Your preference for Alternative No. 3 is noted. Please refer to the attached Fact Sheet # 6 associated with Craig Road Extension.
7 & 37	The extension of Anne Street (Carson Rd to Snow Valley Rd) will bisect the Minesing-Little Lake wildlife corridor. If extended, then wildlife culverts or bridges will need to be put in place.	This Class EA is not recommending the extension of Anne Street North, from Carson Rd to Snow Valley Rd.
	Proposed road infrastructure for Pooles Road is inadequate – need 4 lanes for the "thousands of new cars which will be using Pooles Rd. to St. Vincent." Sidewalk would be needed. St. Vincent needs 4 lanes and sidewalks as well.	The Traffic Study has confirmed that a reconstructed Pooles Road & St Vincent Street, with 1 lane in each direction and left and/or right turn lanes 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. In addition, please refer to the attached Fact Sheet # 5 associated with Existing and Proposed Traffic in Midhurst.
	Who will pay for the expansion of St. Vincent from Midhurst to Barrie?	The costs associated with the reconstruction of all Municipal road projects identified within the Midhurst Class EA, including St. Vincent Street, will be borne by the Midhurst Developers Group. The only exception to this is Craig Road Extension which is included in the Township Development Charges Projects.
	How will you protect the annual migration of turtles across St. Vincent?	Signs will be included in the proposed upgrade, notifying drivers of the seasonal migration of turtles.
	Has Barrie been informed of the possible upgrades needed for Livingstone and Hamner Roads?	The City of Barrie is aware of the Class EA and although outside the scope of this project we do not anticipate that the Midhurst development will necessitate upgrades to, Livingstone and/or Hammer.
	How will residents on the streets between Pooles Rd. and Jodie's Lane get on to St. Vincent with the increased traffic? Left turns are difficult now. Will have to totally rework St. Vincent.	Our traffic model indicates satisfactory Levels of Service for the intersection of St. Vincent and Jodie's Lane with stop control on Jodie's Lane and design horizon traffic for the year 2014 as Level of Service B with average delay of 15 to 20 seconds. Delays to exit a driveway will be similar.

No.	Items of Concern and/or Comments	Proposed Responses
	There needs to be a second sewage pipe (a backup) in case there is a leak and failure of primary pipe.	All pipes (Sewer and Water) will be designed and constructed in accordance with all Ministry of the Environment & Climate Change (MOECC) and Industry standards
	Assumption that new residents will use Forbes Rd. to the 400 Hwy to go to Barrie is incorrect. New residents will use Pooles Rd. across St. Vincent to go to the Barrie malls. Will cause major congestion on Pooles and St. Vincent along with Hamner and Livingstone.	The traffic model includes that trips from the new development areas in Doran North and South to and from the shopping areas at the north end of Barrie, will travel by way of St. Vincent St and/or Bayfield St. The Traffic model assumes that trips with an origin or destination further south will use the Forbes / Hwy 400 route link as the shortest time route.
8	Craig Road - Do not want the extension of Craig Road, anywhere near her property.	Please refer to the attached Fact Sheet # 5 associated with Craig Road Extension. With regard to your specific comment about the location of Craig Road, we note that all alternatives being considered and in particular the Preferred Alternative (Alternative No. 3) is at least 500m away from your property.
	Want to remain on well, they have farm animals on a hobby farm.	It is the current Council's position that the existing residents of Midhurst will not be required to connect to the proposed Water and Wastewater Treatment Facilities.
	Do not want another house, on top of, next to or behind them.	The limits of the proposed development are set out in Official Plan Amendment (OPA) 38 of the Midhurst Secondary Plan. In addition, on November 28, 2012 the Ontario Ministry of Municipal Affairs and Housing withdrew part of its appeal of the Midhurst Secondary Plan. As a result of the Ministry's partial withdrawal, 300 hectares out of the total 756 hectares proposed to be re-designated 'urban' in Official Plan Amendment (OPA) 38 were cleared for development. The remaining 456 hectares and all related policies to OPA 38 remain under appeal at the OMB.
9	Huge issues all around. Go back to drawing board and come back with much scaled down plan.	On November 28, 2012 the Ontario Ministry of Municipal Affairs and Housing withdrew part of its appeal of the Midhurst Secondary Plan. As a result of the Ministry's partial withdrawal, 300 hectares out of the total 756 hectares proposed to be re-designated 'urban' in Official Plan Amendment (OPA) 38 were cleared for development. The remaining 456 hectares and all related policies to OPA 38 will remain under appeal at the OMB. This Class EA process is being completed to identify the Water, Wastewater and Transportation infrastructure that will be necessary to accommodate the aforementioned Midhurst Secondary Plan and in particular OPA 38.
10	If this development does realign Pooles/St. Vincent, Green Pine will the Township install traffic calming to deter traffic speed?	In 2016 the Township developed Traffic Calming polices and within this Class EA we will recommend that Traffic Calming measures be further investigated during the detailed engineering design stage.
	Current traffic surveys should be updated and included actual data on long weekends.	Please refer to the attached Fact Sheet # 5 associated with Existing and Proposed Traffic in Midhurst and # 6 associated with Craig Road Extension.
11 & 41	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.
12 & 13	Please consider options re: Craig Road. Trails in and around it are used year round for recreation. Choose option that has least effect on trails and access to them. Use of these trails enhances quality of life in our	Please refer to the attached Fact Sheet # 6 associated with Craig Road Extension.
	Please consider noise pollution along existing & proposed routes. At what point will noise mitigation strategies be considered, specifically from Hwy. 27? Traffic noise/sound pollution affects the enjoyment of all outdoor spaces.	We reviewed and analyzed the Noise levels along all routes which have proposed improvements associated with the Midhurst Secondary Plan. However, we are not proposing any improvements along County Road 27 other than a new intersection with Craig Road Extension and therefore, there was no need to analyze noise levels along County Road 27.
	Will roundabouts produce less traffic noise than stop lights?	It is generally accepted that roundabouts generate less traffic noise than signalized intersections due to the reduced deceleration and acceleration requirements.

No.	Items of Concern and/or Comments	Proposed Responses
14	Alternative 3 or 1 Craig Road. Live at corner of Craig Road and Gill. You want to kick me out, go to #3 or #1. There are 3 big ravines behind the house you will have to deal with. If you go #1 or #3 you will have a straight line and less problems.	Please refer to the attached Fact Sheet # 6 associated with Craig Road Extension.
15 & 16	Do Not connect neighbourhood #3 using Pooles Rd. at all, instead build a road from their most southern end to St. Vincent and right to Bayfield - or straight south to Barrie. Pooles Rd goes right through the middle of Old Midhurst. Please re-route traffic away from Pooles Rd. onto St. Vincent (i.e. Study traffic already in mornings with school buses). Protect Old Midhurst from urbanization.	We did investigate the feasibility 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 Jodie's Lane to provide additional relief. However, neither of these alternatives provided much benefit to the traffic and had major constraints relating to topographic and/or environmental features along the proposed routes that offset any benefit. Therefore; these are not being recommended.
	Prefer 2 water (assume wastewater?) treatment facilities, therefore do not transport wastewater thru Old Midhurst	The number of wastewater treatment plant options was assessed in detail during the Phase 1 & 2 Master Plan in 2008/09 and it was concluded that one wastewater treatment plant is the best solution.
	We do NOT want hook up to treatment facility.	It is the current Council's position that the existing residents of Midhurst will not be required to connect to the proposed Wastewater Treatment Facility.
17 & 18	Can you provide a simple summary table illustrating the total existing and proposed P loading to Willow Creek? (sanitary and storm combined)	It would be tough to provide a simple summary table to show current and potential future phosphorus conditions in Willow Creek. Therefore, we provide the following information in point form: 1. It is estimated that a loading of 46 kg of phosphorus per year is currently being added to Willow Creek originating from existing land uses (agriculture and forest). 2. Based on the Phase 1 wastewater effluent concentration for total phosphorus (TP = 0.05 mg/L), an estimated 118 kg/yr. of TP would be added to Willow Creek from the Wastewater Treatment Plant (WWTP). 3. Assuming 20 mm of infiltration along with LID techniques, Best Management Practices and stormwater management techniques, it is estimated that the phosphorus loading from stormwater will be reduced to 21 kg/yr from the estimated pre-development loading of 46 kg/yr. 4. It is considered that the development will actually reduce phosphorus loading from stormwater runoff by 25 kg/yr. This could result in a total additional loading of phosphorus of 139 kg/yr, (118 + 21 = 139) which is an increase of 93 kg/yr over the pre-development load of 46 kg/yr. 5. Assuming 25 mm of infiltration the phosphorus load from stormwater runoff is estimated to be 11 kg/yr. resulting in a total additional loading of phosphorus of 129 kg/yr (118 + 11 = 129) which is an increase of 83 kg/yr. over the pre-development load of 46kg.yr. 6. It is estimated that a loading of 134 kg/yr of phosphorus would be directed to Willow Creek in the future from current mixed land uses. 7. Based on the Ultimate (Full Buildout) wastewater effluent concentration for total phosphorus (TP = 0.03 mg/L), an estimated 134 kg/yr of TP would be added to Willow Creek from the 8. Assuming 20 mm of infiltration along with LID techniques, Best Management Practices and stormwater management techniques, it is estimated that the phosphorus loading will be reduced to 66 kg/yr. from the estimated pre-development loading of 134 kg/yr. 9. It is considered that the development will actually reduce phosphorus loading from stormwater runoff by 68 kg/yr. This results in a total additional loading of phosphorus of 200 kg/yr., (134 + 66 = 200) which is an increase of 66 kg/yr. over the pre-development load of 134 kg/yr. 10. Assuming 25 mm of infiltration the phosphorus load from stormwater runoff is estimated to be 33kg/yr. resulting in a total additional loading of phosphorus of 167 kg/yr. (134 + 33 = 167) which is an increase of 33 kg/yr. over the pre-development load of 134kg/yr. Although there will be a reduction in phosphorus loading from the stormwater runoff component, the addition of the WWTP effluent into Willow Creek means that there will be an anticipated increase in phosphorus loading in the subwatershed of 93 kg/yr. for Phase 1 and 66 kg/yr. Ultimately (based on an infiltration rate of 20 mm) and 83 kg/yr. for Phase 1 and 33 kg/yr. for the Ultimate condition (based on an infiltration rate of 25 mm). However, all of these increases are considered to be minor in the overall discharge to the watershed and therefore it is concluded that there would be no effect on the Minesing wetlands. In addition, please see the attached Fact Sheet # 2 associated with Willow Creek & Minesing Wetland and Fact Sheet # 4 associated with LID's.
	Given the stated desire to minimize new traffic through the existing Midhurst Village, would it not make sense to force the Craig Road connection to be completed as part of Phase 1.	Subsequent to the PIC we have adjusted the proposed staging of the Road improvements such that Craig Road will be constructed in conjunction with Phase 1 Stage 1. In addition please refer to the attached Fact Sheet # 6 associated with Craig Road Extension.

No.	Items of Concern and/or Comments	Proposed Responses
	Similarly, why expand St. Vincent and Pooles at all with a new and improved route from Hwy 400 to Hwy. 27. It would make some sense to leave these routes alone and less attractive options compared to Forbes/Craig.	Reconstruction of these routes is proposed for two main reasons: 1) to address platform and/or alignment deficiencies with the existing roads; 2) to provide sidewalks and/or bike lanes. However, further to comments received during and following the Public Information Centre (PIC) we are proposing that Traffic Calming measures, in accordance with the Township's Traffic Calming polices which were developed in 2016 be further investigated during the detailed engineering design stage for the key existing roads such as Pooles, Finlay Mill, St Vincent, etc.
19	A roundabout at Forbes & Russell Road is not a good idea. Canadians are not familiar with roundabouts and they seem to cause chaos at Park Place shopping area.	Your preference for a signalized intersection at Forbes Road and Russell Road is noted and it is proposed that both options (signalized intersection and roundabout) be carried forward and that the final decision be made at detailed engineering stage in the future.
	We need to consider bike paths on St. Vincent on the section of road that connections Barrie to Midhurst. This road is going to become extremely busy and we need to think of the safety of our young people.	It is acknowledged that bike lanes are necessary on St Vincent Street between Midhurst and Barrie and as such they are being proposed. However, the specifics of how they will be incorporated into the design will be determined during the detailed engineering design stage in the future.
20	The Craig Rd. Extension should be put in before any construction starts. Cottage traffic has already made Friday and Sundays way too busy through the village. The gravel trucks already use the village as a cut through and will get a lot worse when construction starts. Craig Rd. installed before any construction!	Subsequent to the PIC we have adjusted the proposed staging of the Road improvements such that Craig Road will be constructed in conjunction with Phase 1 Stage 1. In addition please refer to the attached Fact Sheet # 6 associated with Craig Road Extension.
21	The use of roundabouts are not a good idea. I have never seen/experienced a roundabout in Canada that works well i.e. Park Place and even the ones on Hwy. 26.	Your preference for signalized intersections at all of the designated locations is noted.
	Planning for bike paths/lanes along St. Vincent to allow bikers to get safely into and out of Barrie.	It is acknowledged that bike lanes are necessary on St Vincent Street between Midhurst and Barrie and as such they are being proposed. However, the specifics of how they will be incorporated into the design will be determined during the detailed engineering design stage in the future.
22	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.	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.
	Tractors, horses cyclists, walkers are on Russell Road daily.	Also, we do not anticipate any property takings along the east side of Russell Road.
23 & 38	Live at the corner of Russell and Doran and the driveway would be part of the revisions to this intersection.	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.
	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.	The mapping associated with the proposed Alternative has been updated with the 2016 aerial imagery.
24	Storm sewer holding pond planned for beside my property will it affect my drinking water and if does who is going to help me? Where will this pond discharge?	The proposed Stormwater Management Pond adjacent to your property would only be receiving storm run off from the Water and Wastewater property and we do not have any concerns with it being located adjacent to residential properties. However, given that we have other locations within the overall property, we will be looking at relocating it further north-east during the detailed design stage which would mean it would not be adjacent to your property. Further, with regard to your concern about your well, please note that prior to any construction activities proceeding in close proximity to existing residential homes, we would be conducting a private well monitoring program whereby the quantity and quality of private wells would be monitored, subject to getting the homeowners permission, on a number of occasions before and after construction to determine if there was any impact. If it is determined that there are impacts to a specific well, then the Developers, via the Township, would be responsible to implement a solution to the specific problem.
	You must be very careful in regard to the Minesing swamp. It needs protection and it's up to us to preserve it for future generations. It's so important. You are holding a jewel in your hands.	Please refer to the attached Fact Sheet # 2 associated with Willow Creek and Minesing Wetlands.
25	I think this is great. The improvements will raise the value of my home. The added tax base - in the form of additional residents and the boost in assessment value - will help resolve the Township financial issue and improve service levels for all.	No response required.
26	Alternative 1 should be the route for extending Forbes Road to Hwy. 27. This option is the most direct route and will encourage traffic and discourage traffic from the current village.	Your preference for Alternative No. 1 is noted. Please refer to the attached Fact Sheet # 6 associated with Craig Road Extension. It should be noted that Alternative 1 and 3 are very similar, with Alternative 3 making more efficient use of the land west of Russell Road.

No.	Items of Concern and/or Comments	Proposed Responses
27	A roundabout at Wilson/Carson sounds great, but what about the cemetery?	Your preference for a round-about at the intersection of Wilson Drive and Carson Road is noted. As part of our preliminary review we have noted that the alignment of Wilson Road will need to shift to the east and will require property acquisition on the east side of the road. The schematic drawing provided at the last PIC shows a shift in the centerline alignment of 11 metres to the east to avoid disturbance to the cemetery.
	Carson Road development is being built on the 5th generation Hickling farm. It would be lovely to honour them, including a township reeve by naming some streets after them.	Your suggestion is noted and will be considered by the Township to see if the naming of streets, to honor pioneer families, can be accommodated.
	The "shoe tree" at Anne/Carson is an eye sore that collection garbage.	The Shoe Tree on the north side of the road would only be taken down if, during detailed design, it was determined to be within the limit of disturbance of the proposed reconstruction of Carson Road.
	Beware of trespassing ATVs and snowmobiles through Carson.	
28	Anne Street should be extended from Carson Road to Highway 26.	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 proposed 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.
	Carson Road should be extended to St. Vincent Street.	Similarly, an extension of Carson Road east to St. Vincent was not identified as being required to improve traffic movement and therefore was not considered as part of this Class EA process.
	All roads need some form of bicycle lanes.	All roads being proposed for reconstruction will include bicycle lanes.
29	What is going on with the maintenance of the outlet of the Willow, 1980 was the last time it was dredge, sand traps removed 2008 and no maintenance being done on the silt and sand coming down stream. Willow Creek filling up with sand and breaking out and flooding my fields. No mention or concern from Ainley & Associates	On November 28, 2012, the Ministry of Municipal Affairs and Housing (MMAH) withdrew part of its appeal of the Midhurst Secondary Plan. As a result of, the Ministry's partial withdrawal, 300 hectares out of the total 756 hectares proposed to be re-designated "Urban" in Official Plan Amendment (OPA) 38 had Draft Plan Conditions development and were cleared for development. The remaining 456 hectares and all related policies to OPA 38, will remain under appeal at the OMB. This Class EA process is being completed to identify the Water, Wastewater and Transportation infrastructure that will be necessary to accommodate the Midhurst Secondary Plan and in particular OPA 38. However, independent of this Class EA, a comprehensive Stormwater Drainage Study is being completed in conjunction with the Township and the NVCA for the Midhurst Secondary Plan. The issues related to the maintenance of Willow Creek at George Johnston Road or other locations are outside the scope of this Class EA process. We understand that the creek is a navigable waterway under the Department of Fisheries (DFO), Ministry of Natural Resources & Forestry (MNRF) and Nottawasaga Valley Conservation Authority (NVCA) and lands through which the creek flows are subject to NVCA authority. Although Ainley were not involved, the following is a brief history of the sand traps, according to the Township: There were two sand trap developments. One back in the early 1970's located on private lands whereby Willow Creek would break out regularly and one set in the early 2000's. After access was denied to the original lands the dredging at that location had to cease. In the case of the latter location, dredging of the Willow Sand traps was completed in accordance with the design prepared by R.J. Burnside & Associates on Harold Parkers land west of George Johnson Road. However, this was also halted as a direct result of NVCA concerns over excess fill material being piled along the bank on the property north of Willow Creek. NVCA wanted the fill removed due to sand eroding back into the creek. Before any further dredging could have been undertaken in the late 2000's an alternate plan would have had to be developed. As there was no fill of this nature required for municipal projects anymore and the expense to haul and dispose of the dredged material was considered excessive and not financially viable or sustainable (under Township budget) the program was stopped under direction of the previous Township Council, in agreement with Mr. Harold Parker and the adjacent landowner.

No.	Items of Concern and/or Comments	Proposed Responses
	Drainage Act is not being followed. You cannot put harm on lower land owners. My question about drainage was presented at the township EA in 2010. Still no answer is that not a requirement in the EA process. "Drainage outlet" or no more water.	Similar to above, this question is outside the scope of this Class EA, however, we note that the NVCA have accepted the proposed drainage outlets from the proposed Midhurst Developments following detailed site visits. In addition, the stormwater runoff from the proposed Midhurst Secondary Plan Developments must comply with the 2012 Ontario Municipal Board (OMB) Minutes of Settlement between the NVCA and the Developers Group. These Minutes of Settlement include, but are not limited to, the following requirements: • The stormwater management systems are to hold back the first 25 mm of storm runoff for a period of 48 hours; • 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; • Reduction in 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. These requirements, which greatly exceed the standard MOECC and/or NVCA requirements, have been set to ensure that the proposed developments will not have an impact on the Willow Creek or other downstream receivers.
30	Main concern is that cost will be passed onto existing Midhurst residents. Pass the cost onto the developers and in turn to the persons who wish to reside in Midhurst in a new build. We have already paid for the current infrastructure (i.e. Septic etc.) already.	All of the costs associated with the construction of Water, Wastewater & Transportation infrastructure/improvements to accommodate the Midhurst Secondary Plan will be borne by the Midhurst Developers. The only exception to this is the costs associated with Craig Road Extension of which 100% is included in the Township Development Charges Projects.
	We do NOT want to hook into sewer!	It is the current Council's position that the existing residents of Midhurst will not be required to connect to the proposed Wastewater Treatment Plant.
	Please do not add sidewalks, we do not want them. They bring people closer to your house and things get damaged (we've seen this before). Also they rarely get maintained. In Midhurst we can hear the crickets, and see the stars! We want to keep it this way. Don't buy into BIG CITY ideas!	The need for inclusion of sidewalks and bike lanes has been identified by a large number of respondents throughout the Class EA process. Therefore, the reconstruction of the main routes 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.
	We want a happy and healthy community for our children to grow up in.	
31	Against the Russel Road 4 lane expansion. Why is it needed if there are no driveways facing Russel Rd?	The proposed upgrade of Russell Road to 4 lanes is required to provide traffic from the future development areas south of Doran Road easy access to Hwy 400. However, the upgrading from 2 to 4 lanes is only required in conjunction with Phase 2, currently anticipated after 2031.
	Why can't all traffic be sent through the new Craig Rd. expansion?	Please refer to the attached Fact Sheets # 5 associated with Existing & Proposed Traffic in Midhurst and # 6 Craig Road Extension.
	Will Existing residence be forced to hook up to sewers? Will the existing council guarantee we will not have to hook up to sewer?	It is the current Council's position that the existing residents of Midhurst will not be required to connect to the proposed Wastewater Treatment Facility.
	How are the developers doing at meeting the 150 EA requirements before development can begin?	The "clearing" of the Draft Plan conditions associated with the development is not related to this Class EA and is being handled by the Township Planning Department. However, it is our understanding that very few of the Draft Plan Conditions have been cleared to date.
	How will you maintain existing water on top of new development?	The extensive Hydrogeological studies that have been completed have confirmed that the new proposed Water Systems in the east and west will have no impact on the existing Municipal Water Wells or Private Water Wells serving the existing Midhurst. In addition, please refer to the attached Fact Sheet # 1 associated with Water Supply.
	What will be the annual cost of maintaining the waste water for example replacement of filters? There is always an extensive cost of using the best technology.	The cost of maintaining the proposed new servicing works (water and wastewater) will borne by the benefitting users (new residents). Further it is anticipated that the user fees associated with the operation and future maintenance of the systems, will be in line with other Municipal Water and Wastewater user fees in the industry.
	Having Poole and Green Pine off set is a benefit to decrease traffic speeding problems. It should be left as is. The goal should be to reduce the traffic impact to existing Midhurst residents not increase traffic flow problems.	In 2016 the Township developed Traffic Calming polices and within this Class EA we will recommend that Traffic Calming measures be further investigated during the detailed engineering design stage.
32	I am in favor of Option #1 for Forbes Rd extension crossing Gill Rd. in a straight line, as it is the most direct route and keeps traffic away from residences.	Your preference for Alternative No. 1 is noted. Please refer to the attached Fact Sheet # 6 associated with Craig Road Extension. It should be noted that Alternative 1 and 3 are very similar, with Alternative 3 making more efficient use of the land west of Russell Road.

No.	Items of Concern and/or Comments	Proposed Responses
	I have just witnessed a presentation that proposed traffic measures (turning lanes, traffic circles, road improvements (widening) that speed and encourage increased traffic flow. At the same time they proposed traffic calming measures to be introduced by the Township. To slow and discourage traffic chicanes and impediments have to be put in place. The sewer line is to be run down Finlay Mill. This is the time to construct a street that encourages cycling/pedestrians and traffic slowing. Also impediments must be put in place at the top of Doran Rd. to discourage through traffic. This should apply to Doran/Russell, Wattie, St. Vincent and Poole's and Gill Rd.	The completion of the Traffic Studies associated with 2016 the Township developed Traffic Calming polices and within this Class EA we will recommend that Traffic Calming measures be further investigated during the detailed engineering design stage.
33 & 35	I am pleased to see that Craig Rd. will be extended to Hwy. 27. This should be done at the very start of construction. From the very beginning we were assured that the essential nature of Midhurst should be preserved. The above plan would be a start. Finlay Mill is already heavily used by cyclists from Forest Hill School and even cycling groups from Barrie and Toronto. These cycling routes should be marked by safety barriers, not painted lines. This can be achieved by narrowing Finlay Mill, which would have the added advantage of slowing traffic chicanes and other impediments can be added to discourage through traffic. This should be done when the sewage line goes through.	Subsequent to the PIC, we have adjusted the proposed staging of the Road improvements such that Craig Road will be constructed in conjunction with Phase 1 Stage 1. In addition please refer to the attached Fact Sheets # 5 associated with Existing & Proposed Traffic in Midhurst and # 6 associated with Craig Road Extension.
	The proposed commercial strip development along Hwy. 27 and the start of Finlay Mills must be stopped! There is no room for a parallel access road. Bayfield St. is already a road disaster. Strip developments are ugly, dangerous and in this case an impediment on a through highway.	The approvals associated with the development and/or re-development of lands within the Midhurst Secondary Plan are outside the scope of this Class EA and is handled by the Township Planning Department.
	Russell Rd. - Doran Rd. roundabout - unacceptable too much impact on existing residence at location.	After reviewing the comments received the Recommended Alternative for the intersection of Russel Road and Doran Road is Signalization.
	Intersection 26 and 27 must be signal lights - no roundabout.	Your preference for a signalized intersection at Highway 26 and County Road 27 is noted.
	No forced main on Doran (27 to 'Finley Mill Rd.).	A number of Alternative detailed routes for the forcemain between Doran Rd and Carson Rd Development were analyzed and Doran Road, Finlay Mills Road and Snow Valley Road route was selected as the most suitable.
34	Tertiary sewage treatment does not remove drug residues (no safe level known), toxins such as Nano silver, copper and other continuously developed new "products". Once disposed of by residents they combine to form new toxins. (See U. of Waterloo, Groundwater Institute and Civil Engineering Department. I believe the Minesing Wetland (an International RAMSAR site) cannot tolerate both the quantity of discharge from the proposed plant or the toxins which pass through even this technology untouched). Species there are dependent on specific seasonal water levels (both up and down), fairly pristine water quality excepting phosphorus and specific temperature. Whereas phosphorus is a fertilizer, things like Nano silver, lawn pesticide, etc. are poisons. So the question how much poison do we want to feed to not only these species but all other children, seniors and others living downstream.	Please refer to the attached Fact Sheet # 3 associated with Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs). In addition, there are no current regulated parameters for the "products" that you have listed. However, controlling concentrations of indicator contaminants currently monitored in all wastewater treatment plants in the Province, also reduces the concentrations of other contaminants within the effluent.
	Very concerned about the impact of the MSP on the wetlands. Phosphorus levels are already on the high side and the effluent will continue to add to the level. Even though the TP concentrations are 0.05 mg/L Phase 1 and 0.03 mg/L at Phase 2. The effluent is still adding additional P that would not otherwise be in the creek. Concentrations might be the same level but we are still adding more and more flow to the creek. On one of the boards, there is a statement that says that the effluent "will not alter the nutrient status of the Willow". That comment is quite definitive. What if you are wrong down the road? There are also other chemicals that will be discharged. How will these PPCP affect the flora and fauna? What will be done to minimize the chemicals? Most WWTP discharge into larger bodies of water not a creek.	Please refer to the attached Fact Sheets # 2 associated with Willow Creek and Minesing Wetlands and # 3 associated with Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs).

No.	Items of Concern and/or Comments	Proposed Responses
36	Natural ecosystems cycle with seasons, the steady flow will alter the natural flow of the Willow. How will this affect the Minesing ecosystem?	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 particular 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 0.01 to 0.03m and average increased velocity of 0.01 m/sec, changes that would be virtually immeasurable in Willow Creek. The Flows within the Minesing Wetland are many multiples of the flows within the Willow therefore an additional 143L/s will not affect the Minesing Wetland from a fluvial geomorphological perspective.
	What will happen if there is an overflow or spillage problem? And who will pay and be responsible for the clean up if the plant is built and an accident happens?	The treatment process units within the Wastewater Treatment Plant will have redundancy to minimize the potential for overflow problems. In addition, the proposed Wastewater Treatment Plant will be equipped with standby power units (diesel or gas generator sets) which would be automatically activated in the event of a power outage. These generators will be sized and equipped to provide extended backup power, in the event of extended outage.
	Who verifies the accuracy of these findings of these studies (Water Supply)? How can they guarantee that it will not affect the wells of farmers and other land owners who share the aquifer?	Please refer to the attached Fact Sheet # 1 associated with Water Supply.
	What evidence do they have of another Wastewater plant to compare with that discharges into such a small creek and the short and long term effects on the ecosystem?	Very few Wastewater Treatment Plants are exactly alike, because most facilities have different effluent discharge criteria. However, there are many Wastewater Treatment Plants, that have been in operation of years with similar technology and criteria and we will provide details of those within the Environmental Study Report (ESR). In addition, most of the individual processes being proposed within the Wastewater Treatment Plant has been successfully operated at Wastewater Treatment Plants in Ontario and around the world. Further the Membrane filter technology that is being proposed has become more common for Wastewater Treatment in recent years in Ontario; however, it has been in use in the Water Treatment industry for decades in Ontario, helping to ensure that Municipal Water systems meet or exceed the Ontario Drinking Water Objectives. For example, in the late 1990's when the Town of Collingwood had an apparent Cryptosporidium (microscopic parasites) outbreak in their Municipal Water system they constructed a new Water Treatment Plant utilizing Membrane technology to filter out bacteria, pathogens and viruses including Cryptosporidium from the raw water being drawn out of Georgian Bay.
	Will we have to hook up? (wastewater collection system)	It is the current Council's position that the existing residents of Midhurst will not be required to connect to the proposed Wastewater Treatment Facility.
39	Concerned about water supply – a finite resource	Please refer to the attached Fact Sheet # 2 associated with Water Supply.
	Also concerned about the volume of wastewater discharge into Willow Creek and in particular about toxins in the wastewater along with the increase in the temperature in Willow creek	Please refer to the attached Fact Sheet # 3 associated with Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs).
	Also concerned about toxins in the wastewater and the increase in temperature in Willow 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 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 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.

No.	Items of Concern and/or Comments	Proposed Responses
		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.
	Concerned about transportation – 2013 Study is not good enough – needs to be updated. New residents will not use Hwy 400 to get to	Please refer to the attached Fact Sheet # 5 associated with Existing and Proposed Traffic in Midhurst and # 6 associated with Craig Road Extension.
	Craig Road will cost more than stated	The total estimated cost associated with Craig Road Extension ($14.5Milion) is based upon Preliminary analysis and current construction estimates.
40	We would like to recommend that an opaque fence of significant height and sound-attenuating/deflecting ability be erected along the rear lot line of the industrial properties on Snow Valley Road, from about 1471 Snow Valley Road (Algonquin Bridge) to 1533 Snow Valley Road (Springwater Woodcraft). An additional green-space buffer with trees would be appropriate, the Mick's lots' depths may have already been established. So perhaps this oversight can and should be corrected, so conformance to the Official Plan can be achieved and a more harmonious community realized. Fear of noise complaints.	The requests are noted and have been forwarded to the Township Planning Department for their consideration and inclusion in the Subdivision Agreement between the Developer and the Township, in the future.
42 & 45	Is our garbage cost going to skyrocket? Will we have to ship garbage plus building materials to other areas and at what cost?	The County of Simcoe is aware of the Midhurst Secondary Plan and as such the Solid Waste Management Strategy for the County would include the growth associated with the Midhurst Secondary Plan.
	Wants two WWTP to avoid forcemain on Finlay Mill Rd. Wants all main service pipes and lines (water, wastewater, gas, and hydro) to be routed across new Craig Road extension.	The issue of two Wastewater Treatment Plants versus one, was reviewed in detail and it was determined that one facility was best. Subsequently, a number of Alternative routes for the forcemain between Doran Rd and Carson Rd Development were analyzed and Doran Road, Finlay Mills Road and Snow Valley Road route was selected as the most suitable.
	Concerned about increased traffic on Finlay Mill Rd.	Please refer to the attached Fact Sheet # 5 associated with Existing and Proposed Traffic in Midhurst.

No.	Items of Concern and/or Comments	Proposed Responses
43	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.
44	Lack of left turn lane into Mills Circle. Add left turn lane and bike lanes to Hwy 27 in conjunction with Craig Road extension	The Intersection of Mills Circle and County Road 27 is over 1 km away from the proposed intersection of Craig Road Extension and County Road 27. Therefore, we do not foresee the proposed Craig Road Extension having an impact on Mills Circle intersection. However, we understand the Township have spoken with Simcoe County (Operating authority for County Road 27) about the Mills Circle & County Rd 27 intersection to see if any modifications could be made to improve it.
46	Need a more thorough and updated transportation study. Weekends were not considered.	Please refer to the attached Fact Sheet # 5 associated with Existing and Proposed Traffic in Midhurst and # 6 associated with Craig Road Extension.
	How was it determined that nearly half of future southbound traffic from the proposed Doran Road developments would choose the Hwy 400 Option?	Southbound traffic is considered to be traffic headed to downtown Barrie or along the commercial area along Bayfield Street as well as commuter traffic headed south on Highway 400. We conducted some rudimentary time trials for travel from Doran Road between Russell Road and St. Vincent Street to get to the intersection of Bayfield Street and Highway 400. The quickest route was found to be Russell Road to Forbes Road to Highway 400. Our traffic model acknowledges that commercial area along Bayfield Street and downtown Barrie are significant portion of the southbound trips but destinations accessed by Hwy 400, south of the Bayfield Street & Hwy 400 intersection are better served by getting on Hwy 400 at Forbes Road. We assigned approximately half of the southbound traffic based on the draw of those destinations. We may have overestimated the percentage drawn to St. Vincent and Bayfield Streets but this will present a conservative approach maximizing the estimated impact on those routes and not overstate the benefit of the improved link to Forbes Road and Highway 400.
	Were there any destination studies done on existing traffic?	The traffic origin / destination split was taken from the Simcoe County Master Transportation Study which identifies 70% to the south, and 10% to each of the other three directions.
	How many trips are destined for Highway 400 south of Bayfield Street versus the northern Bayfield Street shopping area?	Our traffic model assumes approximately two thirds of the southbound traffic from Doran North will use Highway 400. The rest is distributed to St. Vincent (10%) and Finlay Mill Rd to Hwy 26 (10%) and to Craig Road to County Road 27 (15 %). For Doran South the model assigns approximately two thirds of southbound traffic to Highway 400 and the rest to St. Vincent (20%) and Findlay Mill Road to Highway 26 (15%). In our opinion we have included a significant percentage of the trips to the shopping/business area of Bayfield Street.
	Concerning the Craig Road extension, why would it not be placed within the existing approved development lands to the south of Alternative 3, instead of on farm land not yet approved for development? Alternative 3 would have the least effect on still farmable land and existing forest areas.	Please refer to the attached Fact Sheet # 5 associated with Craig Road Extension.

No.	Items of Concern and/or Comments	Proposed Responses
	Have any identical wastewater treatment plants been built and, if so, what is their record of mishaps? If not, is the proposed plant an untested version?	Very few Wastewater Treatment Plants are exactly alike, because most facilities have different effluent discharge criteria. However, there are many Wastewater Treatment Plants, that have been in operation of years with similar technology and criteria and we will provide details of those within the Environmental Study Report (ESR). In addition, most of the individual processes being proposed within the Wastewater Treatment Plant has been successfully operated at Wastewater Treatment Plants in Ontario and around the world. Further the Membrane filter technology that is being proposed has become more common for Wastewater Treatment in recent years in Ontario; however, it has been in use in the Water Treatment industry for decades in Ontario, helping to ensure that Municipal Water systems meet or exceed the Ontario Drinking Water Objectives. For example, in the late 1990's when the Town of Collingwood had an apparent Cryptosporidium (microscopic parasites) outbreak in their Municipal Water system they constructed a new Water Treatment Plant utilizing Membrane technology to filter out bacteria, pathogens and viruses including Cryptosporidium from the raw water being drawn out of Georgian Bay.
	Were studies and modelling undertaken to evaluate the long term effects on local existing wells (considering the proposal for new wells to be drilled into a deep aquifer.)? If so, what are the results?	Yes, extensive modelling and analysis was completed on the various aquifers in the overall area and is documented in the Hydrogeological Study associated with the Class EA. Please refer to the attached Fact Sheet # 1 associated with Water Supply.
47	Suggests that comment sheets should be mailed to people in the village in conjunction with the notification.	Comment Sheets were available at the Public Information Centre (PIC) for attendees to fill out while at the meeting or take with them and mail/email them back to us later. However, we would accept comments from all interested parties in any form (letter, email hand written notes) and they did not specifically need to on the Comment Sheet available at the PIC, but we will consider your suggestion in future.
	Worried about increase in traffic/noise/air pollution.	Please refer to the attached Fact Sheet # 5 associated with Existing and Proposed Traffic in Midhurst and # 6 associated with Craig Road Extension.
	Concerned about runoff/drainage issues – effect on water sources including Willow Creek, Minesing Swamp, Little Lake.	Please refer to the attached Fact Sheet # 3 associated with Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs) # 4 associated with Willow Creek and Minesing Wetland. Independent of this Class EA, a comprehensive Stormwater Drainage Study is being completed in conjunction with the NVCA for the Midhurst Secondary Plan.
	Impact on rural wells from the excavations.	Please refer to the attached Fact Sheet # 1 associated with Water Supply.
	Will Belmont Crescent be disturbed to install new water or sewer infrastructure?	There is no new Municipal Water or Sewer infrastructure planned along Belmont Crescent.
	Does not want to incur cost of connecting to Municipal sewer system.	It is the current Council's position that the existing residents of Midhurst will not be required to connect to the proposed Wastewater Treatment Facility.
	Information should be passed along by more than just word of mouth or meetings.	While it was unfortunate that you were not able to attend the PIC, all the documentation that was available at the PIC, was posted to the Township website for individuals such as yourself who were not able to attend.
	Can the Minesing Wetlands maintain or improve its' ecological features and functions with the current level of Phosphorus loading, or does this need to be reduced form the existing levels, rather than adding a new source of Phosphorus from the proposed Wastewater Treatment Plant (WTP)?	Please refer to the attached Fact Sheet # 3 associated with Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs) # 4 associated with Willow Creek and Minesing Wetland.
	How are the impacts of Climate Change, including changes in annual rainfall amounts and in the frequency, severity and duration of storm events, properly assessed for the impacts of this project on the Minesing Wetlands?	This Class EA process is being completed to identify the Water, Wastewater and Transportation infrastructure that will be necessary to accommodate the Midhurst Secondary Plan and in particular OPA 38. Independent of this Class EA, a comprehensive Stormwater Drainage Study is being completed in conjunction with the NVCA for the Midhurst Secondary Plan. The impacts of climate change are being considered in that study.
	What are the impacts of an increase in total flow in the Willow Creek of about 1/3 on the physical nature of the creek channel, on erosion and on downstream siltation, which is a long time issue for the creek and the downstream wetlands?	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 particular 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 0.01 to 0.03m and average increased velocity of 0.01 m/sec, changes that would be virtually immeasurable in Willow Creek.

No.	Items of Concern and/or Comments	Proposed Responses
48	What are the impacts of the warmer temperature of the effluent from the WTP on the base flow of the Willow Creek and Minesing Wetlands and the creatures that live in this wetland complex?	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 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 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.
	How can the project ensure that there will be no downstream impacts from contaminant discharges, including all exotic chemicals, pharmaceuticals, hormones, heavy metals, microbeads, other commercial or household chemicals, etc. either from sewage or storm runoff?	Please refer to the attached Fact Sheet # 3 associated with Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs).
	How and where will the biosolids from the WTP be managed to ensure no downstream impacts from contaminants on the Willow Creek and Minesing Wetlands, and no impact on the health of flora or fauna who may come in contact with them when these biosolids are ultimately spread on the land or otherwise disposed of?	The biosolids will be contained within tanks that will be designed and constructed in accordance with industry standards and will have 240 days of storage capacity. The disposal of the biosolids will be handled by Provincially regulated haulers and spread on land that have also received Provincial approval.
	How can the engineering of this project demonstrate that there will be a reduction rather than an increase in the amount of wildlife mortality with the additional roads and increased traffic and widening of existing roads? What measures will be taken to achieve this? How will greatly increased traffic on St. Vincent St. impact the Little Lake/Willow Creek Provincially Significant Wetland and movement of wildlife through this corridor and what measures will be taken to reduce wildlife mortality?	During detailed design of external roads, such as St Vincent St, input will be sought from NVCA regarding wildlife mitigation measures and patterns. The details that could be incorporated into the design, include appropriate warning signs, special fencing and/or dry culverts specifically for small animals and/or reptiles to cross the street.
	What consideration has been given to the impact of traffic on the safety of cycling along St. Vincent St. into Barrie, as well as the impact of much heavier traffic along the St. Vincent St. corridor on the residents of Barrie? These questions should have regard to the other north/south corridors linking Midhurst to Barrie.	The proposed cross-section for St. Vincent Street results in a road platform width only marginally wider than the existing roadway. For the portion of St. Vincent Street between City of Barrie and Willow Creek it is anticipated that a 1.5m± metre wide paved shoulder on each side of the road would be proposed for use by pedestrians and bicycles. North of Willow Creek the proposed cross-section includes sidewalk and bicycle lanes in an urban cross-section.

No.	Items of Concern and/or Comments	Proposed Responses
	How have other alternatives been considered and evaluated, including less growth and alternative locations for growth which would have a lesser or no impact on the Minesing Wetlands and Willow Creek?	On November 28, 2012 the Ontario Ministry of Municipal Affairs and Housing withdrew part of its appeal of the Midhurst Secondary Plan. As a result of the Ministry's partial withdrawal, 300 hectares out of the total 756 hectares proposed to be re-designated "urban" in Official Plan Amendment (OPA) 38 were cleared for development. The remaining 456 hectares and all related policies to OPA 38 will remain under appeal at the OMB. As such this Class EA process is being completed to identify the Water, Wastewater and Transportation infrastructure that will be necessary to accommodate the Midhurst Secondary Plan and OPA 38.
49	Feels that the increased traffic volume will compromise the safety of the residents of Mills Circle (on County Rd 27). Cites danger of making a left turn into the subdivision and the lack of bike lanes. Wants left turn lane on County Rd 27.	The Intersection of Mills Circle and County Road 27 is over 1 km away from the proposed intersection of Craig Road Extension and County Road 27. Therefore we do not foresee the proposed Craig Road Extension having an impact on Mills Circle. However, we understand the Township have spoken with Simcoe County (Operating authority for County Road 27) about the Mills Circle & County Rd 27 intersection to see if any modifications could be made to improve it.
50	Concerns with traffic flow through Midhurst.	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. The resulting traffic is within the capacity of the roadways and where it is not proposed improvements along selected existing roads have been designed to accommodate those increases. The proposed extension of Craig Road as an extension of Forbes Road to County Road 27 provides an attractive route for existing and future development traffic to avoid the downtown area of Midhurst.
	Improved intersection at Forbes Rd and Hwy 400 may attract more traffic through Midhurst. Need peer review of Traffic Study.	The extension of Craig Road from Russel Rd to County Rd 27 is now proposed in conjunction with Phase 1 - Stage 1. This new road, which will be constructed prior to any improvements at the Forbes Road and Hwy 400 Intersection, will create a main arterial road that provides a direct, controlled access, connection between Hwy 400, Hwy 26/Cty Rd 27 & Hwy 93. This new road also 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.
	Models used for Traffic Study were based on existing urban centre buildout behaviour. Expansion in Midhurst is rural. Traffic will migrate to Bayfield and St. Vincent (not to Hwy 400) in order to access shopping in Barrie.	Our traffic model assumes approximately two thirds of the southbound traffic from Doran North will use Highway 400. The rest is distributed to St. Vincent (10%) and Finlay Mill Rd to Hwy 26 (10%) and to Craig Road to County Road 27 (15 %). For Doran South the model assigns approximately two thirds of southbound traffic to Highway 400 and the rest to St. Vincent (20%) and Findlay Mill Road to Highway 26 (15%). In our opinion we have included a significant percentage of the trips to the shopping/business area of Bayfield Street. Southbound traffic is considered to be traffic headed to downtown Barrie or along the commercial area along Bayfield Street as well as commuter traffic headed south on Highway 400. We conducted some rudimentary time trials for travel from Doran Road between Russell Road and St. Vincent Street to get to the intersection of Bayfield Street and Highway 400. The quickest route was found to be Russell Road to Forbes Road to Highway 400. Our traffic model acknowledges that commercial area along Bayfield Street and downtown Barrie are significant portion of the southbound trips but destinations accessed by Hwy 400, south of the Bayfield Street & Hwy 400 intersection are better served by getting on Hwy 400 at Forbes Road. We assigned approximately half of the southbound traffic based on the draw of those destinations. We may have overestimated the percentage drawn to St. Vincent and Bayfield Streets but this will present a conservative approach maximizing the estimated impact on those routes and not overstate the benefit of the improved link to Forbes Road and Highway 400.
	Major recent shift in the north east end of Barrie will attract new Midhurst residents to use St. Vincent St. Need more proof that modelling which may be outdated is correct. May require new independent study.	The recent development in the north east end of Barrie (Duckworth St & Cundles Rd) is predominately commercial development (commercial stores and restaurants) and the traffic patterns associated with such development will be different and not coincide with the normal AM and PM Weekday Peaks that have been modelled coming out of and going into Midhurst.
	Concerned that effluent focus is on Phosphorus and Nitrate as the main criteria. Also that in a low flow situation, the effluent will represent 25% of the stream flow.	The reports have highlighted phosphorus and nitrate as these are two of the mains contaminants that are know concerns; however, the reports also identify several other discharge criteria that the Wastewater Treatment Plant will have to meet, in accordance with Provincial requirements. 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 of 0.01 m/sec, changes that would be virtually immeasurable in Willow Creek and would have no effects on erosion.

No.	Items of Concern and/or Comments	Proposed Responses
	Needs proof that adding 143 kg of phosphorus a year is acceptable.	With use of Low Impact Development (LID) measures throughout the Midhurst Secondary Plan, the phosphorus loading associated with the stormwater will be reduced from the Pre-Development levels which reduces the net load loading from the new Wastewater Treatment Plant from 143kg/day to 66kg/day which (conservatively) represents less than 0.5% of the current phosphorus load flowing through the Minesing Wetland on an annual basis. In addition, 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 by the MOECC through 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 from other sources and therefore, offset the additional load from the new Wastewater Treatment Plant and ensure no negative impact on the watershed.
	Pharmaceuticals, nano silver and other micro organisms and such ingredients may exceed the current water system assimilative capacity.	Please refer to the attached Fact Sheet # 3 associated with Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs).
	"What will be the impact of another 30,000 people have on the natural eco system of the of the Minesing Wetlands?" Needs more assurances.	Please refer to the attached Fact Sheet # 4 associated with Willow Creek and Minesing Wetland.
	"…EA, to be acceptable, must address all aspects of a protecting and improving a truly sustainable system which means responding and confirming that the Economic, Environmental and Social well being of all of us is protected."	The Class Environmental Assessment process is a Provincially regulated process and has an extensive proven track record of dealing with and resolving Economic, Environmental and Social impacts. However, when considering the Economic, Environmental and Social impacts these must be measured against Provincial and or Industry Standards to determine if there is an impact. For example, when considering the impact of increased traffic on an existing road, we review the proposed traffic volume against the "Industry Standard" capacity for that particular class of road and if the proposed traffic is within the value, then the Social and/or Economic impacts are noted as acceptable. When considering the additional Water demand and/or additional Wastewater load we must measure these against Provincial requirements and if they are within those then the Environmental and/or Social impacts are noted as acceptable.
	"...fully supports … requesting independent studies from other agencies to ensure that we are not undertaking a venture that will have long term irreversible negative impact on the world renowned Minesing Wetlands."	When the Draft Environmental Study Report (ESR) is submitted to the Ministry of Environment and Climate Change (MOECC) prior to being finalized, they will conducted a comprehensive Review and provide comments back to the Township.
51	As requested in initial comments (May13, 2013), The MOECC would like to review the draft ESR before it is made public.	As noted in Ainley's reply email sent to MOECC on September 26, 2016 the Draft ESR will be provided.
52 & 53	We would like to ask for the shapefiles of the study zone. Is that something you could provide?	Unfortunately, shapefiles are not available, however all information regarding the Class EA project can be found on the Township website http://www.springwater.ca/cms/One.aspx?portalId=312&pageId=4779649
54	The correspondence Hiawatha FN has received is not considered meaningful consultation but rather information sharing. Proposed project is deemed to have little, if any, impact on Hiawatha FN's traditional territory and/or rights. Hiawatha FN requests that they be contacted if archaeological artifacts are found as they require their trained archaeological liaisons be present at the archaeological sites during the assessments. Please forward any archaeological reports as they are completed. Any maps pertaining to the project should be sent to Hiawatha First Nation in a shape file.	Unfortunately, shapefiles are not available, however all information regarding the Class EA project can be found on the Township website (http://www.springwater.ca/cms/one.aspx?pageId=4779649). Hiawatha FN will be notified if any archaeological artifacts are found.
55	Letter has been reviewed and shared with Council and forwarded to Karry Sandy McKenzie, Williams Treaties First Nation Process Coordinator/ Negotiator. Ms. McKenzie to review and take necessary action if required. In future, contact Ms. McKenzie directly at k.a.sandy-mckenzie@rogers.com	Thanks for your comments and Karry Sandy McKenzie was also sent a copy of the Notice as part of the mass mailing on September 19, 2016.

No.	Items of Concern and/or Comments	Proposed Responses
	Gravely concerned regarding the potential impacts which the water, wastewater and transportation infrastructure this project proposes will have on our drinking water, air quality, farmland and the environment. "….measurable regulatory requirements are incapable of adequately protecting our drinking water, air quality, farmland and the environment."	On November 28, 2012, the Ministry of Municipal Affairs and Housing (MMAH) withdrew part of its appeal of the Midhurst Secondary Plan. As a result of, the Ministry's partial withdrawal, 300 hectares out of the total 756 hectares proposed to be re-designated "Urban" in Official Plan Amendment (OPA) 38 had Draft Plan Conditions development and were cleared for development. The remaining 456 hectares and all related policies to OPA 38, will remain under appeal at the OMB. Further to this, the stormwater runoff from the proposed Midhurst Secondary Plan Developments must comply with the 2012 Ontario Municipal Board (OMB) Minutes of Settlement between the NVCA and the Developers Group. These Minutes of Settlement include, but are not limited to, the following requirements: • The stormwater management systems are to hold back the first 25 mm of storm runoff for a period of 48 hours; • 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; • Reduction in 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. These requirements will be met with the implementation of extensive Low Impact Development (LID) measures which mimic a site's pre-development hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source. In addition, these requirements which greatly exceed the standard MOECC and/or NVCA requirements for stormwater, have been set to ensure that the proposed developments will not have an impact on the Willow Creek or other downstream receivers.
56	Demands that there be no negative impacts. Requests that all new development create a net improvement to all environmental systems such that the pre-settlement function of these natural systems be realized.	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; 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. 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. The Midhurst Developers Group is also committed to working with the NVCA to achieving a net-zero increase in phosphorus, if required by the MOECC.

No.	Items of Concern and/or Comments	Proposed Responses
	Science does not yet know any measurable acceptable limits to changes in the Hines Emerald's dragonfly groundwater sources. "…taking of groundwater…and dumping of wastewater effluent and stormwater into the surface water systems ….must not be tolerated until the science is developed to measure and assess the impacts of those changes on the Springwater sources of the existing and potential Hine's Emerald habitats." "...demand that the post development quality and quantity of groundwater recharge and of stormwater and wastewater discharge from the area being developed will be proven to be restored to that of pre human development."	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 a 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. 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. 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 Willow Creek or Minesing Wetlands will not be detrimentally impacted.
	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 uses.
	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.

No.	Items of Concern and/or Comments	Proposed Responses
	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.

No.	Items of Concern and/or Comments	Proposed Responses
57	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 particular 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.

No.	Items of Concern and/or Comments	Proposed Responses
		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.
58	Water well at the corner of Russell Road and Storey Road in Midhurst that has not been caped or decommissioned. If you could email us with updates regarding this issue that would be great.	Thank you for your comments, the test well has been caped and locked.
	The effects of diverted bypass traffic through the community of Midhurst due to Craig Road implementation were not taken into account in the traffic analysis. It is anticipated that that a reduction in traffic volumes on the existing road network would occur, which may affect recommendations made for road widening and intersection improvements.	In general the claim for diversion of traffic from Finlay Mill Road due to the Craig Road alternate route was in reference to the weekend traffic getting off Hwy 400 which is not a timeframe used for the analysis of the various intersections. Craig Road will provide an alternate route for Doran Road area development to reach CR 27/Hwy 26 other than Finlay Mill Road. The widening of Russell Road to 4 lanes is required to provide traffic from the new development areas easier and quicker access to Hwy 400 in lieu of using the Pooles Road, St. Vincent Street, etc. However, even with both in place (Craig Road & 4 Lanes on Russell) the developments still results in a significant increase in weekday traffic on Finlay Mill Road and other key existing streets in Midhurst.

No.	Items of Concern and/or Comments	Proposed Responses
59	Several roadways were proposed for full urbanization and reconstruction throughout the horizon timeline. It is recommended that alternative cross sections with reduced impact to the existing community be considered. In particular, rural cross-sections can be implemented while achieving capacity and active transportation objectives.	The detailed analysis that was completed in advance of the Public Information Centre (PIC) related to the type of road reconstruction was based on the results from the Phase 1 & 2 Master Plan that all road reconstructions would be to a "full urban cross-section" with curbs, storm sewers. However, with more detailed review and consideration other keys items including promoting stormwater infiltration with the use of open ditches and keeping the existing character of the neighbourhoods, we are now undertaking evaluating the need for full urbanization versus rural cross-section on a street by street basis. In completing this more detailed analysis we also have to take in the consideration the need for sidewalk(s) and/or bicycle lanes on each specific street. We will endeavour to outline the proposed cross-sections for each street in the ESR.
	Active transportation objectives can be achieved without requiring full urbanization of roadways. In particular, distance-to-destination should be considered for implementation of pedestrian facilities and target cyclist demand. Widespread urbanization of roadways will also decrease the rural character of the Midhurst community, particularly if a rural alternative can be implemented while meeting comparable transportation engineering alternative. Accordingly, alternative cross sections should be considered for roadways such as Craig Road, Forbes Road, Russell Road, St. Vincent Street and segments of roadways outside of the built boundaries lacking destinations within reasonable travel distance for pedestrians and cyclists.	The active transportation objective was to interconnect existing and proposed trails, bike routes and general pedestrian accommodation. The proposed bike lanes on St. Vincent, Wilson, and Carson accommodate proposed extensions of bike routes northwards by the City of Barrie at some time in the future. Bike routes , sidewalks and or multi-use trails or paved shoulders along Snow Valley Road, Russell Road, Craig Road, Doran Road and Pooles Road provide connectivity between the development hubs with the rest of Midhurst and existing trail systems behind the County buildings on Highway 26, the Ganaraska Trail and the Anne Street corridor trail between Carson Road and Hwy 26.
	The benefits of the Craig Road Extension to existing users should be considered in its implementation. In addition, the benefit of active transportation infrastructure implementation on Finlay Mill Road should also be considered. These roadworks will provide greater benefits to existing users and residents as compared to those of the proposed development. Accordingly, this should be considered when evaluating shared costs and improvement to existing community.	With regard to Craig Road Extension see the response provide above. With regard to active transportation there is a commitment to having an interconnected Active Transportation Network for the overall community which includes sidewalks and/or bike lanes. However, we acknowledge challenges that this will create and as part of our more detailed review of each street we are including alternatives such as a 2 metre paved shoulders to accommodate bicycles and pedestrians in lieu of the traditional 1.5 metre concrete sidewalk.
	Multiple Comments within Attachment No. 1	Attachment No.1, is the same as the official letter received from the Midhurst Developers Group; therefore see Item #63 for response comments.
	1) Is there enough water supply available for use without impacting local aquifers, watercourses, local wetlands and fisheries?	The Hydrogeological Study (prepared by Golder & Associates) assessed potential impacts of the future water takings on groundwater receptors. The 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 (pumping) tests; and the use of a regional-scale, transient numerical model to assess the potential for future groundwater impacts. The Study concluded that the future water supply pumping was sustainable and would not result in adverse impacts to the aquifer system and associated groundwater receptors such as Minesing Wetland and Willow Creek. In addition the Hydrogeological Study concluded that the proposed groundwater extractions for the Midhurst Development are from Aquifers A3 and A4, which are deep units with limited hydraulic connectivity to the shallow aquifers (A1 and A2), which provide the primary source of groundwater to the Minesing Wetland and associated surface water features. It was also concluded that baseflow losses would be <10% in Willow Creek over the course of the year and these would reduce stream flow by 3.3% (March) to 7.2% . Fisheries and Oceans Canada (2013) concludes that flow alterations below 10% have a low probability of detectable impacts to aquatic ecosystems. The predicted stream flow reductions of 3.3-7.2% are below the DFO threshold of 10% and so there will be no impact on fisheries resulting from the potential interaction of groundwater taking with surface waters.
	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?	The Hydrogeological Study focused on the hydrogeological investigations. In particular the water supply system design as it is currently envisioned will include seven supply wells at four locations. As part of the Hydrogeological Study, five pumping tests were conducted to evaluate water supply aquifer properties and also to assess the potential for impacts to surface water receivers by monitoring water levels in shallow aquifer A1 . No water level response was observed in any of the shallow aquifer monitors during pumping. Thereafter, a regional-scale, transient numerical model was utilized to assess the potential long-term impacts of full build-out pumping to surface water receptors. It was found that baseflow changes were minor with less than 10% reduction at Willow Creek and less than 6% reduction at Minesing Wetland.

No.	Items of Concern and/or Comments	Proposed Responses
	3) Is there enough water quality information available to understand the Willow Creek system?	Yes, water quality information was summarized from the MOECC Provincial Water Quality Monitoring Network (PWQMN) station 03005703002 (Willow Creek at Hwy. 28, 13 years of data – 2002 to 2014) and field investigations at: 1) six sampling locations in Willow Creek in 2013, 2014 and 2016; 2) four sampling locations in Black Creek; 3) three sampling locations in Matheson Creek; and 4) three sampling locations in an unnamed tributary that empties into Little Lake over 6 sampling events in 2008, 7 sampling events in 2015 and 8 sampling events in 2016. Information on streamflow was summarized from Water Survey of Canada (WSC) Station 02ED032 (Willow Creek near Minesing; 10 years of data – 2006 – 2016). This data informed the preparation of an Assimilative Capacity Study for Willow Creek, and characterized baseline conditions for the Adaptive Management Plan. All water quality samples were analyzed for a full suite of chemical parameters and loads of individual parameters were calculated through assessment of recorded stream discharge data.
	4) How will the sewage treatment plant conform with the Intergovernmental Action Plan (IGAP), particularly related to phosphorus and assimilative capacity?	The Intergovernmental Action Plan (IGAP) for Simcoe, Barrie and Orillia was completed in 2006. The IGAP recommended fully-serviced settlement areas, and growth areas which "maintained watershed health by implementing initiatives and best practices". The effluent limits for the proposed Midhurst wastewater treatment plant (WWTP) were developed through analysis of the assimilative capacity of Willow Creek (Willow Creek Assimilative Capacity Study, HESL, May 2016) and will maintain water quality at or below the PWQOs. The Midhurst Secondary Plan Area will thus be fully serviced and best practices for wastewater treatment will maintain watershed health. In the case of total phosphorus (in which 75th percentile Willow Creek concentrations are above the PWQO), state of the art treatment technologies are proposed to achieve effluent limits of 0.05 mg/L (Phase 1) and 0.03 mg/L (Full Build Out). These are currently some of the lowest TP limits in the Province of Ontario and the limit of 0.03 mg/L is below the current 75th percentile TP concentration of 0.031mg/L in Willow Creek.
	5) Will the effluent result in elevated total phosphorus in Willow Creek and the Nottawasaga River?	There will be no measurable increase in total phosphorus (TP) concentrations in Willow Creek or the Nottawasaga River at Full Build Out of the Midhurst Secondary Plan Area. Willow Creek is a Policy 2 receiver for TP since 75th percentile creek concentration of 0.031 mg/L is above the Provincial Water Quality Objective (PWQO) of 0.03 mg/L. At Phase 1 WWTP effluent flows and a TP effluent limit of 0.05 mg/L, Willow Creek downstream concentrations would increase slightly to between 0.032 and 0.034 mg/L. At Full Build Out and a TP effluent limit of 0.03 mg/L, Willow Creek downstream concentrations would slightly improve creek TP concentrations to just below the current concentration of 0.031 mg/L. These calculations were completed using the 75th percentile TP concentration in Willow Creek, as calculated from year-round water quality data. Total Phosphorus concentrations in Willow Creek vary seasonally in response to spring freshet and other periods of greater run-off and subsequent sedimentation. The impact of additional loading from the WWTP is minimal in months with existing TP concentrations near the PWQO. In March, the WWTP discharge improves water quality. In the months of January, February, May, August, September, October, and November, existing Willow Creek average TP concentrations were below the PWQO. In all cases, except May minimum flows for Phase 1, the input from the WWTP discharge (at both Phase 1 and Full Build Out levels) did not result in the downstream TP concentration increasing to beyond the PWQO of 0.03 mg/L.
	6) Will the sewage outfall aggravate flooding and erosion hazards in Willow Creek?	A fluvial geomorphic assessment of Willow Creek concluded that the addition of the proposed treated effluent discharge would increase water depth by 0.01 to 0.03 m and average velocity by 0.01 m/sec and that bed and bank erosion rates would be unaffected. The addition of effluent will not alter flows beyond their current natural range. The maximum effluent volume of 143 L/sec is <1% of the maximum recorded daily flows (HESL 2016).

No.	Items of Concern and/or Comments	Proposed Responses
60	7) Will the water quality of Willow Creek, the Nottawasaga River, Georgian Bay and the Minesing Wetlands be protected?	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. By protecting water quality in Willow Creek, downstream waterbodies including the Nottawasaga River, Georgian Bay and the Minesing Wetland, will also be protected. • 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.
	8) Have the cumulative impacts of multiple sewage systems outletting into the Matheson/Willow Creek system and the overall Nottawasaga River been considered?	Any impact of septic systems to Willow Creek or the Nottawasaga River are not within the scope of the Midhurst Secondary Plan Area Class EA but our assessment does account for any existing impacts. The Assimilative Capacity Study utilized current water quality information from Willow Creek to inform modelling and the determination of effluent objectives that meet PWQO. The water quality information integrates any impacts of sewage systems that currently outlet into the Matheson/Willow Creek system so effluent objectives have inherently included these and will protect the creek to current levels. The Nottawasaga River is protected through determination of effluent objectives which meet PWQO for Willow Creek.
	9) Will there be safeguards in the sewage treatment plant in case there are upsets/spills or failures of the treatment system?	The Wastewater Treatment Plant will include redundancy to addresses the risk of upsets/failures as follows: 1. A Standby power will be provided so that the plant can operate during power failure situation. 2. 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). 3. 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.
	10) Will there be thermal impacts to Willow 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 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.

No.	Items of Concern and/or Comments	Proposed Responses
		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 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.
	11) Will the fishery be protected?	Potential impacts to the fishery include inputs of stormwater and wastewater. The ACS and determination of effluent objectives will protect fish from deleterious inputs. A habitat assessment was also completed to determine an outfall location that would minimize impacts to fish habitat. Fish assemblages and habitat were characterized through background review and field investigations throughout Willow Creek in 2013, 2014 and 2016. Establishment of accurate baseline conditions is an important component of the Adaptive Management Plan as future monitoring will compare results to baseline conditions and develop mitigation and management plans if required. In addition, a Storm Water Management Plan will be implemented that is designed to infiltrate the first 20 mm of precipitation which will protect the flow regime and water quality in streams and reduce the temperature of stormwater. Baseline characterization of fish and aquatic habitat has been completed through background review and field efforts at all watercourses where stormwater will be discharged, including four sampling locations in Black Creek, three sampling locations in Matheson Creek, and three sampling locations in an unnamed tributary that empties into Little Lake over 6 sampling events in 2008, 7 sampling events in 2015 and 8 sampling events in 2016. These monitoring efforts have characterized baseline conditions and will be used to inform the Adaptive Management Plan.
	12) Will Source Water Protection be addressed?	Yes the key aspects of source water protection, including future wellhead protection areas, aquifer vulnerability, well interference, groundwater recharge and changes to groundwater baseflow are discussed in Appendix M of Hydrogeological Study. An Assessment Report and Source Water Protection Plan as per the Technical Rules will be prepared when the project is approved and the water supply system adopted by the Township of Springwater.

No.	Items of Concern and/or Comments	Proposed Responses
	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.	A comprehensive monitoring program has been completed which characterizes baseline information in Willow Creek and its tributaries. Water quality information was summarized from the MOECC Provincial Water Quality Monitoring Network (PWQMN) station 03005703002 (Willow Creek at Hwy. 28; 13 years of data – 2002 to 2014) and field investigations by HESL staff at: 1) six sampling locations in Willow Creek in 2013, 2014 and 2016; 2) four sampling locations in Black Creek; 3) three sampling locations in Matheson Creek; and 4) three sampling locations in an unnamed tributary that empties into Little Lake over 6 sampling events in 2008, 7 sampling events in 2015 and 8 sampling events in 2016. Information on streamflow was summarized from Water Survey of Canada (WSC) Station 02ED032 (Willow Creek near Minesing10 years of data – 2006 – 2016). This data informed the completion of an Assimilative Capacity Study for Willow Creek, and characterized baseline conditions for the Adaptive Management Plan. All water quality samples were analyzed for a full suite of chemical parameters and loads of individual parameters were calculated through assessment of recorded stream discharge data. We have also samples of benthic invertebrates, and fish community and documented fish habitat conditions in the watercourses within the Midhurst Secondary Plan Area. These will be fully documented in a baseline conditions report in the spring of 2017. The baseline data set will allow for comparison with measurements of water quality, water quantity and natural heritage in the future. HESL has completed monitoring associated with water quality, water quantity, fisheries, benthic invertebrates and aquatic habitat, while characterization of the baseline terrestrial environment has been completed by Beacon Environmental. An Adaptive Monitoring Plan has been developed and will be implemented to track future conditions in the study area.
61	Address change to Suite 300.	Master List updated. No response required.
	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?

No.	Items of Concern and/or Comments	Proposed Responses
	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 EA.. specifically consider the Frankcom lands when key information that is normally tied to development applications/approvals is not yet available?
62	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)

No.	Items of Concern and/or Comments	Proposed Responses
	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.

No.	Items of Concern and/or Comments	Proposed Responses
	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.
63	1. Reconsider the requirement of full urbanization of 100% of the Roads identified for improvement. Consider other road cross sections for road reconstruction projects. Proposes alternate road cross sections for identified streets.	The analysis that was completed in advance of the Public Information Centre (PIC) related to the type of road reconstruction was based on the results from the Phase 1 & 2 Master Plan that all roads reconstructions would be to a "full urban cross-section" with curbs, storm sewers., etc, etc. However, a more detailed review and consideration other keys items including promoting stormwater infiltration with the use of open ditches and keeping the existing character of the neighbourhoods has been completed on a street by street basis. This includes the evaluating the need for full urbanization versus rural cross-section and/or a hybrid of the two. In completing this more detailed analysis we also have to take in the consideration the need for sidewalk(s) and/or bicycle lanes on each specific street.
	2. Some flexibility in how active transportation lanes be accommodated should be made in the EA materials.	We acknowledge the concern and agree that issues and the need for compromise may arise during detailed design. From comments received from the PIC we have revisited many of the proposed cross-sections for improvement to existing roads and have proposed paved shoulders on a rural cross-section as a suitable active transportation feature and is generally more easily adapted within the existing ROW and grading constraints. As noted at the PIC we are committed to providing an interconnected Active Transportation Network. Some routes such as Finlay Mill Road it may not be physical possible to accommodate bike lanes. We will endeavour to outline the proposed cross-sections for each street in the ESR.
	3. Separate sidewalks should be provided in areas adjacent to development in order to accommodate walking through residential areas within neighbourhoods. However, on rural roads that are not adjacent to development and for beyond a typical walking route, sidewalks should not be required.	The commitment to having an interconnected Active Transportation Network for the community includes the sidewalks. However, we acknowledge challenges that this will create and as part of our more detailed review of each street we are including alternatives such as a 2 metre paved shoulders to accommodate bicycles and pedestrians in lieu of the traditional 1.5 metre concrete sidewalk.
	4. Where roads are outside of development areas….rural cross section should be considered with active transportation accommodated within a paved shoulder.	See the earlier responses.
	5. Where roads are within the development area….active transportation lanes could be accommodated within cycling lanes either within a paved shoulder, or within a lane in an urban cross section. In these areas, separate sidewalks should be provided to accommodate pedestrians.	Roads within the development areas will have the typical Township Standard cross-section with sidewalk on one or both sides. On through routes within the development areas bike lanes are to be provided but not on minor local streets within the development areas.
	6. Where roads pass through transitional areas where new development is located on only one side of the road, a combination of paved shoulders and urban cross section (or partial urbanized) should be considered in order to provide flexibility.	See the earlier responses.
	7. AECOM traffic volume forecasts along Forbes Road are 3 to 4.5 times higher than Ainley Group forecasts (for 2031 forecast). AECOM suggests lower traffic forecasts in 2041 as compared to Ainley forecast. Recommend that the 2031 and 2041 AECOM forecasts for the Forbes Road interchange be re-confirmed.	The AECOM traffic forecasts come from the Regional EMME model that was created initially for the "Simcoe Area Multi-Modal Transportation Strategy" and the "Highway 400 Widening (Hwy 89 to Hwy 11 split) Preliminary Design." The AECOM traffic study is a broader Regional traffic analysis that was carried out to see if replacing a previously considered new interchange with Highway 400 at Pooles Road with improvements at the existing Forbes Road interchange could provide the required benefits to traffic distribution. Their conclusion was that there was value in using the existing interchange at Forbes Road and improving it as may be necessary. The traffic analysis by Ainley Group is more focused on Midhurst Development and individual intersections and uses a different methodology in developing the traffic projections specific to background traffic and trip generation from proposed adjacent development.
	8. Re: Craig Road. Existing traffic will benefit from the Craig Rd extension. Analysis should be done to confirm the benefit of the Craig Road extension for existing and future motorists in the Midhurst area, separate from those that would result from proposed developments. May have impact on the conclusions/level of improvement on Russell Rd (4 lanes in 2031 could be reduced).	In general, the claim for diversion of traffic from Finlay Mill Road due to the Craig Road alternate route was in reference to the weekend evening traffic which is not a timeframe used for the analysis of the various intersections. Craig Road will provide an alternate route for Doran Road area development to reach CR 27/Hwy 26 other than Finlay Mill Road. The widening of Russell Road to 4 lanes is required to provide traffic from the new development areas easier and quicker access to Hwy 400 in lieu of using the Pooles Road, St. Vincent Street, etc. However, even with both in place (Craig Road & 4 Lanes on Russell) the developments still results in a significant increase in weekday traffic on Finlay Mill Road.
	9. Recommend Ainley forecasts be utilized to review traffic operations at the Forbes Road interchange and that the current planned improvements outlined in the EA, and the corresponding cost estimates, be revisited.	The Ainley Group traffic model was used to identify the required improvements at the intersection of Forbes Road and Hwy 400 and the timing of those improvements.

No.	Items of Concern and/or Comments	Proposed Responses
	10. Forbes Rd/Hwy 400 west ramps are proposed to be required during Phase 1 of development without signalization. May be more appropriately configured as part of the Forbes Rd widening and urbanization during Phase 2.	Our analysis provides for a left turn lane and right turn lane at the western ramp terminals on Forbes Road early in the development process. We note that by 2031 the LOS for is LOS E. We did not want to delay the improvements. One of the comments in the AECOM analysis identifying the Forbes Road interchange as an alternate strategy instead of a new interchange at Pooles Road was that we should make the Forbes Road link as convenient as possible to derive maximum benefit for diversion to this route. Further discussion will be held with MTO who have final say on the type and timing of improvement.
	11. Separate turn lanes (at St. Vincent/Pooles intersection) would not be required for either west westbound or eastbound approaches, assuming signalization.	We have revisited our analysis for this intersection and are currently recommending keeping the offset intersection with signalization of the intersection of the southern portion (Pooles and St. Vincent).
	12. Recommends that the widening of Russell Rd. to 4 lanes be deferred into Phase 2 of development.	We are proposing an interim rural 2 lane phase and possibly multi-use trail in Phase 1 Stage 2 followed by four-lane urban section between Doran Road and Forbes Road at the beginning of Phase 2.
	13. Recommends that the timing of any improvement to Snow Valley Rd. be tied into the development of the employment lands and not Stage 1 of the residential lands.	Carson North development area will have access to Snow Valley Road at Phase 1 Stage 1 and combined with sewer works required for servicing of Doran Developments the timing of the reconstruction of this road has been placed at the initial stage of development.
	14. Recommend that the entirety of the Craig Rd. extension be included in one stage, rather than westerly in Stage 2 and easterly in Stage 3.	A large number of Comments have been received following the PIC requesting that Craig Road Extension be constructed in conjunction with Phase 1 Stage 1, as such we have adjusted the schedule to show this.
	15. Recommends that widening of Wilson Dr. be shown as a separate, County of Simcoe project.	The Staging Plan that was developed for the purpose of identifying when (in conjunction with what stage of Development) a particular section of road will need to upgraded and not who it will be upgraded by. It is acknowledged that Wilson Drive is a County Road and that detailed discussions will have to take place to coordinate who actually undertakes the work.
	16. Requesting that the Township consider approaching the County to initiate the process in evaluating the benefit of adding Craig Rd extension and Forbes Rd upgrade to the County's Capital Roads Program.	Representatives (Senior Staff and key Politicians) from both Township and Simcoe County had a meeting recently, whereby one of the items on the Agenda was the future ownership of Craig Road Extension. The discussions at this meeting were very "high level", however, these was an interest on both sides to continue them. It was concluded that the next steps in this process will involve Ainley's providing technical information relating to Craig Road Extension to the County Staff for review.
64	Wants additional information/clarification re: proposed future traffic generation and impact upon existing City transportation corridors.	
	1. Wants proposed timing of transportation improvements;	Timing of transportation improvements have been identified in the PIC presentation material and are related to each specific stage of development. Some aspects of the timing are being reviewed based on comments received at or following the PIC.
	2. Why is Anne St not being considered as a major transportation link?	Anne Street south of Carson Road to the City of Barrie limits is considered a significant transportation link for the Carson South development area and to a lesser extent for Carson North development.
	3. 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.	That growth rate was selected as generally representative of growth within the area. Table 7.3.1-1 provided growth rates along 4 routes only one of them was significantly higher than 1% and that was for Forbes Road from CR 93 to Hwy 400. It is interesting to note that County Road 11 to the east of this segment had a growth of 0.15%. The County figures for Wilson Road south of Carson between 2012 and 2016 was zero and decreased in 2016. In our opinion the 1% growth rate applied is suitable as a general approximation.
	4. Confirm that development area will have a single local street access to the employment lands on Snow Valley Road and that there are no intensions of extending Anne St north to Snow Valley Road.	That is correct.
	5. Existing traffic assessment has not considered traffic growth on Anne St. – Section 4.3.2 of Transportation Study.	Traffic from and to Anne Street through our study area has to pass through the intersections of Carson Road with Hwy 26 and Wilson Road and those traffic volumes have been factored for background growth.
	6. Draft Traffic Operational Analysis has not accounted for Saturday trips – minimal retail shopping trips. City of Barrie traffic corridors will be impacted. Please update Analysis to account for Saturday trips.	Traffic analysis is typically carried out for the weekday morning and weekday afternoon peak hours. Saturday peaks are typically included for commercial development areas and developments in a Central Business District. In addition, weekend traffic to or from the commercial areas in Barrie will be dispersed throughout the day and therefore, lower than the weekday AM and PM peaks. Also, the aim is to complete the analysis for the 30th highest traffic hour of the year.
	7. Clarify what is proposed for the upgrades on Anne St and St. Vincent St. Please clarify number of lanes, bike lanes, sidewalks etc.	Anne Street is proposed as a two lane urban cross-section with bicycle lanes and sidewalk(s)
	8. Please provide clarification as to the estimated start time of Phase 1 – Stage 3.	We have not predicated specific dates for each stage of development as it is very dependent upon the market. However, it is anticipated that Phase 1 - Stage 1 will start in 2019/20 with the development uptake being approximately 300 to 400 units per year. Also, note that this estimated development uptake is a combined total for both Carson Road and Doran Road development areas.
	9. Clarify how County Transportation Master Plan has been considered – expansion of municipal transit into the Community.	The County Transportation Master Plan was used as background information to estimate background traffic growth and general information on trip destination.

No.	Items of Concern and/or Comments	Proposed Responses
65	Concerned about Craig Road extension increasing traffic to County Rd 27. Consider safety of residents of Mills Circle – dangerous turn into development from County Rd 27.	The Intersection of Mills Circle and County Road 27 is over 1 km away from the proposed intersection of Craig Road Extension and County Road 27. Therefore we do not foresee the proposed Craig Road Extension having an impact on Mills Circle. However, we understand the Township have spoken with Simcoe County (Operating authority for County Road 27) about the Mills Circle & County Rd 27 intersection to see if any modifications could be made to improve it.
	Wants bike lanes on County Rd 27	The inclusion of bike lanes on a County Road is not proposed in this Class EA.
66	1. Council has not ensured that the Residents of Midhurst understand exactly how much traffic will increase along their primary and secondary roads in the village and what the implications of this potential traffic increase might be. Once the following requested information and studies are complete, the full details should be mailed to each residence in Midhurst and then a referendum on the options outlined under Traffic Calming below should be held. The MSP EA 3 and 4 should not be voted on until that is complete.	The Township initiated a comprehensive communication plan, in excess of the Class EA requirements, to ensure that the existing residents are well informed about the Midhurst Class EA and provided for a number of extended comments periods associated with the overall Class EA. This included setting up a special Resident Liaison Group to disseminate information on a regular basis back out to the existing residents of Midhurst. In addition, the detailed background Technical Reports (for Water, Wastewater & Traffic) have been available on the Township website since the summer of 2016.
	2a. Requests a summary sheet showing estimates of how many vehicles will use each identified commuter Road for each stage of each development in each neighbourhood. Summary to include the 2008, 2013 estimates for each road so we might determine what future traffic numbers might look like even if the Doran Road Development is never built. Current chart for 2013, 2031 and 2041 is very confusing. Without these numbers, the developers will argue that infrastructure is based on the number of homes built, not how many new car trips are generated. Also need these estimates to confirm the 8 probable trips per household that is currently assumed. Chart should also include estimates of new levels of traffic passing through the village from residents and businesses living north and south of Midhurst (not generated by the MSP) for each stage of each Phase of each Development.	The requested tables are attached.
	2b. Unknown party conducted a 5-day traffic count during the 2016 Victoria Day weekend, at 7 locations along St. Vincent and then followed it up with a similar study along Finlay Mill Rd. Who undertook the study and why? Why were we not informed that these studies were taking place and why didn't our engineers or town staff recommend that we conduct these same real time studies?	The Township did not undertake any Traffic Counts during the Victoria Day weekend. In addition, the Township has contacted the Simcoe County and they confirmed that they did not undertake any Traffic Counts. Therefore, we are unware who completed the referenced traffic counts.
	3a. Craig Road bypass will become an absolute necessity if concerns expressed above come to pass. Must have hard and firm costs associated with the construction of this bypass (peer reviewed). Recommend that construction bids be requested for its construction before any other construction associated with the MSP be allowed to commence.	Subsequent to the PIC we have adjusted the proposed staging of the Road improvements such that Craig Road will be constructed in conjunction with Phase 1 Stage 1. In addition please refer to the attached Fact Sheet # 6 associated with Craig Road Extension.
	3b. If the Town proceeds with plans to build the bypass before any Doran Road homes are built, it is conceivable that a disruption to the economy could delay construction of homes, meaning tax revenue would have to be diverted to pay for the bypass. Will there be enough revenue coming in to avoid a massive increase in the tax rate or destroy our borrowing ability for any other infrastructure or repairs required by the Township?	The financial model associated with funding the construction of Craig Road Extension has not been finalized yet and when it is the Township will ensure that the appropriate safety measures are in place to protect the Township.
	4. Any estimate on construction of the Craig Road bypass should contain a secondary quote to pre-build bridges to 4 lanes. If we cannot afford to expand the bypass to 4 lanes, the traffic will find its way south and overwhelm the Village.	There are no bridges proposed along Craig Road. The two drainage crossings will require the installation of small to medium sized culverts, but not bridges.
	5a. Completion of traffic calming studies and referendum, along with firm costs associated with the 4 lane Craig Road bypass would allow negotiations with the developers during the cost sharing portion of this plan in a far stronger negotiating position.	In 2016 the Township developed Traffic Calming polices and within the Environmental Study Report (ESR) we will recommend that Traffic Calming measures be further investigated during the detailed engineering design stage for key existing streets. Preliminary construction cost estimates have been prepared for Craig Road which in our opinion are conservative and will be refined again after detailed design in the future. In addition please refer to the attached Fact Sheet #6 associated with Craig Road Extension.

No.	Items of Concern and/or Comments	Proposed Responses
	5b. Developers will not pay for improvement to secondary roads in Midhurst, Waite, Park Trail, Silverwood, Frid, Green Pine Road and Spence might all require upgrades and sidewalks installed to accommodate traffic bypassing clogged primary roads.	The detailed Traffic Model has confirmed that the identified road improvements can be accommodate the proposed traffic from the new developments. Any increase in traffic on the secondary roads will be relatively minor and well within the capacity of the existing municipal road. In particular, the model has identified the following: • 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. • Park Trail will not be a route preferred over the proposed completion of the link between Gill Road and St. Vincent. • 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. • 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.
	6. 100% of the new traffic going through the Village will be generated by people who do not live here. They won't care about the safety of our residents and we will not have sufficient traffic enforcement to ensure compliance with traffic laws. Should ask for one more study. What are the traffic implications and associated costs and/or savings involved in implementing a full traffic calming plan, (either slowing traffic down through the village, as a disincentive to use these roads by NON Midhurst traffic) or a full traffic diversion plan, (prohibiting traffic going southbound out of, or northbound into the new Doran Road developments?	As noted earlier in 2016 the Township developed Traffic Calming polices and within the Environmental Study Report (ESR) we will recommend that Traffic Calming measures be further investigated during the detailed engineering design stage for the key existing streets.
67	Unable to attend PIC and looking for information	All information regarding the Class EA project can be found on the Township website (http://www.springwater.ca/cms/one.aspx?pageId=4779649).
68	Will he have to pay for sewers (for himself or anyone else?)	It is the current Council's position that the existing residents of Midhurst will not be required to connect to the proposed Wastewater Treatment Facility.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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.

- *How do you propose to keep chemo, estrogen and other pharmaceuticals out of Willow Creek, Minesing Wet Lands, the Nottawasaga and the "Blue" beaches of Wasaga?*

Please refer to the attached Fact Sheet # 3 associated with Pharmaceuticals and Personal Care Products (PPCP's).

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.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. McDonald:

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.

- *Re: Craig Rd. Extension. Like Alternative 3. To follow Craig Rd. takes access away from our farm tractors, too close to farmland.*

Your preference for Alternative No. 3 is noted. Please refer to the attached Fact Sheet # 6 associated with Craig Road Extension.

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

Marc 3, 2017

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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.

- *What happens in event of power or mechanical failure impacting on this proposed "stage of the art" facility (facilities)? Barrie has quite recently added "state of the art" wastewater facility in the event of prolonged power outage, the untreated effluent has gone directly into Lake Simcoe. Same scenario for Willow Creek. Bell Communications has extensive records on the marked increase in lightning strikes and power failures in our area.*

All of the proposed water and wastewater facilities will be equipped with standby power units (diesel or gas generator sets) which would be automatically activated in the event of a power outage. These generators will be sized and equipped to provide extended backup power, in the event of an extended power outage.

In addition, the treatment process units at each of the Water and Wastewater facilities will have redundancy to allow for mechanical failure.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. [redacted]

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.

- *Concerned with water, wastewater and transportation plans. First off regarding water and wastewater plans that are not wanted. Individual is worried about the land that is being consumed to house the facilities that are required to operate such plans.*

The proposed lands that have been identified for the Water and Wastewater facilities are in line with industry standards for similar sized facilities throughout Ontario. In addition, while endeavouring to minimize the overall size of the properties, it is essential that sufficient space be included for landscaping and buffer zones, especially at the Water and Wastewater Treatment Plants.

- *Wants her own independent septic system.*

It is the current Council's position that the existing residents of Midhurst will not be required to connect to the proposed Wastewater Treatment Plant.

- *While living in Barrie lived close to transit stops that were unmaintained, noisy and congested, poorly laid out, planned out and not something Midhurst should consider. Consult Barrie. Barrie's system is flawed and extremely inadequate. Midhurst has been a community that is elite and people have and continue to pay a premium to live there. These suggested plans will be a huge negative and transit will trash up our area allowing students to move in. Not what we want!*

The implementation of a transit system throughout the proposed Developments is not part of the Preferred transportation improvements outlined in this Class EA. However, the Class EA has reviewed and confirmed that should the Township wish to implement a Municipal Transit system at some point in the future, that the proposed road network could accommodate it.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. and Mrs. [redacted]

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.

- *Wants Craig Road - Alternative No. 3 to be chosen as the preferred location for the extension of Craig Road. New to the area and welcomes change but concerned about the safety of their young children, if Alternative 2B is chosen.*

Your preference for Alternative No. 3 is noted. Please refer to the attached Fact Sheet # 6 associated with Craig Road Extension.

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 # 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.

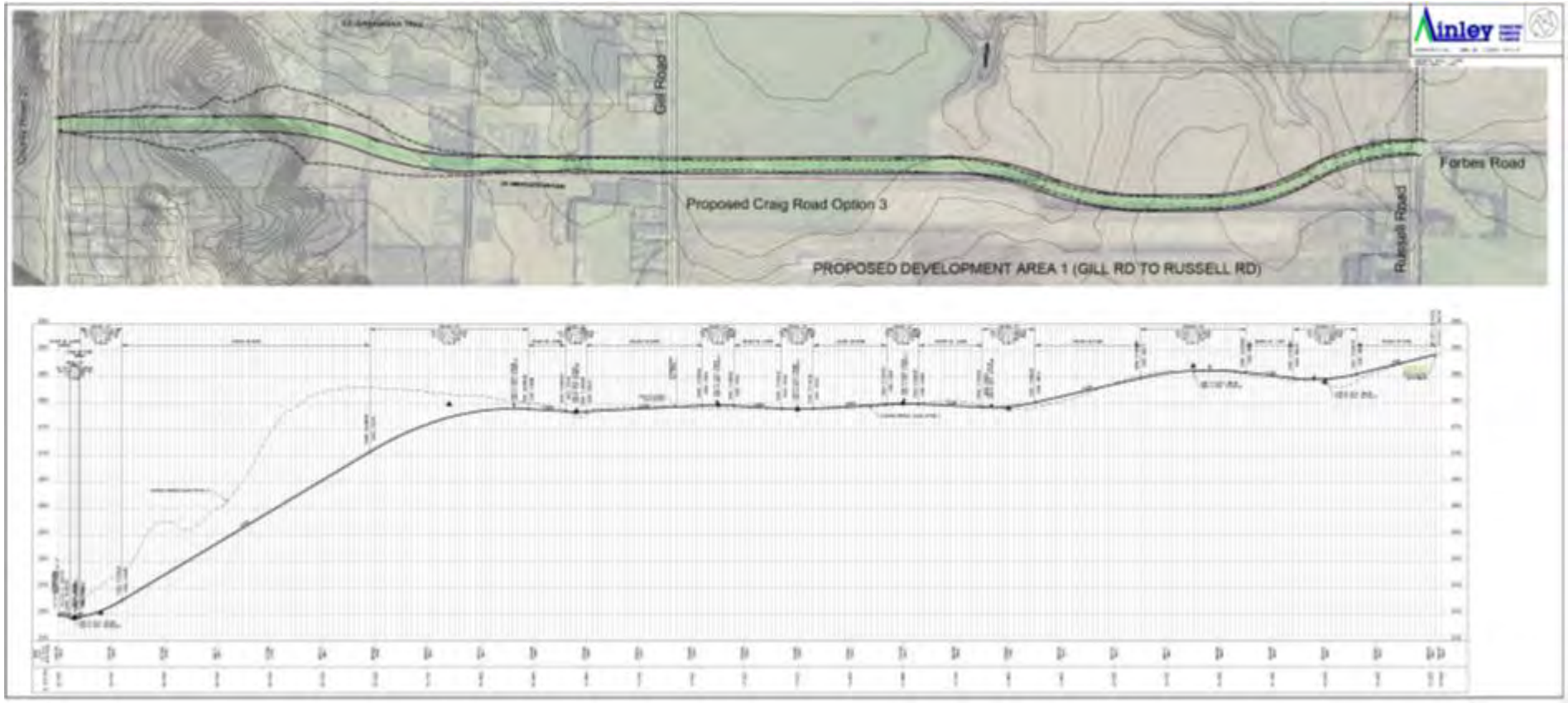
6) This proposed alignment (Alternative No. 3) will have no impact on the existing trails in the area and in particular the Ganarska Trail. In addition, the proposed design for Craig Road Extension allows for the construction of a multi-use trail that could provide additional interconnection with the 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



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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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.

- *The extension of Anne Street (Carson Rd to Snow Valley Rd) will bisect the Minesing-Little Lake wildlife corridor. If extended, then wildlife culverts or bridges will need to be put in place.*

This Class EA is not recommending the extension of Anne Street North, from Carson Rd to Snow Valley Rd.

- *Proposed road infrastructure for Pooles Road is inadequate – need 4 lanes for the thousands of new cars which will be using Pooles Rd. to St. Vincent. Sidewalk would be needed. St. Vincent needs 4 lanes and sidewalks as well.*

The Traffic Study has confirmed that a reconstructed Pooles Road & St Vincent Street, with 1 lane in each direction and left and/or right turn lanes 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.

In addition, please refer to the attached Fact Sheet # 5 associated with Existing and Proposed Traffic in Midhurst."

- *Who will pay for the expansion of St. Vincent from Midhurst to Barrie?*

The costs associated with the reconstruction of all Municipal road projects identified within the Midhurst Class EA, including St. Vincent Street, will be borne by the Midhurst Developers Group. The only exception to this is Craig Road Extension which is included in the Township Development Charges Projects.

- *How will you protect the annual migration of turtles across St. Vincent?*

Signs will be included in the proposed upgrade, notifying drivers of the seasonal migration of turtles.

- *Has Barrie been informed of the possible upgrades needed for Livingstone and Hamner Roads?*

The City of Barrie is aware of the Class EA and although outside the scope of this project we do not anticipate that the Midhurst development will necessitate upgrades to, Livingstone and/or Hammer.

- *How will residents on the streets between Pooles Rd. and Jodie's Lane get on to St. Vincent with the increased traffic? Left turns are difficult now. Will have to totally rework St. Vincent.*

Our traffic model indicates satisfactory Levels of Service for the intersection of St. Vincent and Jodie's Lane with stop control on Jodie's Lane and design horizon traffic for the year 2014 as Level of Service B with average delay of 15 to 20 seconds. Delays to exit a driveway will be similar.

- *There needs to be a second sewage pipe (a backup) in case there is a leak and failure of primary pipe.*

All pipes (Sewer and Water) will be designed and constructed in accordance with all Ministry of the Environment & Climate Change (MOECC) and Industry standards

- *Assumption that new residents will use Forbes Rd. to the 400 Hwy to go to Barrie is incorrect. New residents will use Pooles Rd. across St. Vincent to go to the Barrie malls. Will cause major congestion on Pooles and St. Vincent along with Hamner and Livingstone.*

The traffic model includes that trips from the new development areas in Doran North and South to and from the shopping areas at the north end of Barrie, will travel by way of St. Vincent St and/or Bayfield St. The Traffic model assumes that trips with an origin or destination further south will use the Forbes / Hwy 400 route link as the shortest time route.

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 30th Peak Hour of traffic throughout a year and similarly for urban roads a design of between the 10th and 20th 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.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. [redacted]

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.

- *Craig Road - Do not want the extension of Craig Road, anywhere near her property.*

Please refer to the attached Fact Sheet # 5 associated with Craig Road Extension. With regard to your specific comment about the location of Craig Road, we note that all alternatives being considered and in particular the Preferred Alternative (Alternative No. 3) is at least 500m away from your property.

- *Want to remain on well, they have farm animals on a hobby farm.*

It is the current Council's position that the existing residents of Midhurst will not be required to connect to the proposed Water and Wastewater Treatment Facilities.

- *Do not want another house, on top of, next to or behind them.*

The limits of the proposed development are set out in Official Plan Amendment (OPA) 38 of the Midhurst Secondary Plan. In addition, on November 28, 2012 the Ontario Ministry of Municipal Affairs and Housing withdrew part of its appeal of the Midhurst Secondary Plan. As a result of the Ministry's partial withdrawal, 300 hectares out of the total 756 hectares proposed to be re-designated 'urban' in Official Plan Amendment (OPA) 38 were cleared for development. The remaining 456 hectares and all related policies to OPA 38 remain under appeal at the OMB.

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 30th Peak Hour of traffic throughout a year and similarly for urban roads a design of between the 10th and 20th 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.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. [redacted]

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.

- *Huge issues all around. Go back to drawing board and come back with much scaled down plan*

On November 28, 2012 the Ontario Ministry of Municipal Affairs and Housing withdrew part of its appeal of the Midhurst Secondary Plan. As a result of the Ministry's partial withdrawal, 300 hectares out of the total 756 hectares proposed to be re-designated 'urban' in Official Plan Amendment (OPA) 38 were cleared for development. The remaining 456 hectares and all related policies to OPA 38 will remain under appeal at the OMB.

This Class EA process is being completed to identify the Water, Wastewater and Transportation infrastructure that will be necessary to accommodate the aforementioned Midhurst Secondary Plan and in particular OPA 38.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]:

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.

- *If this development does realign Pooles/St. Vincent, Green Pine will the Township install traffic calming to deter traffic speed?*

In 2016 the Township developed Traffic Calming polices and within this Class EA we will recommend that Traffic Calming measures be further investigated during the detailed engineering design stage.

- *Current traffic surveys should be updated and included actual data on long weekends.*

Please refer to the attached Fact Sheet # 5 associated with Existing and Proposed Traffic in Midhurst and # 6 associated with Craig Road Extension.

- *Against the Russel Road 4 lane expansion. Why is it needed if there are no driveways facing Russel Rd?*

The proposed upgrade of Russell Road to 4 lanes is required to provide traffic from the future development areas south of Doran Road easy access to Hwy 400. However, the upgrading from 2 to 4 lanes is only required in conjunction with Phase 2, currently anticipated after 2031.

- *Why can't all traffic be sent through the new Craig Rd. expansion?*

Please refer to the attached Fact Sheets # 5 associated with Existing & Proposed Traffic in Midhurst and # 6 Craig Road Extension.

- *Will Existing residence be forced to hook up to sewers? Will the existing council guarantee we will not have to hook up to sewer?*

It is the current Council's position that the existing residents of Midhurst will not be required to connect to the proposed Wastewater Treatment Facility.

- *How are the developers doing at meeting the 150 EA requirements before development can begin?*

The "clearing" of the Draft Plan conditions associated with the development is not related to this Class EA and is being handled by the Township Planning Department. However, it is our understanding that very few of the Draft Plan Conditions have been cleared to date.

- *How will you maintain existing water on top of new development?*

The extensive Hydrogeological studies that have been completed have confirmed that the new proposed Water Systems in the east and west will have no impact on the existing Municipal Water Wells or Private Water Wells serving the existing Midhurst. In addition, please refer to the attached Fact Sheet # 1 associated with Water Supply.

- *What will be the annual cost of maintaining the waste water for example replacement of filters? There is always an extensive cost of using the best technology.*

The cost of maintaining the proposed new servicing works (water and wastewater) will borne by the benefitting users (new residents). Further it is anticipated that the user fees associated with the operation and future maintenance of the systems, will be in line with other Municipal Water and Wastewater user fees in the industry.

- *Having Poole and Green Pine off set is a benefit to decrease traffic speeding problems. It should be left as is. The goal should be to reduce the traffic impact to existing Midhurst residents not increase traffic flow problems.*

In 2016 the Township developed Traffic Calming polices and within this Class EA we will recommend that Traffic Calming measures be further investigated during the detailed engineering design stage.

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 30th Peak Hour of traffic throughout a year and similarly for urban roads a design of between the 10th and 20th 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.

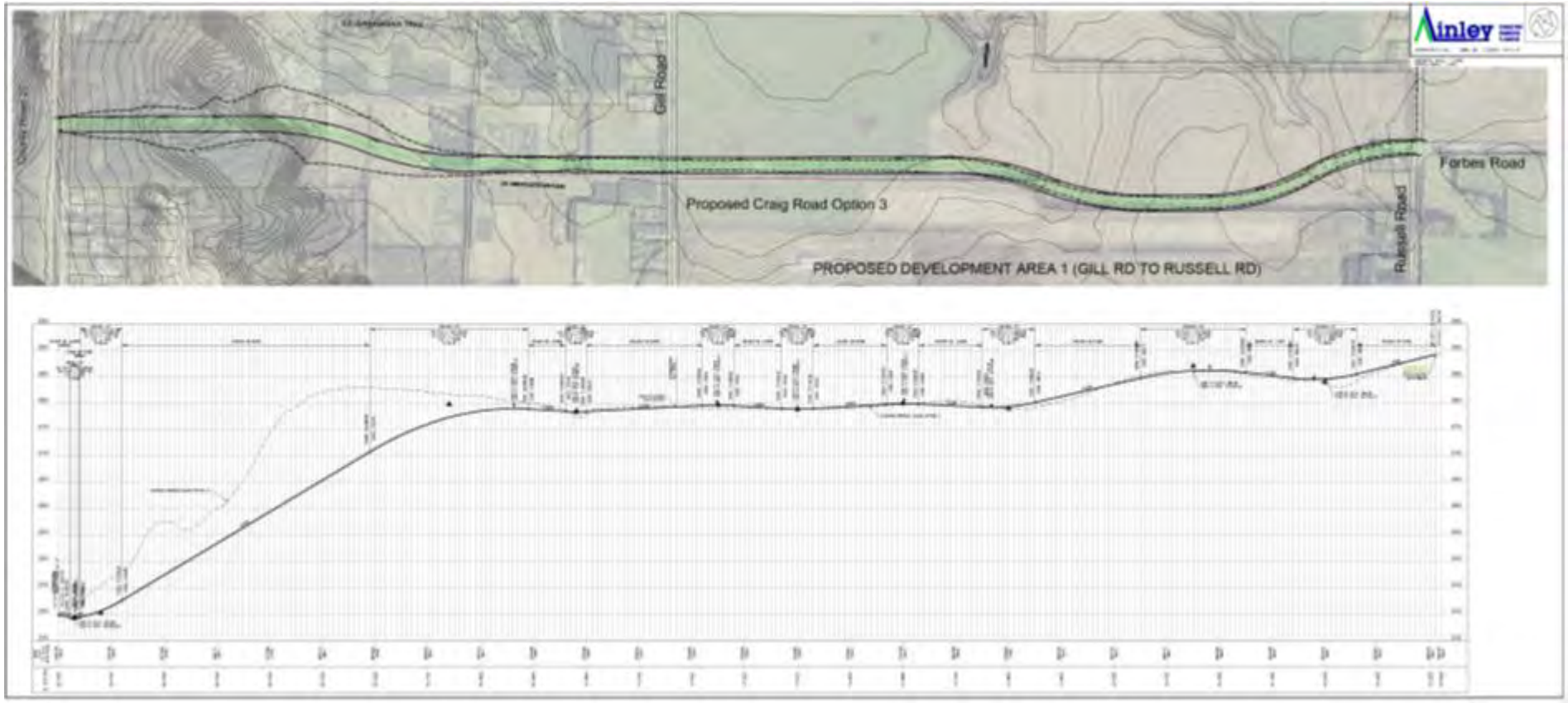
6) This proposed alignment (Alternative No. 3) will have no impact on the existing trails in the area and in particular the Ganarska Trail. In addition, the proposed design for Craig Road Extension allows for the construction of a multi-use trail that could provide additional interconnection with the 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



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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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 30th Peak Hour of traffic throughout a year and similarly for urban roads a design of between the 10th and 20th 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.

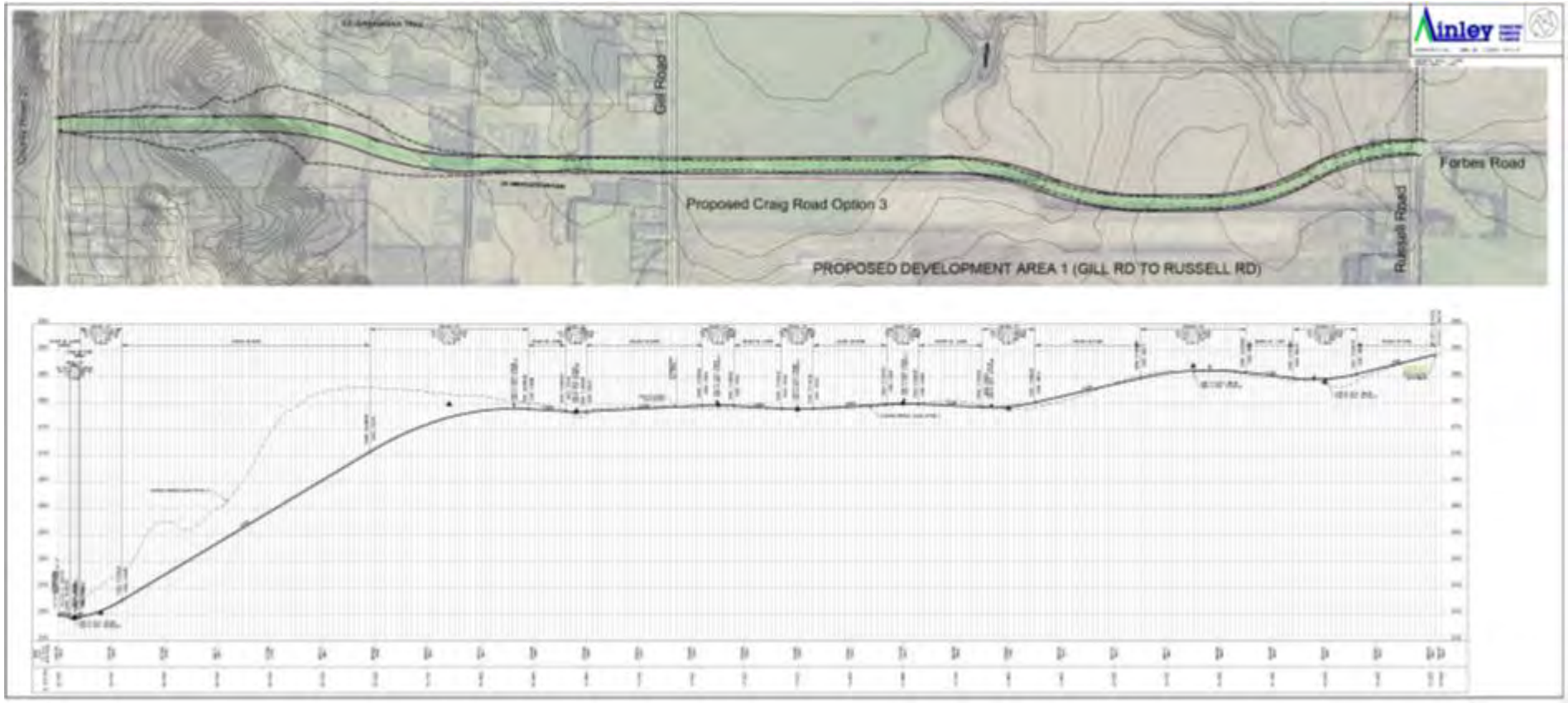
6) This proposed alignment (Alternative No. 3) will have no impact on the existing trails in the area and in particular the Ganarska Trail. In addition, the proposed design for Craig Road Extension allows for the construction of a multi-use trail that could provide additional interconnection with the 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



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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. [redacted]

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.

- *Please consider options re: Craig Road. Trails in and around it are used year round for recreation. Choose option that has least effect on trails and access to them. Use of these trails enhances quality of life in our village.*

Please refer to the attached Fact Sheet # 6 associated with Craig Road Extension.

- *Please consider noise pollution along existing & proposed routes. At what point will noise mitigation strategies be considered, specifically from Hwy. 27? Traffic noise/sound pollution affects the enjoyment of all outdoor spaces.*

We reviewed and analyzed the Noise levels along all routes which have proposed improvements associated with the Midhurst Secondary Plan. However, we are not proposing any improvements along County Road 27 other than a new intersection with Craig Road Extension and therefore, there was no need to analyze noise levels along County Road 27.

- *Will roundabouts produce less traffic noise than stop lights?*

It is generally accepted sthat roundabouts generate less traffic noise than signalized intersections due to the reduced deceleration and acceleration requirements.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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.

- *Alternative 3 or 1 Craig Road. Live at corner of Craig Road and Gill. You want to kick me out, go to #3 or #1.*

- *There are 3 big ravines behind the house you will have to deal with. If you go #1 or #3 you will have a straight line and less problems.*

Please refer to the attached Fact Sheet # 6 associated with Craig Road Extension.

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 # 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.

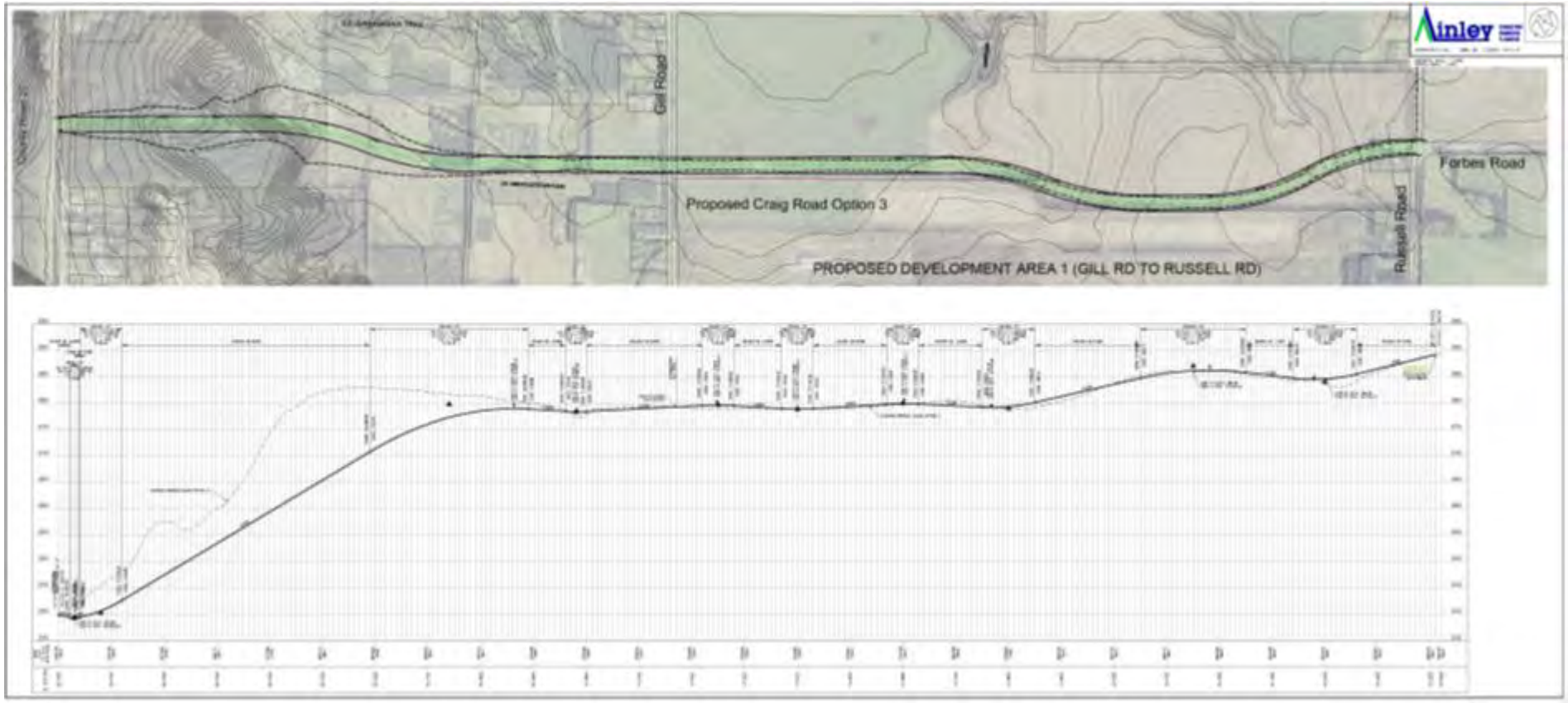
6) This proposed alignment (Alternative No. 3) will have no impact on the existing trails in the area and in particular the Ganarska Trail. In addition, the proposed design for Craig Road Extension allows for the construction of a multi-use trail that could provide additional interconnection with the 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



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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. and Mrs. [redacted]

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.

- *Do Not connect neighbourhood #3 using Pooles Rd. at all, instead build a road from their most southern end to St. Vincent and right to Bayfield - or straight south to Barrie.*
- *Pooles Rd goes right through the middle of Old Midhurst.*
- *Please re-route traffic away from Pooles Rd. onto St. Vincent (i.e. Study traffic already in mornings with school buses).*
- *Protect Old Midhurst from urbanization.*

We did investigate the feasibility 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 Jodie's Lane to provide additional relief. However, neither of these alternatives provided much benefit to the traffic and had major constraints relating to topographic and/or environmental features along the proposed routes that offset any benefit. Therefore; these are not being recommended.

- *Prefer 2 water (assume wastewater?) treatment facilities, therefore do not transport wastewater thru Old Midhurst*

The number of wastewater treatment plant options was assessed in detail during the Phase 1 & 2 Master Plan in 2008/09 and it was concluded that one wastewater treatment plant is the best solution.

- *We do NOT want hook up to treatment facility.*

It is the current Council's position that the existing residents of Midhurst will not be required to connect to the proposed Wastewater Treatment Facility.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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.

- *Can you provide a simple summary table illustrating the total existing and proposed P loading to Willow Creek? (sanitary and storm combined)*

It would be tough to provide a simple summary table to show current and potential future phosphorus conditions in Willow Creek. Therefore, we provide the following information in point form:

1. It is estimated that a loading of 46 kg of phosphorus per year is currently being added to Willow Creek originating from existing land uses (agriculture and forest).
2. Based on the Phase 1 wastewater effluent concentration for total phosphorus (TP = 0.05 mg/L), an estimated 118 kg/yr. of TP would be added to Willow Creek from the Wastewater Treatment Plant (WWTP).
3. Assuming 20 mm of infiltration along with LID techniques, Best Management Practices and stormwater management techniques, it is estimated that the phosphorus loading from stormwater will be reduced to 21 kg/yr from the estimated pre-development loading of 46 kg/yr.
4. It is considered that the development will actually reduce phosphorus loading from stormwater runoff by 25 kg/yr. This could result in a total additional loading of phosphorus of 139 kg/yr, (118 + 21 = 139) which is an increase of 93 kg/yr over the pre-development load of 46 kg/yr.
5. Assuming 25 mm of infiltration the phosphorus load from stormwater runoff is estimated to be 11 kg/yr. resulting in a total additional loading of phosphorus of 129 kg/yr (118 + 11 = 129) which is an increase of 83 kg/yr. over the pre-development load of 46kg.yr.
6. It is estimated that a loading of 134 kg/yr of phosphorus would be directed to Willow Creek in the future from current mixed land uses.
7. Based on the Ultimate (Full Buildout) wastewater effluent concentration for total phosphorus (TP = 0.03 mg/L), an estimated 134 kg/yr of TP would be added to Willow Creek from the WWTP.

8. Assuming 20 mm of infiltration along with LID techniques, Best Management Practices and stormwater management techniques, it is estimated that the phosphorus loading will be reduced to 66 kg/yr. from the estimated pre-development loading of 134 kg/yr.
9. It is considered that the development will actually reduce phosphorus loading from stormwater runoff by 68 kg/yr. This results in a total additional loading of phosphorus of 200 kg/yr., (134 + 66 = 200) which is an increase of 66 kg/yr. over the pre-development load of 134 kg/yr.
10. Assuming 25 mm of infiltration the phosphorus load from stormwater runoff is estimated to be 33kg/yr. resulting in a total additional loading of phosphorus of 167 kg/yr. (134 + 33 = 167) which is an increase of 33 kg/yr. over the pre-development load of 134kg/yr.

Although there will be a reduction in phosphorus loading from the stormwater runoff component, the addition of the WWTP effluent into Willow Creek means that there will be an anticipated increase in phosphorus loading in the subwatershed of 93 kg/yr. for Phase 1 and 66 kg/yr. Ultimately (based on an infiltration rate of 20 mm) and 83 kg/yr. for Phase 1 and 33 kg/yr. for the Ultimate condition (based on an infiltration rate of 25 mm). However, all of these increases are considered to be minor in the overall discharge to the watershed and therefore it is concluded that there would be no effect on the Minesing wetlands.

In addition, please see the attached Fact Sheet # 2 associated with Willow Creek & Minesing Wetland and Fact Sheet # 4 associated with LID's."

- *Given the stated desire to minimize new traffic through the existing Midhurst Village, would it not make sense to force the Craig Road connection to be completed as part of Phase 1.*

Subsequent to the PIC we have adjusted the proposed staging of the Road improvements such that Craig Road will be constructed in conjunction with Phase 1 Stage 1. In addition please refer to the attached Fact Sheet # 6 associated with Craig Road Extension.

- *Similarly, why expand St. Vincent and Pooles at all with a new and improved route from Hwy 400 to Hwy. 27. It would make some sense to leave these routes alone and less attractive options compared to Forbes/Craig.*

Reconstruction of these routes is proposed for two main reasons:

1) to address platform and/or alignment deficiencies with the existing roads;
2) to provide sidewalks and/or bike lanes.

However, further to comments received during and following the Public Information Centre (PIC) we are proposing that Traffic Calming measures, in accordance with the Township's Traffic Calming polices which were developed in 2016 be further investigated during the detailed engineering design stage for the key existing roads such as Pooles, Finlay Mill, St Vincent, etc."

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 # 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 # 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.

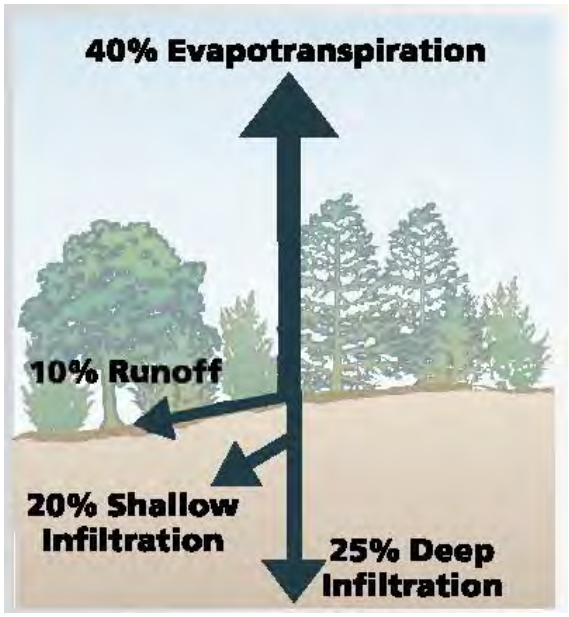
2) LID Provides many environmental and economic Benefits

- 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.

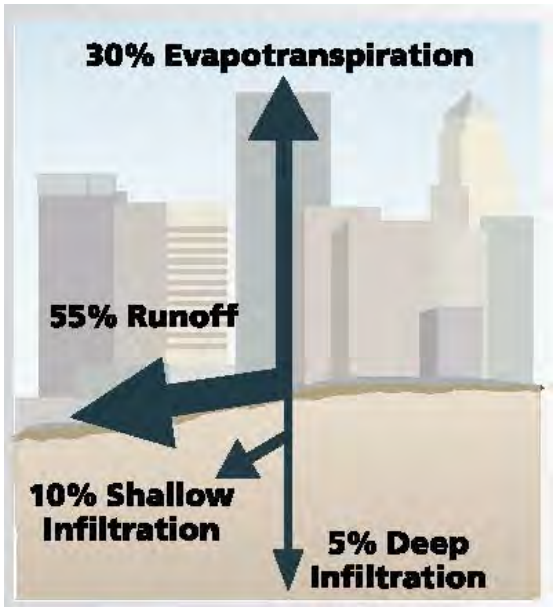
Fact Sheet # 4: Low Impact Development (LID)

- 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

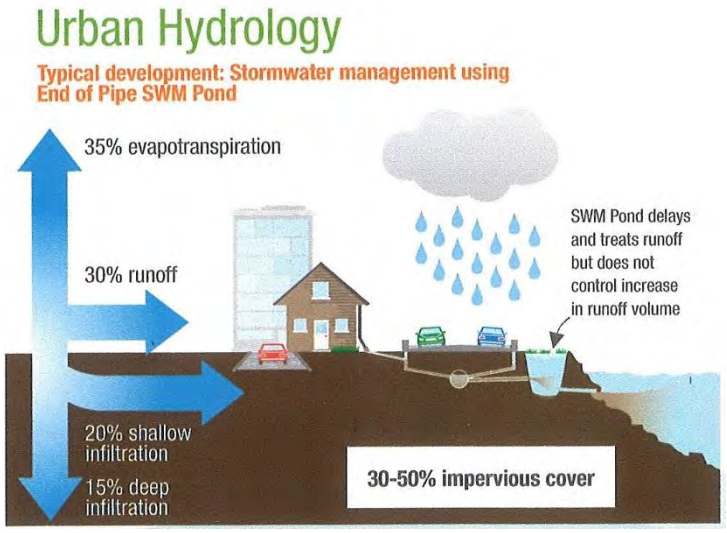


Typical Post-Development Stormwater Flows with No LIDs

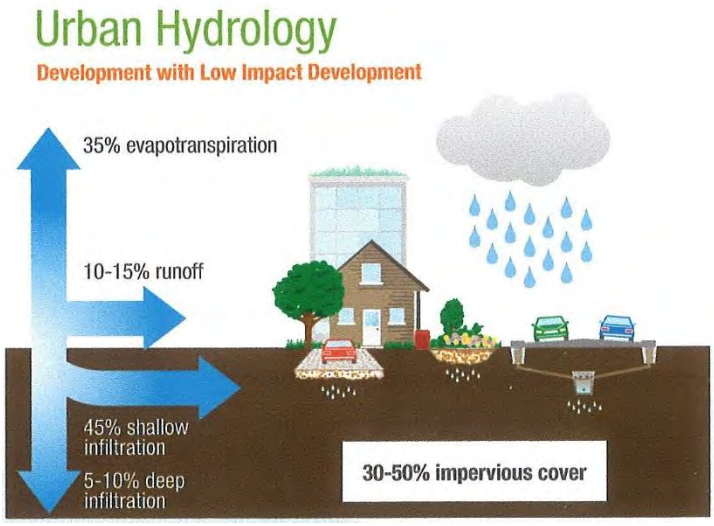
Fact Sheet # 4: Low Impact Development (LID)

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.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. [redacted]

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 roundabout at Forbes & Russell Road is not a good idea. Canadians are not familiar with roundabouts and they seem to cause chaos at Park Place shopping area.*

Your preference for a signalized intersection at Forbes Road and Russell Road is noted and it is proposed that both options (signalized intersection and roundabout) be carried forward and that the final decision be made at detailed engineering stage in the future.

- *We need to consider bike paths on St. Vincent on the section of road that connections Barrie to Midhurst. This road is going to become extremely busy and we need to think of the safety of our young people.*

It is acknowledged that bike lanes are necessary on St Vincent Street between Midhurst and Barrie and as such they are being proposed. However, the specifics of how they will be incorporated into the design will be determined during the detailed engineering design stage in the future.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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.

- *The Craig Rd. Extension should be put in before any construction starts. Cottage traffic has already made Friday and Sundays way too busy through the village. The gravel trucks already use the village as a cut through and will get a lot worse when construction starts. Craig Rd. installed before any construction!*

Subsequent to the PIC we have adjusted the proposed staging of the Road improvements such that Craig Road will be constructed in conjunction with Phase 1 Stage 1. In addition please refer to the attached Fact Sheet # 6 associated with Craig Road Extension.

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 # 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.

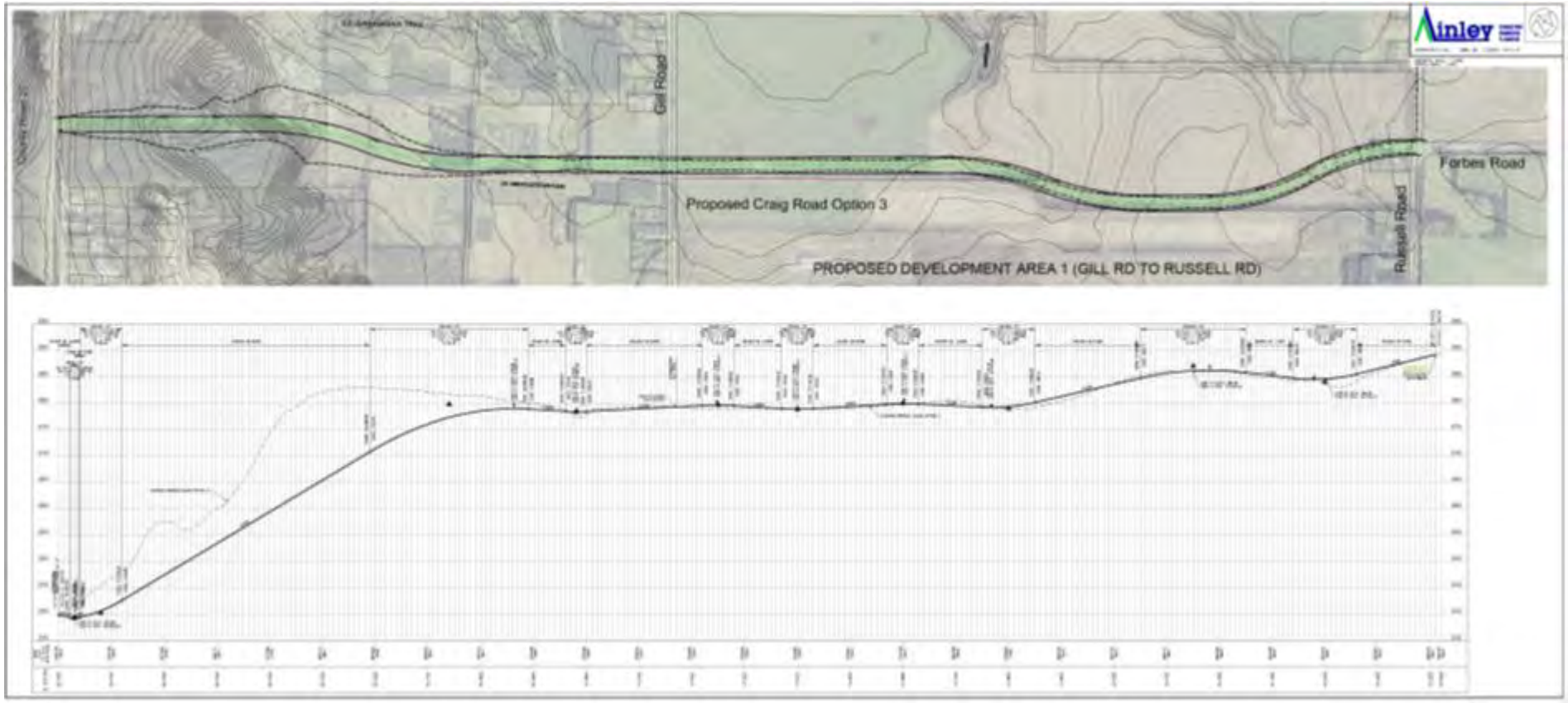
6) This proposed alignment (Alternative No. 3) will have no impact on the existing trails in the area and in particular the Ganarska Trail. In addition, the proposed design for Craig Road Extension allows for the construction of a multi-use trail that could provide additional interconnection with the 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



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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. [redacted]

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.

- *The use of roundabouts are not a good idea. I have never seen/experienced a roundabout in Canada that works well i.e. Park Place and even the ones on Hwy. 26.*

Your preference for signalized intersections at all of the designated locations is noted.

- *Planning for bike paths/lanes along St. Vincent to allow bikers to get safely into and out of Barrie.*

It is acknowledged that bike lanes are necessary on St Vincent Street between Midhurst and Barrie and as such they are being proposed. However, the specifics of how they will be incorporated into the design will be determined during the detailed engineering design stage in the future.

Thank you again for your interest in this Class EA. If you have any other concerns, please do not hesitate to contact us.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. [redacted]

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

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. [redacted]

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.*

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.

- *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.*

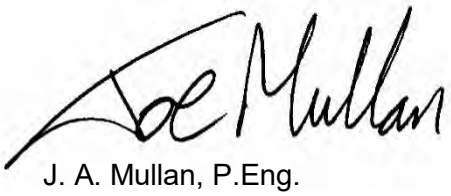
The mapping associated with the proposed Alternative has been updated with the 2016 aerial imagery.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. [redacted]

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.

- *Storm sewer holding pond planned for beside my property will it affect my drinking water and if does who is going to help me? Where will this pond discharge?*

The proposed Stormwater Management Pond adjacent to your property would only be receiving storm run off from the Water and Wastewater property and we do not have any concerns with it being located adjacent to residential properties. However, given that we have other locations within the overall property, we will be looking at relocating it further north-east during the detailed design stage which would mean it would not be adjacent to your property.

Further, regarding your concern about your well, please note that prior to any construction activities proceeding in close proximity to existing residential homes, we would be conducting a private well monitoring program whereby the quantity and quality of private wells would be monitored, subject to getting the homeowners permission, on a number of occasions before and after construction to determine if there was any impact. If it is determined that there are impacts to a specific well, then the Developers, via the Township, would be responsible to implement a solution to the specific problem.

- *You must be very careful in regard to the Minesing swamp. It needs protection and it's up to us to preserve it for future generations. It's so important. You are holding a jewel in your hands.*

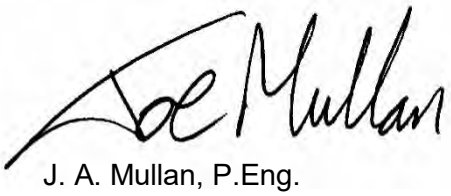
Please refer to the attached Fact Sheet # 2 associated with Willow Creek and Minesing Wetlands.

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 # 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.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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.

- *Alternative 1 should be the route for extending Forbes Road to Hwy. 27. This option is the most direct route and will encourage traffic and discourage traffic from the current village.*

Your preference for Alternative No. 1 is noted. Please refer to the attached Fact Sheet # 6 associated with Craig Road Extension. It should be noted that Alternative 1 and 3 are very similar, with Alternative 3 making more efficient use of the land west of Russell Road.

Thank you again for your interest in this Class EA. If you have any other concerns, please do not hesitate to contact us.

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 # 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.

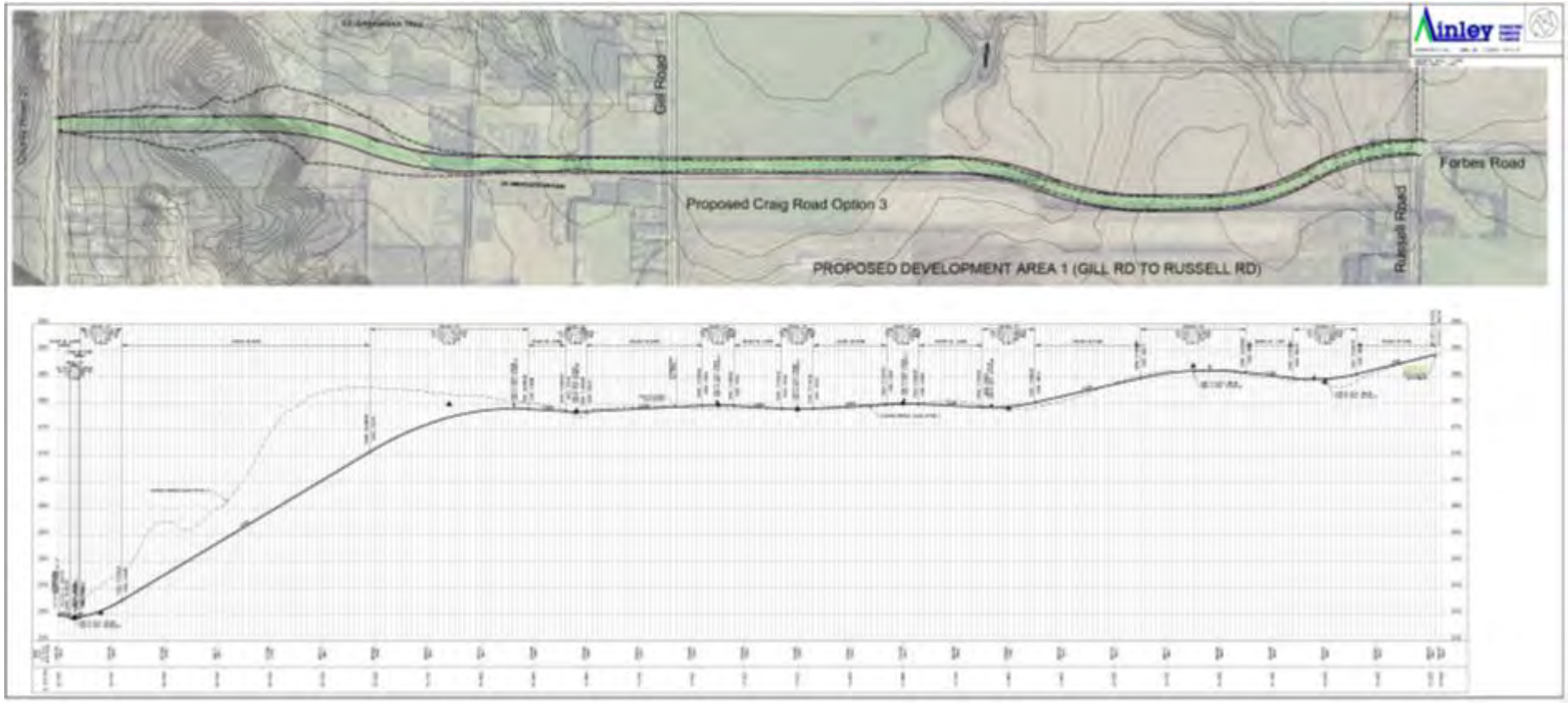
6) This proposed alignment (Alternative No. 3) will have no impact on the existing trails in the area and in particular the Ganarska Trail. In addition, the proposed design for Craig Road Extension allows for the construction of a multi-use trail that could provide additional interconnection with the 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



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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. [redacted]

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 roundabout at Wilson/Carson sounds great, but what about the cemetery?*

Your preference for a round-about at the intersection of Wilson Drive and Carson Road is noted. As part of our preliminary review we have noted that the alignment of Wilson Road will need to shift to the east and will require property acquisition on the east side of the road. The schematic drawing provided at the last PIC shows a shift in the centerline alignment of 11 metres to the east to avoid disturbance to the cemetery.

- *Carson Road development is being built on the 5th generation Hickling farm. It would be lovely to honour them, including a township reeve by naming some streets after them.*

Your suggestion is noted and will be considered by the Township to see if the naming of streets, to honor pioneer families, can be accommodated.

- *The "shoe tree" at Anne/Carson is an eye sore that collection garbage.*

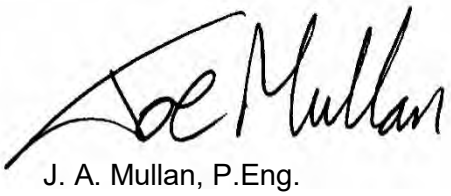
The Shoe Tree on the north side of the road would only be taken down if, during detailed design, it was determined to be within the limit of disturbance of the proposed reconstruction of Carson Road.

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

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]:

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.

- *Anne Street should be extended from Carson Road to Highway 26.*

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 proposed 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.

- *Carson Road should be extended to St. Vincent Street.*

Similarly, an extension of Carson Road east to St. Vincent was not identified as being required to improve traffic movement and therefore was not considered as part of this Class EA process.

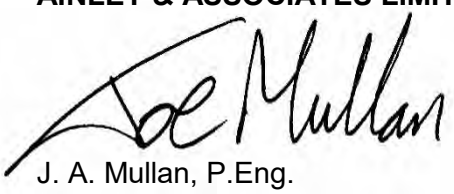
- *All roads need some form of bicycle lanes.*

All roads being proposed for reconstruction will include bicycle lanes.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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.

- *What is going on with the maintenance of the outlet of the Willow, 1980 was the last time it was dredge, sand traps removed 2008 and no maintenance being done on the silt and sand coming down stream.*
- *Willow Creek filling up with sand and breaking out and flooding my fields. No mention or concern from Ainley & Associates*

On November 28, 2012, the Ministry of Municipal Affairs and Housing (MMAH) withdrew part of its appeal of the Midhurst Secondary Plan. As a result of, the Ministry's partial withdrawal, 300 hectares out of the total 756 hectares proposed to be re-designated "Urban" in Official Plan Amendment (OPA) 38 had Draft Plan Conditions development and were cleared for development. The remaining 456 hectares and all related policies to OPA 38, will remain under appeal at the OMB.

This Class EA process is being completed to identify the Water, Wastewater and Transportation infrastructure that will be necessary to accommodate the Midhurst Secondary Plan and in particular OPA 38. However, independent of this Class EA, a comprehensive Stormwater Drainage Study is being completed in conjunction with the Township and the NVCA for the Midhurst Secondary Plan.

The issues related to the maintenance of Willow Creek at George Johnston Road or other locations are outside the scope of this Class EA process. We understand that the creek is a navigable waterway under the Department of Fisheries (DFO), Ministry of Natural Resources & Forestry (MNRF) and Nottawasaga Valley Conservation Authority (NVCA) and lands through which the creek flows are subject to NVCA authority.

Although Ainley were not involved, the following is a brief history of the sand traps, according to the Township:

There were two sand trap developments. One back in the early 1970's located on private lands whereby Willow Creek would break out regularly and one set in the early 2000's. After access was

denied to the original lands the dredging at that location had to cease. In the case of the latter location, dredging of the Willow Sand traps was completed in accordance with the design prepared by R.J. Burnside & Associates on Harold Parkers land west of George Johnson Road. However, this was also halted as a direct result of NVCA concerns over excess fill material being piled along the bank on the property north of Willow Creek. NVCA wanted the fill removed due to sand eroding back into the creek. Before any further dredging could have been undertaken in the late 2000's an alternate plan would have had to be developed. As there was no fill of this nature required for municipal projects anymore and the expense to haul and dispose of the dredged material was considered excessive and not financially viable or sustainable (under Township budget) the program was stopped under direction of the previous Township Council, in agreement with Mr. Harold Parker and the adjacent landowner.

- *Drainage Act is not being followed. You cannot put harm on lower land owners.*
- *My question about drainage was presented at the township EA in 2010. Still no answer is that not a requirement in the EA process.*
- *"Drainage outlet" or no more water.*

Similar to above, this question is outside the scope of this Class EA, however, we note that the NVCA have accepted the proposed drainage outlets from the proposed Midhurst Developments following detailed site visits. In addition, the stormwater runoff from the proposed Midhurst Secondary Plan Developments must comply with the 2012 Ontario Municipal Board (OMB) Minutes of Settlement between the NVCA and the Developers Group. These Minutes of Settlement include, but are not limited to, the following requirements:

- The stormwater management systems are to hold back the first 25 mm of storm runoff for a period of 48 hours;
- 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;
- Reduction in 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.

These requirements, which greatly exceed the standard MOECC and/or NVCA requirements, have been set to ensure that the proposed developments will not have an impact on the Willow Creek or other downstream receivers.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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.

- *Main concern is that cost will be passed onto existing Midhurst residents. Pass the cost onto the developers and in turn to the persons who wish to reside in Midhurst in a new build. We have already paid for the current infrastructure (i.e. Septic etc.) already.*

All of the costs associated with the construction of Water, Wastewater & Transportation infrastructure/improvements to accommodate the Midhurst Secondary Plan will be borne by the Midhurst Developers. The only exception to this is the costs associated with Craig Road Extension of which 100% is included in the Township Development Charges Projects.

- *We do NOT want to hook into sewer!*

It is the current Council's position that the existing residents of Midhurst will not be required to connect to the proposed Wastewater Treatment Plant.

- *Please do not add sidewalks, we do not want them. They bring people closer to your house and things get damaged (we've seen this before). Also they rarely get maintained. In Midhurst we can hear the crickets, and see the stars! We want to keep it this way. Don't buy into BIG CITY ideas!*

The need for inclusion of sidewalks and bike lanes has been identified by a large number of respondents throughout the Class EA process. Therefore, the reconstruction of the main routes 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.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr [redacted]

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 am in favor of Option #1 for Forbes Rd extension crossing Gill Rd. in a straight line, as it is the most direct route and keeps traffic away from residences.*

Your preference for Alternative No. 1 is noted. Please refer to the attached Fact Sheet # 6 associated with Craig Road Extension. It should be noted that Alternative 1 and 3 are very similar, with Alternative 3 making more efficient use of the land west 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

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.

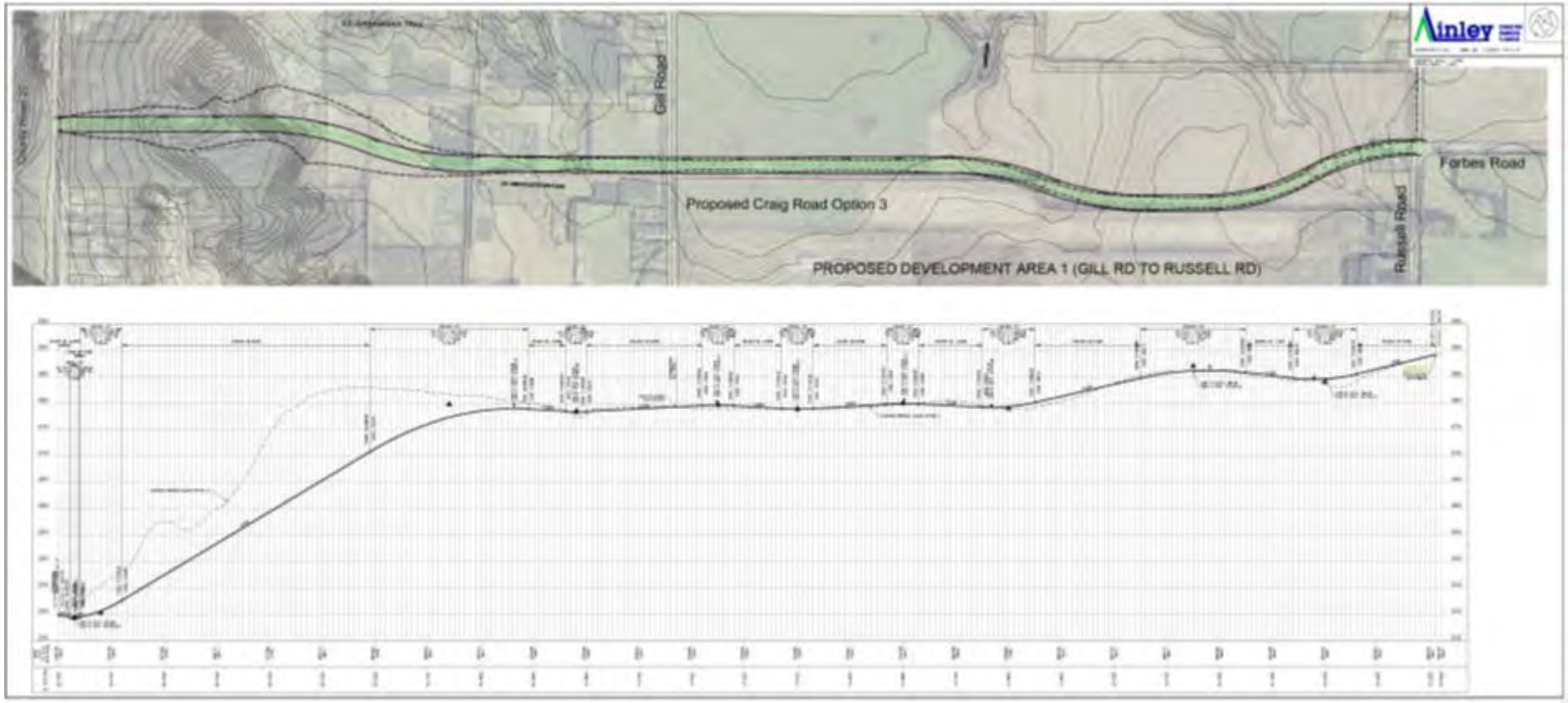
6) This proposed alignment (Alternative No. 3) will have no impact on the existing trails in the area and in particular the Ganarska Trail. In addition, the proposed design for Craig Road Extension allows for the construction of a multi-use trail that could provide additional interconnection with the 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



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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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 have just witnessed a presentation that proposed traffic measures (turning lanes, traffic circles, road improvements (widening) that speed and encourage increased traffic flow. At the same time they proposed traffic calming measures to be introduced by the Township. To slow and discourage traffic chicanes and impediments have to be put in place.*

- *The sewer line is to be run down Finlay Mill. This is the time to construct a street that encourages cycling/pedestrians and traffic slowing. Also impediments must be put in place at the top of Doran Rd. to discourage through traffic. This should apply to Doran/Russell, Wattie, St. Vincent and Poole's and Gill Rd.*

The completion of the Traffic Studies associated with 2016 the Township developed Traffic Calming polices and within this Class EA we will recommend that Traffic Calming measures be further investigated during the detailed engineering design stage.

- *I am pleased to see that Craig Rd. will be extended to Hwy. 27. This should be done at the very start of construction. From the very beginning we were assured that the essential nature of Midhurst should be preserved. The above plan would be a start. Finlay Mill is already heavily used by cyclists from Forest Hill School and even cycling groups from Barrie and Toronto. These cycling routes should be marked by safety barriers, not painted lines. This can be achieved by narrowing Finlay Mill, which would have the added advantage of slowing traffic chicanes and other impediments can be added to discourage through traffic. This should be done when the sewage line goes through.*

Subsequent to the PIC, we have adjusted the proposed staging of the Road improvements such that Craig Road will be constructed in conjunction with Phase 1 Stage 1. In addition, please refer to the attached Fact Sheets # 5 associated with Existing & Proposed Traffic in Midhurst and # 6 associated with Craig Road Extension.

- *The proposed commercial strip development along Hwy. 27 and the start of Finlay Mills must be stopped! There is no room for a parallel access road. Bayfield St. is already a road disaster. Strip developments are ugly, dangerous and in this case an impediment on a through highway.*

The approvals associated with the development and/or re-development of lands within the Midhurst Secondary Plan are outside the scope of this Class EA and is handled by the Township Planning Department.

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 30th Peak Hour of traffic throughout a year and similarly for urban roads a design of between the 10th and 20th 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.

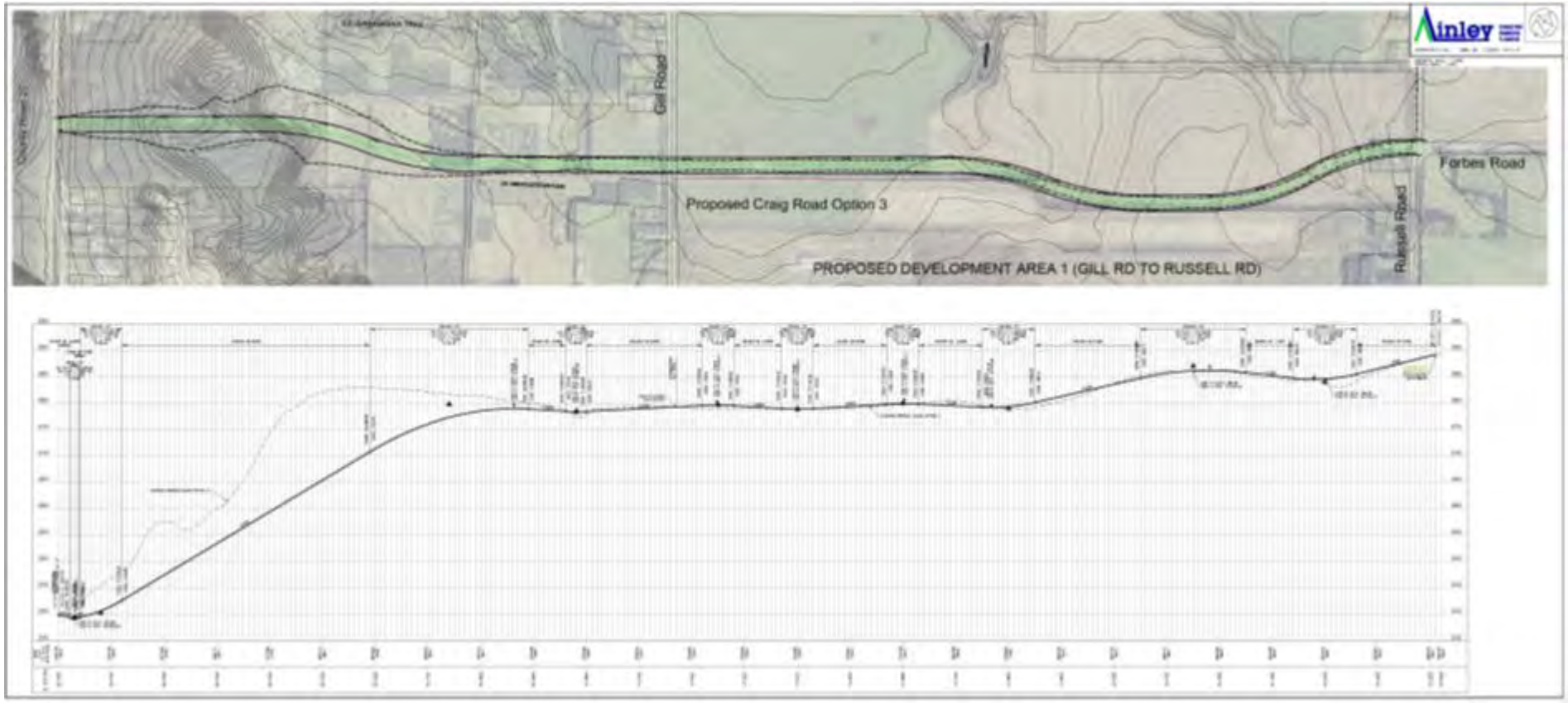
6) This proposed alignment (Alternative No. 3) will have no impact on the existing trails in the area and in particular the Ganarska Trail. In addition, the proposed design for Craig Road Extension allows for the construction of a multi-use trail that could provide additional interconnection with the 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



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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. [redacted]

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.

- *Russell Rd. - Doran Rd. roundabout - unacceptable too much impact on existing residence at location.*

After reviewing the comments received the Recommended Alternative for the intersection of Russel Road and Doran Road is Signalization.

- *Intersection 26 and 27 must be signal lights - no roundabout.*

Your preference for a signalized intersection at Highway 26 and County Road 27 is noted.

- *No forced main on Doran (27 to 'Finley Mill Rd.).*

A number of Alternative detailed routes for the forcemain between Doran Rd and Carson Rd Development were analyzed and Doran Road, Finlay Mills Road and Snow Valley Road route was selected as the most suitable.

- *Tertiary sewage treatment does not remove drug residues (no safe level known), toxins such as Nano silver, copper and other continuously developed new "products". Once disposed of by residents they combine to form new toxins. (See U. of Waterloo, Groundwater Institute and Civil Engineering Department.*
- *I believe the Minesing Wetland (an International RAMSAR site) cannot tolerate both the quantity of discharge from the proposed plant or the toxins which pass through even this technology untouched). Species there are dependent on specific seasonal water levels (both up and down), fairly pristine water quality excepting phosphorus and specific temperature.*
- *Whereas phosphorus is a fertilizer, things like Nano silver, lawn pesticide, etc. are poisons. So the question how much poison do we want to feed to not only these species but all other children, seniors and others living downstream.*

Please refer to the attached Fact Sheet # 3 associated with Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs). In addition, there are no current regulated parameters for the “products” that you have listed. However, controlling concentrations of indicator contaminants currently monitored in all wastewater treatment plants in the Province, also reduces the concentrations of other contaminants within the effluent.

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.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. [redacted]

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.

- *Very concerned about the impact of the MSP on the wetlands. Phosphorus levels are already on the high side and the effluent will continue to add to the level. Even though the TP concentrations are 0.05 mg/L Phase 1 and 0.03 mg/L at Phase 2. The effluent is still adding additional P that would not otherwise be in the creek. Concentrations might be the same level but we are still adding more and more flow to the creek. On one of the boards, there is a statement that says that the effluent "will not alter the nutrient status of the Willow". That comment is quite definitive. What if you are wrong down the road? There are also other chemicals that will be discharged. How will these PPCP affect the flora and fauna? What will be done to minimize the chemicals? Most WWTP discharge into larger bodies of water not a creek.*

Please refer to the attached Fact Sheets # 2 associated with Willow Creek and Minesing Wetlands and # 3 associated with Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs).

- *Natural ecosystems cycle with seasons; the steady flow will alter the natural flow of the Willow. How will this affect the Minesing ecosystem?*

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 particular 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 0.01 to 0.03m and average increased velocity of 0.01 m/sec, changes that would be virtually immeasurable in Willow Creek. The Flows within the Minesing Wetland are many multiples of the flows within the

Willow therefore an additional 143L/s will not affect the Minesing Wetland from a fluvial geomorphological perspective."

- *What will happen if there is an overflow or spillage problem? And who will pay and be responsible for the clean up if the plant is built and an accident happens?*

The treatment process units within the Wastewater Treatment Plant will have redundancy to minimize the potential for overflow problems. In addition, the proposed Wastewater Treatment Plant will be equipped with standby power units (diesel or gas generator sets) which would be automatically activated in the event of a power outage. These generators will be sized and equipped to provide extended backup power, in the event of extended outage.

- *Who verifies the accuracy of these findings of these studies (Water Supply)? How can they guarantee that it will not affect the wells of farmers and other land owners who share the aquifer?"*

Please refer to the attached Fact Sheet # 1 associated with Water Supply.

- *What evidence do they have of another Wastewater plant to compare with that discharges into such a small creek and the short and long term effects on the ecosystem?*

Very few Wastewater Treatment Plants are exactly alike, because most facilities have different effluent discharge criteria. However, there are many Wastewater Treatment Plants, that have been in operation of years with similar technology and criteria and we will provide details of those within the Environmental Study Report (ESR).

In addition, most of the individual processes being proposed within the Wastewater Treatment Plant has been successfully operated at Wastewater Treatment Plants in Ontario and around the world. Further the Membrane filter technology that is being proposed has become more common for Wastewater Treatment in recent years in Ontario; however, it has been in use in the Water Treatment industry for decades in Ontario, helping to ensure that Municipal Water systems meet or exceed the Ontario Drinking Water Objectives. For example, in the late 1990's when the Town of Collingwood had an apparent Cryptosporidium (microscopic parasites) outbreak in their Municipal Water system they constructed a new Water Treatment Plant utilizing Membrane technology to filter out bacteria, pathogens and viruses including Cryptosporidium from the raw water being drawn out of Georgian Bay.

- *Will we have to hook up? (wastewater collection system).*

It is the current Council's position that the existing residents of Midhurst will not be required to connect to the proposed Wastewater Treatment Facility.

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 # 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.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. [redacted]

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.

- *Concerned about water supply – a finite resource*

Please refer to the attached Fact Sheet # 2 associated with Water Supply.

- *Also concerned about the volume of wastewater discharge into Willow Creek and in particular about toxins in the wastewater along with the increase in the temperature in Willow creek.*

Please refer to the attached Fact Sheet # 3 associated with Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs).

- *Also concerned about toxins in the wastewater and the increase in temperature in Willow 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 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.

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 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.

- *Concerned about transportation – 2013 Study is not good enough – needs to be updated. New residents will not use Hwy 400 to get to Barrie – they will go through Midhurst.*

Please refer to the attached Fact Sheet # 5 associated with Existing and Proposed Traffic in Midhurst and # 6 associated with Craig Road Extension.

- *Craig Road will cost more than stated.*

The total estimated cost associated with Craig Road Extension ($14.5Milion) is based upon Preliminary analysis and current construction estimates.

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 # 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 # 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 30th Peak Hour of traffic throughout a year and similarly for urban roads a design of between the 10th and 20th 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.

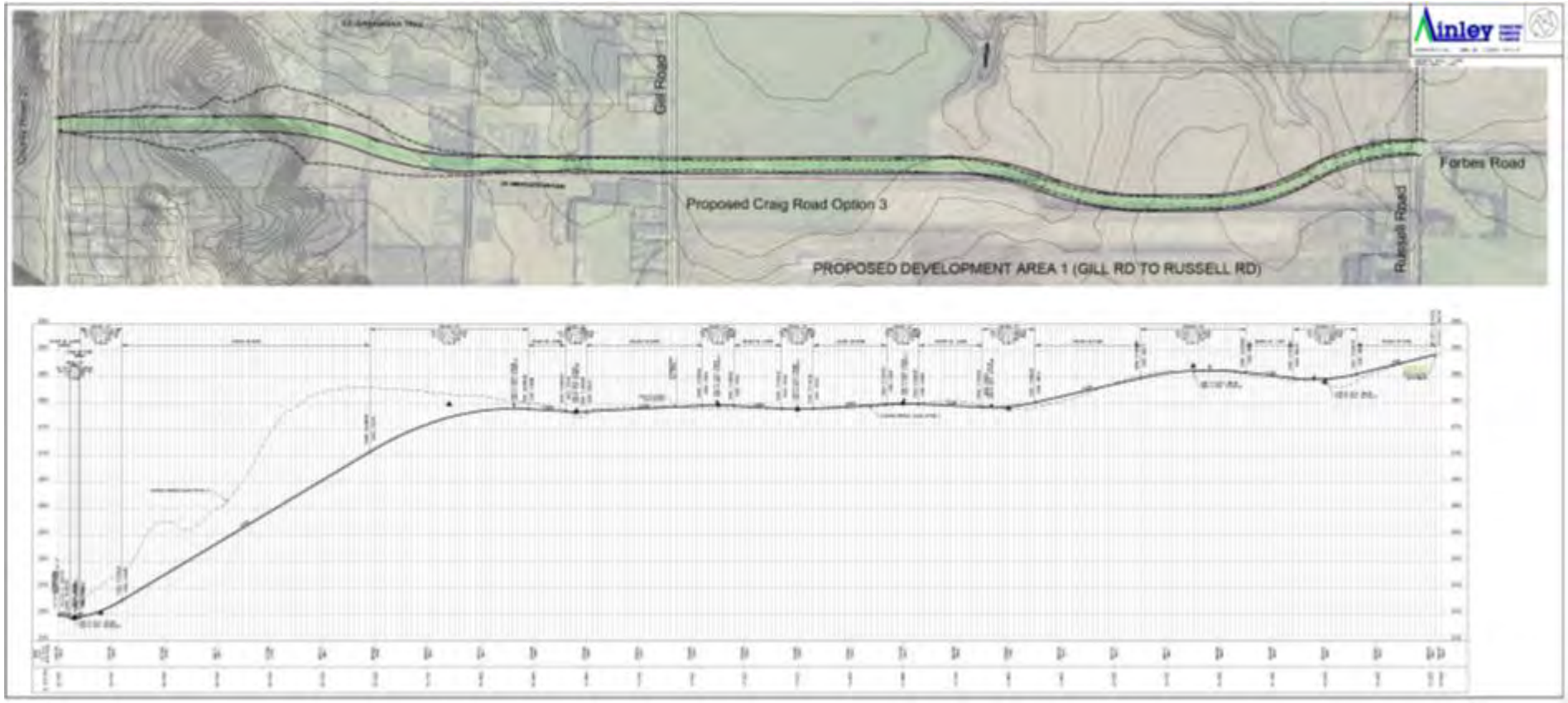
6) This proposed alignment (Alternative No. 3) will have no impact on the existing trails in the area and in particular the Ganarska Trail. In addition, the proposed design for Craig Road Extension allows for the construction of a multi-use trail that could provide additional interconnection with the 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



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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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.

- *We would like to recommend that an opaque fence of significant height and sound-attenuating/deflecting ability be erected along the rear lot line of the industrial properties on Snow Valley Road, from about 1471 Snow Valley Road (Algonquin Bridge) to 1533 Snow Valley Road (Springwater Woodcraft). An additional green-space buffer with trees would be appropriate, the Mick's lots' depths may have already been established. So perhaps this oversight can and should be corrected, so conformance to the Official Plan can be achieved and a more harmonious community realized. Fear of noise complaints.*

The requests are noted and have been forwarded to the Township Planning Department for their consideration and inclusion in the Subdivision Agreements between the Developer and the Township, in the future.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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.

- *Is our garbage cost going to skyrocket? Will we have to ship garbage plus building materials to other areas and at what cost?*

The County of Simcoe is aware of the Midhurst Secondary Plan and as such the Solid Waste Management Strategy for the County would include the growth associated with the Midhurst Secondary Plan.

- *Wants two WWTP to avoid forcemain on Finlay Mill Rd. Wants all main service pipes and lines (water, wastewater, gas, and hydro) to be routed across new Craig Road extension.*

The issue of two Wastewater Treatment Plants versus one was reviewed in detail and it was determined that one facility was best. Subsequently, a number of Alternative routes for the forcemain between Doran Rd and Carson Rd Development were analyzed and Doran Road, Finlay Mills Road and Snow Valley Road route was selected as the most suitable.

- *Concerned about increased traffic on Finlay Mill Rd.*

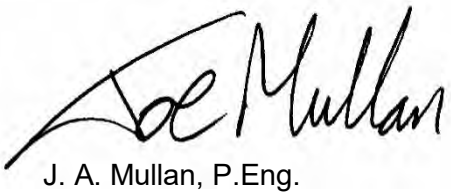
Please refer to the attached Fact Sheet # 5 associated with Existing and Proposed Traffic in Midhurst.

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 30th Peak Hour of traffic throughout a year and similarly for urban roads a design of between the 10th and 20th 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.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. [redacted]

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.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. [redacted]

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.

- *Lack of left turn lane into Mills Circle. Add left turn lane and bike lanes to Hwy 27 in conjunction with Craig Road extension.*

The Intersection of Mills Circle and County Road 27 is over 1 km away from the proposed intersection of Craig Road Extension and County Road 27. Therefore, we do not foresee the proposed Craig Road Extension having an impact on Mills Circle intersection.

However, we understand the Township have spoken with Simcoe County (Operating authority for County Road 27) about the Mills Circle & County Rd 27 intersection to see if any modifications could be made to improve it.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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.

- *Need a more thorough and updated transportation study. Weekends were not considered.*

Please refer to the attached Fact Sheet # 5 associated with Existing and Proposed Traffic in Midhurst and # 6 associated with Craig Road Extension.

- *How was it determined that nearly half of future southbound traffic from the proposed Doran Road developments would choose the Hwy 400 Option?*

Southbound traffic is considered to be traffic headed to downtown Barrie or along the commercial area along Bayfield Street as well as commuter traffic headed south on Highway 400. We conducted some rudimentary time trials for travel from Doran Road between Russell Road and St. Vincent Street to get to the intersection of Bayfield Street and Highway 400. The quickest route was found to be Russell Road to Forbes Road to Highway 400. Our traffic model acknowledges that commercial area along Bayfield Street and downtown Barrie are significant portion of the southbound trips but destinations accessed by Hwy 400, south of the Bayfield Street & Hwy 400 intersection are better served by getting on Hwy 400 at Forbes Road. We assigned approximately half of the southbound traffic based on the draw of those destinations. We may have overestimated the percentage drawn to St. Vincent and Bayfield Streets but this will present a conservative approach maximizing the estimated impact on those routes and not overstate the benefit of the improved link to Forbes Road and Highway 400.

- *Were there any destination studies done on existing traffic?*

The traffic origin / destination split was taken from the Simoce County Master Transportation Study which identifies 70% to the south, and 10% to each of the other three directions.

- *How many trips are destined for Highway 400 south of Bayfield Street versus the northern Bayfield Street shopping area?*

Our traffic model assumes approximately two thirds of the southbound traffic from Doran North will use Highway 400. The rest is distributed to St. Vincent (10%) and Finlay Mill Rd to Hwy 26 (10%) and to Craig Road to County Road 27 (15 %). For Doran South the model assigns approximately two thirds of southbound traffic to Highway 400 and the rest to St. Vincent (20%) and Findlay Mill Road to Highway 26 (15%). In our opinion we have included a significant percentage of the trips to the shopping/business area of Bayfield Street.

- *Concerning the Craig Road extension, why would it not be placed within the existing approved development lands to the south of Alternative 3, instead of on farm land not yet approved for development? Alternative 3 would have the least effect on still farmable land and existing forest areas.*

Please refer to the attached Fact Sheet # 5 associated with Craig Road Extension.

- *Have any identical wastewater treatment plants been built and, if so, what is their record of mishaps? If not, is the proposed plant an untested version?*

Very few Wastewater Treatment Plants are exactly alike, because most facilities have different effluent discharge criteria.

In addition, most of the individual processes being proposed within the Wastewater Treatment Plant has been successfully operated at Wastewater Treatment Plants in Ontario and around the world. Further the Membrane filter technology that is being proposed has become more common for Wastewater Treatment in recent years in Ontario; however, it has been in use in the Water Treatment industry for decades in Ontario, helping to ensure that Municipal Water systems meet or exceed the Ontario Drinking Water Objectives. For example, in the late 1990's when the Town of Collingwood had an apparent Cryptosporidium (microscopic parasites) outbreak in their Municipal Water system they constructed a new Water Treatment Plant utilizing Membrane technology to filter out bacteria, pathogens and viruses including Cryptosporidium from the raw water being drawn out of Georgian Bay.

- *Were studies and modelling undertaken to evaluate the long term effects on local existing wells (considering the proposal for new wells to be drilled into a deep aquifer.)? If so, what are the results?*

Yes, extensive modelling and analysis was completed on the various aquifers in the overall area and is documented in the Hydrogeological Study associated with the Class EA.

Please refer to the attached Fact Sheet # 1 associated with Water Supply.

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 # 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 # 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 30th Peak Hour of traffic throughout a year and similarly for urban roads a design of between the 10th and 20th 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.

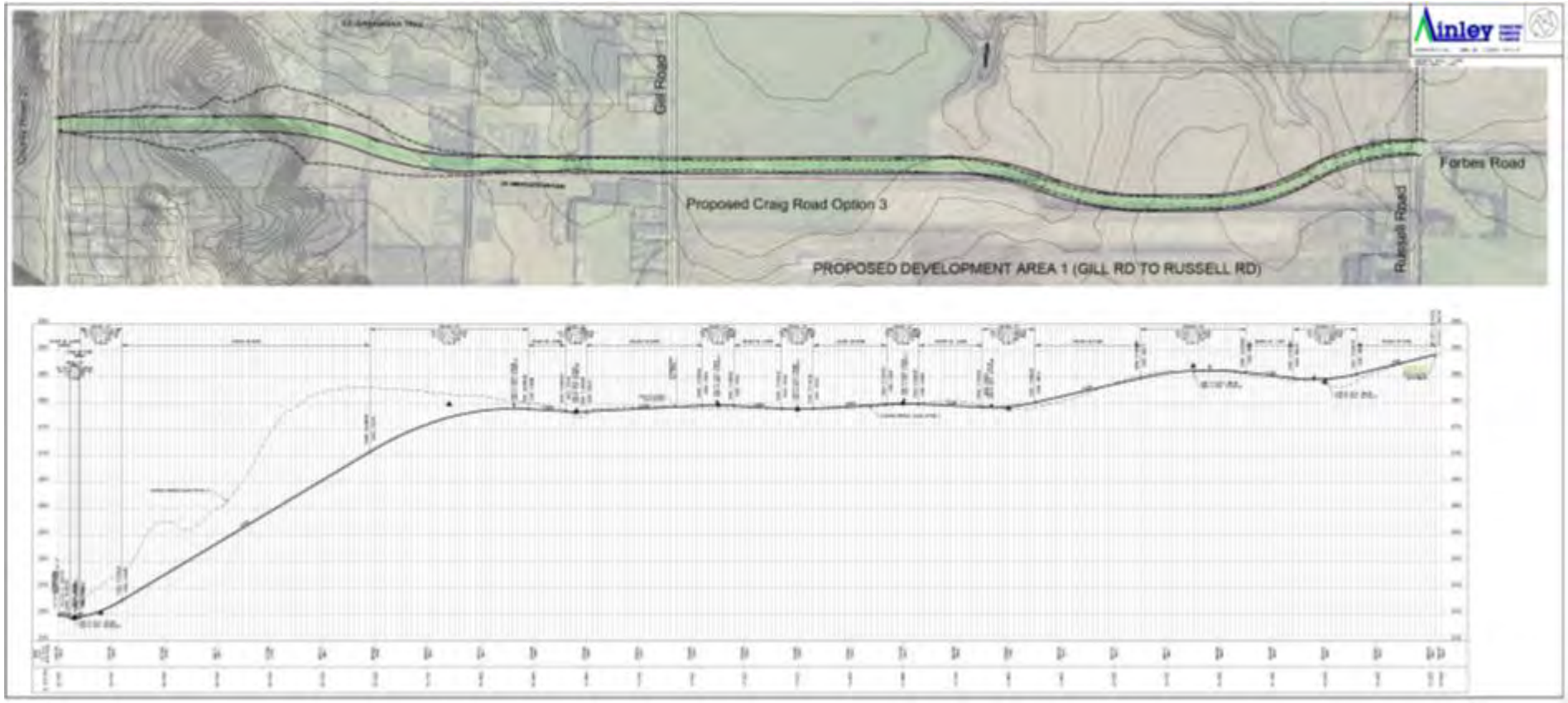
6) This proposed alignment (Alternative No. 3) will have no impact on the existing trails in the area and in particular the Ganarska Trail. In addition, the proposed design for Craig Road Extension allows for the construction of a multi-use trail that could provide additional interconnection with the 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



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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. and [redacted]

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.

- *Suggests that comment sheets should be mailed to people in the village in conjunction with the notification.*

Comment Sheets were available at the Public Information Centre (PIC) for attendees to fill out while at the meeting or take with them and mail/email them back to us later. However, we would accept comments from all interested parties in any form (letter, email hand written notes) and they did not specifically need to on the Comment Sheet available at the PIC, but we will consider your suggestion in future.

- *Worried about increase in traffic/noise/air pollution.*

Please refer to the attached Fact Sheet # 5 associated with Existing and Proposed Traffic in Midhurst and # 6 associated with Craig Road Extension.

- *Concerned about runoff/drainage issues – effect on water sources including Willow Creek, Minesing Swamp, Little Lake.*

Please refer to the attached Fact Sheet # 3 associated with Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs) # 4 associated with Willow Creek and Minesing Wetland. Independent of this Class EA, a comprehensive Stormwater Drainage Study is being completed in conjunction with the NVCA for the Midhurst Secondary Plan.

- *Impact on rural wells from the excavations.*

Please refer to the attached Fact Sheet # 1 associated with Water Supply.

- *Will Belmont Crescent be disturbed to install new water or sewer infrastructure?*

There is no new Municipal Water or Sewer infrastructure planned along Belmont Crescent.

- *Does not want to incur cost of connecting to Municipal sewer system.*

It is the current Council's position that the existing residents of Midhurst will not be required to connect to the proposed Wastewater Treatment Facility.

- *Information should be passed along by more than just word of mouth or meetings.*

While it was unfortunate that you were not able to attend the PIC, all the documentation that was available at the PIC, was posted to the Township website for individuals such as yourself who were not able to attend.

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 # 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 # 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.

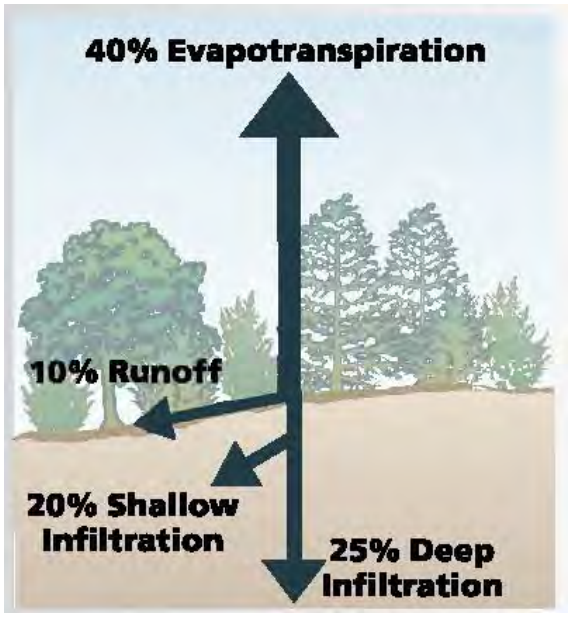
2) LID Provides many environmental and economic Benefits

- 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.

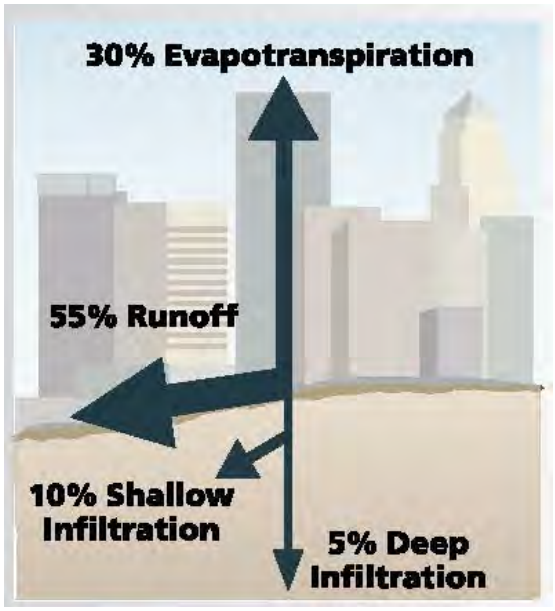
Fact Sheet # 4: Low Impact Development (LID)

- 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

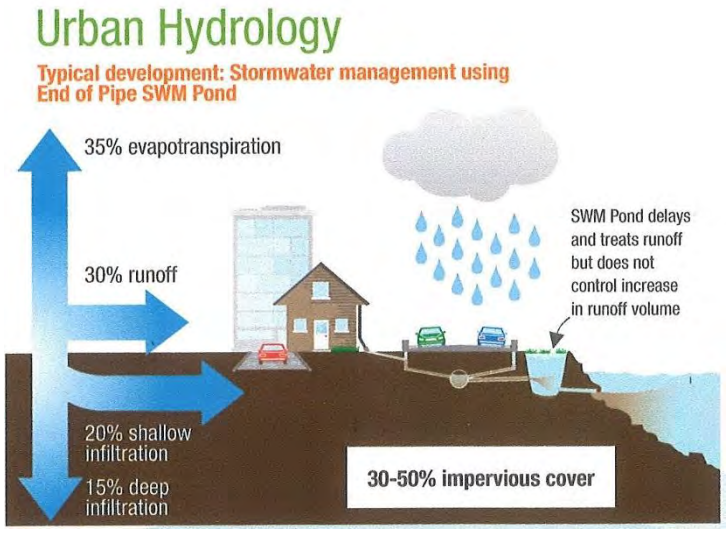


Typical Post-Development Stormwater Flows with No LIDs

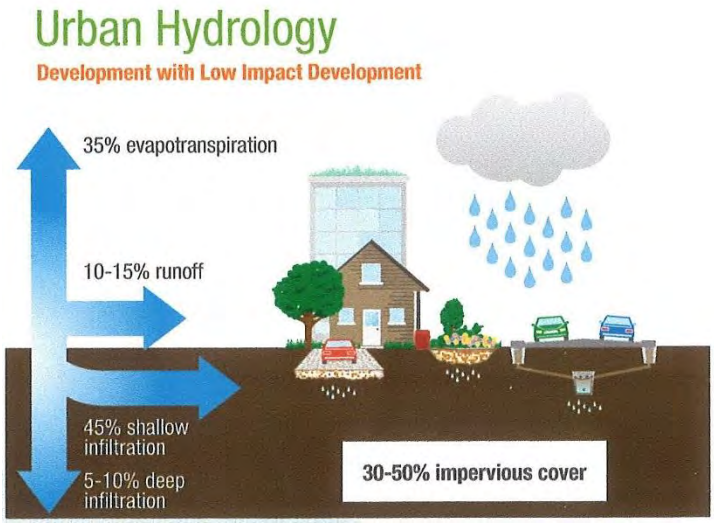
Fact Sheet # 4: Low Impact Development (LID)

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 30th Peak Hour of traffic throughout a year and similarly for urban roads a design of between the 10th and 20th 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.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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.

- *Can the Minesing Wetlands maintain or improve its' ecological features and functions with the current level of Phosphorus loading, or does this need to be reduced form the existing levels, rather than adding a new source of Phosphorus from the proposed Wastewater Treatment Plant (WTP)?*

Please refer to the attached Fact Sheet # 3 associated with Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs) # 4 associated with Willow Creek and Minesing Wetland.

- *How are the impacts of Climate Change, including changes in annual rainfall amounts and in the frequency, severity and duration of storm events, properly assessed for the impacts of this project on the Minesing Wetlands?*

This Class EA process is being completed to identify the Water, Wastewater and Transportation infrastructure that will be necessary to accommodate the Midhurst Secondary Plan and in particular OPA 38. Independent of this Class EA, a comprehensive Stormwater Drainage Study is being completed in conjunction with the NVCA for the Midhurst Secondary Plan. The impacts of climate change are being considered in that study.

- *What are the impacts of an increase in total flow in the Willow Creek of about 1/3 on the physical nature of the creek channel, on erosion and on downstream siltation, which is a long time issue for the creek and the downstream wetlands?*

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 particular 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 0.01 to 0.03m and average increased velocity of 0.01 m/sec, changes that would be virtually immeasurable in Willow Creek.

- *What are the impacts of the warmer temperature of the effluent from the WTP on the base flow of the Willow Creek and Minesing Wetlands and the creatures that live in this wetland complex?*

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 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.

- *How can the project ensure that there will be no downstream impacts from contaminant discharges, including all exotic chemicals, pharmaceuticals, hormones, heavy metals, microbeads, other commercial or household chemicals, etc. either from sewage or storm runoff?*

Please refer to the attached Fact Sheet # 3 associated with Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs).

- *How and where will the biosolids from the WTP be managed to ensure no downstream impacts from contaminants on the Willow Creek and Minesing Wetlands, and no impact on the health of flora or fauna who may come in contact with them when these biosolids are ultimately spread on the land or otherwise disposed of?*

The biosolids will be contained within tanks that will be designed and constructed in accordance with industry standards and will have 240 days of storage capacity. The disposal of the biosolids will be handled by Provincially regulated haulers and spread on land that have also received Provincial approval.

- *How can the engineering of this project demonstrate that there will be a reduction rather than an increase in the amount of wildlife mortality with the additional roads and increased traffic and widening of existing roads? What measures will be taken to achieve this? How will greatly increased traffic on St. Vincent St. impact the Little Lake/Willow Creek Provincially Significant Wetland and movement of wildlife through this corridor and what measures will be taken to reduce wildlife mortality?*

During detailed design of external roads, such as St Vincent St, input will be sought from NVCA regarding wildlife mitigation measures and patterns. The details that could be incorporated into the design, include appropriate warning signs, special fencing and/or dry culverts specifically for small animals and/or reptiles to cross the street.

- *What consideration has been given to the impact of traffic on the safety of cycling along St. Vincent St. into Barrie, as well as the impact of much heavier traffic along the St. Vincent St. corridor on the residents of Barrie? These questions should have regard to the other north/south corridors linking Midhurst to Barrie.*

The proposed cross-section for St. Vincent Street results in a road platform width only marginally wider than the existing roadway. For the portion of St. Vincent Street between City of Barrie and Willow Creek it is anticipated that a 1.5m± metre wide paved shoulder on each side of the road would be proposed for use by pedestrians and bicycles. North of Willow Creek the proposed cross-section includes sidewalk and bicycle lanes in an urban cross-section.

- *How have other alternatives been considered and evaluated, including less growth and alternative locations for growth which would have a lesser or no impact on the Minesing Wetlands and Willow Creek?*

On November 28, 2012, the Ontario Ministry of Municipal Affairs and Housing withdrew part of its appeal of the Midhurst Secondary Plan. As a result of the Ministry's partial withdrawal, 300 hectares out of the total 756 hectares proposed to be re-designated "urban" in Official Plan Amendment (OPA) 38 were cleared for development. The remaining 456 hectares and all related policies to OPA 38 will remain under appeal at the OMB.

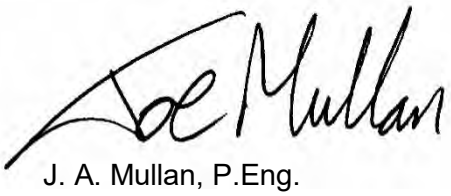
As such this Class EA process is being completed to identify the Water, Wastewater and Transportation infrastructure that will be necessary to accommodate the Midhurst Secondary Plan and OPA 38.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. and Mrs. [redacted]

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.

- *Feels that the increased traffic volume will compromise the safety of the residents of Mills Circle (on County Rd 27). Cites danger of making a left turn into the subdivision and the lack of bike lanes. Wants left turn lane on County Rd 27.*

The Intersection of Mills Circle and County Road 27 is over 1 km away from the proposed intersection of Craig Road Extension and County Road 27. Therefore we do not foresee the proposed Craig Road Extension having an impact on Mills Circle. However, we understand the Township will be having discussions with the Simcoe County (Operating authority for County Road 27) about the Mills Circle & County Rd 27 intersection and if any modifications could be made to improve it.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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.

- *Concerns with traffic flow through Midhurst.*

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. The resulting traffic is within the capacity of the roadways and where it is not proposed improvements along selected existing roads have been designed to accommodate those increases. The proposed extension of Craig Road as an extension of Forbes Road to County Road 27 provides an attractive route for existing and future development traffic to avoid the downtown area of Midhurst.

- *Improved intersection at Forbes Rd and Hwy 400 may attract more traffic through Midhurst. Need peer review of Traffic Study.*

The extension of Craig Road from Russel Rd to County Rd 27 is now proposed in conjunction with Phase 1 - Stage 1. This new road, which will be constructed prior to any improvements at the Forbes Road and Hwy 400 Intersection, will create a main arterial road that provides a direct, controlled access, connection between Hwy 400, Hwy 26/Cty Rd 27 & Hwy 93. This new road also provides 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.

- *Models used for Traffic Study were based on existing urban centre buildout behaviour. Expansion in Midhurst is rural. Traffic will migrate to Bayfield and St. Vincent (not to Hwy 400) in order to access shopping in Barrie.*

Our traffic model assumes approximately two thirds of the southbound traffic from Doran North will use Highway 400. The rest is distributed to St. Vincent (10%) and Finlay Mill Rd to Hwy 26 (10%) and to Craig Road to County Road 27 (15 %). For Doran South the model assigns approximately two thirds of southbound traffic to Highway 400 and the rest to St. Vincent (20%) and Findlay Mill Road to Highway 26 (15%). In our opinion we have included a significant percentage of the trips to the shopping/business area of Bayfield Street.

Southbound traffic, is considered to be traffic headed to downtown Barrie or along the commercial area along Bayfield Street as well as commuter traffic headed south on Highway 400. We conducted some rudimentary time trials for travel from Doran Road between Russell Road and St. Vincent Street to get to the intersection of Bayfield Street and Highway 400. The quickest route was found to be Russell Road to Forbes Road to Highway 400. Our traffic model acknowledges that commercial area along Bayfield Street and downtown Barrie are significant portion of the southbound trips but destinations accessed by Hwy 400, south of the Bayfield Street & Hwy 400 intersection are better served by getting on Hwy 400 at Forbes Road.

We assigned approximately half of the southbound traffic based on the draw of those destinations. We may have overestimated the percentage drawn to St. Vincent and Bayfield Streets but this will present a conservative approach maximizing the estimated impact on those routes and not overstate the benefit of the improved link to Forbes Road and Highway 400.

- *Major recent shift in the north-east end of Barrie will attract new Midhurst residents to use St. Vincent St. Need more proof that modelling which may be outdated is correct. May require new independent study.*

The recent development in the north-east end of Barrie (Duckworth St & Cundles Rd) is predominately commercial development (commercial stores and restaurants) and the traffic patterns associated with such development will be different and not coincide with the normal AM and PM Weekday Peaks that have been modelled coming out of and going into Midhurst.

- *Concerned that effluent focus is on Phosphorus and Nitrate as the main criteria. Also that in a low flow situation, the effluent will represent 25% of the stream flow.*

The reports have highlighted phosphorus and nitrate as these are two of the mains contaminants that are know concerns; however, the reports also identify several other discharge criteria that the Wastewater Treatment Plant will have to meet, in accordance with Provincial requirements.

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 of 0.01 m/sec, changes that would be virtually immeasurable in Willow Creek and would have no effects on erosion.

- *Needs proof that adding 143 kg of phosphorus a year is acceptable.*

With use of Low Impact Development (LID) measures throughout the Midhurst Secondary Plan, the phosphorus loading associated with the stormwater will be reduced from the Pre-Development levels which reduces the net load loading from the new Wastewater Treatment Plant from 143kg/day to 66kg/day which (conservatively) represents less than 0.5% of the current phosphorus load flowing through the Minesing Wetland on an annual basis.

In addition, 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 by the MOECC through 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 from other sources and therefore, offset the additional load from the new Wastewater Treatment Plant and ensure no negative impact on the watershed.

- *Pharmaceuticals, nano silver and other micro organisms and such ingredients may exceed the current water system assimilative capacity.*

Please refer to the attached Fact Sheet # 3 associated with Pharmaceuticals & Personal Care Products (PPCPs) and Endocrine Disrupting Compounds (EDCs).

- *What will be the impact of another 30,000 people have on the natural eco system of the of the Minesing Wetlands? Needs more assurances.*

Please refer to the attached Fact Sheet # 4 associated with Willow Creek and Minesing Wetland.

- *EA, to be acceptable, must address all aspects of protecting and improving a truly sustainable system which means responding and confirming that the Economic, Environmental and Social wellbeing of all of us is protected.*

The Class Environmental Assessment process is a Provincially regulated process and has an extensive proven track record of dealing with and resolving Economic, Environmental and Social impacts. However, when considering the Economic, Environmental and Social impacts these must be measured against Provincial and or Industry Standards to determine if there is an impact.
For example, when considering the impact of increased traffic on an existing road, we review the proposed traffic volume against the “Industry Standard” capacity for that particular class of road and if the proposed traffic is within the value, then the Social and/or Economic impacts are noted as acceptable. When considering the additional Water demand and/or additional Wastewater load we must measure these against Provincial requirements and if they are within those then the Environmental and/or Social impacts are noted as acceptable.

- *fully supports … requesting independent studies from other agencies to ensure that we are not undertaking a venture that will have long term irreversible negative impact on the world renowned Minesing Wetlands.*

When the Draft Environmental Study Report (ESR) is submitted to the Ministry of Environment and Climate Change (MOECC) prior to being finalized, they will conduct a comprehensive Review and provide comments back to the Township.

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. Maxime Picard, B. Sc. A.
Coordonnateur de Projets - Ontario
Nation Huronne-Wendat
255, Place Chef Michel-Laveau
Wendake, Quebec
G0A 4V0

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. Picard:

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.

- *We would like to ask for the shapefiles of the study zone. Is that something you could provide?*

Unfortunately, shapefiles are not available, however all information regarding the Class EA project can be found on the Township website (http://www.springwater.ca/cms/one.aspx?pageId=4779649).

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. Lori Loucks
Core Consultation Worker
Hiawatha First Nation
123 Paudash Street
Hiawatha, Ontario
K9J 0E6

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. Loucks:

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.

- *The correspondence Hiawatha FN has received is not considered meaningful consultation but rather information sharing.*
- *Proposed project is deemed to have little, if any, impact on Hiawatha FN's traditional territory and/or rights. Hiawatha FN requests that they be contacted if archaeological artifacts are found as they require their trained archaeological liaisons be present at the archaeological sites during the assessments. Please forward any archaeological reports as they are completed.*
- *Any maps pertaining to the project should be sent to Hiawatha First Nation in a shape file.*

Unfortunately, shapefiles are not available, however all information regarding the Class EA project can be found on the Township website (http://www.springwater.ca/cms/one.aspx?pageId=4779649) Hiawatha FN will be notified if any archaeological artifacts are found.

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. Hollie Nolan
Executive Assistant to the Chief, Administration
Chippewas of Rama First Nation
hollien@ramafirstnation.ca

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. Nolan:

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.

- *Letter has been reviewed and shared with Council and forwarded to Karry Sandy McKenzie, Williams Treaties First Nation Process Coordinator/ Negotiator. Ms McKenzie to review and take necessary action if required. In future, contact Ms. McKenzie directly at k.a.sandy-mckenzie@rogers.com*

Thanks for your comments and Karry Sandy McKenzie was also sent a copy of the Notice as part of the mass mailing on September 19, 2016.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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.

- *Gravely concerned regarding the potential impacts which the water, wastewater and transportation infrastructure this project proposes will have on our drinking water, air quality, farmland and the environment. "….measurable regulatory requirements are incapable of adequately protecting our drinking water, air quality, farmland and the environment."*

On November 28, 2012, the Ministry of Municipal Affairs and Housing (MMAH) withdrew part of its appeal of the Midhurst Secondary Plan. As a result of, the Ministry's partial withdrawal, 300 hectares out of the total 756 hectares proposed to be re-designated "Urban" in Official Plan Amendment (OPA) 38 had Draft Plan Conditions development and were cleared for development. The remaining 456 hectares and all related policies to OPA 38, will remain under appeal at the OMB.

Further to this, the stormwater runoff from the proposed Midhurst Secondary Plan Developments must comply with the 2012 Ontario Municipal Board (OMB) Minutes of Settlement between the NVCA and the Developers Group. These Minutes of Settlement include, but are not limited to, the following requirements:

- The stormwater management systems are to hold back the first 25 mm of storm runoff for a period of 48 hours;
- 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;
- Reduction in 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.

These requirements will be met with the implementation of extensive Low Impact Development (LID) measures which mimic a site's pre-development hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source. In addition, these requirements which greatly exceed the standard MOECC and/or NVCA requirements for stormwater, have been set to

ensure that the proposed developments will not have an impact on the Willow Creek or other downstream receivers.

- *Demands that there be no negative impacts. Requests that all new development create a net improvement to all environmental systems such that the pre-settlement function of these natural systems be realized.*

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;
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.

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. 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.

The Midhurst Developers Group is committed to working with the NVCA to achieving a net-zero increase in phosphorus, if required by MOECC.

- *Science does not yet know any measurable acceptable limits to changes in the Hines Emerald's dragonfly groundwater sources. "…taking of groundwater…and dumping of wastewater effluent and stormwater into the surface water systems….must not be tolerated until the science is developed to measure and assess the impacts of those changes on the Springwater sources of the existing and potential Hine's Emerald habitats."*

- *"...demand that the post development quality and quantity of groundwater recharge and of stormwater and wastewater discharge from the area being developed will be proven to be restored to that of pre-human development."*

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 predicts a maximum potential drawdown of 1mm in the groundwater table near the HED habitat as a result of operating the water supply wells for the development. 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 and Associates indicated a maximum surface water level decrease of less than 1 mm in the menacing wetland over a ten-year period at full development build out. Therefore, with respect to the regulated HED habitat that he 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 have 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.

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.

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 Willow Creek or Minesing Wetlands will not be detrimentally impacted.

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.

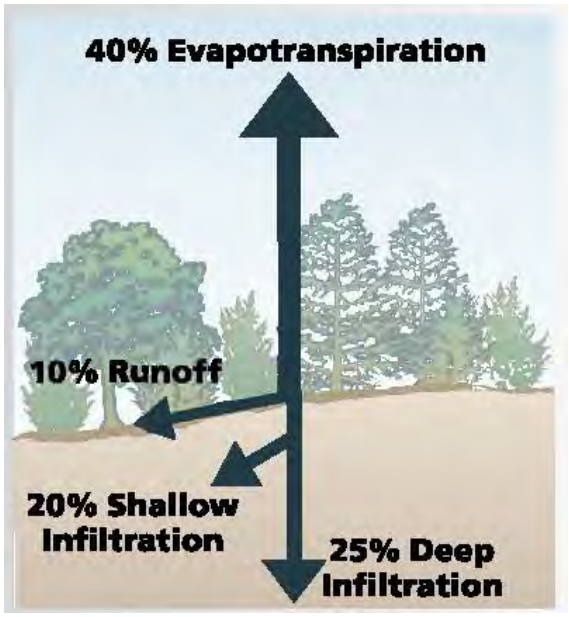
2) LID Provides many environmental and economic Benefits

- 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.

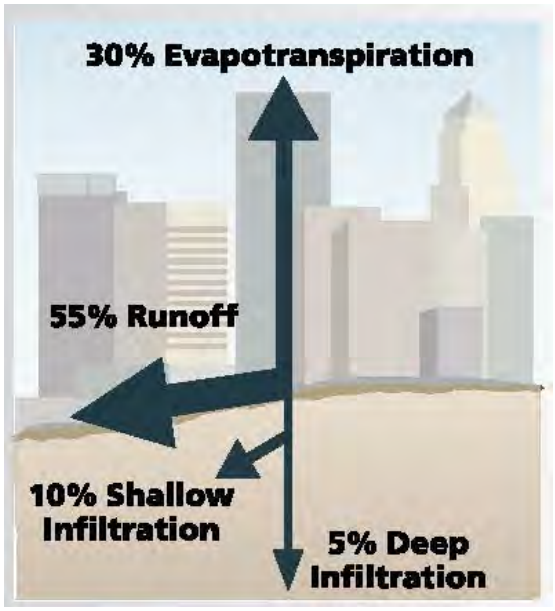
Fact Sheet # 4: Low Impact Development (LID)

- 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

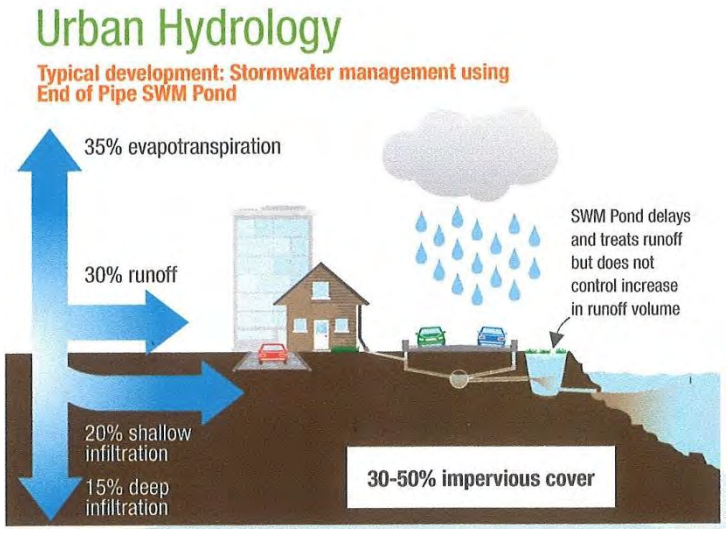


Typical Post-Development Stormwater Flows with No LIDs

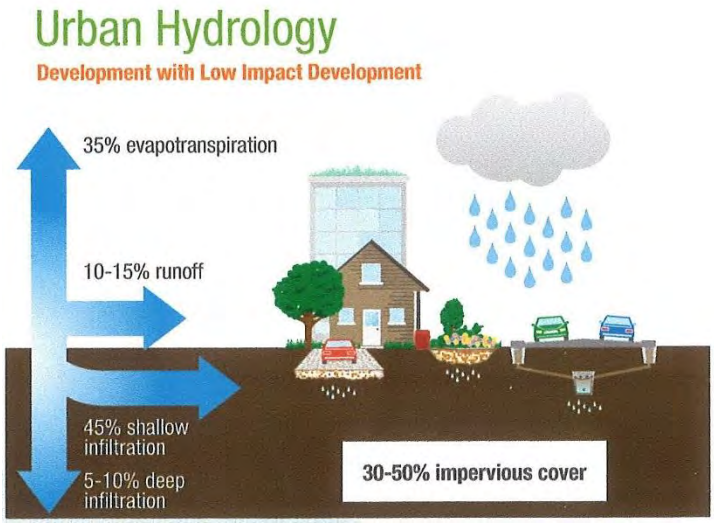
Fact Sheet # 4: Low Impact Development (LID)

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.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. [redacted]

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.

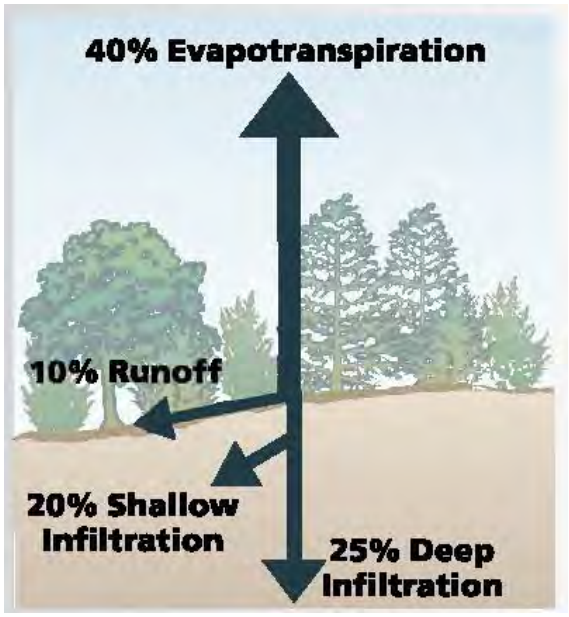
2) LID Provides many environmental and economic Benefits

- 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.

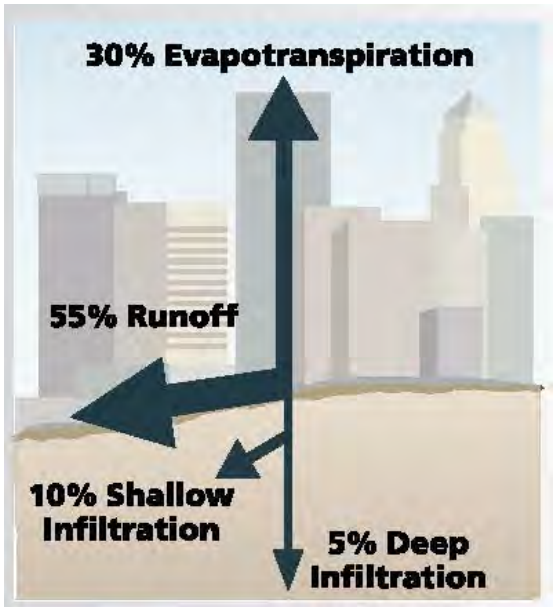
Fact Sheet # 4: Low Impact Development (LID)

- 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

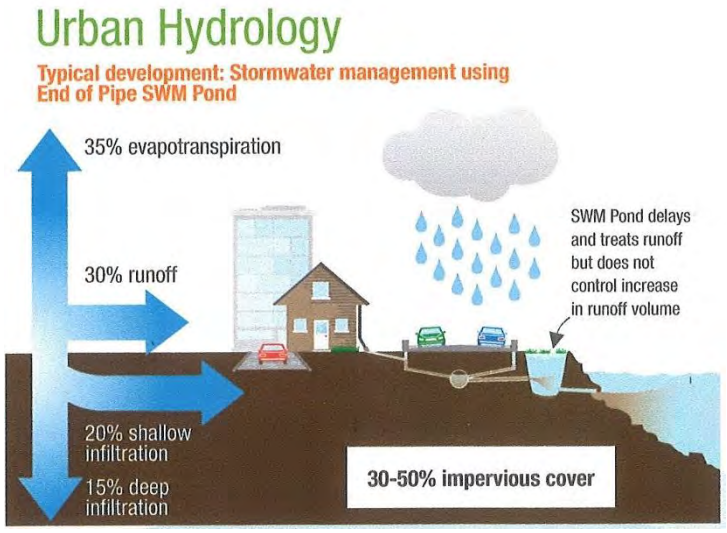


Typical Post-Development Stormwater Flows with No LIDs

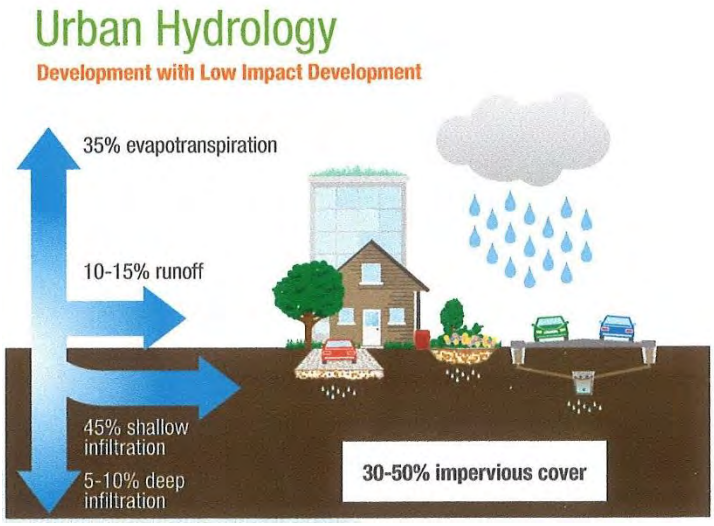
Fact Sheet # 4: Low Impact Development (LID)

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 30th Peak Hour of traffic throughout a year and similarly for urban roads a design of between the 10th and 20th 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.

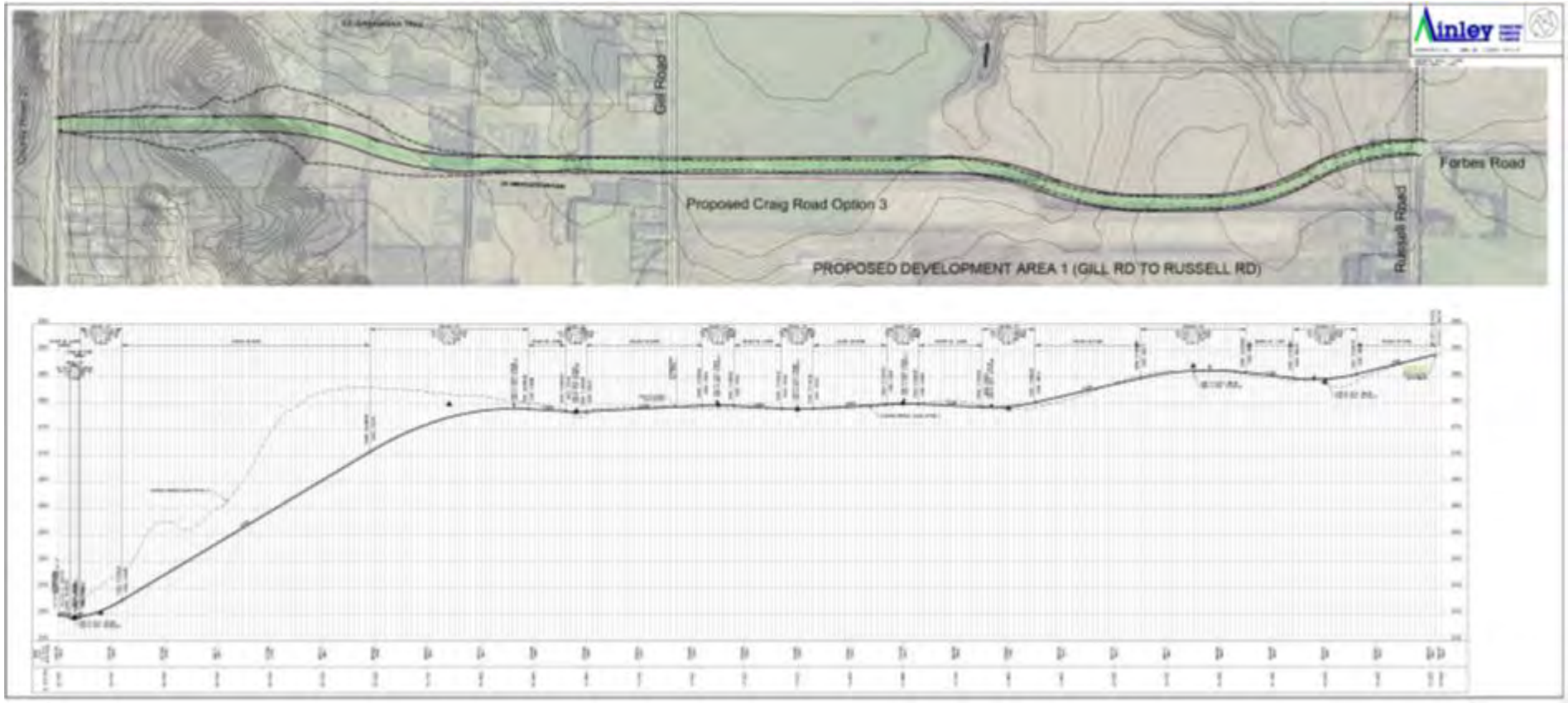
6) This proposed alignment (Alternative No. 3) will have no impact on the existing trails in the area and in particular the Ganarska Trail. In addition, the proposed design for Craig Road Extension allows for the construction of a multi-use trail that could provide additional interconnection with the 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



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

February 24, 2017

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr.[redacted]

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.

- *Water well at the corner of Russell Road and Storey Road in Midhurst that has not been caped or decommissioned. If you could email us with updates regarding this issue that would be great.*

Thank you for your comments, the test well has been caped and locked.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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.

1. ***The effects of diverted bypass traffic through the community of Midhurst due to Craig Road implementation were not taken into account in the traffic analysis. It is anticipated that that a reduction in traffic volumes on the existing road network would occur, which may affect recommendations made for road widening and intersection improvements.***

In general, the claim for diversion of traffic from Finlay Mill Road due to the Craig Road alternate route was in reference to the weekend traffic getting off Hwy 400 which is not a timeframe used for the analysis of the various intersections. Craig Road will provide an alternate route for Doran Road area development to reach CR 27/Hwy 26 other than Finlay Mill Road. The widening of Russell Road to 4 lanes is required to provide traffic from the new development areas easier and quicker access to Hwy 400 in lieu of using the Pooles Road, St. Vincent Street, etc. However, even with both in place (Craig Road & 4 Lanes on Russell) the developments still results in a significant increase in weekday traffic on Finlay Mill Road and other key existing streets in Midhurst.

2. ***Several roadways were proposed for full urbanization and reconstruction throughout the horizon timeline. It is recommended that alternative cross sections with reduced impact to the existing community be considered. In particular, rural cross-sections can be implemented while achieving capacity and active transportation objectives.***

The detailed analysis that was completed in advance of the Public Information Centre (PIC) related to the type of road reconstruction was based on the results from the Phase 1 & 2 Master Plan that all road reconstructions would be to a “full urban cross-section” with curbs, storm sewers. However, with more detailed review and consideration other keys items including promoting stormwater infiltration with the use of open ditches and keeping the existing character of the neighbourhoods, we are now undertaking evaluating the need for full urbanization versus rural cross-section on a street by street basis. In completing this more detailed analysis we also have to take in the consideration the need for sidewalk(s) and/or bicycle lanes on each specific street. We will endeavour to outline the proposed cross-sections for each street in the ESR.

We acknowledge the concern and agree that issues and the need for compromise may arise during detailed design. From comments received from the PIC we have revisited many of the proposed cross-sections for improvement to existing roads and have proposed paved shoulders on a rural cross-section as a suitable active transportation feature and is generally more easily adapted within the existing ROW and grading constraints. As noted at the PIC we are committed to providing an interconnected Active Transportation Network. Some routes such as Finlay Mill Road it may not be physical possible to accommodate bike lanes. We will endeavour to outline that option in the ESR.

3. ***Active transportation objectives can be achieved without requiring full urbanization of roadways. In particular, distance-to-destination should be considered for implementation of pedestrian facilities and target cyclist demand. Widespread urbanization of roadways will also decrease the rural character of the Midhurst community, particularly if a rural alternative can be implemented while meeting comparable transportation engineering alternative. Accordingly, alternative cross sections should be considered for roadways such as Craig Road, Forbes Road, Russell Road, St. Vincent Street and segments of roadways outside of the built boundaries lacking destinations within reasonable travel distance for pedestrians and cyclists.***

The active transportation objective was to interconnect existing and proposed trails, bike routes and general pedestrian accommodation. The proposed bike lanes on St. Vincent, Wilson, and Carson accommodate proposed extensions of bike routes northwards by the City of Barrie at some time in the future. Bike routes, sidewalks and or multi-use trails or paved shoulders along Snow Valley Road, Russell Road, Craig Road, Doran Road and Pooles Road provide connectivity between the development hubs with the rest of Midhurst and existing trail systems behind the County buildings on Highway 26, the Ganaraska Trail and the Anne Street corridor trail between Carson Road and Hwy 26.

4. ***The benefits of the Craig Road Extension to existing users should be considered in its implementation. In addition, the benefit of active transportation infrastructure implementation on Finlay Mill Road should also be considered. These roadworks will provide greater benefits to existing users and residents as compared to those of the proposed development. Accordingly, this should be considered when evaluating shared costs and improvement to existing community.***

With regard to Craig Road Extension see the response provide above.

With regard to active transportation there is a commitment to having an interconnected Active Transportation Network for the overall community which includes sidewalks and/or bike lanes. However, we acknowledge challenges that this will create and as part of our more detailed review of each street we are including alternatives such as a 2 metre paved shoulders to accommodate bicycles and pedestrians in lieu of the traditional 1.5 metre concrete sidewalk.

5. ***Multiple Comments within Attachment No. 1***

Attachment No.1, is the same as the official letter received from the Midhurst Developers Group; therefore, see Item #63 for response comments.

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

Chris Hibberd, MCIP, RPP, Director, Planning Services
Nottawasaga Valley Conservation Authority
8195 8th Line, Utopia Ontario
L0M 1T0

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. Hibberd:

We are responding to your email of November 2, 2016 in which you request a response to comments provided by the NVCA on May 29, 2013. As you are aware, a Phase 3 Public Information Centre (PIC) was held at Snow Valley Resort on October 18, 2016. Numerous information "Boards" were presented to the public outlining the proposed servicing projects for the Midhurst Secondary Plan area. These "Boards" can be found on the Township website.

The Class EA planning process is now in a position to provide responses to the NVCA comments/questions. We have reprinted the original comments/questions and our responses are numbered in accordance with the NVCA's letter of May 29, 2013.

1. ***Is there enough water supply available for use without impacting local aquifers, watercourses, local wetlands and fisheries?***

   The Hydrogeological Study (prepared by Golder & Associates) assessed potential impacts of the future water takings on groundwater receptors. The 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 (pumping) tests; and the use of a regional-scale, transient numerical model to assess the potential for future groundwater impacts. The Study concluded that the future water supply pumping was sustainable and would not result in adverse impacts to the aquifer system and associated groundwater receptors such as Minesing Wetland and Willow Creek.

   In addition, the Hydrogeological Study concluded that the proposed groundwater extractions for the Midhurst Development are from Aquifers A3 and A4, which are deep units with limited hydraulic connectivity to the shallow aquifers (A1 and A2), which provide the primary source of groundwater to the Minesing Wetland and associated surface water features. It was also concluded that baseflow losses would be <10% in Willow Creek over the course of the year and these would reduce stream flow by 3.3% (March) to 7.2%. Fisheries and Oceans Canada (2013) concludes that flow alterations below 10% have a low probability of detectable impacts to aquatic ecosystems. The predicted stream flow reductions of 3.3-7.2% are below the DFO threshold of 10% and so there will be no impact on fisheries resulting from the potential interaction of groundwater taking with surface waters.

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?***

   The Hydrogeological Study focused on the hydrogeological investigations. In particular, the water supply system design as it is currently envisioned will include seven supply wells at four locations. As part of the Hydrogeological Study, five pumping tests were conducted to evaluate water supply aquifer properties and also to assess the potential for impacts to surface water receivers by monitoring water levels in shallow aquifer A1. No water level response was observed in any of the shallow aquifer monitors during pumping. Thereafter, a regional-scale, transient numerical model was utilized to assess the potential long-term impacts of full build-out pumping to surface water receptors. It was found that baseflow changes were minor with less than 10% reduction at Willow Creek and less than 6% reduction at Minesing Wetland.

3. ***Is there enough water quality information available to understand the Willow Creek system?***

   Yes, water quality information was summarized from the MOECC Provincial Water Quality Monitoring Network (PWQMN) station 03005703002 (Willow Creek at Hwy. 28, 13 years of data – 2002 to 2014) and field investigations at: 1) six sampling locations in Willow Creek in 2013, 2014 and 2016; 2) four sampling locations in Black Creek; 3) three sampling locations in Matheson Creek; and 4) three sampling locations in an unnamed tributary that empties into Little Lake over 6 sampling events in 2008, 7 sampling events in 2015 and 8 sampling events in 2016. Information on streamflow was summarized from Water Survey of Canada (WSC) Station 02ED032 (Willow Creek near Minesing; 10 years of data – 2006 – 2016). This data informed the preparation of an Assimilative Capacity Study for Willow Creek, and characterized baseline conditions for the Adaptive Management Plan. All water quality samples were analyzed for a full suite of chemical parameters and loads of individual parameters were calculated through assessment of recorded stream discharge data.

4. ***How will the sewage treatment plant conform with the Intergovernmental Action Plan (IGAP), particularly related to phosphorous and assimilative capacity?***

   The Intergovernmental Action Plan (IGAP) for Simcoe, Barrie and Orillia was completed in 2006. The IGAP recommended fully-serviced settlement areas, and growth areas which “maintained watershed health by implementing initiatives and best practices”. The effluent limits for the proposed Midhurst wastewater treatment plant (WWTP) were developed through analysis of the assimilative capacity of Willow Creek (Willow Creek Assimilative Capacity Study, HESL, May 2016) and will maintain water quality at or below the PWQOs. The Midhurst Secondary Plan Area will thus be fully serviced and best practices for wastewater treatment will maintain watershed health.

   In the case of total phosphorus (in which 75th percentile Willow Creek concentrations are above the PWQO), state of the art treatment technologies are proposed to achieve effluent limits of 0.05 mg/L (Phase 1) and 0.03 mg/L (Full Build Out). These are currently some of the lowest TP limits in the Province of Ontario and the limit of 0.03 mg/L is below the current 75th percentile TP concentration of 0.031 in Willow Creek.

5. Will the effluent result in elevated total phosphorous in Willow Creek and the Nottawasaga River?

There will be no measurable increase in total phosphorus (TP) concentrations in Willow Creek or the Nottawasaga River at Full Build Out of the Midhurst Secondary Plan Area.

Willow Creek is a Policy 2 receiver for TP since 75th percentile creek concentration of 0.031 mg/L is above the Provincial Water Quality Objective (PWQO) of 0.03 mg/L. At Phase 1 WWTP effluent flows and a TP effluent limit of 0.05 mg/L, Willow Creek downstream concentrations would increase slightly to between 0.032 and 0.034 mg/L. At Full Build Out and a TP effluent limit of 0.03 mg/L, Willow Creek downstream concentrations would slightly improve creek TP concentrations to just below the current concentration of 0.031 mg/L. These calculations were completed using the 75th percentile TP concentration in Willow Creek, as calculated from year-round water quality data. Total Phosphorus concentrations in Willow Creek vary seasonally in response to spring freshet and other periods of greater run-off and subsequent sedimentation. The impact of additional loading from the WWTP is minimal in months with existing TP concentrations near the PWQO. In March, the WWTP discharge improves water quality. In the months of January, February, May, August, September, October, and November, existing Willow Creek average TP concentrations were below the PWQO. In all cases, except May minimum flows for Phase 1, the input from the WWTP discharge (at both Phase 1 and Full Build Out levels) did not result in the downstream TP concentration increasing to beyond the PWQO of 0.03 mg/L.

6. Will the sewage outfall aggravate flooding and erosion hazards in Willow Creek?

A fluvial geomorphic assessment of Willow Creek concluded that the addition of the proposed treated effluent discharge would increase water depth by 0.01 to 0.03 m and average velocity by 0.01 m/sec and that bed and bank erosion rates would be unaffected. The addition of effluent will not alter flows beyond their current natural range. The maximum effluent volume of 143 L/sec is <1% of the maximum recorded daily flows (HESL 2016).

7. Will the water quality of Willow Creek, the Nottawasaga River, Georgian Bay and the Minesing Wetlands be protected?

The Willow Creek Assimilative Capacity Study was completed. 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. By protecting water quality in Willow Creek, downstream waterbodies including the Nottawasaga River, Georgian Bay and the Minesing Wetland, will also be protected.

- 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.

8. Have the cumulative impacts of multiple sewage systems outletting into the Matheson/Willow Creek system and the overall Nottawasaga River been considered?

Any impact of septic systems to Willow Creek or the Nottawasaga River are not within the scope of the Midhurst Secondary Plan Area Class EA but our assessment does account for any existing impacts. The Assimilative Capacity Study utilized current water quality information from Willow Creek to inform modelling and the determination of effluent objectives that meet PWQO. The water quality information integrates any impacts of sewage systems that currently outlet into the Matheson/Willow Creek system so effluent objectives have inherently included these and will protect the creek to current levels.
The Nottawasaga River is protected through determination of effluent objectives which meet PWQO for Willow Creek.

9. Will there be safeguards in the sewage treatment plant in case there are upsets/spills or failures in the treatment system?

The Wastewater Treatment Plant will included redundancy to addresses the risk of upsets/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.

10. Will there be thermal impacts to Willow 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 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.

11. Will the fishery be protected?

Potential impacts to the fishery include inputs of stormwater and wastewater. The ACS and determination of effluent objectives will protect fish from deleterious inputs. A habitat assessment was also completed to determine an outfall location that would minimize impacts to fish habitat. Fish assemblages and habitat were characterized through background review and field investigations throughout Willow Creek in 2013, 2014 and 2016. Establishment of accurate baseline conditions is an important component of the Adaptive Management Plan as future monitoring will compare results to baseline conditions and develop mitigation and management plans if required.

In addition, a Storm Water Management Plan will be implemented that is designed to infiltrate the first 20 mm of precipitation which will protect the flow regime and water quality in streams and reduce the temperature of stormwater. Baseline characterization of fish and aquatic habitat has been completed through background review and field efforts at all watercourses where stormwater will be discharged, including four sampling locations in Black Creek, three sampling locations in Matheson Creek, and three sampling locations in an unnamed tributary that empties into Little Lake over 6 sampling events in 2008, 7 sampling events in 2015 and 8 sampling

events in 2016. These monitoring efforts have characterized baseline conditions and will be used to inform the Adaptive Management Plan.

12. Will Source Water Protection be addressed?

Yes, the key aspects of source water protection, including future wellhead protection areas, aquifer vulnerability, well interference, groundwater recharge and changes to groundwater baseflow are discussed in Appendix M of Hydrogeological Study. An Assessment Report and Source Water Protection Plan as per the Technical Rules will be prepared when the project is approved and the water supply system adopted by the Township of Springwater.

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.

A comprehensive monitoring program has been completed which characterizes baseline information in Willow Creek and its tributaries. Water quality information was summarized from the MOECC Provincial Water Quality Monitoring Network (PWQMN) station 03005703002 (Willow Creek at Hwy. 28; 13 years of data – 2002 to 2014) and field investigations by HESL staff at: 1) six sampling locations in Willow Creek in 2013, 2014 and 2016; 2) four sampling locations in Black Creek; 3) three sampling locations in Matheson Creek; and 4) three sampling locations in an unnamed tributary that empties into Little Lake over 6 sampling events in 2008, 7 sampling events in 2015 and 8 sampling events in 2016. Information on streamflow was summarized from Water Survey of Canada (WSC) Station 02ED032 (Willow Creek near Minesing10 years of data – 2006 – 2016).

This data informed the completion of an Assimilative Capacity Study for Willow Creek, and characterized baseline conditions for the Adaptive Management Plan. All water quality samples were analyzed for a full suite of chemical parameters and loads of individual parameters were calculated through assessment of recorded stream discharge data. We have also samples of benthic invertebrates, and fish community and documented fish habitat conditions in the watercourses within the Midhurst Secondary Plan Area. These will be fully documented in a baseline conditions report in the spring of 2017.

The baseline data set will allow for comparison with measurements of water quality, water quantity and natural heritage in the future. HESL has completed monitoring associated with water quality, water quantity, fisheries, benthic invertebrates and aquatic habitat, while characterization of the baseline terrestrial environment has been completed by Beacon Environmental. An Adaptive Monitoring Plan has been developed and will be implemented to track future conditions in the study area.

We have also attached several Fact Sheets that have been developed in response to questions at 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.

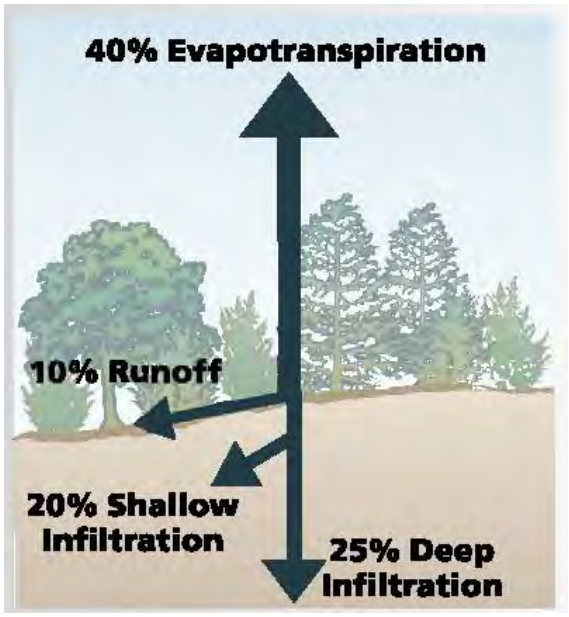
2) LID Provides many environmental and economic Benefits

- 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.

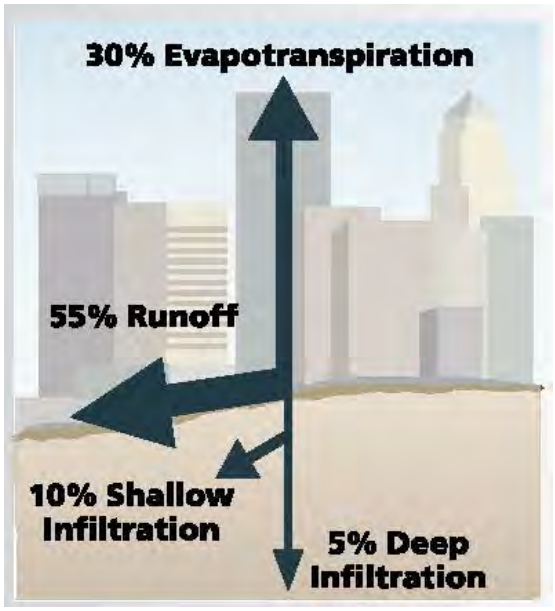
Fact Sheet # 4: Low Impact Development (LID)

- 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

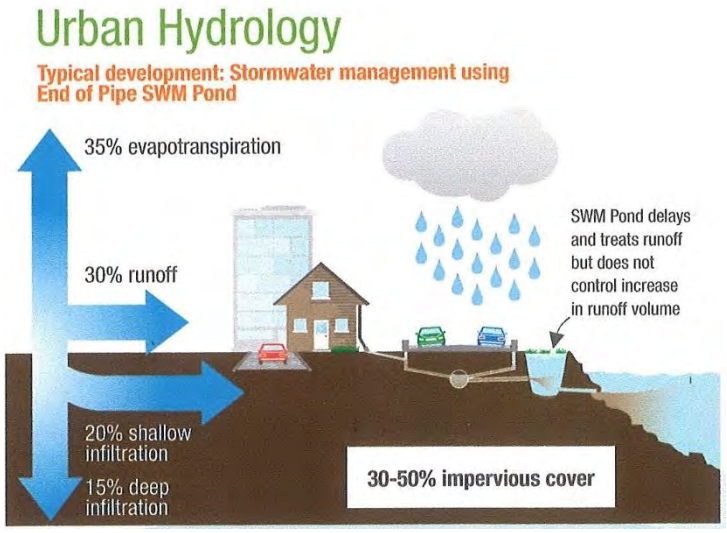


Typical Post-Development Stormwater Flows with No LIDs

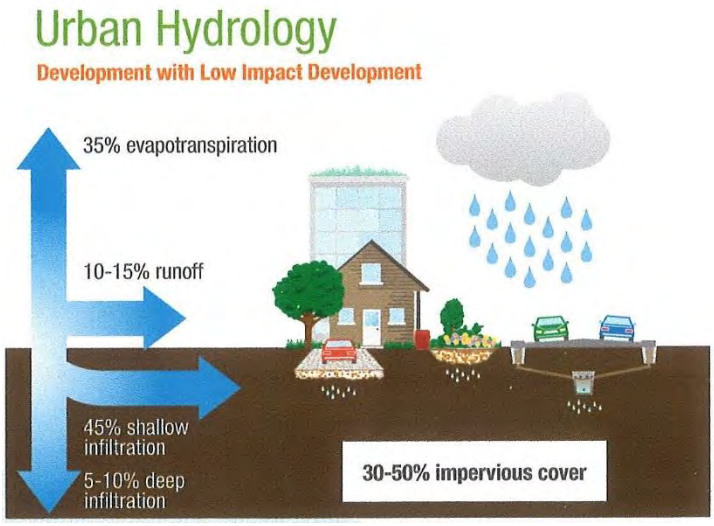
Fact Sheet # 4: Low Impact Development (LID)

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.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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

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. Kim Beckman
Midhurst Landowners Group c/o Group Trustee
Davies Howe Partners LLP
99 Spadina Avenue
Toronto On.
M5V 3P8

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. Beckman

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.

1. ***Reconsider the requirement of full urbanization of 100% of the Roads identified for improvement.***
   Consider other road cross sections for road reconstruction projects.
   Proposes alternate road cross sections for identified streets.

   The analysis that was completed in advance of the Public Information Centre (PIC) related to the type of road reconstruction was based on the results from the Phase 1 & 2 Master Plan that all roads reconstructions would be to a "full urban cross-section" with curbs, storm sewers., etc, etc. However, a more detailed review and consideration other keys items including promoting stormwater infiltration with the use of open ditches and keeping the existing character of the neighbourhoods has been completed on a street by street basis. This includes the evaluating the need for full urbanization versus rural cross-section and/or a hybrid of the two. In completing this more detailed analysis we also have to take in the consideration the need for sidewalk(s) and/or bicycle lanes on each specific street.

2. ***Some flexibility in how active transportation lanes be accommodated should be made in the EA materials.***

   We acknowledge the concern and agree that issues and the need for compromise may arise during detailed design. From comments received from the PIC we have revisited many of the proposed cross-sections for improvement to existing roads and have proposed paved shoulders on a rural cross-section as a suitable active transportation feature and is generally more easily adapted within the existing ROW and grading constraints. As noted at the PIC we are committed to providing an interconnected Active Transportation Network. Some routes such as Finlay Mill Road it may not be physical possible to accommodate bike lanes. We will endeavour to outline the proposed cross-sections for each street in the ESR.

3. ***Separate sidewalks should be provided in areas adjacent to development in order to accommodate walking through residential areas within neighbourhoods. However, on rural roads that are not adjacent to development and for beyond a typical walking route, sidewalks should not be required.***

   The commitment to having an interconnected Active Transportation Network for the community includes the sidewalks. However, we acknowledge challenges that this will create and as part of our more detailed review of each street we are including alternatives such as a 2 metre paved shoulders to accommodate bicycles and pedestrians in lieu of the traditional 1.5 metre concrete sidewalk.

4. ***Where roads are outside of development areas….rural cross section should be considered with active transportation accommodated within a paved shoulder.***

   See the earlier responses.

5. ***Where roads are within the development area….active transportation lanes could be accommodated within cycling lanes either within a paved shoulder, or within a lane in an urban cross section. In these areas, separate sidewalks should be provided to accommodate pedestrians.***

   Roads within the development areas will have the typical Township Standard cross-section with sidewalk on one or both sides. On through routes within the development areas bike lanes are to be provided but not on minor local streets within the development areas.

6. ***Where roads pass through transitional areas where new development is located on only one side of the road, a combination of paved shoulders and urban cross section (or partial urbanized) should be considered in order to provide flexibility.***

   See the earlier responses.

7. ***AECOM traffic volume forecasts along Forbes Road are 3 to 4.5 times higher than Ainley Group forecasts (for 2031 forecast). AECOM suggests lower traffic forecasts in 2041 as compared to Ainley forecast. Recommend that the 2031 and 2041 AECOM forecasts for the Forbes Road interchange be re-confirmed.***

   The AECOM traffic forecasts come from the Regional EMME model that was created initially for the “Simcoe Area Multi-Modal Transportation Strategy” and the “Highway 400 Widening (Hwy 89 to Hwy 11 split) Preliminary Design.” The AECOM traffic study is a broader Regional traffic analysis that was carried out to see if replacing a previously considered new interchange with Highway 400 at Pooles Road with improvements at the existing Forbes Road interchange could provide the required benefits to traffic distribution. Their conclusion was that there was value in using the existing interchange at Forbes Road and improving it as may be necessary.

   The traffic analysis by Ainley Group is more focused on Midhurst Development and individual intersections and uses a different methodology in developing the traffic projections specific to background traffic and trip generation from proposed adjacent development.

8. ***Re: Craig Road. Existing traffic will benefit from the Craig Rd extension. Analysis should be done to confirm the benefit of the Craig Road extension for existing and future***

motorists in the Midhurst area, separate from those that would result from proposed developments. May have impact on the conclusions/level of improvement on Russell Rd (4 lanes in 2031 could be reduced).

In general, the claim for diversion of traffic from Finlay Mill Road due to the Craig Road alternate route was in reference to the weekend evening traffic which is not a timeframe used for the analysis of the various intersections. Craig Road will provide an alternate route for Doran Road area development to reach CR 27/Hwy 26 other than Finlay Mill Road. The widening of Russell Road to 4 lanes is required to provide traffic from the new development areas easier and quicker access to Hwy 400 in lieu of using the Pooles Road, St. Vincent Street, etc. However, even with both in place (Craig Road & 4 Lanes on Russell) the developments still results in a significant increase in weekday traffic on Finlay Mill Road.

9. ***Recommend Ainley forecasts be utilized to review traffic operations at the Forbes Road interchange and that the current planned improvements outlined in the EA, and the corresponding cost estimates, be revisited.***

   The Ainley Group traffic model was used to identify the required improvements at the intersection of Forbes Road and Hwy 400 and the timing of those improvements.

10. ***Forbes Rd/Hwy 400 west ramps are proposed to be required during Phase 1 of development without signalization. May be more appropriately configured as part of the Forbes Rd widening and urbanization during Phase 2.***

    See the earlier responses.

11. ***Separate turn lanes (at St. Vincent/Pooles intersection) would not be required for either west westbound or eastbound approaches, assuming signalization.***

    We have revisited our analysis for this intersection and are currently recommending keeping the offset intersection with signalization of the intersection of the southern portion (Pooles and St. Vincent).

12. ***Recommends that the widening of Russell Rd. to 4 lanes be deferred into Phase 2 of development.***

    We are proposing an interim rural 2 lane phase and possibly multi-use trail in Phase 1 Stage 2 followed by four-lane urban section between Doran Road and Forbes Road at the beginning of Phase 2.

13. ***Recommends that the timing of any improvement to Snow Valley Rd. be tied into the development of the employment lands and not Stage 1 of the residential lands.***

    Carson North development area will have access to Snow Valley Road at Phase 1 Stage 1 and combined with sewer works required for servicing of Doran Developments the timing of the reconstruction of this road has been placed at the initial stage of development.

14. ***Recommend that the entirety of the Craig Rd. extension be included in one stage, rather than westerly in Stage 2 and easterly in Stage 3.***

A large number of Comments have been received following the PIC requesting that Craig Road Extension be constructed in conjunction with Phase 1 Stage 1, as such we have adjusted the schedule to show this.

15. ***Recommends that widening of Wilson Dr. be shown as a separate, County of Simcoe project.***

    The Staging Plan that was developed for identifying when (in conjunction with what stage of Development) a particular section of road will need to upgraded and not who it will be upgraded by.

    It is acknowledged that Wilson Drive is a County Road and that detailed discussions must take place to coordinate who undertakes the work.

16. ***Requesting that the Township consider approaching the County to initiate the process in evaluating the benefit of adding Craig Rd extension and Forbes Rd upgrade to the County's Capital Roads Program.***

    Representatives (Senior Staff and key Politicians) from both Township and Simcoe County had a meeting recently, whereby one of the items on the Agenda was the future ownership of Craig Road Extension. The discussions at this meeting were very "high level", however, these was an interest on both sides to continue them. It was concluded that the next steps in this process will involve Ainley's providing technical information relating to Craig Road Extension to the County Staff for review.

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. Lorran Cooney, C. E. T.
City of Barrie
City Hall
70 Collier Street
Barrie ON.
P. O. Box 400 L4M 4T5

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. Cooney

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.

- *Wants additional information/clarification re: proposed future traffic generation and impact upon existing City transportation corridors. Wants proposed timing of transportation improvements*

Timing of transportation improvements have been identified in the PIC presentation material and are related to each specific stage of development. Some aspects of the timing are being reviewed based on comments received at or following the PIC.

- *Why is Anne St not being considered as a major transportation link?*

Anne Street south of Carson Road to the City of Barrie limits is considered a significant transportation link for the Carson South development area and to a lesser extent for Carson North development.

- *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.*

That growth rate was selected as generally representative of growth within the area. Table 7.3.1-1 provided growth rates along 4 routes only one of them was significantly higher than 1% and that was for Forbes Road from CR 93 to Hwy 400. It is interesting to note that County Road 11 to the east of this segment had a growth of 0.15%. The County figures for Wilson Road south of Carson between 2012 and 2016 was zero and decreased in 2016. In our opinion the 1% growth rate applied is suitable as a general approximation.

- *Confirm that development area will have a single local street access to the employment lands on Snow Valley Road and that there are no intensions of extending Anne St north to Snow Valley Road.*

That is correct.

- *Existing traffic assessment has not considered traffic growth on Anne St. – Section 4.3.2 of Transportation Study.*

Traffic from and to Anne Street through our study area has to pass through the intersections of Carson Road with Hwy 26 and Wilson Road and those traffic volumes have been factored for background growth.

- *Draft Traffic Operational Analysis has not accounted for Saturday trips – minimal retail shopping trips. City of Barrie traffic corridors will be impacted. Please update Analysis to account for Saturday trips.*

Traffic analysis is typically carried out for the weekday morning and weekday afternoon peak hours. Saturday peaks are typically included for commercial development areas and developments in a Central Business District. In addition, weekend traffic to or from the commercial areas in Barrie will be dispersed throughout the day and therefore, lower than the weekday AM and PM peaks. Also, the aim is to complete the analysis for the 30th highest traffic hour of the year.

- *Clarify what is proposed for the upgrades on Anne St and St. Vincent St. Please clarify number of lanes, bike lanes, sidewalks etc.*

Anne Street is proposed as a two lane urban cross-section with bicycle lanes and sidewalk(s)

- *Please provide clarification as to the estimated start time of Phase 1 – Stage 3.*

We have not predicated specific dates for each stage of development as it is very dependent upon the market. However, it is anticipated that Phase 1 - Stage 1 will start in 2019/20 with the development uptake being approximately 300 to 400 units per year. Also, note that this estimated development uptake is a combined total for both Carson Road and Doran Road development areas.

- *Clarify how County Transportation Master Plan has been considered – expansion of municipal transit into the Community.*

The County Transportation Master Plan was used as background information to estimate background traffic growth and general information on trip destination.

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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.

- *Concerned about Craig Road extension increasing traffic to County Rd 27. Consider safety of residents of Mills Circle – dangerous turn into development from County Rd 27.*

The Intersection of Mills Circle and County Road 27 is over 1 km away from the proposed intersection of Craig Road Extension and County Road 27. Therefore we do not foresee the proposed Craig Road Extension having an impact on Mills Circle.

However, we understand the Township have spoken with Simcoe County (Operating authority for County Road 27) about the Mills Circle & County Rd 27 intersection to see if any modifications could be made to improve it.

- *Wants bike lanes on County Rd 27.*

The inclusion of bike lanes on a County Road is not proposed in this Class EA.

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

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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.

1. ***Council has not ensured that the Residents of Midhurst understand exactly how much traffic will increase along their primary and secondary roads in the village and what the implications of this potential traffic increase might be. Once the following requested information and studies are complete, the full details should be mailed to each residence in Midhurst and then a referendum on the options outlined under Traffic Calming below should be held. The MSP EA 3 and 4 should not be voted on until that is complete.***

   The Township initiated a comprehensive communication plan, in excess of the Class EA requirements, to ensure that the existing residents are well informed about the Midhurst Class EA and provided for a number of extended comments periods associated with the overall Class EA. This included setting up a special Resident Liaison Group to disseminate information, on a regular basis, back out to the existing residents of Midhurst. In addition, the detailed background Technical Reports (for Water, Wastewater & Traffic) have been available on the Township's website since the summer of 2016.

2a. ***Requests a summary sheet showing estimates of how many vehicles will use each identified commuter Road for each stage of each development in each neighbourhood. Summary to include the 2008, 2013 estimates for each road so we might determine what future traffic numbers might look like even if the Doran Road Development is never built. Current chart for 2013, 2031 and 2041 is very confusing. Without these numbers, the developers will argue that infrastructure is based on the number of homes built, not how many new car trips are generated.***
   Also, need these estimates to confirm the 8 probable trips per household that is currently assumed.
   Chart should also include estimates of new levels of traffic passing through the village from residents and businesses living north and south of Midhurst (not generated by the MSP) for each stage of each Phase of each Development.?

The requested tables are attached.

2b. Unknown party conducted a 5-day traffic count during the 2016 Victoria Day weekend, at 7 locations along St. Vincent and then followed it up with a similar study along Finlay Mill Rd. Who undertook the study and why? Why were we not informed that these studies were taking place and why didn't our engineers or town staff recommend that we conduct these same real time studies?

The Township did not undertake any Traffic Counts during the Victoria Day weekend. In addition, the Township has contacted the Simcoe County and they confirmed that they did not undertake any Traffic Counts. Therefore, we are unware who completed the referenced traffic counts.

3a. Craig Road bypass will become an absolute necessity if concerns expressed above come to pass. Must have hard and firm costs associated with the construction of this bypass (peer reviewed). Recommend that construction bids be requested for its construction before any other construction associated with the MSP be allowed to commence.

The financial model associated with funding the construction of Craig Road Extension has not been finalized yet and when it is the Township will ensure that the appropriate safety measures are in place to protect the Township.

3a. Craig Road bypass will become an absolute necessity if concerns expressed above come to pass. Must have hard and firm costs associated with the construction of this bypass (peer reviewed). Recommend that construction bids be requested for its construction before any other construction associated with the MSP be allowed to commence.

Subsequent, to the PIC we have adjusted the proposed staging of the Road improvements such that Craig Road will be constructed in conjunction with Phase 1 Stage 1. In addition, please refer to the attached Fact Sheet # 6 associated with Craig Road Extension.

3b. If the Town proceeds with plans to build the bypass before any Doran Road homes are built, it is conceivable that a disruption to the economy could delay construction of homes, meaning tax revenue would have to be diverted to pay for the bypass. Will there be enough revenue coming in to avoid a massive increase in the tax rate or destroy our borrowing ability for any other infrastructure or repairs required by the Township?

The financial model associated with funding the construction of Craig Road Extension has not been finalized yet and when it is the Township will ensure that the appropriate safety measures are in place to protect the Township.

4. Any estimate on construction of the Craig Road bypass should contain a secondary quote to pre-build bridges to 4 lanes. If we cannot afford to expand the bypass to 4 lanes, the traffic will find its way south and overwhelm the Village.

There are no bridges proposed along Craig Road. The two drainage crossings will require the installation of small to medium sized culverts, but not bridges.

5a. Completion of traffic calming studies and referendum, along with firm costs associated with the 4 lane Craig Road bypass would allow negotiations with the developers during the cost sharing portion of this plan in a far stronger negotiating position.

In 2016 the Township developed Traffic Calming polices and within the Environmental Study Report (ESR) we will recommend that Traffic Calming measures be further investigated during the detailed engineering design stage for key existing streets.

Preliminary construction cost estimates have been prepared for Craig Road which in our opinion are conservative and will be refined again after detailed design in the future.

In addition, please refer to the attached Fact Sheet #6 associated with Craig Road Extension.

5b. Developers will not pay for improvement to secondary roads in Midhurst, Waite, Park Trail, Silverwood, Frid, Green Pine Road and Spence might all require upgrades and sidewalks installed to accommodate traffic bypassing clogged primary roads.

The detailed Traffic Model has confirmed that the identified road improvements can be accommodate the proposed traffic from the new developments. Any increase in traffic on the secondary roads will be relatively minor and well within the capacity of the existing municipal road. In particular, the traffic model has identified the following:

- 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.
- Park Trail will not be a route preferred over the proposed completion of the link between Gill Road and St. Vincent.
- 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.
- 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.

6. 100% of the new traffic going through the Village will be generated by people who do not live here. They won't care about the safety of our residents and we will not have sufficient traffic enforcement to ensure compliance with traffic laws. Should ask for one more study. What are the traffic implications and associated costs and/or savings involved in implementing a full traffic calming plan, (either slowing traffic down through the village, as a disincentive to use these roads by NON Midhurst traffic) or a full traffic diversion plan, (prohibiting traffic going southbound out of, or northbound into the new Doran Road developments?

As noted earlier, in 2016 the Township developed Traffic Calming polices and within the Environmental Study Report (ESR) we will recommend that Traffic Calming measures be further investigated during the detailed engineering design stage for the key existing streets.

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 # 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.

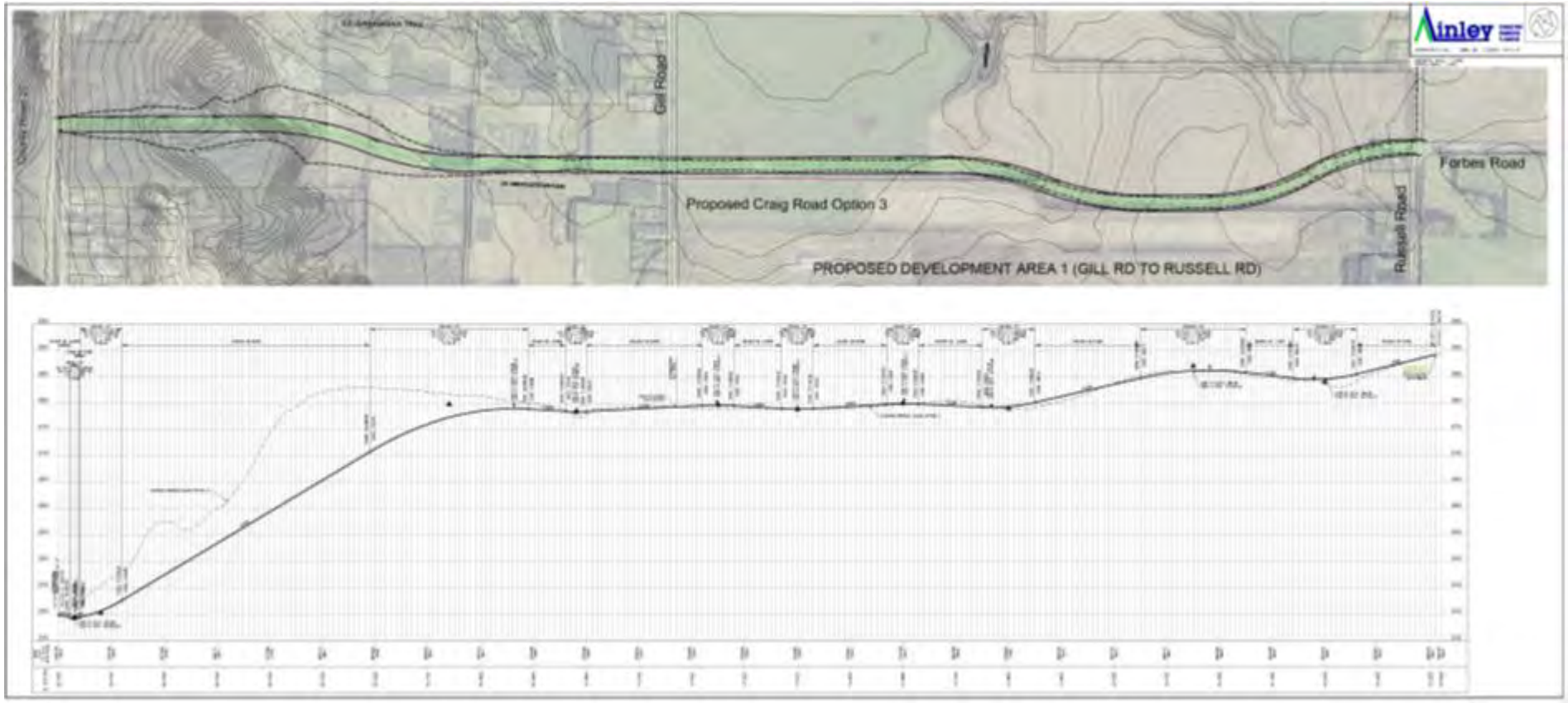
6) This proposed alignment (Alternative No. 3) will have no impact on the existing trails in the area and in particular the Ganarska Trail. In addition, the proposed design for Craig Road Extension allows for the construction of a multi-use trail that could provide additional interconnection with the 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



MIDHURST CLASS EA

TABLE 1 - 2013 TO 2031 BACKGROUND AND DEVELOPMENT TRAFFIC ON EXISTING STREETS

Road Links	Position	Existing 2013 Traffic Counts			Background Growth Without MSP Development Two Way Traffic																	
					2016			2018			2022			2025			2027			2031		
		AM	PM	AADT	AM	PM	AADT	AM	PM	AADT	AM	PM	AADT	AM	PM	AADT	AM	PM	AADT	AM	PM	AADT
Pooles Road	Just East of St. Vincent Street Int.	116	143	1,295	118	146	1,230	122	150	1,360	126	157	1,415	131	162	1,465	134	165	1,495	139	172	1,555
St. Vincent Street	Just South of Willow Creek	243	308	2,755	248	315	2,815	255	325	2,900	266	337	3,015	274	347	3,105	280	354	3,170	291	369	3,300
Finlay Mill Road	Just East of Hwy 26 int.	435	619	5,220	449	639	5,440	459	652	5,555	476	678	5,770	491	698	5,945	502	714	6,080	522	741	6,315
Forbes Road	Between Hwy 400 and Old Second Rd.	187	262	2,245	193	270	2,315 2,300	197	276	2,365	205	287	2,460	211	297	2,420	216	302	2,590	224	313	2,685
Forbes Rd/Craig Rd	Just East of County Rd 27 Int	NA	NA		NA	NA																
Doran Road	Just east of Finlay Mill Rd Int	233	368	3,005	240	379	3,095	243	383	3,130	248	394	3,210	253	402	3,275	256	406	3,310	262	417	3,395
Doran Road	Just east of County Rd 27 Int.	UNK	UNK		UNK	UNK																
Anne Street	South of Carson Rd	UNK	UNK		UNK	UNK																
Snow Valley Road	Just west of Hwy 26 int.	233	323	2,780	240	333	2,865 3,000	245	340	2,925	255	355	3,050	262	364	3,130	269	373	3,210	279	388	3,335
Hwy 26	South of Carson Road Int.	1,565	2,021	17,930	1,614	2,084	18,490 21,000	1,644	2,124	18,840	1,708	2,204	19,560	1,757	2,266	20,115	1,791	2,309	20,500	1,856	2,399	21,275
County Rd 27	North of Craig Road Int	608	916	7,620	628	946	7,870 10,900	622	965	7,935	666	1,003	8,345	686	1,033	8,595	700	1,054	8,770	728	1,097	9,125
Wilson Road	South of Carson Rd Int.	622	675	6,485	641	789	7,150 6,800	652	803	7,275	676	832	7,540	695	855	7,750	707	871	7,890	731	903	8,170

Development Generated Traffic					
2018	2022	2025	2027	2031	
Ph1 - St 1	Ph1 - St 2	Ph1 - St 3	Ph1 - St 4	P1 - St 5	
980	1,116	778	626	1,150	
100	100	100	50	0	
1,080	1,216	878	676	1,150	
1,080	2,296	3,174	3,850	5,000	
AADT	AADT	AADT	AADT	AM	PM	AADT
403	1,172	1,620	1,436	162	211	1,865
453	568	785	1,613	194	225	2,095
811	1,671	2,310	2,891	298	453	3,755
2,426	3,494	4,830	8,647	1,066	1,180	11,230
1,020	2,452	3,390	3,634	425	519	4,720
642	1,345	1,860	2,287	232	362	2,970
NA	NA	NA		NA	NA	NA
NA	NA	NA		NA	NA	NA
1,852	5,679	7,850	6,603	748	967	8,575
2,380	6,886	9,520	8,485	910	1,294	11,020
896	2,564	3,545	3,196	328	502	4,150
1,251	3,993	5,520	4,458	507	651	5,790

NOTE: AADT derived from 5 X (AM +PM Peak)

NOTE: 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

MIDHURST CLASS EA

TABLE 2 - 2031 TO 2041 BACKGROUND AND DEVELOPMENT TRAFFIC ON EXISTING STREETS

		Background Growth Without Midhurst Secondary Plan Two Way Traffic											
Road Links	**Position**	**2,034**			**2,036**			**2,039**			**2,041**		
Residential units													
Equivalent Employment													
Stage Total Units													
Cumulative Total Units													
		AM	**PM**	**AADT**	**AM**	**PM**	**AADT**	**AM**	**PM**	**AADT**	**AM**	**PM**	**AADT**
Pooles Road	Just East of St. Vincent Street Int.	143	177	1,602	147	182	1,650	152	188	1,699	154	188	1,710
St. Vincent Street	Just South of Willow Creek	300	380	3,399	309	391	3,501	318	403	3,606	322	408	3,650
Finlay Mill Road	Just East of Hwy 26 int.	538	763	6,504	554	786	6,700	570	810	6,901	576	819	6,975
Forbes Road	Between Hwy 400 and Old Second Rd.	228	319	2,739	233	326	2,793	240	335	2,877	247	347	2,970
Forbes Rd/Craig Rd	Just East of County Rd 27 Int												
Doran Road	Just east of Finlay Mill Rd Int	267	425	3,463	273	434	3,532	278	443	3,603	280	448	3,640
Doran Road	Just east of County Rd 27 Int.												
Anne Street	South of Carson Rd												
Snow Valley Road	Just west of Hwy 26 int.	287	400	3,435	296	412	3,538	305	424	3,644	309	427	3,680
Hwy 26	South of Carson Road Int.	1,912	2,471	21,913	1,969	2,545	22,571	2,028	2,621	23,248	2,038	2,632	23,350
County Rd 27	North of Craig Road Int	750	1,130	9,399	772	1,164	9,681	796	1,199	9,971	805	1,210	10,075
Wilson Road	South of Carson Rd Int.	753	930	8,415	776	958	8,668	791	977	8,841	798	988	8,930

Development Generated Traffic Two Way Traffic												
2,034			**2,036**			**2,039**			**2,041**			
Ph2 - St 1			Ph2 - St 2			Ph2 - St 3			Ph2 - St 4			
1,009			750			725			724			
0			0			0			0			
1,009			750			725			724			
6,009			6,759			7,484			8,208			
									AM	**PM**	**AADT**	
									461	613	5,370	
									469	533	5,010	
									482	658	5,700	
									2,279	2,495	23,870	
									532	638	5,850	
									453	589	5,210	
									858	1,091	9,745	
									1,048	1,451	12,495	
									427	614	5,205	
									538	687	6,125	

NOTE: AADT derived from 5 X (AM +PM Peak)

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 Natasha Charles
Project Consultant
Chippewas of Georgina Island First Nation
P. O. Box N-13, Sutton West, On.
L0E 1R0

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Ms. Charles:

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.

- *Unable to attend PIC and looking for information*

All information regarding the Class EA project can be found on the Township website (http://www.springwater.ca/cms/one.aspx?pageId=4779649).

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

[redacted]

Ref: Township of Springwater
Class Environmental Assessment (Phase 3 and 4)
Midhurst Servicing

Dear Mr. [redacted]

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 he have to pay for sewers for himself or anyone else?*

It is the current Council's position that the existing residents of Midhurst will not be required to connect to the proposed Wastewater Treatment Facility.

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 # 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.

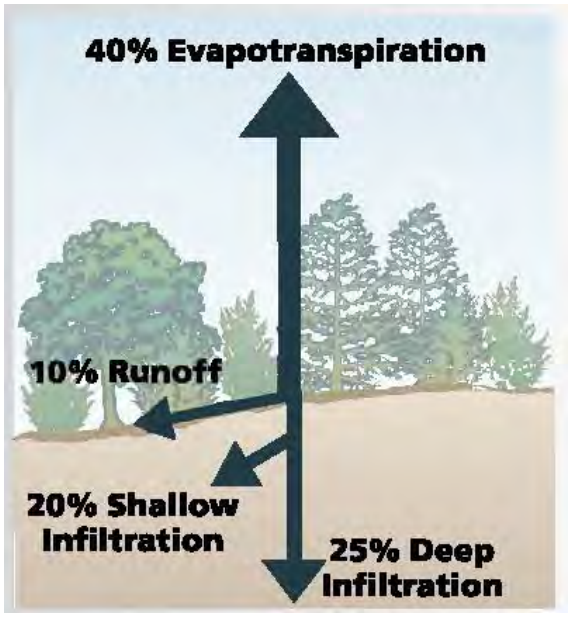
2) LID Provides many environmental and economic Benefits

- 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.

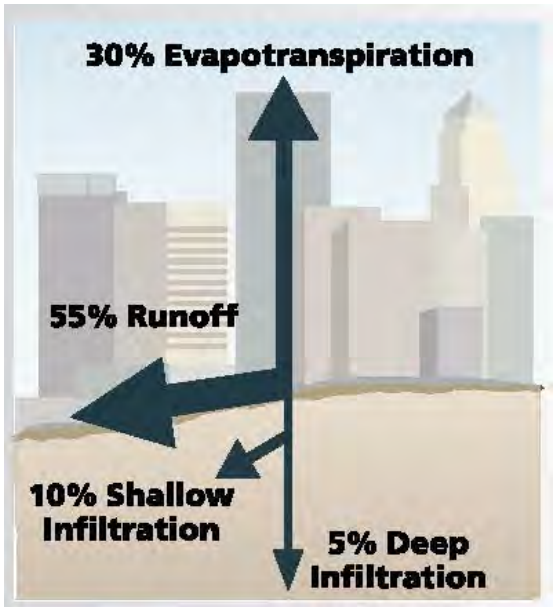
Fact Sheet # 4: Low Impact Development (LID)

- 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

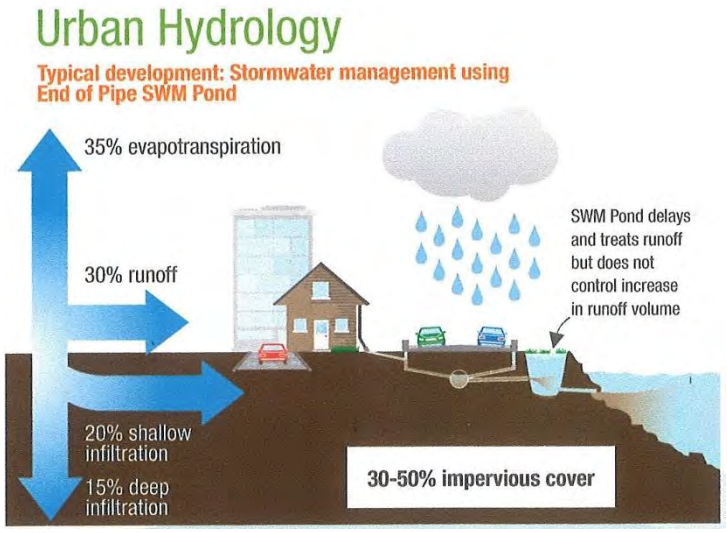


Typical Post-Development Stormwater Flows with No LIDs

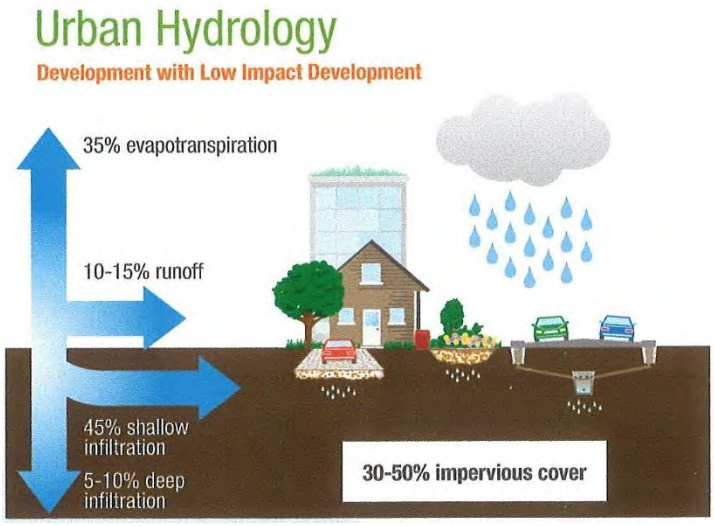
Fact Sheet # 4: Low Impact Development (LID)

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 30th Peak Hour of traffic throughout a year and similarly for urban roads a design of between the 10th and 20th 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.

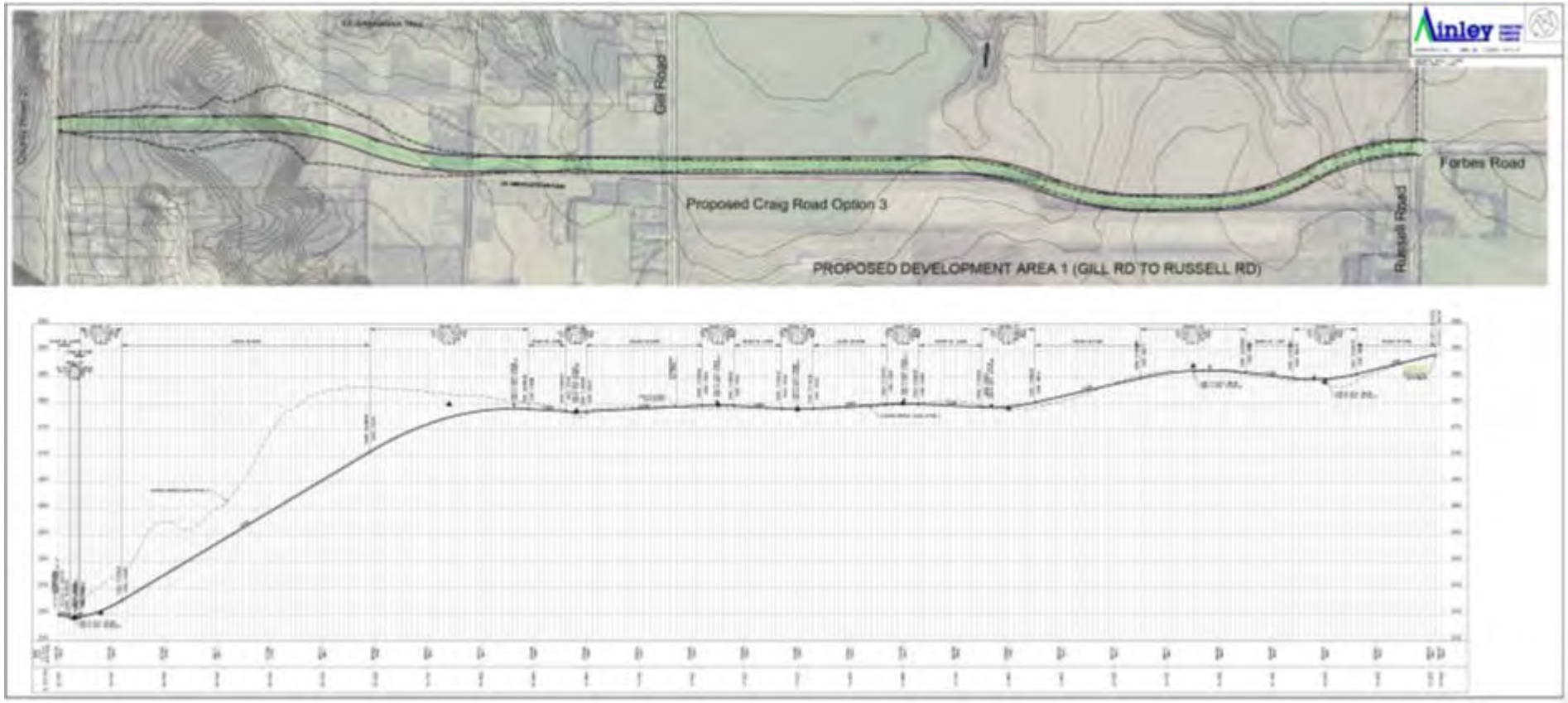
6) This proposed alignment (Alternative No. 3) will have no impact on the existing trails in the area and in particular the Ganarska Trail. In addition, the proposed design for Craig Road Extension allows for the construction of a multi-use trail that could provide additional interconnection with the 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



APPENDIX 'Y'

Impacts and Mitigation Measures Related to Wastewater Servicing Infrastructure

EFFECT	MITIGATING MEASURES	APPLICATION WHERE/WHEN
SURFACE DRAINAGE SYSTEM		
Sedimentation and turbidity of adjacent water bodies	▪ erosion control measures ▪ buffers and setbacks ▪ sediment traps ▪ staging work ▪ bio-engineering techniques	After site grading and during construction on slopes and channels Collect sediment before entering drainage channel During biologically critical periods
Ponding effects on adjacent properties due to natural drainage disruption	▪ appropriate use of culverts, porous backfill and tile drains ▪ apply natural channel design principles	In new construction projects and expansion
Streambank erosion from diversion, construction or channelization of watercourse	▪ erosion control measures ▪ bio-engineering techniques	River crossings, drainage outlets
Contamination of surface waters through runoff, spills, leaks and disinfection activities	▪ provision for spill control ▪ fast accurate reporting of spill ▪ spill containment ▪ stockpile materials or devices for spill control ▪ avoid adverse soil conditions ▪ monitor facility for leaks ▪ implement disinfection techniques in concert with fisheries requirements ▪ pollution prevention and source control by best management land use practices and best management stormwater practices. ▪ buffers and setbacks ▪ install check dams on drainage swales	As a general practice and particularly in vicinity of water bodies, wetlands
Changes in volume of surface runoff	▪ use design measures to minimize increase in surface runoff	New impervious surfaces
Changes in flood storage capacity by placing fill and structures in floodplain	▪ avoid placing fill and structures in floodplain or compensate ▪ flood and fill permits from Local Conservation Authority	Construction within river valleys. Disposal of excess fill.
GROUNDWATER		
Interference of shallow aquifers and springs	▪ hydrogeologic investigation to identify such areas in advance develop alternatives to avoid impacts	Excavations
Reduce groundwater quantity through construction dewatering	▪ locate construction activities away from groundwater users and water bearing formations (soils) where possible. ▪ proper dewatering techniques ▪ seasonal constraints on	Depletion or lowering of shallow aquifers and springs by groundwater utilization

EFFECT	MITIGATING MEASURES	APPLICATION WHERE/WHEN
	construction	
Spills or leaks resulting in contamination of groundwater supply	▪ construction refuelling precautions ▪ land filling precautions ▪ operation and storage precautions	Near watercourses and on site generally. Areas of high infiltration capability
Drainage of wetland areas resulting in a reduced groundwater contribution to surface waterbodies	▪ avoid wetland areas ▪ utilize appropriate backfill material, i.e. high permeable backfill is unsuitable	Trenching, excavation, placing fill, dewatering
Reduced surface water recharge to groundwater particularly in soils	▪ restrict extent of impervious surfaces in zones of high	Subsurface barriers, e.g., foundations, areas of impervious
Interference with groundwater movement	▪ maintenance of the existing groundwater regime through engineering design	Excavations, drainage, construction, dewatering, e.g. in roadbeds, foundations and trenches
Contaminations of adjacent wells through runoff from construction	▪ erosion and sediment control ▪ locate projects appropriately ▪ setbacks	Construction adjacent to well sites and exposed acquifers
FISH, AQUATIC WILDLIFE AND VEGETATION		
Introduction of warmer water from ponds into colder surface watercourse	▪ appropriate selection of ponding site ▪ pond design ▪ infiltrate into groundwater system ▪ planting to provide shade	Dewatering of trench and excavations. Sediment traps. Extend detention ponds.
Modification or removal of aquatic habitat; displacement of plants and animals	▪ stage work to non-critical times ▪ restore stream substrate ▪ choose suitable site for stream diversions ▪ seasonal constraints	During construction, e.g. river crossings, dewatering of excavations
Reduced water quality of nearby surface water having value as wildlife habitat	▪ provisions for spill control ▪ fast and accurate reporting of spill ▪ spill containment ▪ stockpile materials or devices for spill control ▪ avoid adverse soil conditions ▪ minimize tree removal ▪ buffers and setbacks	Storm sewers, ditches, diversions and by-passing
Timing effects of construction on spawning, nesting and breeding periods	▪ staging of work to avoid spawning and breeding periods ▪ seasonal constraints for cold and warmwater systems	For stream crossings and diversions
Lowering of water table resulting in reduced contribution to streams and stress of riparian	▪ design to maintain existing groundwater flows ▪ restrict extent of impervious	Dewatering of trenches, excavations and aquifers. Areas of newly created impervious

EFFECT	MITIGATING MEASURES	APPLICATION WHERE/WHEN
vegetation	surfaces in zones of high infiltration	surfaces.
Increased nutrient loading of existing habitats	▪ buffers and setbacks ▪ provisions for spill control ▪ land filling precautions	Near watercourses and on site generally.
Drainage of wetland areas causing mortality or stress to animals and possible changes in species composition	▪ maintain existing groundwater regime ▪ avoid wetland areas ▪ utilize appropriate backfill material,	Trenching or excavating
Siltation to surface watercourses resulting in "smothered" plants and animals due to the deposition of silt and increased turbidity of surface watercourses	▪ utilize suitable backfill material ▪ trench drainage should be discharged to settling areas before being permitted to enter surface waterbodies ▪ erosion control measures ▪ staging of work	Road bed and ditch construction. Storm sewer outfalls. Erodible soils, stockpiles.
Stress on biological communities	▪ consider the carrying capacity of the local natural environment ▪ avoid sensitive periods such a breeding seasons	Municipal infrastructure is necessary to service projected municipal / population growth. This increases stress on recreational and natural resources.
Tree removal will affect the amount of sunlight reaching waters and affect plan productivity and increase watercourse temperatures	▪ avoid tree removal near surface waterbodies ▪ restoration planting	Stream crossings
TERRESTRIAL VEGETATION AND WILDLIFE		
Introduction of exotic plant species through erosion control restoration	▪ restoration planting ▪ use annuals which later die out ▪ use indigenous (native) species only	On slopes and other areas to control erosion. In any distribution area requiring restoration work.
Changes in vegetative composition as a result of loss of topsoil and subsoil or mixing	▪ restore site by replacing soils in preconstruction horizons	Trenching or excavating
Removal or disturbance of significant trees and/or ground flora	▪ review status of species ▪ avoid these areas ▪ employ tree protection measures	During site grading and construction phase of any project
New or increased exposure of forest edge with resultant effects of windthrow, leading to loss of habitat for wildlife	▪ avoid woodlots and similar areas ▪ pre-stress woodlots ▪ restore edges	During site grading and construction phase of any project
Mortality / stress due to changes in soil moisture conditions, resulting in loss of wildlife habitat	▪ minimum fragmentation of forest habitat ▪ avoid poorly drained areas ▪ use of appropriate roadbed and	During construction of roadbed and storm sewers

EFFECT	MITIGATING MEASURES	APPLICATION WHERE/WHEN
	backfill materials ▪ revegetation using indigenous species able to survive new conditions	
HERITAGE RESOURCES		
Threatened viability of, or opportunity for, retention of sites having heritage value	▪ avoid these areas ▪ record or salvage information on features to be lost	Where appropriate with respect to significance of the heritage recourse
Unavoidable alteration to or destruction of heritage structures or archaeological sites	▪ record or salvage information on features to be lost	Where appropriate with respect to significance of the heritage resource
Disruption of quiet enjoyment	▪ staging of construction to cause least disruption ▪ employ noise and dust control measures	As general practice.
RESIDENTIAL, INSTITUTIONAL, COMMERCIAL AND INDUSTRIAL		
Disruption of pedestrian movements between adjacent uses	▪ maintain continuity of pedestrian walkway system as much as possible ▪ provide walkway strips to adjacent residential areas	As general practice. Where suitable.
Disruption of tourism facilities	▪ stage construction ▪ employ noise and dust control measures ▪ provide crosswalks and sidewalks at access points	As general practice. Where suitable.
Facilities inconsistent with or which disrupt character of area	▪ preserve existing amenities as much as possible ▪ design and site structures to blend with adjacent building forms and materials ▪ site grading; utilize berms or other screening devices	As general practice. Where suitable.
Temporary disruption during construction and/or inconvenience to users of adjacent properties and building	▪ notify public agencies and adjacent owners of construction scheduling ▪ prepare emergency program to ensure quick resolution of servicing problems ▪ consult with public agency and/or adjacent landowners regarding temporary access routes ▪ schedule construction so as to minimize period of disruption in proximity of adjacent uses and structures ▪ ensure access for emergency response vehicles / personnel ▪ apply noise and vibration control	Where substantial inconvenience or disruption to adjacent uses would be experienced and where measures would substantially reduce effects. As general practice.

EFFECT	MITIGATING MEASURES	APPLICATION WHERE/WHEN
	measures (use quieter equipment, maintain equipment properly)	
OUTDOOR RECREATION		
Temporary disruption of open space activities during construction	▪ employ noise and dust control measures ▪ staging of construction to cause least disruption	In areas within or adjacent to public open space.
SOILS GEOLOGY		
Erosion by wind, water and ice	▪ restoration planting ▪ stage work ▪ avoid highly erodible soils ▪ stabilize slopes ▪ compaction ▪ chemical stabilizers ▪ gravel blankets ▪ seeding ▪ sodding ▪ toe drainage	Erodible soils in excavations, cut and fill areas. Stockpiles, cut slopes.
Slumping of encroached slopes	▪ avoid potentially unstable slopes ▪ mechanical stabilization methods ▪ revegetation (only effective once the root infrastructure has developed) ▪ restrict dewatering near slopes ▪ engineering design to control potential slumping	Steep slopes. Cut slopes. Removal of the toe of a slope during construction. Dewatering.
Loss of aggregate and mineral resources	▪ avoid sites of aggregate and mineral reserves ▪ extract aggregate and minerals prior to construction	Zones of economic aggregate and mineral occurrence.
Contamination of soils by petrochemicals, etc.	▪ remedial measures to avoid spills and leaks ▪ contingency plan for clean-up	During construction.
Mixing of topsoil with subsoil	▪ stripping and stockpiling of topsoil separate from subsoil	Generally in areas of undisturbed soils.
TOPOGRAPHY / LANDFORMS		
"Scarring" of significant landscape features	▪ avoid significant features	Designation of significant feature, i.e. landmark.
CLIMATIC FEATURES		
Drought, increased flooding, changes in water levels, increases in surface water runoff due to extreme weather events and climate change	Consider the following: ▪ Design associated drainage and storm ponds to manage extreme weather events ▪ Use of pervious pavement or reduce impervious pavement and other low impact development	Construction in close proximity to buildings or activity areas

EFFECT	MITIGATING MEASURES	APPLICATION WHERE/WHEN
	methodologies to manage or reduce storm water runoff and on-site flow control ▪ Increase elevations of structures over waterways ▪ Increased capacity of sewer and treatment systems to accommodate additional flows ▪ Monitoring and adaptive management to manage flow rates ▪ Artificial destratification to manage evaporation ▪ Stormwater runoff to roadside ditches and/or grassed swales ▪ Back-up features and infrastructure for upset conditions and emergency response procedures (e.g. standby power for water and waste water facilities) ▪ Water conservation and efficiency through leakage/loss detection and prevention in distribution system	
Cracked concrete during freeze thaw cycles; deterioration of roadway/structures sooner than anticipated	Consider using materials resilient to freeze-thaw effect and salting, and survive higher temperatures	Design and construction
PUBLIC HEALTH		
Exhaust emissions from construction equipment and vehicles	▪ Minimize operation on site, control location on site	Where adjacent uses or natural vegetation could be adversely affected
Effects on groundwater elevation of existing subsurface sewage disposal systems (e.g. septic systems)	▪ Monitor groundwater levels and, if necessary, take appropriate action	Where appropriate
Groundwater contamination	▪ construction refuelling precautions ▪ fill design and operation precautions ▪ precautions in operation and storage facilities ▪ containment of leachate maintenance facilities	On site generally.
Effects of emergency by-passing of sewage	▪ contact potentially affected government agencies and public downstream within 24 hours of by-pass event	In all cases.
OPERATIONAL AND CONSTRUCTION NOISE		

EFFECT	MITIGATING MEASURES	APPLICATION WHERE/WHEN
Proximity to noise sensitive land uses (e.g. hospitals); insufficient setbacks; road grades (steep hills); high traffic volumes; poor road surface; stopping / starting of truck traffic; operation of construction equipment	▪ relocate major roads away from sensitive land uses, divert traffic ▪ reduce grades of hills ▪ use appropriate asphalt surface to reduce tire noise ▪ institute truck prohibitions ▪ construct noise barriers ▪ modify speed limits ▪ Proper maintenance of equipment	As general practice. Construction in urban areas.