Colgan Wastewater Class Environmental Assessment

Comments and Responses

Background

In January 2016, the Township of Adjala-Tosorontio completed the Colgan Master Servicing Plan Amendment, which identified a preferred wastewater servicing solution for approved growth areas in the Community of Colgan. The Master Servicing Plan satisfied Phases 1 and 2 of the Municipal Class Environmental Assessment (Class EA) process for the wastewater projects, which are subject to Schedule C of the Municipal Class EA.

Phases 3 and 4 of the Class EA process are now underway to identify the preferred locations and design concepts for the wastewater treatment plant (WWTP) and outfall to service the growth areas.

On June 20, 2017, a Public Information Centre was held to share information about the project with the public, to discuss the project with them, and to listen to their comments, questions and concerns. As part of this consultation, the public were also invited to provide written comments on the project.

The Project Team appreciates the written comments provided during this consultation process. There was overlap in many of the topics, and the Project Team felt that those who submitted comments and questions who may benefit from reading the project's responses. Therefore, this Comments and Responses document has been prepared to address the comments received to September 7, 2017.

To make the document easier to follow, we have summarized the questions and comments into key headings (in bold text), followed by the Project Team's responses in italics.

What is a Class EA study?

Class Environmental Assessments (Class EAs) are planning processes approved under the Ontario Environmental Assessment Act for municipal road, water, and wastewater projects. Class EAs facilitate municipal infrastructure planning by providing an approved process designed to: (1) protect the environment as a whole (which includes the natural, cultural and socio-economic aspects); (2) help proponents and municipalities understand their responsibilities in providing municipal services to the public in a timely and responsible manner; and (3) provide a transparent and streamlined planning process.

What has been approved in Colgan?

The Township of Adjala-Tosorontio approved two Draft Plans of Subdivision, referred to as Colgan 1 (south) and Colgan 2 (north). About 315 lots were approved in the Colgan 1 (south) Subdivision, comprised of single-detached dwellings of various sizes. About 307 lots were

approved in the Colgan 2 (north) Subdivision, comprised of various sized single-detached dwellings, street townhouses. In addition to this, a retirement home with 170 beds was also approved for Colgan 2 (north). The planning process for the approved subdivisions has been reviewed by the public and agencies over the last several years. Before lots are registered, the developer must meet all of the conditions of the Township and agencies. The developer Tribute Communities has been working to address these conditions.

Colgan is designated as a "settlement area" in Simcoe County's Official Plan, which means that it has been designated for development over the long-term planning horizon.

Wastewater Treatment Plant (WWTP)

Can the new Colgan residents use individual septic tanks to treat their wastewater?

The Ontario Ministry of Environment and Climate Change (MOECC) requires that new homes in settlement areas be built with full municipal water and sewer services. Individual septic systems are not considered to be full services and new subdivision homes are not permitted to use them. The policy is found in the Provincial Policy Statement (2014) at sections 1.6.6.2 and 1.6.6.4

A large communal subsurface septic system was reviewed in the 2016 Colgan Master Servicing Plan as part of the Environmental Assessment process. That option was found to not be viable and would not have sufficient capacity to serve the new residents.

How effective will the WWTP be at removing fecal matter, chemicals, and pharmaceuticals from the wastewater?

The proposed WWTP will be a modern, advanced and highly effective treatment facility. Solids and sludge will be removed through primary treatment (settling and removal of suspended particles). Dissolved matter will be removed through secondary treatment and clarification, which will be achieved via a membrane bio-reactor, or MBR. The membrane bio-reactor involves a combination of a suspended growth bioreactor (which uses micro-organisms to consume dissolved organic matter) and a micro-filtration membrane (to remove the micro-organisms and other dissolved materials such as phosphorus). The project team considered the membrane bio-reactor in a comparison with several other modern treatment technologies. The project team recommends the membrane bio-reactor because it is a technology that is proven and capable of achieving the treatment objectives.

For your information, a detailed description of the proposed wastewater treatment process has been attached to this document.

The new WWTP will be able to meet the strict effluent limits identified in the Assimilative Capacity Study, prepared during the Master Servicing Plan. The limits identified in the Assimilative Capacity Study are listed below in comparison with that of a "normal" plant that might discharge into a watercourse:

- *0.05 mg/L total phosphorus (Normal plants – 0.3 mg/L)*
- *0.5 mg/L total ammonia nitrogen (Normal plants – 3.0 mg/L)*
- *80 fecal coliforms per 100 mL (Normal plants – 200 fecal coliforms per 100 ml)*
- *6 mg/L CBOD (chemical-biological oxygen demand (Normal plant – 10-20 mg/L)*

While pharmaceutical detection and removal is an emerging field, the proposed MBR system should be effective at removing chemicals and pharmaceutical substances.

How much noise and odour will come from the WWTP?

Little to no noise is anticipated from the WWTP. There are no significant noise sources within the proposed membrane bioreactor plant, and the membrane bioreactor plant will be fully enclosed in a building.

Odour from wastewater is predominantly caused by sulphur compounds, of which hydrogen sulphide (H_2S) is the most common and identifiable. Sulphide and odour generation depends on the characteristics of the wastewater, turbulence in the collection and treatment system, and anaerobic conditions. Odour generation will be controlled and mitigated in the following ways:

- *The Colgan WWTP process will be designed to minimize odour generation;*
- *The Colgan WWTP will be enclosed to contain possible odours; and*
- *An odour collection and treatment system will be included (e.g. a biofilter, chemical scrubber, and/or activated carbon system).*

How will the WWTP blend into the residential area?

The Colgan plant will be architecturally designed to complement the neighbourhood and fit in with the local community. Landscaping at the plant site will add to its attractiveness and help it blend in with the planned subdivision. The WWTP site will be surrounded by fencing to limit access to the site; the fence could be designed to aid in the aesthetics of the facility.

Comments raised about the design during the Class EA process will be carried forward to the detailed design stage, which occurs following completion of the Class EA.

How often will trucks come and go from the WWTP?

Operations of the WWTP will include remote monitoring and an automatic alarm system. This will reduce the presence of vehicles at the site and provide real time feedback on WWTP operations to Township Public Works staff. On average, it is anticipated that 1 to 2 trucks per week will visit the plant for sludge removal and the delivery of supplies. In addition, the plant will be visited by Township staff with regular passenger vehicles, as needed.

How much will the WWTP cost to build and operate? Will the taxpayer have to pay for this?

The estimated capital cost of the WWTP, forcemain and outfall is approximately $12 million. Annual operations and maintenance costs will be approximately $500,000. The capital cost will be fully paid for by the Colgan developer. The annual operations and maintenance costs will be covered through a utility service bill paid by the residents of the Colgan community who are connected to the water and wastewater services. Capital or operating costs will not be paid for by the existing local taxpayers.

Will the WWTP lower the value of nearby properties?

While there will be temporary inconveniences to nearby landowners during the construction of the WWTP, no long term noise, odour, visual or environmental impacts are anticipated. This will be achieved through:

- *Best practices during construction to reduce potential impacts to existing residents (e.g., traffic controls, dust management and safeguards around water)*
- *Effective odour and noise control for the WWTP;*
- *Continuous remote and regular on-site monitoring of the WWTP operations;*
- *An architectural design that complements the local community; and*
- *Advanced wastewater treatment technology that ensures a high level of wastewater treatment for the approved development.*

Based on the above, we do not anticipate that the WWTP would have any impact on property values.

Does the project support 2.67 people per household? What will happen if there are more people than planned?

The proposed estimate is based on the County of Simcoe standards for average household size and is deemed to be conservative. This coupled with reasonable estimates of wastewater generation per person were used to develop the average daily capacity for the WWTP.

Also, in accordance with Ministry of the Environment and Climate Change requirements, operation of the WWTP will not be allowed to exceed its approved capacity. The plant will be monitored on an ongoing basis to ensure that the system usage does not exceed the WWTP's approved capacity.

About the Forcemain

Will there be room for the forcemain pipe in the Keenansville road allowance? Where under the Keenansville road allowance would the pipe go?

The size of the proposed forcemain pipe is expected to be approximately 300 mm (12 inches) in diameter and will be installed using modern construction practices with the least disruption to traffic and the immediate area as possible. The forcemain pipe will likely be built under the road surface (to be confirmed during the detailed design stage following completion of the Class EA). The existing road allowance is wide enough to accommodate the proposed forcemain pipe. The location of the pipe will be carefully considered during detailed design and the construction staged such that traffic disruption will be minimized.

About the Outfall

Will the treated wastewater from the plant pollute the creek? What impact will the treated wastewater have on local wells, groundwater, and wildlife? Will the treated wastewater make the creek less safe for children who swim in the creek?

Given the high level of treatment, the strict effluent limits, and the relatively small volume of wastewater being treated, the treated water will not pollute the creek, local wells or groundwater. As such, no negative impacts on local aquatic or terrestrial wildlife are anticipated from operation of the WTTP. The treated water discharged will not make the creek less safe for children who splash, wade or swim in the creek.

As noted previously, the treated water will look and smell like water one would find in Bailey Creek. The 250ml sample bottle depicted in the picture is an example of treated wastewater from an MBR facility.

Image source: Eflo International Ltd. www.eflo.com/MBR.html.

How will the treated wastewater discharged from the WWTP affect the water temperature of the creek?

As it passes through the disinfection part of the wastewater treatment, the treated water will be less than ambient or room temperature. The treated water will then cool as it travels along the approximately 3 km of underground pipe before it reaches the outfall. While the actual design of the outfall will be completed during detailed design, the location of the mouth of the outfall is several feet from the watercourse. This distance will allow the treated water to interact with the air and ground, further moderating its temperature before entering the watercourse. In addition, the amount of treated water exiting the outfall will be a small part of the watercourse flow, further minimizing any potential impact to the temperature.

Temperature of the treated water as it leaves the WWTP is often regulated and will be examined during detailed design.

Will the treated water discharged from the plant increase the impact of flooding in the area?

The treated water discharged from the plant will be a very small portion of the water present in the creek at any one time. The volume of treated water discharged from the plant will remain consistent and not increase when the creek is running high and at risk of flooding. While natural causes like high rainfall or snowmelt may still result in flooding of the creek, the volume of treated water discharged from the plant would not contribute to flooding. The volume of treated water discharged from the plant does not rise when there is rainy weather but remains a constant flow. The flow of treated water will provide a small and steady input into the creek so that, in times of low flows, the treated water from the plant will help maintain fish habitat and aquatic plant life.

The design of the outfall and sewer system, which will be undertaken after the Class EA study is completed, will address any comments from key agencies with regard to the potential for impacts from flooding. The design will incorporate appropriate measures to address these comments.

If creek water floods onto our land, including farmland, will it pollute our crops? What about pools of standing water left after the flood waters recede?

The treated water would not have any impact on farms or gardens in the event that the creek floods onto these lands, as the treated water discharged from the plant will meet or exceed the surface water Provincial Water Quality Objectives (PWQOs). In addition to the very high quality of the treated water, during periods of flooding the treated water would be much more diluted.

Also, there are several square kilometers of land above the proposed outfall location that drain into Bailey Creek and Keenansville Creek. There are various existing land uses in this drainage area, including agriculture and a road network that may contribute contaminants to the watercourse, such as pesticide and fertilizer residue, road salts, oils, silt or sediment. The highly-treated water at the outfall from the WWTP will make only a negligible contribution compared to these existing sources.

What will happen to the outfall if flooding occurs?

If flooding occurs in the creek and the creek waters rise, the volume of wastewater treated at the WWTP and discharged from the outfall will remain the same.

The design of outfall will consider creek flooding. Also, given the elevation and slope of the pipe leading to the outfall, flooding of the creek would not have the potential to cause a back-up within the pipe.

What environmental studies were done to support discharging the treated wastewater to Bailey Creek? Why is the outfall being located in Keenansville for a development in Colgan?

As part of the Master Servicing Plan Study, an Assimilative Capacity Study was completed to assess the opportunities and constraints for wastewater servicing in Colgan, with specific attention given to local bodies of water and their ability to assimilate treated wastewater. The study built upon several other previous studies and examined hydrogeologic conditions, creek water quality and quantity, and treatment options. As a result, four discharge scenarios were assessed. The study found that discharging to Bailey Creek at Keenansville Road would have a negligible impact on phosphorus concentrations (the limiting factor) downstream. As a result, the study team for the Master Servicing Plan recommended the outfall location of Bailey Creek at Keenansville Road as the preferred discharge option.

For a copy of the MSP, please visit the Township's website at http://www.adjtos.ca.

Next Steps?

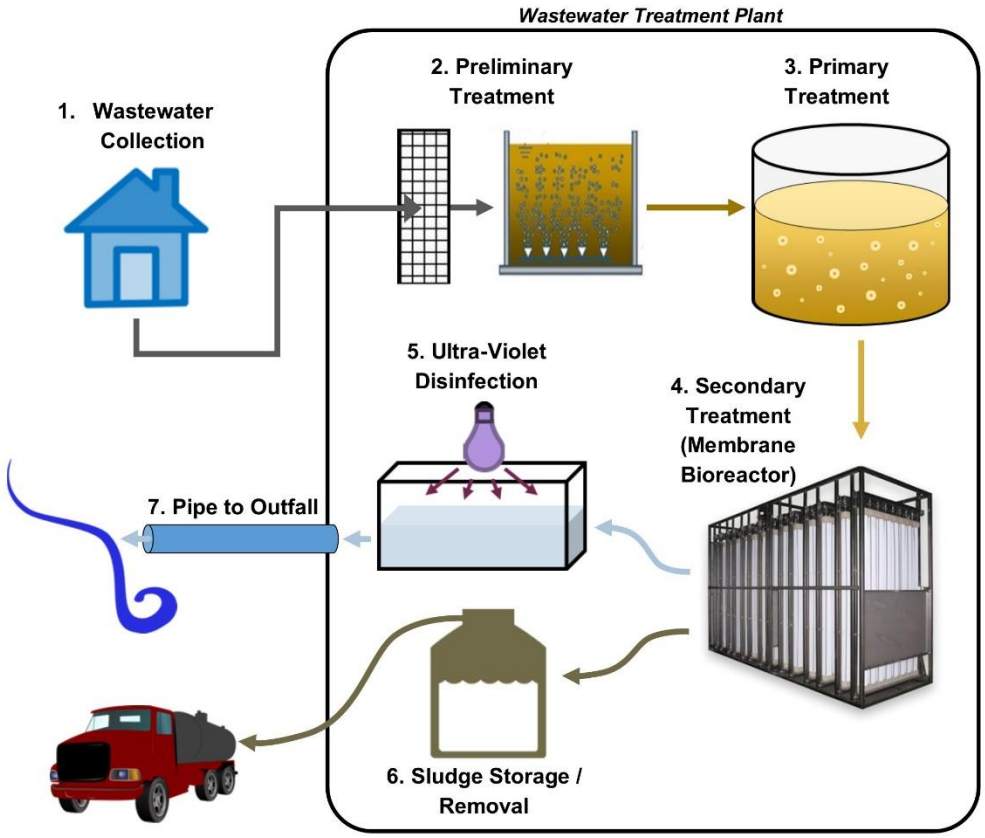
What are the next steps once the Class EA process is completed?

Once the Class EA study is completed, there will be other steps required before the proposed WWTP can be built and operated. The WWTP, forcemain and outfall will go through a detailed design stage (referred to in some of the responses above), where engineering and architectural drawings are prepared. It is during the detailed design stage that the recommended design identified and commitments made during the Class EA process will be implemented. As part of the design process, the required approvals from regulating bodies (such as the MOECC and the NVCA) will be secured as well.

Proposed Colgan Wastewater Treatment Process

To meet the discharge limits for this project, an advanced form of wastewater treatment is required. The process proposed for this project uses multiple stages to treat and disinfect the wastewater. The process is illustrated below, followed by a description of each stage.

Figure: Schematic of Proposed Wastewater Treatment Process



Stage 1: Wastewater Collection

Wastewater will travel from homes in the Colgan development to the wastewater treatment plant (WWTP) through a network of underground sanitary sewer pipes. These pipes will only be used for wastewater (i.e., from toilets, sinks, showers, washing machines, etc. within the home). No stormwater from rain or snow melt runoff will be collected in the sanitary sewer system, nor will it be treated in the WWTP. Since stormwater for the Colgan development will be handled separately in a stormwater pond, rain events or snow melts will not increase the amount of wastewater handled by the Colgan WTTP.

Once the wastewater reaches the WWTP, it will be cleaned and disinfected using a multi-stage treatment process. This treatment process (Stages 2 to 6) will occur within the enclosed WWTP building.

Stage 2. Preliminary Treatment

During preliminary treatment, the incoming wastewater travels through mechanical coarse and fine screens to filter out any large inorganic solids. Wastewater then enters a tank called an equalization chamber. This chamber helps to manage fluctuations in the flow of incoming wastewater and ensures there is a balanced volume of wastewater flowing through the treatment process. The equalization chamber is aerated, which means air bubbles are pumped into the wastewater; this helps to begin and enhance the treatment process.

Stage 3. Primary Treatment

Primary treatment occurs in a tank where the majority of suspended solids settle out by gravity from the wastewater. This tank is called a primary clarifier.

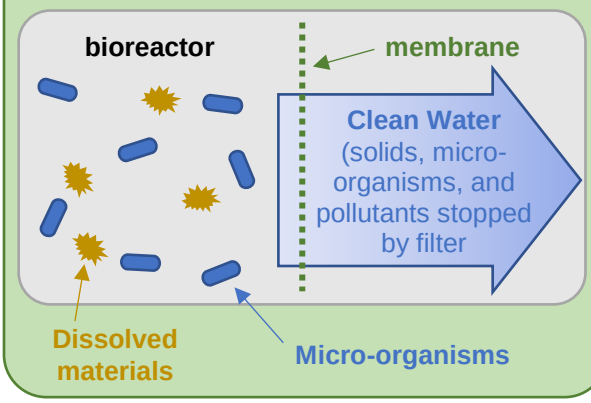
Stage 4. Secondary Treatment (including Secondary Clarification and Tertiary Treatment)

The next three steps for wastewater treatment all occur within the Membrane Bio-Reactor unit. These steps include:

- Secondary Treatment - During secondary treatment, dissolved organic matter is consumed by micro-organisms in aerated tanks or other basins. This process removes all organic material from the wastewater.
- Secondary Clarification - Once the –micro-organisms have consumed the organic matter, they are removed from the treated wastewater.
- Tertiary Treatment - Tertiary treatment is an additional cleaning process that removes inorganic compounds such as nitrogen and phosphorus. This is performed by filtering the treated wastewater through the membranes of the bio-reactor (see note). The outcome is treated wastewater, also known as *effluent*.

What is a Membrane Bio-Reactor?

A Membrane Bio-Reactor (MBR) uses a combination of a suspended growth bioreactor and a micro or ultrafiltration membrane to treat wastewater. The suspended growth bio-reactor uses micro-organisms that consume the dissolved organic matter, while the membrane filters suspended and dissolved solids including inorganics and pollutants, such as phosphorus.



Stage 5. Disinfection

Once filtered through the Membrane Bio-Reactor, the treated wastewater is disinfected using Ultraviolet (UV) Disinfection technology. This process allows the treated effluent to be disinfected without the use of chemicals, such as chlorine.

Once the treated wastewater finishes the treatment process, it will look and smell just like regular water in creeks and rivers in the area. It will be clear and odourless. It will meet the Ministry of Environment and Climate Change (MOECC) strict requirements for treatment.

Stage 6. Sludge Storage and Removal

The solids, including the settled micro-organisms, will form a sludge, which will be stored in an separate enclosed tank. Once or twice a week, a truck will come (slightly smaller than a garbage truck) to pump out the sludge from the covered storage tank. The sludge will not be exposed to open air; therefore, this step will not generate odours. The sludge is removed for disposal in accordance with MOECC requirements.

Stage 7. Pipe to the Outfall

Once the treated wastewater has been disinfected, it will be regularly sampled to ensure it meets the MOECC's effluent limits. The treated wastewater will then flow via underground pipe to the outfall location at Bailey Creek on Keenansville Road.

The pipe to the outfall will include two sections. The first section will travel north along Concession Road 8 to Keenansville Road. This portion is mostly uphill, which requires the treated wastewater to be pumped (this is called a forcemain). Once the treated wastewater reaches Keenansville Road, it will then flow by gravity through a pipe installed under the roadway to the outfall location.