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BAYSHORE VILLAGE EFFLUENT SPRAY IRRIGATION CLASS EA
PUBLIC INFORMATION OPEN HOUSE NO. 2, NOVEMBER 15, 2016

QUESTIONS/COMMENTS AND ANSWERS

Following a brief presentation on the project, attendees of the Public Information Open House were invited to ask questions to the consultant team. The following is a record of the questions and answers. Where required, further clarifications obtained after the meeting are included.

1) Does the water and soil quality monitoring data indicate any impact on Wainman Creek and/or the spray fields?

The water quality monitoring data indicate no adverse impact from the spray irrigation on the water quality of Wainman Creek. Soil quality monitoring data show localized and temporary increases in contaminants such as phosphorus and chlorides during the spray season, but the overall soil quality is constant from year to year.

2) Water from the irrigation pipe crossing Concession Rd 8 has been observed leaking into Wainman Creek.

This question was passed on to Township operating staff after the PIC. The Township operator suggests that this water is likely groundwater, not lagoon effluent. The pipe does not leak when the spray fields are in operation. When the pipe is not pressurized, the pipe coupling gaskets relax, which allows groundwater to enter and escape at pipe joints.

3) What temperature is required for evaporation of the lagoon effluent when spray irrigated?

Evaporation is proportional to the temperature and relative humidity of the surrounding air. Unless the surrounding air is completely saturated with water vapour, some degree of evaporation will take place. Regardless, evaporation is not taken into account when calculating the quantity of effluent that can be spray irrigated and absorbed by the soils.

4) What depth of soil is required to treat the spray irrigated lagoon effluent?

The 2008 MOE Design Guidelines for Sewage Works require 0.5 m (20 inches) of unsaturated soil for contaminant and pathogen removal. Particulate phosphorus is adsorbed onto soil particles. However, dissolved phosphorus is more mobile and typically migrates to the local groundwater.

5) How much lagoon effluent actually soaks into the ground?

The amount of effluent that soaks into the ground depends on the soil type and its degree of saturation. Operators strive to operate the spray irrigation equipment such that all lagoon effluent soaks into the ground. However, ponding and some runoff have been observed when the soils have not dried up before spraying.

6) What is the cost of each the alternative? Who will pay for any new or expanded sewage works? Will residents on septic systems in the Township pay for any new or expanded sewage works?

The estimated cost of each alternative is shown on the PIC display boards, which are posted on the Township website. Only the residents on municipal sewer systems will pay for any new or expanded sewage works. Residents on septic systems do not pay for sewer system projects.

7) Which option provides highest degree of treatment?

Properly designed and operated lagoons and subsurface disposal systems can achieve a high degree of treatment. However, Alternative No. 6, upgrading the lagoons with tertiary treatment and UV disinfection, would provide the highest level of treatment and produce an effluent quality that can be measured at the point of discharge.

8) Which option requires the most operation and maintenance?

Feedback from Township operators suggests alternatives that include spray irrigation require significant operation and maintenance. Setting up and tearing down the spray irrigation piping each season, monitoring and repairing the spray irrigation piping, risers and heads, and controlling application rates, is very labour intensive. All other options also have operation and maintenance requirements.

9) It appears that the best option (Alternative No. 6) is at odds with the Lake Simcoe Protection Plan.

The Lake Simcoe Protection Plan (LSPP) prohibits the establishment of a new municipal sewage treatment plant that discharges to Lake Simcoe. As the LSPP does not recognize the Bayshore Village sewage works as an existing municipal sewage treatment plant that contributes phosphorus to Lake Simcoe, Alternative 6 cannot be implemented without changes made to the LSPP regulations and/or policies.

10) Is it possible to take advantage of phosphorus credits/trading?

This has been discussed with the Ministry of the Environment and Climate Change (MOECC). It is difficult to quantify phosphorus reductions from non-point sources. To account for this, phosphorus credits are given at a ratio. For example, for a 1 kg phosphorus reduction credit, one must demonstrate 3 to 4 kg of phosphorus has been reduced from other non-point sources. Further, there are limited opportunities for non-point source phosphorus reduction in the Township. There is the potential for sharing the allowed phosphorus load from the Lagoon City Sewage Treatment Plant (STP), which services Brechin and Lagoon City. The Lagoon City

STP achieves a high level of phosphorus removal and discharges a fraction of its allowed phosphorus contribution to Lake Simcoe. However, this could place some limitations on the development potential in Brechin and Lagoon City. Phosphorus trading may form part of the preferred solution and will be discussed further with the Township.

11) Adding tertiary treatment requires upstream primary and secondary treatment.

The Bayshore Village sewage lagoons provide primary and secondary treatment. A tertiary treatment system can be added to the lagoon effluent.

12) Why not truck or pipe the lagoon effluent elsewhere for disposal?

This would be a costly endeavour. It is also at odds with the MOECC's policy to treat and dispose of sewage in the community in which it is generated.

13) Would you drink the water out of Wainman Creek?

No. Water from surface water sources should not be drunk without proper water treatment and disinfection. Sewage is never treated to drinking water quality. It is treated to remove pollutants. In the US because of water shortages, there are now some water reclamation facilities that treat sewage to a very high level and then discharge the effluent in man-made reservoirs that are then used as the source for water treatment plants. They are very complex and expensive. This is not required nor possible here.

14) Is government funding available for any new or expanded sewage works?

The Township has aggressively pursued a number of government funding programs in the past few years for the Bayshore Village spray irrigation project, with no success so far. The Township will continue to apply for provincial/federal government funding.

15) What is the capacity of the lagoons, how deep are the lagoons, and how much sludge has accumulated in the lagoons?

The primary cell has a capacity of 30,000 m^3 and the secondary cell has a capacity of 110,000 m^3. Both cells are approximately 3 m deep. Sludge accumulation was measured in the primary cell in 2013 and in the secondary cell in 2014. Sludge accumulation was found to be 0.1 m to 0.2 m deep (4 to 8 inches), well below the 0.6 m (24 inches) of lagoon capacity allocated for sludge storage.

16) What happens to "flushable" wipes that are flushed down toilets?

The wipes are conveyed with the rest of the sewage and settle to the bottom of the primary cell where they will very slowly biodegrade. They can plug pumps and should not be flushed down toilets.

17) Microbeads, primarily from exfoliating soaps, and microfibers, from clothing fabrics, are problematic for sewage treatment plants to remove.

Microbeads in sewage likely settle at the bottom of the lagoons. Fortunately, Canada has moved to ban microbeads in 2018. We cannot comment on the fate of microfibers, which is an emerging issue that has not been studied extensively to date.

18) If we were to build Bayshore Village now would you as engineers recommend spray irrigation or a tile bed?

A development such as Bayshore Village would be difficult to make happen today as sewage treatment and disposal would be a major constraint in view of the poor soils in the area for subsurface disposal and the prohibition of new STPs in the Lake Simcoe watershed. If the regulatory environment allowed it, we would likely suggest a tertiary sewage treatment plant with a surface water discharge.

19) Can you please explain the Lake Simcoe Protection Act and Lake Simcoe Protection Plan and how they affect this project?

The policies of the Lake Simcoe Protection Plan prohibit the establishment of new municipal sewage treatment plants in the Lake Simcoe watershed unless it replaces an existing municipal STP. Regulation 60/08 of the *Lake Simcoe Protection Act* lists the existing municipal STPs that discharge to Lake Simcoe. Bayshore Village Sewage Works is not one of them. Bayshore Village was not listed and considered as a municipal STP that contributes phosphorus to Lake Simcoe, likely because spray irrigation is considered a subsurface effluent disposal system, and its contribution to the phosphorus loads to Lake Simcoe was not added in the model.

In order to move forward with Alternative No. 6, which involves a tertiary STP and direct discharge to Wainman Creek to Lake Simcoe, the Township would need to convince the MOECC to amend Regulation 60/08 and recognize Bayshore Village Sewage Works as an existing municipal STP that is currently contributing phosphorus to Lake Simcoe through groundwater discharge. There are sufficient groundwater quality data to estimate how much phosphorus is reaching Lake Simcoe. It could be demonstrated that adding tertiary treatment to the lagoon system would result in no net increase or even a reduction in the phosphorus load to Lake Simcoe from the Bayshore Village Sewage Works.

CCTA and the Township have met with MOECC staff on numerous occasions, and with the Minister of the Environment and his deputies, to discuss the situation and the need for a viable long term solution. The Township has also extended an open invitation for the Minister to tour the spray irrigation facilities. So far, the Minister has not responded.

20) Can we add tertiary treatment and spray irrigate the tertiary treated effluent?

Spray irrigating tertiary treated effluent was considered. This approach would improve the effluent quality but it would not address the challenge associated with the limited area for spray irrigation unless more lands

were acquired and set-up with spray irrigation equipment. The costs of this approach would therefore be very high.

21) Does the Township own the long narrow field shown in the figures for the Alternatives to the west of the lagoons? Was the price of acquiring land included in the cost estimates presented for each option? Are the soil characteristics known?

The parcel of land west of the lagoons is privately owned. Future facilities on this piece of land are shown on the figures for the Alternatives for illustration purposes only. They could be located on other adjacent land. The cost of acquiring additional land was not included in the cost estimates for any of the alternatives. Lands in the immediate vicinity of the Bayshore Village Sewage Works also have soils with low permeability and high groundwater table. Upgrading the lagoon with tertiary treatment would not require additional land.

22) Can Bayshore Village residents construct individual septic systems to treat their sewage?

It would be very difficult to retrofit each home with a septic system and meet the clearances required by the Ontario Building Code for decks, sheds, driveways, etc. Furthermore, approval from the MOECC would not likely be obtained: where there is municipal piped drinking water service, there should also be municipal sewage service.

23) Can Bayshore Village install a holding tank and haul sewage to a municipal sewage treatment plant?

Hauling sewage on an ongoing basis would be a very costly endeavour. Further, the MOECC does not permit holding tanks as a means of sewage treatment and disposal except under very extenuating circumstances that do not apply to Bayshore Village.

24) Where do the Barrie Sewage Treatment Plant and the Orillia Sewage Treatment Plant discharge their effluent?

Barrie and Orillia discharge their treated effluent to Lake Simcoe. These municipal sewage treatment plants are currently, or have recently, implemented upgrades to reduce the phosphorus content of their effluent to meet the requirements of the Lake Simcoe Protection Plan.

25) What is the quality of the soil in the spray fields?

The spray fields are not contaminated. The Bayshore Village sewage works treat domestic sewage only, not industrial sewage, and it contains mainly organic matter and nutrients. Soil quality monitoring data show localized and temporary increases in contaminants such as phosphorus and chlorides during the spray season, but the overall soil quality is constant from year to year. The spray fields' decreasing hydraulic infiltrative capacity is driving this project. Soil quality is not the issue.

26) Can the soil be excavated and replaced?

The Township uses approximately 24 ha of land for spray irrigation. Excavating and replacing the soils would be prohibitively expensive.

27) Can the soil be tilled in the spring before the spray season or in November after the spray season?

Evapotranspiration through vegetation is a major component of effluent disposal by spray irrigation. Tilling the fields destroys the vegetative cover and root structure. The existing spray fields do not have sufficient capacity to take all or part of a field out of service for a season in order for it to re-establish its vegetative cover. The Township piloted turf aeration techniques, including deep tining and shatter tining, in the spring of 2016. The aeration appears to have marginally increased the soil permeability.

28) How long does it take effluent to absorb into the ground?

The rate at which the effluent absorbs into the ground depends on the soil type and saturation. Studies have not been undertaken to quantify this rate on the Bayshore spray irrigation fields.

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