Public Information Centre No. 2 Presentation Transcript

Slide 1 – Title Slide

Hello and welcome to the second Public Information Centre for the Havelock Wastewater Treatment Plant Schedule 'C' Municipal Class Environmental Assessment, or Class EA Study. My name is Marisa Scott and I will be presenting on behalf of CIMA+, the Township of Havelock-Belmont-Methuen and the Ontario Clean Water Agency also known as OCWA. CIMA+ was the consultant selected by the Township and OCWA to complete the Class EA study for this project.

Public Consultation Centre 1 was previously held for this study to introduce the project, provide background information on the Havelock Wastewater Treatment Plant, answer any questions about the study, and provide an opportunity to get involved in the project. Presentation boards from the first Public Consultation Centre are available on the Townships's website at the link shown.

Before we begin, some housekeeping notes. This video is currently available on the Township's website. On the Township's website, there is a transcript of my narration for this presentation, and a PDF copy of the slides. If you have any questions or comments, please send them to Amber Coupland from OCWA or Mina Yousif from CIMA+. Contact information for these project leads is in this presentation. Alternatively, you could fill out a comment form provided on the Township's website and submit it to the project team.

An in person public information center is also being held on November 8, 2022, at 1:00 pm. All public and stakeholders are invited to attend. The location of the public information center is listed below.

Location: Lions Hall, Havelock Community Centre

39 George Street East, Havelock

Slide 2 – Why are we here?

The Township of Havelock-Belmont-Methuen and the Ontario Clean Water Agency (OCWA) are undertaking a Municipal Class Environmental Assessment Study to complete infrastructure upgrades at the Havelock Wastewater Treatment Plant (WWTP)

The main objectives of this virtual Public Information Centre are:

- Provide an update on the project progress,
- Present the evaluation of design concepts and preferred solutions
- And provide an opportunity for the public to get involved in the project

Slide 3 – We Need Your Input!

Public consultation and engagement are integral to Municipal Class EA studies. We are holding this session to provide the public with opportunities to learn more about the Municipal Class EA process being followed. Activities completed to date and a Preliminary Preferred Solution will be presented at this session.

As mentioned, background information including this presentation is available on the Township's website for your review. An online comment form is also available on the website for your use. We look forward to your feedback!

Slide 4 - What is the Purpose of the Study?

The Township of Havelock-Belmont-Methuen has one wastewater treatment plant that receives wastewater from homes and businesses in the urban area of the Village of Havelock, and hauled septage from the rural areas within the Township. The Havelock WWTP ensures that wastewater is fully treated before clean effluent is returned to the Plato Creek.

There are two main purposes for this study. First, in order to support population growth in the Village of Havelock up to the year 2041, additional wastewater servicing capacity needs to be planned for the Havelock system. The second purpose is to identify and recommend the preferred infrastructure improvements to accommodate the required capacity increase, while minimizing impacts on the natural and socio-cultural environments as well as considering technical and financial implications. More details will be provided regarding the wastewater treatment process and population projections in the subsequent slides.

Slide 5 – Municipal Class EA Process and Timeline

A Schedule C Municipal Class EA follows 5 main steps.

The first step involves reviewing background information and establishing the problem or opportunity statement. A notice of study commencement is issued at this stage. The Notice of Commencement for this project was issued to the project stakeholder list in August of 2021.

Slide 6 – Proposed Growth and Design Flows for the Havelock WWTP

In order to establish the needs for this project, it was important to understand the growth projections, and associated wastewater design flows, anticipated for the Township. Planned growth was identified in the Havelock South Development Area, which includes 3 phases of residential homes, the Peterborough Housing Development and the Havelock Long-Term Care Facility. Additional growth was also forecasted to

approximately 2,400 people over a 20-year planning period to provide some flexibility to the Township for future growth and wastewater treatment.

The current rated capacity of the Havelock WWTP, 1,200 m^3/d, is shown as a blue bar on the chart, and the projected capacity required to accommodate the future population, 1,580 m^3/d, is shown in orange. The red line in the middle of the chart represents the current average day flow of approximately 950 m^3/d. Typically for water and wastewater systems, the need to initiate planning for upgrades or expansion is triggered when the treatment plant reaches 75-80% of the rated capacity, as is the case with the Havelock WWTP.

Slide 7 – Municipal Class EA Process and Timeline

The second step involves brainstorming ways to address existing concerns, reviewing the study area, evaluating options that address the problem or opportunity statement, and recommending the Preliminary Preferred Solution. Information developed through this step was presented at the first public information center, and input from all project stakeholders was incorporated into the next steps of the project.

Slide 8 – Review of PIC No. 1

During the first Public Information Center, held in March 2022 the following alternative solutions were identified:

- Do nothing
- Limit community growth
- Reduce inflow and infiltration
- Expand the existing Havelock WWTP
- Construct a new WWTP on the existing site
- Construct a new WWTP on a new site

Alternative solutions that did not satisfy the must meet criteria were eliminated from further consideration because they did not meet the core requirements of the project. It was determined that expanding the existing Havelock WWTP was the preferred solution and was carried forward.

Slide 9 – Municipal Class EA Process and Timeline

In the next stage, design concepts are developed to implement the Preferred Solution. Design concepts are evaluated based on their impacts and mitigation measures, and the results of this step, including the evaluation process are then presented at the 2nd Public Information Centre, which is currently taking place.

Once the Preliminary Preferred Design Concept has been confirmed via input from the public, an Environmental Study Report is compiled, to document the results of the EA. The report will be made available for public review for a minimum of 30 days. The study is anticipated to be completed fall of 2022.

Following the completion of the Class EA process and subsequent approval of the project, the project implementation phase includes detailed design of the recommended design concept and construction.

Slide 10 – Overview of Existing Havelock Wastewater Treatment Plant (WWTP)

The Havelock WWTP is located at 719 Old Norwood Road. It services the Village of Havelock, shown as the shaded area on the figure to the right. The plant was built in 2009 and has a current rated capacity of 1,200 cubic metres per day (m^3/d).

An overall study area, outlined in red, was identified at the beginning of the project to define the area on the existing treatment plant site for potential future infrastructure. The study area image shows the Havelock WWTP, marked with the yellow star, and two adjacent lagoons which previously provided wastewater treatment for the community. The lagoons were decommissioned when the new Havelock WWTP was built in 2009. The study area also includes the access road from Old Norwood Road, leading to the treatment facility.

Slide 11 – Key Process Components of the Havelock WWTP

This slide provides an overview of the treatment processes utilized at the Havelock WWTP. Wastewater enters the facility through the raw sewage pumping station which pumps the wastewater to the headworks building. A septage receiving facility is located adjacent to the pumping station which receives wastewater in the form of hauled septage from the rural population in Havelock, and transfers it to the pumping station.

At the headworks building, the wastewater is passed through screening and grit removal processes before it can enter the main treatment process, which is the Sequencing Batch Reactors, referred to as SBRs. SBR is a form of biological wastewater treatment which uses microbes to "digest" the wastewater. In this system, wastewater is added to a single "batch" reactor, treated to remove undesirable components, and then discharged to the next treatment step. The process takes advantage of micro-organisms that can digest organic matter in sewage, and clump together (by flocculation) as they do so. It thereby produces a liquid that is relatively free from suspended solids, and flocculated particles that will readily settle out and can be removed. Reaction with the microbes is facilitated by a fine bubble aeration system run by blowers.

An equalization tank is located next to the SBRs. The main purpose of this tank is to prevent short-term surges during high flow conditions. From here, the wastewater is transferred to the tertiary filters for further treatment.

The tertiary filters employ sand filtration technology combined with chemical precipitation. A coagulant is added at this step to expedite the precipitation process, and further remove solids from the wastewater. Filtered wastewater is treated for bacteria and viruses via ultraviolet reactors before the clean effluent is discharged to Plato Creek.

The SBRs also contain sludge pumps which transfer waste solids to a sludge digester to be stabilized. Processed sludge is pumped from the sludge digester to the biosolids holding tank where it is stored temporarily before it can be hauled away.

Slide12 – Existing Havelock WWTP Lagoons

This slide presents an ariel and a photo of the previously used decommissioned lagoons.

Slide 13 – Overview of Wastewater Treatment Process

There are several processes in wastewater treatment, which include:

- Preliminary Treatment – removes rags and grit – reducing the wear and tear of equipment downstream.
- Secondary Treatment – removes organic matter, ammonia and suspended solids.
- Filtration – removes small particulate solids and phosphorus
- Disinfection – eliminates pathogens
- Digestion – converts the solids generated during the treatment process to a stable end product
- Biosolids Storage – stores stabilized biosolids until they are removed from site

A technology review for each process was completed and will be discussed through subsequent slides.

Slide 14 – Overview of Wastewater Treatment Process

For preliminary treatment it was determined that using the existing technology at the plant would maximize use of existing infrastructure.

Slide 15 – Overview of Wastewater Treatment Process

Following preliminary treatment – secondary technologies are utilized.

Several technologies were evaluated to treat future levels of ammonia, BOD and TSS to the required limits that are set by the MECP.

Slide 16 – Secondary Treatment Technology Review

The secondary treatment technologies evaluated included:

- Conventional Activated Sludge (CAS)
- Ballasted Activated Sludge
- Biological Phosphorus Removal – Using CAS
- Membrane Bioreactor
- Membrane Aerated Biofilm Reactor (MABR)
- Integrated Fixed-Film Activated Sludge / Moving Bed Bioreactor
- Sequencing Batch Reactor (SBR)
- Aerobic Granular Sludge
- Biological Aerated Filter

SBR was selected as the preferred technology, which is currently the technology utilized by the plant. This would allow for an easier integration into the existing plant.

Slide 17 – Overview of Wastewater Treatment Process

Following secondary treatment – filtration is utilized.

Slide 18 – Filtration Design Criteria

During the Class EA an Assimilative Capacity Study was competed, which concluded that Plato Creek is sensitive to phosphorus in the effluent water received by the plant during low flow conditions.

Two WWTP discharge scenarios were considered:

- Continuous discharge – requires very strict effluent objectives for total phosphorus
- Seasonal effluent equalization/storage – requires less stringent effluent objectives for total phosphorus

Slide 19 – Filtration Technology Review

The filtration technologies evaluated included:

- Deep Bed Filter
- Disc Filter
- Membrane Bioreactor (MBR)

- Membrane Filtration
- Two-stage Filtration

Deep bed filtration, which is the existing technology at the WWTP, was selected as the preferred filtration technology for achieving effluent criteria for the seasonal discharge scenario.

Two-stage filtration was selected as the preferred filtration technology for achieving the stricter effluent objectives for the continuous discharge scenario.

Slide 20 – Overview of Wastewater Treatment Process

Following filtration – disinfection technologies are utilized to eliminate pathogens.

Slide 21 – Disinfection Technology Review

The disinfection technologies evaluated included:

- Ultraviolet (UV) Disinfection
- Ozone
- Peracetic Acid (PAA)Membrane Filtration

UV disinfection was selected as the preferred technology since it is currently used at the plant, which would maximize use of existing infrastructure and allow for an easier integration.

Slide 22 – Overview of Wastewater Treatment Process

For the digestion process it was determined that the existing technology at the plant was suitable for future upgrades and maximized use of existing infrastructure. Therefore, no further technology was reviewed.

Slide 23 – Overview of Wastewater Treatment Process

For biosolids storage it was determined that the existing type of storage at the plant was suitable for future upgrades.

Slide 24 – Design Concept 1

Design concept 1 involves expanding the plant without the use of the lagoons and falls under the continuous discharge scenario.

Preliminary treatment would require an increase in the raw sewage pump capacity as well as an increase in screening capacity.

Slide 25 – Design Concept 1

Secondary treatment would require a capacity increase by adding a new SBR tank adjacent to the existing two.

Slide 26 – Design Concept 1

Filtration would require an increase in capacity of the existing filtration system as well as the addition of a second filtration stage. The second filtration stage is required to meet the low phosphorus requires of continuous effluent discharge.

Slide 27 – Design Concept 1

Disinfection would require an increase to the existing UV system.

Slide 28 – Design Concept 1

The biosolids train would require an additional aerobic digester as well as an additional biosolids storage tank, similar to the one currently on site.

Slide 29 – Design Concept 1

The different areas that require upgrades at the plant for concept 1 are shown in this site plan.

Slide 30 – Design Concept 2

Design concept 2 involves expanding the plant and using one of the existing lagoons as influent equalization. This deign concept also falls under the continuous discharge scenario.

To recommission a lagoon it would need to be drained, cleaned and repaired.

During times of high flow, influent would be directed to the lagoon by gravity. This would reduce the impact on the existing plant. Once the high flow period was over, a new pump station would pump the raw sewage to the plant, which would then be treated as usual.

Slide 31 – Design Concept 2

Secondary treatment would require a capacity increase by adding a new SBR tank adjacent to the existing two.

Slide 32 – Design Concept 2

Filtration would require the addition of a second filtration stage. The second filtration stage is required to meet the low phosphorus requirements of the continuous effluent discharge scenario.

Slide 33 – Design Concept 2

The biosolids train would require an additional aerobic digester as well as an additional biosolids storage tank, similar to the one currently on site.

Slide 34 – Design Concept 2

The different areas that require upgrades at the plant for concept 2 are shown in this site plan.

Slide 35 – Design Concept 3

Design concept 3 involves expanding the plant and using both of the existing lagoons for secondary effluent storage. This design concept falls under the seasonal discharge scenario.

Preliminary treatment would require an increase in the raw sewage pump capacity as well as an increase in screening capacity.

Slide 36 – Design Concept 3

Secondary treatment would require a capacity increase by adding a new SBR tank adjacent to the existing two.

Slide 37 – Design Concept 3

Filtration would require an increase in capacity of the existing deep bed filters. Second stage filters would not be required as the plant would not be discharging to Plato Creek during low flow seasons.

Slide 38 – Design Concept 3

Disinfection would require an increase in capacity of the existing UV system.

Slide 39 – Design Concept 3

To recommission the lagoons they would need to be drained, cleaned and repaired.

During months when Plato Creek is most sensitive to phosphorous, all secondary treatment effluent would be directed to the lagoons for storage. Once these months have passed, the lagoons would be drained and all effluent would be directed to the filters where it would continue treatment as usual.

This concept would require additional pumping stations to fill and drain the lagoons.

Slide 40 – Design Concept 3

The biosolids train would require an additional aerobic digester as well as an additional biosolids storage tank, similar to the one currently on site.

Slide 41 – Design Concept 3

The different areas that require upgrades at the plant for concept 3 are shown in this site plan.

Slide 42 – Design Concept 4

Design concept 4 involves expanding the plant using both of the existing lagoons for filtered effluent storage. This design concept falls under the seasonal discharge scenario.

Preliminary treatment would require an increase in the raw sewage pump capacity as well as an increase in screening capacity.

Slide 43 – Design Concept 4

Secondary treatment would require a capacity increase by adding a new SBR tank adjacent to the existing two.

Slide 44 – Design Concept 4

Filtration would require an increase in capacity of the existing deep bed filters. Second stage filters would not be required as the plant would not be discharging to Plato Creek during low flow seasons.

Slide 45 – Design Concept 4

Disinfection would require an increase in capacity of the existing UV system.

Slide 46 – Design Concept 4

To recommission the lagoons they would need to be drained, cleaned and repaired.

During months when Plato Creek is most sensitive to phosphorous, all treated effluent would be directed to the lagoons for storage. Once these months have passed, the lagoons would discharge into Plato Creek.

Slide 47 – Design Concept 4

The biosolids train would require an additional aerobic digester as well as an additional biosolids storage tank, similar to the one currently on site.

Slide 48 – Design Concept 4

The different areas that require upgrades at the plant for concept 2 are shown in this site plan.

Slide 49 – Detailed Evaluation Criteria

Detailed evaluation criteria were used in the assessment of the alternative solutions. Four (4) main criteria categories were identified to include socio-cultural, natural environmental, technical, and financial.

Specific factors were considered within each of the four (4) criteria categories.

Factors related to the socio-cultural criteria included:

- Public and Operator Health and Safety
- Aesthetic and Operational Impacts
- Construction Impacts

Factors related to the natural environment criteria included:

- Effluent Receiving Water Body Assessment
- Sensitive Natural Features and Regulated Areas
- Climate Change

Factors related to the technical criteria included:

- Operational Complexity
- Ease of Implementation
- Redundancy and Flexibility
- Energy efficiency
- Constructability
- Regulatory Approvals

Life cycle costs from capital, installation and operation and maintenance costs were considered as part of the financial category.

Slide 50 – Preliminary Evaluation of Design Concepts

Based on the evaluation results presented in this table, Design Concept 2 was selected.

Slide 51 – Design Concept 2

Design Concept 2 involves:

- A rehabilitated equalization lagoon
- A new lagoon return pump station
- A new third SBR train
- A new dual staged filters
- Expanding biosolids storage
- Other upgrades involving civil, mechanical and electrical.

This design concept does not require an expansion of preliminary treatment and disinfection system and has a capital cost of $14M.

Slide 52 – What are the Next Steps?

Next steps include:

Determining staging and phasing of upgrade and expansion

Preparing the Environmental Study Report documenting project information and the decision-making process

Make the Environmental Study Report available for a 30-day review period for public and agency comment.

Slide 53 – Thank you for your participation! Please Stay Engaged

Thank you for participating in this virtual Public Information Centre for the Havelock Wastewater Treatment Plant Schedule 'C' Municipal Class Environmental Assessment.

Please submit any comments or questions that you may have by email or phone to Amber Coupland or Mina Yousif before November 22, 2022.

Amber Coupland is OCWA's Operations Manager/Project Manager. Amber can be reached by phone at 613-472-2131 ext 3, or via email at acoupland@ocwa.com.

Mina Yousif is the Consultant Class EA Lead with CIMA+. Mina can be reached by phone at 905-695-1005, extension 5776, or via email at mina.yousif@cima.ca.

On behalf of the entire project team, thank you for your interest in this Project and for participating in this Public Information Centre.