

12 August 2026

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Municipality of Bayham
56169 Heritage Line,
Straffordville, Ontario
N0J 1Y0

RE: TECHNICAL MEMORANDUM
PORT BURWELL WWTP CAPACITY REVIEW
MUNICIPALITY OF BAYHAM
COUNTY OF ELGIN

ATTENTION: AARON BELL, PLANNING COORDINATOR

This technical memorandum is provided in response to Municipality of Bayham Staff Report DS-27-26 to confirm the current committed capacity of the Port Burwell wastewater treatment plant (WWTP). The Staff Report noted a June 2026 capacity of 75.5% at the WWTP, increasing to an estimated 94.3% if all approved and known in-progress developments were realized within the Municipality. This memorandum is provided to review the current capacity of the Port Burwell WWTP to verify the Municipal values in report DS-27-26.

Based on information provided from Municipal Staff, the Port Burwell WWTP currently services 1,330 properties (including 12 additional residential units (ARUs)), equating to an estimated service population of 4,123 people, based on the 2021 Census data of 3.1 people per household within the Municipality of Bayham.

The WWTP is designed to accommodate an average daily sewage flow of 1,060 m³/d, with a maximum hydraulic capacity of 3,763 m³/d.

The flow data for the past 5-years (2022 – July 2026 inclusive) shows an average daily sewage flow of 704 m³/d, with a maximum daily flow of 3,256 m³/d. These 5-year averages correspond to 66.4% and 86.5% of the design capacities, respectively. Based on the service area of 1,330 properties, the 5-year average data equates to approx. 0.53 m³/d per household and 171 L/cap/d.

Ministry of the Environment, Conservation and Parks (MECP) procedure D-5-1 for calculating and reporting uncommitted reserve capacity indicates that the committed capacity is the sum of 3-5 year average inflows + unconnected approved developments. The MECP defines unconnected approved developments as those projects that have draft plan approval or have executed development agreements, but have not been built.

Within the Municipality of Bayham, there are 121 units within the service areas of the WWTP (Eden, Straffordville, Vienna, Port Burwell) that would fall under the definition for unconnected approved developments. The estimated design sewage from these 121 units needs to be deducted from the available capacity at the WWTP to determine the remaining uncommitted reserve capacity. The MECP recommended design sewage flow is 225 – 450 L/cap/d, which equates to 0.7 – 1.4 m³/d per unit (based on 3.1 people per unit). An estimated design flow of 1.0 m³/d per household was carried as a conservative middle-range value, that well exceeds the actual flows experienced (0.53 m³/d per unit).

Utilizing the 5-year average inflow of 704 m³/d, along with the 121 m³/d estimated inflow from the unconnected approved lots (121 units @ 1.0 m³/d per unit), the total current committed capacity of

the Port Burwell WWTP is 825 m³/d, which represents 77.8% of the current 1,060 m³/d average daily sewage flow.

The remaining uncommitted reserve capacity is 235 m³/d (1,060 m³/d total – 825 m³/d committed). Based on the estimated design flow of 1.0m³/d per unit, this would equate to 235 units of remaining uncommitted capacity.

Based on the proposed Interim Control By-Law that was introduced at the July 16th, 2026 Bayham Council Meeting, and is being considered for implementation at the August 20th, 2026 Bayham Council Meeting, there are approx. 102 units being allowed to proceed towards development approvals and eventual construction.

If the 121 unconnected approved lots and the 102 units being allowed to move forward were realized, then the anticipated inflows to the Port Burwell WWTP would be 927 m³/d, which equates to 87.4% of the rated design flow (1,060 m³/d).

From review of the past 5-years building permit and sanitary connection data, the Municipality of Bayham has averaged 15-20 units per year that are constructed and connected to the Municipal sanitary system. The 121 unconnected approved units + the 102 units being allowed to proceed would equate to approx. 10 years of housing inventory based on these rates. However, the housing market is very volatile and spikes in the market can greatly increase these numbers, as was seen in the recent 2020-2021 housing demand. Increases in build rates would utilize capacity within the plant much faster than the 5-year average build rate in Bayham.

In addition to the above, the MECP mandated 5-year average flows utilized for this capacity review are less than the inflows being experienced in 2026. If the 2026 average daily flow was used (782.4 m³/d), rather than the 5-year average (704.0 m³/d), the current committed capacity would be 85.2% (782.4 m³/d + 121.0 m³/d = 903.4 m³/d). Adding in the 102 units being allowed to proceed would equate to 96.6% (903.4 m³/d + 102.0 m³/d = 1,024.4 m³/d) using the 2026 flow data.

It should be noted that the sewage flows experienced at the Port Burwell WWTP fluctuate quite drastically and appear to be aligned with large rainfall events, which is not uncommon within Municipal sanitary sewer systems through infiltration at joints, combined sewers, illegal connections and various other infiltration and inflow (I&I) entry points. Pursuing programs to mitigate I&I within the system will help ensure that peak flows to the plant do not exceed the maximum hydraulic capacity of 3,763 m³/d.

Bayham Staff have confirmed that they have not had any issues with maintaining the treatment quality of effluent released from the WWTP.

Standard practice for review of WWTP expansion and/or optimization occurs when the facilities are at 80-90% committed capacity, with the understanding that it takes several years to determine any required expansion, implement the design, raise capital funds, and construct the solution, all before the existing facility reaches full capacity.

Based on the above, the Port Burwell WWTP is within this threshold for looking at expansion/optimization alternatives to accommodate future development within the Municipality of Bayham.

Based on current MECP requirements, any expansion of the Port Burwell WWTP, which increases the capacity beyond 1,060 m³/d would need to proceed under a Schedule C Municipal Class Environmental Assessment (Class EA). The Schedule C Class EA process typically takes 1.0 – 1.5 years to complete and would identify the recommended solution to expanding the capacity of the plant, as well as high-level cost estimates for use in Municipal budgeting. From this, a final detailed engineering design would be completed for approval by the MECP, and once Municipal budgeting is sourced, the project could proceed to construction.

The timing of implementing the chosen solution would be highly dependent on how fast development is realized within the Municipality, funding sources for the expansion, and I&I reduction efforts. A Class EA is valid for 10 years from completion, meaning there is ample time to complete the detailed design and construction once approved. If the project does not move forward within the 10-year approval timeline, a renewed Class EA can be completed for a subsequent 10-year approval.

In conclusion:

- Bayham Staff Report DS-27-26 indicated the Port Burwell WWTP is at 75.5% capacity as of June 2026, with an estimated increase to 94.3% capacity if anticipated oncoming development is realized
- This technical memorandum has confirmed that based on MECP Procedure D-5-1, the Port Burwell WWTP is at 77.8% committed capacity, and is estimated to increase to 87.4% capacity if anticipated oncoming development is realized
- If 2026 flow data is used, rather than the MECP mandated 5-year average, the Port Burwell WWTP would be considered at 85.2% capacity currently, and estimated to increase to 96.6% capacity if anticipated oncoming development is realized
- There have been no issues to date with maintaining the required effluent quality parameters for the Port Burwell WWTP
- The 121 unconnected approved units + the 102 units being allowed to proceed under the proposed interim control by-law may take up to 10 years to develop, based on the 5-year average build-out rate within the Municipality of Bayham, however, a housing market spike would drastically reduce this horizon period, so cannot be used solely as a reassurance of capacity
- Based on the current capacity of the WWTP, it is recommended that a review be initiated to look at expansion and optimization alternatives to accommodate future development under a Schedule C Class EA process
- It is further recommended that I&I reduction programs be reviewed by Municipal Staff to try and mitigate peak inflows during rainfall and snow melt events experienced at the WWTP

If there are any questions, please do not hesitate to contact this office.

Yours very truly,



Alex Muirhead, P. Eng.



Peter Penner, P. Eng.

AM/avm

Encl.

cc. Ms. Cindy Howard, Chief Administrative Officer (CAO), Municipality of Bayham
Mr. Lorne James, Treasurer, Municipality of Bayham
Mr. Steve Adams, Manager of Public Works/Drainage Superintendent, Municipality of Bayham
Mr. Jeff Carsey, Water Systems Supervisor, Municipality of Bayham