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Attachment 1

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Town of The Blue Mountains

Mill Street Sewage Pumping Station Interim Solutions Analysis

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

Value through service and commitment

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1.0 Introduction

1.1 Background

In July 2024, JLR and Civica completed an assessment on the Mill Street Sewage Pumping Station (SPS) (Mill Street SPS Capacity Assessment, JLR, 2024) to outline the existing and future capacity constraints at the SPS and identify the remaining capacity available to allocate to new development projects. This analysis identified that under both existing and future demand scenarios, there is no remaining connection capacity at the Mill Street SPS and identified there is an immediate need to address the deficiencies within the forcemain and at the Mill Street SPS. Detailed design of the forcemain upgrade and upgrades at the SPS are currently underway, and construction is anticipated to be completed in 2027.

Due to the existing capacity constraints at the Mill Street SPS and forcemain, the Town of The Blue Mountains (the Town) has not granted allocation for new sanitary connections that flow through the SPS. The Town has sought to explore interim solutions given uncertainty in the timing related to both the design and construction of the Mill Street SPS upgrades. The Town has retained J.L. Richards & Associates Limited (JLR) in association with Civica Infrastructure (Civica) to conduct an analysis on potential interim solutions to address the existing capacity constraints at the Mill Street SPS.

1.2 Study Area Overview

The Mill Street SPS is located on Bay Street East in Thornbury and is part of the Thornbury service area. The Thornbury service area provides wastewater servicing to the areas of Thornbury, Lora Bay, and Camperdown. The Mill Street SPS is the main pumping station for areas west of the Thornbury WWTP. The Mill Street SPS collects flows from the local gravity system and also receives flows from the Sunset SPS, Peel SPS, Moore SPS, and Elgin SPS, as shown in Figure 1. The Mill Street SPS currently pumps directly to the Thornbury Wastewater Treatment Plant (WWTP) via a 300 mm diameter forcemain.

The Mill Street SPS is currently comprised of the following equipment (based on the Town's CLI ECA):

- One inlet channel screen.
- Two pumps (1 duty, 1 standby), each with a peak instantaneous flow rate of 12,096 m^3/day (140 L/s) at a total dynamic head (TDH) of 42.0 m.
- One wet well of 40.6 m^3 capacity.

In a previous memorandum prepared by WT Infrastructure (WT) (October 2023), it was reported that the Mill Street SPS has a rated capacity of 160 L/s, however the pumps have a design capacity of 141 L/s. The Town has noted the maximum measured flow rate of the SPS is 134 L/s.

The theoretical capacity of the forcemain is 212 L/s (assuming a maximum velocity of 3 m/s); however, due to the age of the forcemain the Town does not recommend pumping higher flows than designed (141 L/s) through the existing forcemain.

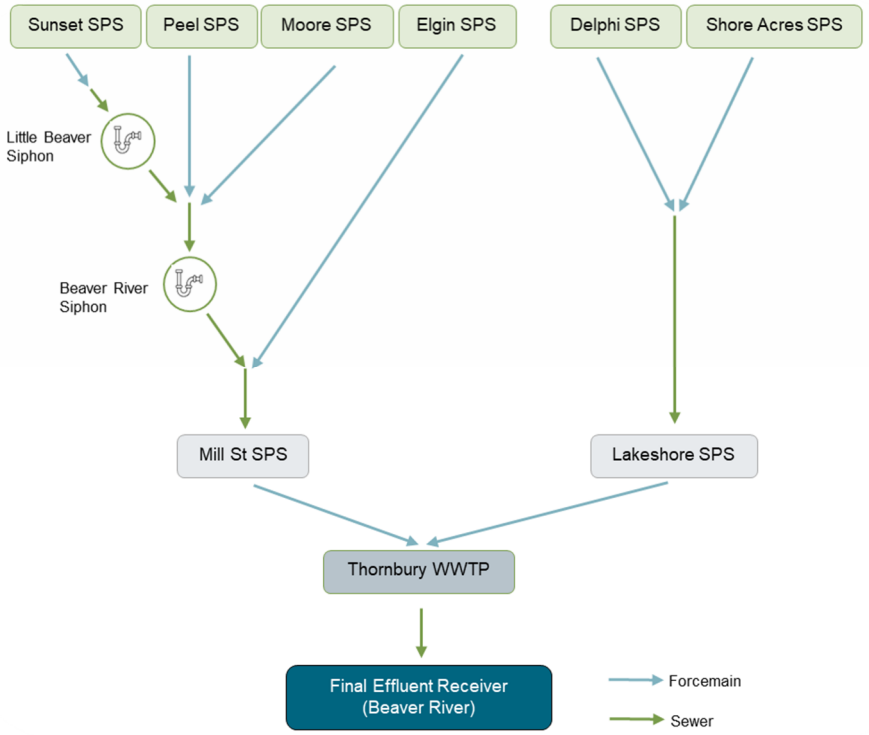

Figure 1. Thornbury WWTP Service Area

2.0 Proposed Level of Service Standard

The existing level of service met by the SPS and level of service proposed in the ongoing Wastewater Master Plan is summarized in Table 1. The interim proposed level of service, agreed upon in discussions with the Town, is to meet the existing level of service at the Mill Street SPS.

Table 1. Level of Service Criteria Summary

Level of Service Timeline	Wet Weather Criteria
Existing Pumping Station Level of Service	1:10 year storm flow(1) inflows to be less than 240 L/s and 1:100 year storm inflows(1) to be less than 300 L/s
Proposed Master Plan Level of Service	1:10 year storm flow(1) to be less than the firm capacity of the SPS and 1:100 year storm flow(1) to be less than the peak capacity of the SPS

Level of Service Timeline	Wet Weather Criteria
Table Notes: (1) MECP design guidelines specify sewage pumping stations with two pumps should be able to provide a firm capacity with one unit out-of-service and at least capable of handling the 10-year design peak hourly flow. For long-term planning purposes, level of service criteria were based on peak instantaneous flows to the SPS. Additional details are provided in the Wastewater Master Plan.	

3.0 Evaluation of Potential Interim Solutions for the Mill Street SPS

Five potential interim solutions were assessed to address the capacity issues at the Mill Street SPS, including:

- Upgrading the pumps at Mill Street to permit more flow through the existing forcemain
- Addressing inflow and infiltration
- Temporary or permanent storage at or upstream of the Mill Street SPS
- Temporary mobile treatment system
- Additional sewage hauling to alternate septage receivers during periods of high flows

The potential interim solutions were evaluated based on the following criteria: time to implement, operations and maintenance considerations, ability to maintain existing level of service, ability to improve level of service, and relative capital cost.

Each alternative was assigned an evaluation impact level (refer to Table 2) for each criterion. The detailed evaluation for each option is shown in Table 3.

Table 2. Evaluation Impact Level

Evaluation Impact Level
Negative Impact
No Anticipated Impact
Positive Impact

Table 3. Detailed Evaluation of Potential Interim Solutions at Mill Street

ALTERNATIVE	TIME TO IMPLEMENT	OPERATIONS AND MAINTENANCE CONSIDERATIONS	ABILITY TO MAINTAIN EXISTING LEVEL OF SERVICE	ABILITY TO IMPROVE LEVEL OF SERVICE	RELATIVE CAPITAL COST	RECOMMENDATION
ALTERNATIVE 1: Maintenance of Forcemain and Upgrading Mill Street SPS Pumps • The pumps at Mill Street would be replaced to the allowed capacity under the CLI ECA (182 L/s, see below) • The forcemain would be inspected and destructive testing could be conducted to remove any potential flow obstructions; there is risk that the issue may not be able to be mitigated. Risks are associated with conducting destructive testing on the forcemain due to the age of the forcemain and the manner it was installed. • There are risks associated with pumping higher flows through the forcemain; consideration should be given to the forcemain age (constructed in 1976), condition, and material (asbestos cement) prior to implementing this solution to understand potential negative impacts. • This alternative would not address the inadequate wet well working volume or provide redundancy for the existing aging forcemain. • Regulatory Considerations: Adding, replacing and modifying pumps is pre-approved under the Town's existing CLI ECA. The capacity of the SPS can increase up to 30% (i.e., up to 182 L/s) under the CLI-ECA.	• One to two years (for inspection and maintenance of the forcemain; design, installation, and commissioning of new pumps) • There is potential for this alternative to conflict with and delay the construction of the currently proposed Mill Street SPS upgrades	• Maintenance (i.e., inspection, destructive testing) of the existing forcemain may be required to remove flow obstruction (not recommended by Town operations due to the age and unusual installation of the forcemain) • The Town identified concerns associated with the efficiency of the pumping, and the speed of sewage hitting the screens at the Thornbury WWTP under this alternative. • This solution would extend the construction period at the Mill Street SPS (i.e., one construction period to inspect and remove forcemain obstruction and upgrade pumps, one construction period for full station upgrade) • No long-term operations and maintenance impacts are anticipated once the Mill Street SPS has been upgraded • It is anticipated that less sewage hauling would be required under this alternative	• Will maintain the existing level of service • The firm pumping capacity of the sewage pumping station would increase to 182 L/s (i.e., the pumping capacity of the SPS will increase by 41 L/s); additional development flows could be accommodated under this alternative (up to 41 L/s) if the level of service were to be maintained	• Will improve upon the existing level of service, but cannot meet the Master Plan level of service (1:10 year storm flow will be higher than the firm capacity of the station (182 L/s))	• $$	**Do not carry forward for consideration**
ALTERNATIVE 2: ADDRESSING I&I • I&I would be reduced to a maximum of 0.5 L/s/ha through I&I reduction and incentive programs (refer to Mill Street Capacity Assessment, JLR, 2024) • Addressing I&I could reduce approximately 35 L/s of peak flows at the Mill Street SPS, if all areas with I&I rates greater than 0.5 L/s/ha are reduced in the Mill Street SPS catchment area	• One to two years to identify and remove direct connections (additional flow monitoring is taking place in the spring of 2025, and smoke/dye testing to identify direct connections could take place once areas of high I&I have been isolated) • This alternative assumes all I&I in the Thornbury service area is reduced, including some areas where reconstruction or replacement projects are required (e.g., Bay Street East reconstruction); the timing of these projects vary and will likely extend beyond one to two years	• No short- or long-term operations and maintenance impacts are anticipated once the Mill Street SPS has been upgraded • It is anticipated that less sewage hauling would be required under this alternative	• Will maintain existing level of service if all I&I in the Thornbury service area is reduced to a maximum rate of 0.5 L/s/ha • Addressing all I&I will reduce approximately 35 L/s of peak flows at the Mill Street SPS, therefore additional developments (up to 35 L/s) could be accommodated under this alternative if the level of service is maintained	• Will improve upon the existing level of service if all I&I in the Thornbury service area is reduced to a maximum rate of 0.5 L/s/ha, but cannot meet the Master Plan level of service (1:10 year storm flow to be less than the firm capacity of the SPS (141 L/s)	• $$$	**Consider in combination with other alternatives**
ALTERNATIVE 3: CONSTRUCT AND EXPEDITE PERMANENT STORAGE AT MILL STREET SPS • In consultation with WT, the currently proposed Mill Street SPS upgrades do not include storage or equalization volume. The design of the upgrades could be modified to provide storage at the Mill Street site. • Approximately 500 m^3 of storage would be required to meet the Master Plan level of service under existing conditions; additional storage would	• One to two years (for design, construction, and installation)	• Long-term operations, inspection, and maintenance would be required from Town staff under this alternative for the life expectancy of the storage system	• This alternative maintains the existing level of service as flows from future developments will be attenuated before reaching the Mill Street SPS	• This alternative meets the Master Plan level of service	• $$$	**Do not carry forward for consideration**

ALTERNATIVE	TIME TO IMPLEMENT	OPERATIONS AND MAINTENANCE CONSIDERATIONS	ABILITY TO MAINTAIN EXISTING LEVEL OF SERVICE	ABILITY TO IMPROVE LEVEL OF SERVICE	RELATIVE CAPITAL COST	RECOMMENDATION
be required if developments are proposed to be constructed before the Mill Street SPS has been upgraded. The volume of storage required would need to be confirmed during detailed design • Regulatory Considerations: Storage is pre-approved under the Town's existing CLI ECA						
ALTERNATIVE 4: CONSTRUCT DEVELOPMENT-SPECIFIC INTERIM STORAGE UPSTREAM OF MILL STREET SPS • Temporary in-line storage could be constructed for proposed developments (e.g., Tatham Engineering has proposed a temporary in-line storage solution, which would be designed such that flows generated by the 58 units in Phase 4B do not impact the existing condition and operation of the Mill Street SPS). These systems would be decommissioned once the Mill Street SPS upgrades have been completed. • This alternative may be applicable on other development sites subject to detailed engineering review. • Regulatory Considerations: Storage is pre-approved under the Town's existing CLI ECA	• Two to four months (to be installed as part of servicing works)	• No short- or long-term operations and maintenance impacts (Developers would be responsible for the operation, inspection, and maintenance for the life expectancy of the storage system)	• This alternative maintains the existing level of service as flows from future developments will not impact the existing condition and operation of the Mill Street SPS during the peak flow scenario	• Will not improve upon the existing level of service or meet the Master Plan level of service	• $	**Carry forward for consideration**
ALTERNATIVE 5: CONSTRUCT GENERAL INTERIM STORAGE • Consideration could be given to permanent storage solutions (e.g., at Sunset SPS, Mill Street SPS or other locations) to mitigate impacts from existing or proposed developments • Approximately 500 m^3 of storage would be required to meet the Master Plan level of service under existing conditions; additional storage would be required if developments are proposed to be constructed before the Mill Street SPS has been upgraded. The volume of storage required would need to be confirmed during detailed design • Regulatory Considerations: Storage is pre-approved under the Town's existing CLI ECA	• Three to five years (design, acquiring land, construction)	• Long-term operations, inspection, and maintenance would be required from Town staff under this alternative for the life expectancy of the storage system	• This alternative maintains the existing level of service as flows from future developments will not reach the Mill Street SPS	• This alternative meets the Master Plan level of service	• $$$	**Do not carry forward for consideration**
ALTERNATIVE 6: TEMPORARY MOBILE TREATMENT SYSTEM • A temporary mobile treatment system would be installed upstream of the Mill Street SPS (e.g., at the Sunset SPS or elsewhere in the system) to remove flows from the Mill Street SPS catchment area. • Regulatory Considerations: A mobile treatment system would require a suitable outlet location and an ECA. ECA effluent criteria may be stringent depending on the outlet location. The temporary mobile treatment system would need to be robust enough to meet required effluent criteria.	• Two to five years, pending approvals timeline from MECP	• Potential for short-term operations and maintenance impacts for Town staff while the temporary mobile treatment system is in operation • Consideration could be given to agreements with developers to operate and maintain the temporary treatment system	• This alternative maintains the existing level of service as flows from future developments will not reach the Mill Street SPS	• Will not improve upon the existing level of service, and cannot meet the Master Plan level of service (1:10 year storm flow to be less than the firm capacity of the SPS (141 L/s)	• $$$	**Do not carry forward for consideration**
ALTERNATIVE 7: ADDITIONAL HAULING AND TEMPORARY ALTERATE SEPTAGE RECEIVER • Excess flows beyond the Mill Street SPS capacity would be hauled to the Thornbury WWTP. To overcome potential septage receiving capacity constraints at the WWTP, hauled sewage could potentially be brought to another septage receiver (e.g., the Meaford STP). • An analysis of available capacity at the Meaford STP and consultation with the Municipality of Meaford should be completed before implementing this solution	• Two to four months (consultation with Municipality of Meaford)	• Additional operation time may be required to coordinate additional haulage at the Mill Street SPS and coordinate with the Municipality of Meaford • No long-term operations and maintenance impacts are anticipated once the Mill Street SPS has been upgraded	• This alternative decreases the current level of service at the Mill Street SPS • Additional hauling would be required to accommodate future development	• This alternative decreases the current level of service at the Mill Street SPS	• $	**Do not carry forward for consideration**

4.0 Conclusions and Recommendations

This memorandum has been prepared to outline the potential interim solutions that can be implemented to address the existing capacity constraints at the Mill Street SPS and allow capacity to be allocated to new development projects. It has previously been identified that under the existing demand scenario there is no remaining connection capacity at the Mill Street SPS, and design for the upgrades at the Mill Street SPS are currently underway.

JLR and Civica recommend that the Town continue to expedite the detailed design and construction for the Mill Street SPS and Forcemain upgrade to immediately alleviate existing limitation imposed by the forcemain and SPS.

In the interim, the Town could consider permitting the construction of interim in-line storage solutions to allow for allocation of new developments prior to the commissioning of the Mill Street SPS and Forcemain upgrades.

5.0 Limitations

This report has been prepared by J.L. Richards & Associates Limited for The Town of The Blue Mountain's exclusive use. Its discussions and conclusions are summary in nature and cannot properly be used, interpreted or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope and limitations. This report is based on information, drawings, data, or reports provided by the named client, its agents, and certain other suppliers or third parties, as applicable, and relies upon the accuracy and completeness of such information. Any inaccuracy or omissions in information provided, or changes to applications, designs, or materials may have a significant impact on the accuracy, reliability, findings, or conclusions of this report.

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J.L. RICHARDS & ASSOCIATES LIMITED

Prepared by:

Gillian Pfeiffer, EIT
Environmental Engineering Graduate

Reviewed by:

Jane Wilson, M.Sc., P.Eng.
Senior Associate
Municipal Infrastructure and Planning Market Chief

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Ottawa
343 Preston Street
Tower II, Suite 1000
Ottawa ON Canada
K1S 1N4
613-728-3571
ottawa@jlrichards.ca

Kingston
203-863 Princess Street
Kingston ON Canada
K7L 5N4
613-544-1424
kingston@jlrichards.ca

Sudbury
314 Countryside Drive
Sudbury ON Canada
P3E 6G2
705-522-8174
sudbury@jlrichards.ca

Timmins
834 Mountjoy Street S
Timmins ON Canada
P4N 7C5
705-360-1899
timmins@jlrichards.ca

North Bay
555-501 Oak Street E
North Bay ON Canada
P1B 8E3
705-495 7597
northbay@jlrichards.ca

Guelph
107-450 Speedvale Ave. West
Guelph ON Canada
N1H 7Y6
519-763-0713
guelph@jlrichards.ca

J.L.Richards
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