



Description: This 57 km, 600 mm diameter pipeline was built by the SNC-Lavalin/Con Drain design-build consortium and administered by OCWA to supply water from Collingwood to Alliston, which is rapidly developing. A single pump station would supply 155 L/s during Phase I but this would ultimately increase to 700 L/s (Phase IV) with 4 booster stations. EHG was initially retained for a review but eventually authorized to conduct an independent hydraulic transient analysis.

A number of surge protection measures were recommended by EHG, including:

- i) The use of a small, flow through surge tank at the highest point. Initially, it would act as a two-way surge tank, then a one-way surge tank and ultimately a reservoir for a booster station (see two figures below).
- ii) During Phase I, the downstream part of the transmission line would function as a gravity line. Several air vents were recommended to promote uniform hydraulic conditions.
- iii) In the later phases, the gravity line would be converted to a pressurized line by installing a pressure-sustaining valve at its end and replacing air vents with air valves.
- iv) Pump by-pass lines with check valves would provide sufficient protection of the downhill or flat sections of the transmission line after Phase I.
- v) A number of pumping operation procedures were also established.

Benefit to the Client: As a result of EHG's analysis, pumping operations could be optimized to minimize sub-atmospheric pressures, extend the life of the transmission line infrastructure and reduce capital construction cost.

