



**Environmental
Hydraulics
Group**

Hydraulic Transients (HT)
- Water & Sewage

Project: Water Transmission Line from Alliston to Beeton – Transient Analysis

2000-802

Location: Alliston / Beeton, Ontario

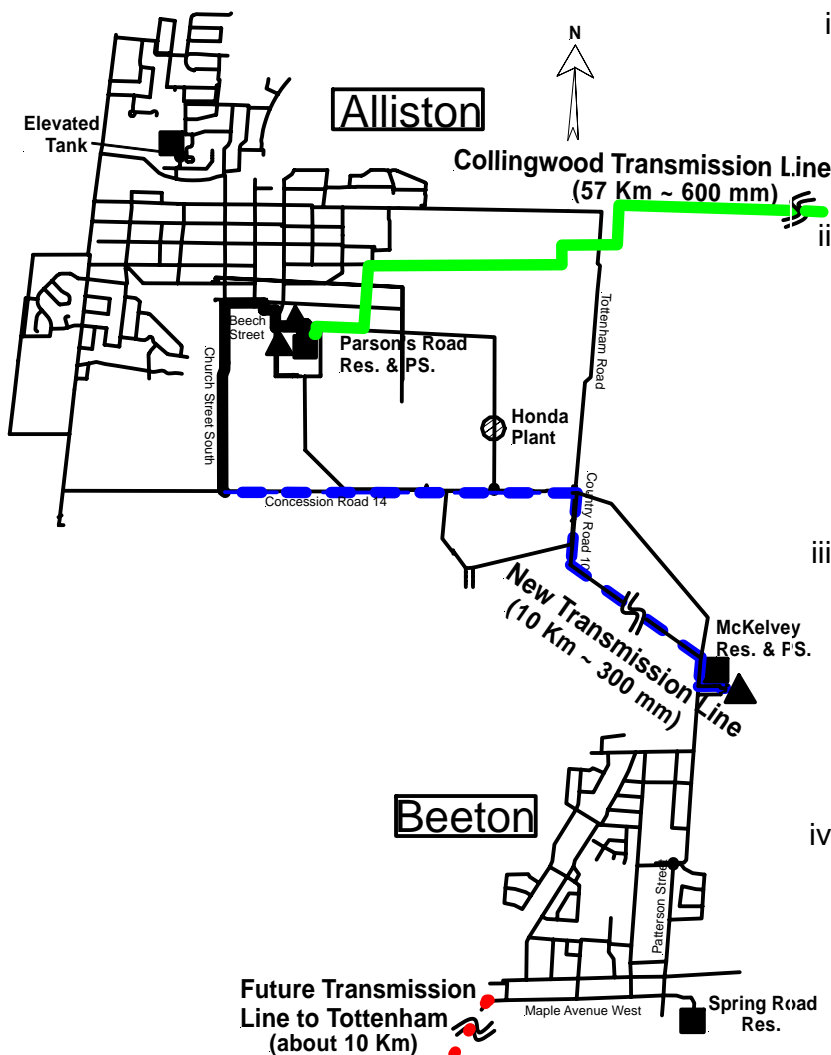
Client: Town of New Tecumseth

Completed: April 2001

Description: EHG completed a water hammer project in 1999 to protect a 57 km long and 600mm diameter water transmission line. In 2001, EHG was retained again by the Town of New Tecumseth to provide surge control measures for a new 10 km - 300 mm water transmission main from Alliston to the Beeton community.

Benefit to the Client: The analysis results obtained by EHG revealed that the upsurge pressure was within the pipe tolerance limit for the new transmission line, but the existence of significant sub-atmospheric pressure indicated that air and groundwater intrusion was possible after a power failure. This undesirable transient condition could be eliminated using a planned network system upgrade and/or pump operational measures.

Since the new line was connected to the existing municipal systems, the transient would eventually extend to cover the entire network of both Alliston and Beeton. Findings included:



- i. The elevated tank provided adequate transient protection to most of Alliston but its protection diminished towards the new transmission line;
- ii. Significant but tolerable transients could occur in the Honda (major industry) line upon pump shut-down. With a proper operational procedure, transient impacts could be reduced to minimal during the normal pumping operation;
- iii. The new water supply strategy did not negatively affect the existing local Beeton system. Minor operational changes or upgrades could minimize pipe fatigue, valve wear-out and energy consumption;
- iv. The steady state water system could be improved greatly by removing bottlenecks; revising pipe network connections; adding elevated storage facilities, air removal at the high points and a new vent pipe at the reservoir outlet.