

Pipe-Splitting and Replacement of a Corrugated Steel Pipe with Submerged Outlet at Canadian Nuclear Laboratories

Presenters:

Pierre Wilder, Colin Goodwin, Gerry Bauer (Stantec Consulting Ltd)

This presentation will discuss the design constraints, method selection, construction challenges and lessons learned during replacement of a corrugated steel pipe with submerged outlet at Canadian Nuclear Laboratories.

The Canadian Nuclear Laboratories site in Chalk River, Ontario features an on-site Sanitary Sewage Treatment Facility (SSTF), which services the entire site. The SSTF was identified as a key component of CNL's infrastructure requiring upgrades to meet the needs of future site development. Although a full reconstruction of the SSTF was required, CNL and Stantec conducted a CCTV inspection and condition assessment of the existing outfall pipe to determine if it was also in need of renewal to support to new SSTF. The inspection of the outfall pipe confirmed that it required renewal in the near future.

The existing 300mm diameter corrugated steel outfall pipe discharges treated effluent from the SSTF into the Ottawa River. The pipe is roughly 150m long, extending approximately 90m into the river with a submerged outlet approximately 4m beneath normal river level. Due to the location and submerged outlet condition of the outfall pipe, an open-cut replacement would have required extensive environmental assessment costs and schedule impacts. In consideration of these constraints, the CNL/Stantec project team reviewed several technical solutions considering schedule, constructability, cost, and risks. It was determined that a trenchless method of pipe replacement by pipe-splitting would be most appropriate. The benefits of pipe splitting include the ability to install the pipe underwater, avoiding existing site utilities and infrastructure, with reduced risks, costs, regulatory approvals, and construction time as compared to open-cut replacement.

As the Engineer of Record, Stantec produced a technical scope of work to outline the design requirements for the pipe-splitting activities and assist CNL in procuring a contractor. In November 2015, the pipe splitting contractor and equipment was mobilized to site. The existing corrugated steel pipe was cut and expanded using a static splitter head and the new DR11 HDPE replacement pipe was pulled through the existing conduit. Using a team approach, the contractor was able to successfully pull the new pipe into place and complete the project within the proposed three-week schedule. This work also included installation of a new access maintenance hole and new pipe stub to allow future connection to the existing SSTF. This new pipe mitigates the risk of a discharge pipe failure and will allow the construction of the new SSTF to proceed.

Pierre Wilder | pierre.wilder@stantec.com