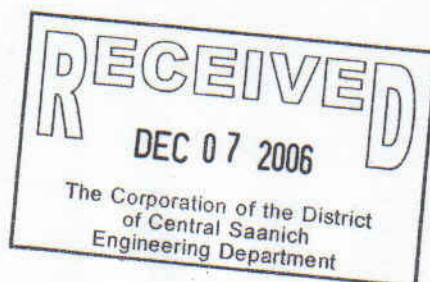


**District of
Central Saanich**

**Senanus Drive
watermain study**

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**District of Central Saanich
Senanus Drive Watermain Study**

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District of Central Saanich Senanus Drive Watermain Extension

executive summary

This summary provides a synopsis of the findings and recommendations for the Senanus Drive Watermain Extension study. This is not intended to be a substitute for the full report.

The objective of the study was to examine two main servicing options for the possible extension of the existing watermain on Mount Newton Cross Road to the end of Senanus Drive at Henderson Point. Option 1 would be provision of domestic water supply only to the end of Senanus Drive. The second alternative would involve supply of domestic and agricultural irrigation water plus fire flow to the end of Senanus Drive. Detailed cost estimates were developed for the two options to facilitate evaluation by Council and Administration with regards to the feasibility of the watermain extension and possible future grant application.

Previous studies and reports were used to provide background information and for comparison of assumptions and calculations made in this report. Domestic water requirements outlined in the District of Central Saanich – Water System report prepared by the District in 1998 were used in this study. Values for agricultural flow demands were obtained from the District of Central Saanich Agricultural Water Study prepared by Bullock Baur Associates in 1998.

The existing Saanichton Pressure Reducing Station (PRV) – low system located at Wallace Drive and East Saanich Road would service the project area which includes properties along Mount Newton Cross Road from East Saanich Road to Senanus Drive at Henderson Point. The hydraulic grade line of the PRV – Low system is currently set at 109 m. A 200 mm diameter AC watermain runs from the PRV to Mount Newton Cross Road and continues along Mount Newton Cross Road and terminates at Thomson Road. This region along Mount Newton Cross Road and Senanus Drive is generally flat with gentle rolling hills. The area consists of a mix of agricultural lands and rural estates. The soil is typically clay and clayey loam with pockets of gravelly sandy loam.

Review of the 1998 Bullock Baur Central Saanich Agricultural Water Study and manuals from Ministry of Agriculture, Soils, and Engineering Branch as well as Ministry of Environment, Water Management Branch, concluded that a maximum day agricultural flow of 0.53 L/s/ha would be appropriate for use in this study. This value reflects the prevalent crops and soil types in the project area, climatic condition, as well as current irrigation demands and practices.

Fire flow requirement was determined using guidelines outlined by Fire Underwriter Survey (FUS). Fire flow calculation is largely dependent on type of house construction, total floor area, and exposure to adjacent structures. With the wide range of house sizes in the area, the required fire flow would range from 67 L/s to 116 L/s. For this study, it was necessary to determine a design fire flow that would meet an acceptable risk tolerance while ensuring the viability of the project. By adopting a higher fire flow value would equate to substantial upgrade to the existing water network and installation of larger new watermains. Consistent with standard practices in other BC municipalities, a value of 80 L/s (1,055 gpm) was considered to be appropriate for use as design fire flow in this study.

The WATSYS software by Expertware CivilSystems was used to analyze various water use patterns for the two main servicing options in this report. Using information providing by District of Central Saanich and the 1998 Bullock Baur Agricultural Water Study, a model reflecting existing land use and agricultural demands was developed to assess the two main servicing alternatives. The model did not make any allowance for possible future increases in residential, commercial, and industrial demands. Assumptions have been made that the existing CRD trunk main would be capable to meet the increase in demand and some modifications to the existing Saanichton PRV would be required.

The existing 200 mm diameter watermain is located along the south shoulder of Mount Newton Cross Road. It is envisioned that this alignment would continue for the extension of the future watermain to West Saanich Road. West of West Saanich Road, due to minimal shoulder width, the future watermain would have to be located within the roadway.

Bedrock probing investigation was completed by Thurber Engineering Ltd. to create a profile of the subsurface condition along the conceptual watermain alignment. With visible rock outcrops on Senanus Drive, it was assumed that bedrock would be encountered along the future watermain trench. The bedrock probing indicated that along Mount Newton Cross Road, bedrock would typically be at a depth greater than 2.4 m, beyond the watermain trench zone. An area of exception would be at approximately 200 m immediately west of Thomson Road, where limited bedrock might be encountered at a shallower depth.

Detailed cost estimates were developed for the two main servicing options. These costs are conceptual only and include allowance for contingency, engineering and administration, and have been adjusted to 2007 dollars. The cost, however, does not include GST or Central Saanich internal administrative costs.

For Option 1 to provide domestic water supply to the end of Senanus Drive, no upgrade would be required on the existing water system. Installation of new 200 mm and 150 mm diameter watermain would be required. The estimated costs for the potential watermain extension to the end of Senanus Drive would be \$1,530,000.

For Option 2, all existing watermains from the Saanichton PRV on Wallace Drive and along Mount Newton Cross Road would require upsizing to meet the maximum day domestic demand, 280 L/s agricultural flow, and 80 L/s fire flow. The estimated costs for servicing Option 2 would be \$3,780,000.

Two further options were considered to minimize the extent of necessary improvements required on the existing water system. Alternate Servicing Option 1 would involve supplying domestic water as well as 80 L/s fire flow to the end of Senanus Drive. During normal operating condition, limited flow could be provided to the agricultural users in this option. In event of a fire, agricultural demand could not be met. The estimated cost for this option would be \$2,920,000.

Alternate Servicing Option 2 entailed provision of domestic water and 280 L/s agricultural irrigation flow to the end of Senanus Drive. In event of a fire, restriction to agricultural flows would be necessary in order to maintain system pressure and deliver the design 80 L/s fire flow. The estimated cost for this alternative would be \$3,420,000.

It is recommended that a more detailed review of two alternate servicing scenarios be carried out. To meet the large flow demand from the agricultural users in the region, extensive upgrade to the existing water system would be required. Further studies should be carried out to examine the feasibility of developing a new connection to the CRD water system as an alternative to upgrading the existing PRV and water network. Alternatively, the use of the Upper John Dean Reservoir could be investigated as an alternate source of supply to the project area.