Township of Langley

Est. 1873

M E M O R A N D U M

TO:	MAYOR AND COUNCIL	**DATE:**	APRIL 30, 2014
FROM:	ENGINEERING DIVISION	**FILE NO:**	5330-27-032
SUBJECT:	EAST LANGLEY WATER SUPPLY PROJECT SALMON RIVER CROSSING		

The purpose of this memorandum is to provide Mayor and Council with information relating to a recent communication from the Salmon River Enhancement Society (SRES) dated April 24, 2014.

In the communication, SRES is requesting that the East Langley Water Supply (ELWS) project be either relocated away from the 52 Avenue alignment or constructed using alternative methods when crossing Salmon River.

History/Background

During preliminary engineering analysis of the ELWS project in 2008/09, potential alignment options were reviewed that included 64 Avenue, 56 Avenue, 52 Avenue, 48 Avenue, and Fraser Highway. Early on, the 56 Avenue alignment was eliminated due to geotechnical conditions and potential soil hazards; the 48 Avenue alignment was eliminated due to similar risk but greater cost than the 52 Avenue alignment. The remaining alignment options were submitted to the public for input via open houses in November 2009.

The 52 Avenue alignment was ultimately endorsed by Council in July 2010. Detailed design work by Associated Engineering, including investigations by Levelton Engineering Ltd. geotechnical and Summit Environmental sub consultants, confirmed that construction along the 52 Avenue alignment is preferred, in consideration of overall environmental, social, geotechnical, economic, and operational factors.

As Council is aware, construction of the ELWS has been underway for some time, with the first phase completed, and is currently ongoing. Phase 1 between Willoughby and Murrayville at 52 Avenue and 224 Street is now substantially complete. Rights-of-way and additional construction easements have been obtained based on the preferred alignment approved by Council.

Contracts for the pump station at 52 Avenue and 224 Street and for the pipeline from the pump station to the connection to the east Langley water system at 56 Avenue and 250 Street have been awarded and construction has started. Delays due to redesign of the ELWS project may require cancelling the contract, resulting in potentially significant claims based on current contractual obligations. The project would not be completed this year, contrary to commitments made to have a sustainable water supply to east Langley by the end of 2014.

Construction Options

The contract calls for open cut trenching on either side of Salmon River with 'auger boring' under the Salmon River based on environmental and economic drivers. This method minimizes risks and costs and was previously reported to Council.

Horizontal directional drilling as proposed in the recent SRES communication does have a risk of hydraulic fracture under the Salmon River and was estimated to be $1 million more expensive than the chosen method. The horizontal drilling and auger boring methods are described in more detail and compared in Attachment A.

Environmental Control

An Environmental Management Plan, including an Erosion and Sediment Control Plan, are in place. Measures following standard engineering practices and best environmental practices will be taken to stabilize banks and manage any run off from the construction site. The current alignment through the Salmon River area was specifically chosen to reduce the number of trees that need to be removed. Some trees within the temporary work zone and permanent right-of-way have been necessarily selected for removal to facilitate construction (Attachment B and C).

Plant salvaging will take place prior to the area being disturbed and the area will be re-vegetated once the project is complete. Staff will also ensure that all applicable federal, provincial, and municipal regulations are followed. Disturbance from construction will be avoided within 30m of the Salmon River.

In regards to a cancelled March 17, 2014 site visit referenced in the SRES correspondence, Township staff is not aware of such meeting and speculate that it may have been a proposed site visit between the contractor and private property owner(s) to discuss issues such as access. Notwithstanding, staff will continue to communicate with SRES.

Attachment A Horizontal Drilling and Auger Boring

Attachment B Salmon River Crossing Aerial Plan

Attachment C Salmon River Crossing Tree Survey

Attachment A

Horizontal Drilling and Auger Boring

Horizontal directional drilling is a trenchless construction technique capable of guided bored installations of new pipe and conduit. A horizontal directional drilling installation is conducted in two phases. First, a pilot bore is launched from the drill rig at the surface and guided or steered utilizing an electronic locator system to the target or exit location also located at the surface. Once the drill string reaches the surface at the exit location, a backreamer is attached to the drill string and pulled back to the entry point. As the reamer is pulled through the pilot bore, the reamer enlarges the bore by cutting or displacing soil. This process increases the diameter of the borehole to be greater than that of the pipe being installed. The product pipe is pulled from the target location to the drill rig, after the borehole is of adequate diameter to accommodate the pipe. Throughout the installation process the drill rig injects drilling fluid through the drill stem to the reamer or drill head to assist in cutting and transporting soil out of the borehole to the surface. The drilling fluid is typically a mixture of bentonite (naturally occurring clay mineral) and water, with additional admixtures to assist the installation by lubricating the bore for the pulling of the product pipe, as well as stabilizing the borehole.

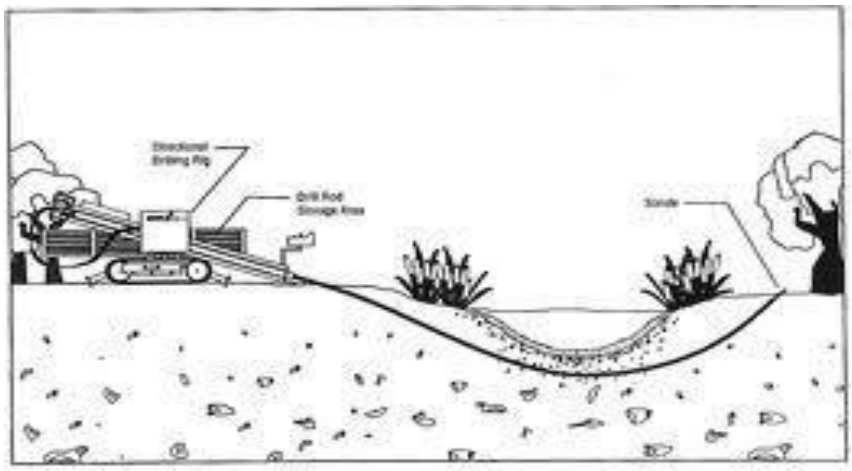
River crossings utilizing horizontal directional drilling are common in the oil and gas industry, and widely used for municipal applications. The size of pipe designed for this project is 600 mm, which is well within the operational envelope for this technology. The general comfort zone for the majority of contractors is with products 1,200 mm or less, with 600 mm being a common large diameter horizontally drilled installation.

Advantages:

- Minimal disturbance to environment and surrounding properties.
- Size and length of installations is within capabilities of technology.
- Several local contractors capable of completing crossings of this length and diameter.

Disadvantages:

- As with all river crossings, there is the risk of hydraulic fracture beneath the riverbed allowing for the release of drilling fluid into the river.
- Some phases of the installation may require continuous operation, creating noise outside the normal construction operational hours.
- Estimated $1,000,000 more expensive than the chosen method.



Horizontal Directional Drilling

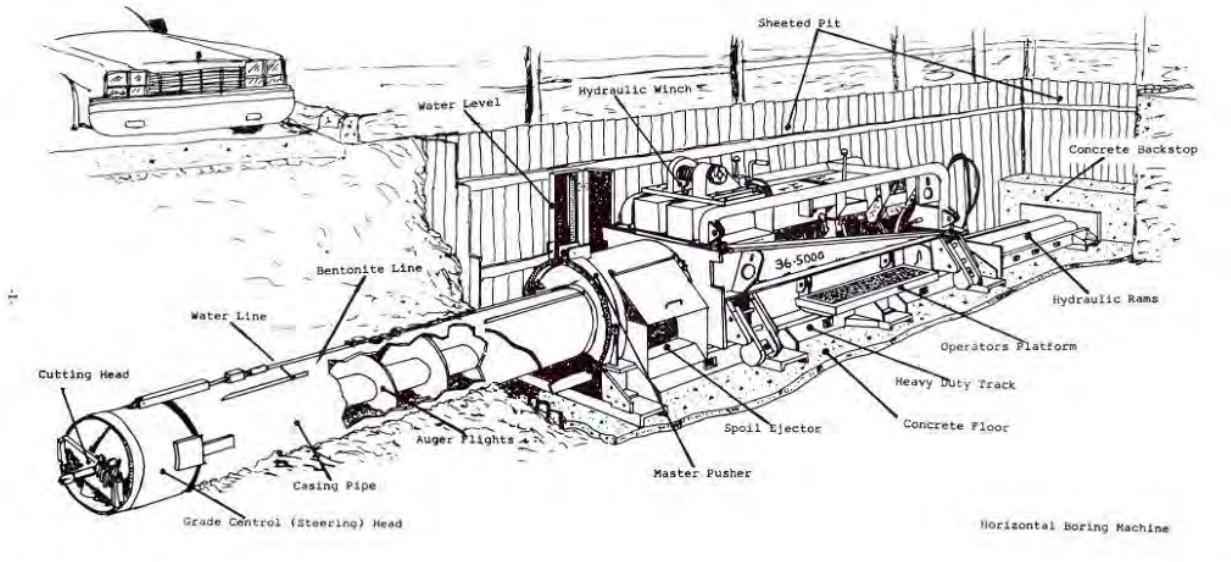
Auger boring is an installation method typically utilized to install steel casing pipes, which will ultimately house the proposed product pipe or utility being installed. Generally utilized for short in length and larger diameter crossings, this method has been applied extensively to cross right of ways, roads, rails and highways. The process involves the simultaneous jacking of an open ended steel casing pipe; while rotating auger flights inside the casing remove spoil material. A power unit (auger boring machine) attached to the casing and augers located in the launch pit supplies the jacking force to advance the casing and torque to rotate the augers during the installation. All spoil materials contained in the casing pipe are pulled back to the machine where they are removed typically by hand from the launch pit. As the installation progresses, lengths of casings with auger flights are added periodically in sections to attain the desired installation length. During the installation process the grade of the casing pipe can be monitored to ensure the casing is being installed along the proposed alignment. In general, the grade and alignment cannot be changed once installation commences.

Advantages:

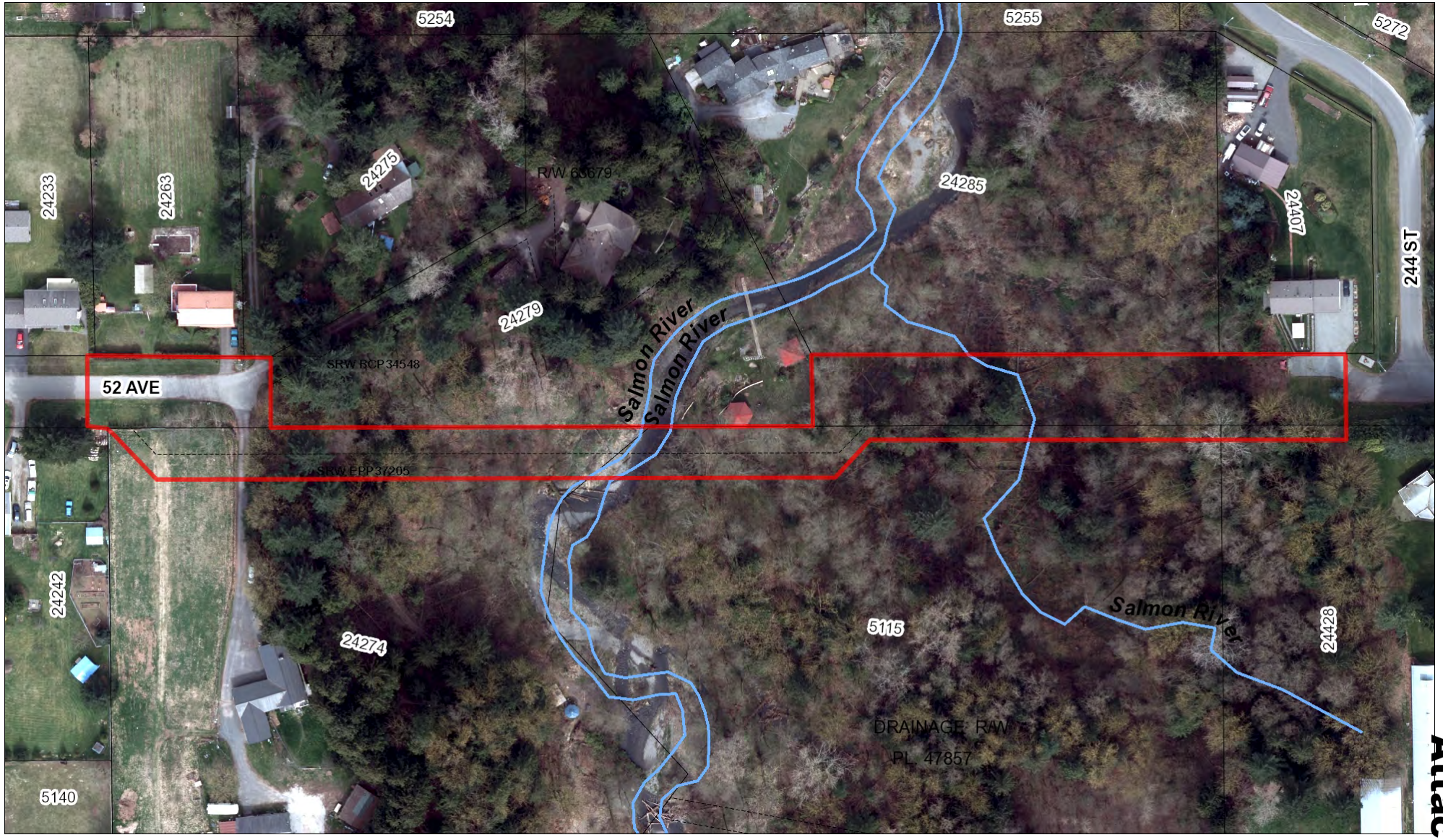
- Minimal disturbance and disruption.
- Size and length of installation is within the capabilities of technology – for crossing the Salmon River.
- Several local contractors are familiar with, and capable of, installing this size of steel casing.

Disadvantages:

- De-watering may be required to install pipes.
- Installation accuracy less reliable than open trench or directional drilling.



Geosource Map



58.41 0 29.20 58.4 Meters

Scale 1: 1,532.95

Township of LANGLEY Geosource

Printed:4/28/2014

Salmon River crossing

The data provided is a compilation of geographic information drawn together from a variety of sources, historic and current, and does not necessarily include everything and anything for a particular purpose; and the person utilizing this information does so entirely at their risk as the Township of Langley assumes no obligation or liability for the use of this information by any person and makes no representations or promises regarding the completeness or accuracy of the information or its fitness for a particular purpose.

Attachment B


Legend
Flow Direction
Source
Catch Basin
Inlet
Lawn Basin
Node
Outlet
Cap
Manhole
Other Manholes
Cleanout
Catch Basin Manhole
Control Manhole
Oil and Grit Interceptor
Regular
Rockpit
Sump
Culvert
Box
Arched
Circular
Elliptical
Unknown
Channel
Unknown
Creek
Dtich
River
Swale
Connection
Pipe
Gravity Main
Preliminary Gravity Main
Private Gravity Main
Abandoned Gravity Main
Lead
Preliminary Lead
Abandoned Lead
Detention Pond
Park

Attachment C