Long List Option No.1 — Conveyance (Estuary Alignments)

This alignment would involve installation of a new forcemain within or along the Comox harbour foreshore. The forcemain would transition to an overland pipe between Comox and the Lazo Road height of land. To convey the sewage over the Lazo Road height of land the following options are suitable:

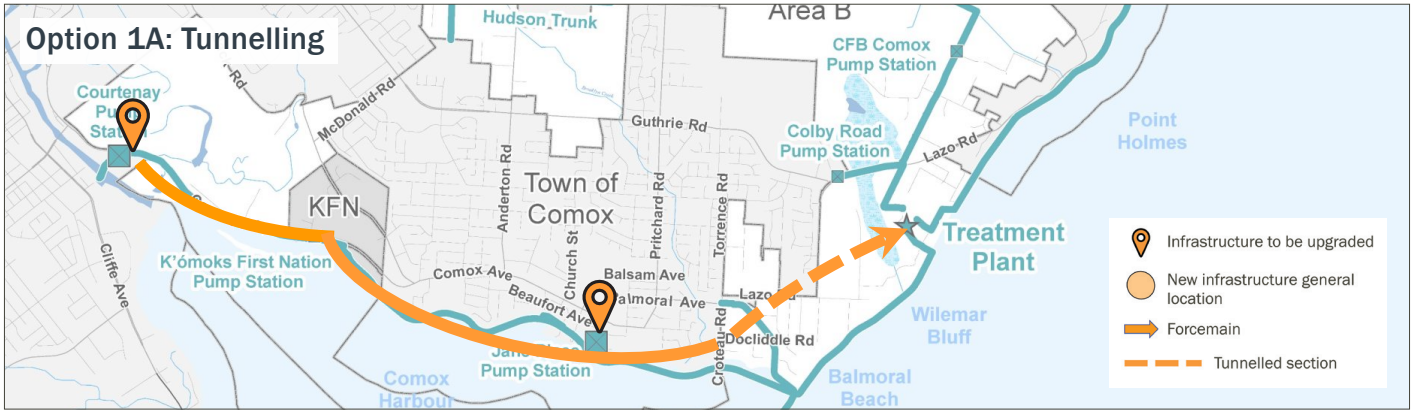
1A. The forcemain from Courtenay Pump Station (PS) would continue directly to the treatment plant through a new tunnel at the Lazo Road height of land. The tunnel would reduce the required pressures in the system. Pending the tunnel elevation, a new pump station may be required in the general vicinity of the existing Jane Pl. Pump Station (PS). In which case, the existing Jane Pl. PS would be repurposed as a small subdivision pump station.

Advantages

- Potentially limited hydraulic changes to existing pump stations hydraulics subject to tunnel elevation.
- Minimizes construction of a forcemain through Comox
- Involves only two large pump stations

Disadvantages

- Involves work along and potentially in the estuary, including environmentally and archaeologically sensitive areas
- Elevated maintenance and risk management needs due to proximity to marine environment
- Elevated construction and operational risk associated with a tunnel



1B. The forcemain from Courtenay Pump Station (PS) would continue directly to the treatment plant such that there is no in-line pump station. In order to overcome the Lazo Road height of land, Courtenay PS would be upgraded to ensure the forcemain pressure is sufficiently high. As a result, the existing Jane Pl. Pump Station (PS) would not be able to cope with this higher hydraulic requirement and a new pump station would be required to convey raw sewage into the forcemain between Courtenay PS and the treatment plant. The existing Jane Pl. PS would be repurposed as a small subdivision pump station.

Visit: www.comoxvalleyrd.ca/lwmp
Email: engineeringservices@comoxvalleyrd.ca
Phone: 250-334-6000

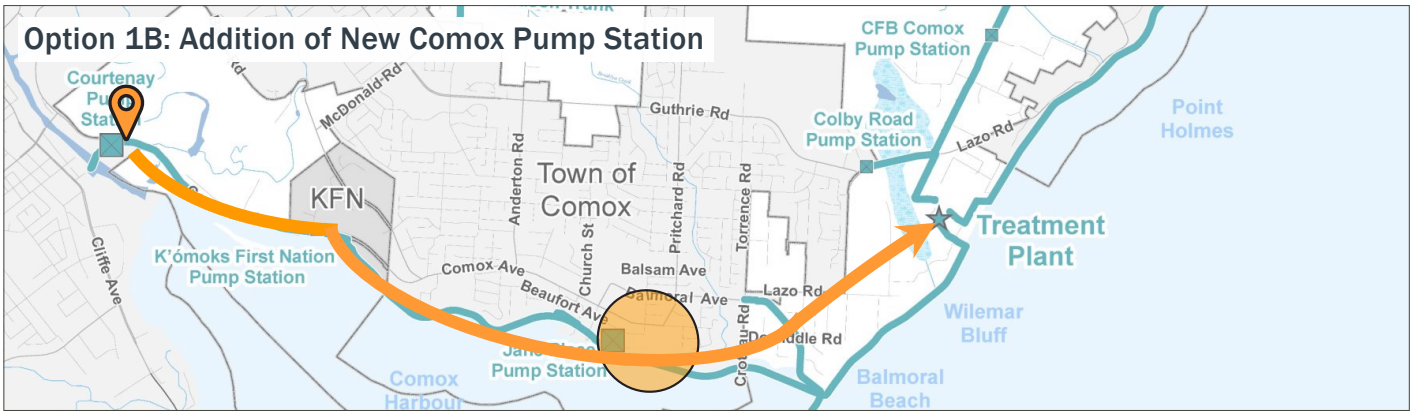
Comox Valley REGIONAL DISTRICT
comoxvalleyrd.ca

Advantages

- Minimizes construction of a forcemain through Comox
- Involves only two large pump stations (Jane Pl. PS repurposed as local facility only)

Disadvantages

- Involves work along and potentially in the estuary, including environmentally and archaeologically sensitive areas.
- Elevated maintenance and risk management needs due to proximity to marine environment



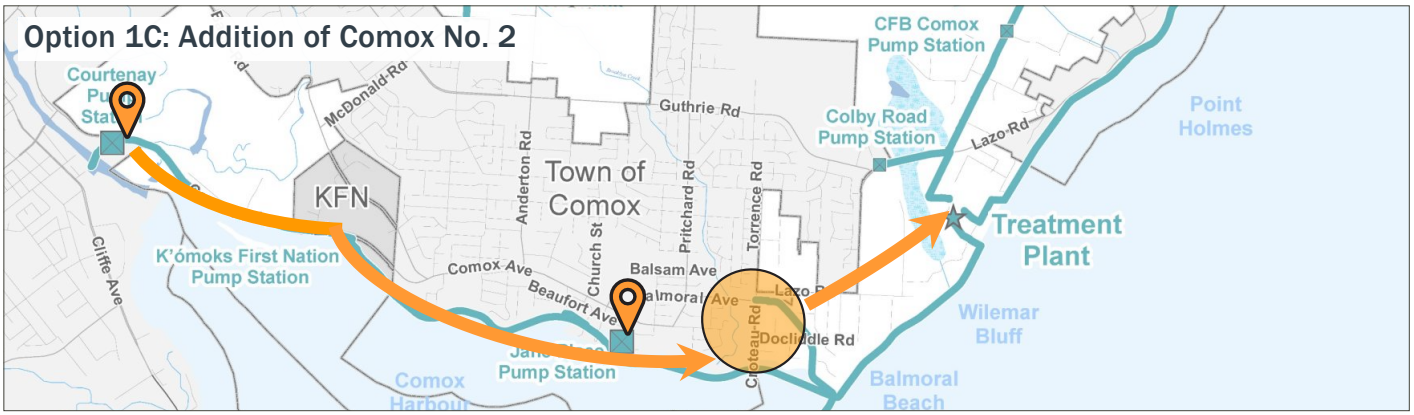
1C. A new pump station facility located somewhere between Comox and Lazo Road height of land. This would be an inline facility which receives raw sewage from Courtenay Pump Station (PS) discharge and pumps it over Lazo Road height of land to the treatment plant. The Jane Pl. Pump Station (PS) would tie-in to the Courtenay PS discharge forcemain at a location upstream of the new pump station. The elevation of the new pump station would have to be low enough to permit the Jane Pl. PS to hydraulically connect.

Advantages

- Minimize hydraulic changes to existing Courtenay and Jane Pl. Pump Stations
- Maximize useful life of existing foreshore forcemain
- Minimizes construction of a forcemain through Comox

Disadvantages

- Single point of failure of sewage conveyance system
- Involves operation and maintenance of three large pump stations, one highly critical
- Involves work along and potentially in the estuary, including sensitive areas
- Elevated maintenance and risk management needs due to proximity to marine environment



Long List Option No.2 — Conveyance (Overland Alignments)

This alignment would involve installation of a new forcemain overland from Courtenay Pump Station (PS) towards the treatment plant. This forcemain would pass over the Comox Rd. hill. Due to the change in discharge pressure a significant upgrade or rebuild would be required at the Courtenay PS. Several routing options are available, including:

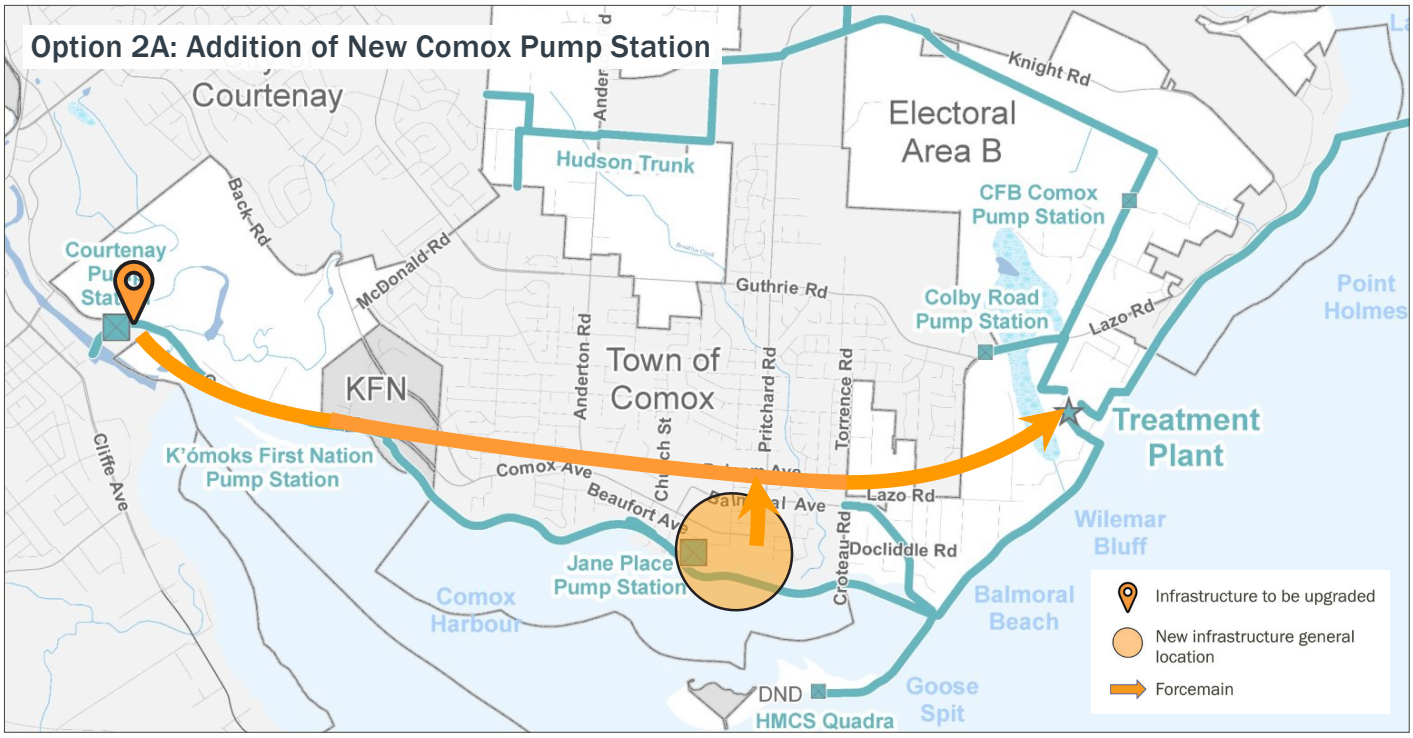
2A. The Courtenay PS would be upgraded to allow sewage from Courtenay to be pumped directly to the treatment plant. As a result, the existing Jane Pl. Pump Station (PS) would not be able to cope with this higher hydraulic requirement and a new high pressure head pump station would be required in the general vicinity of the existing Jane Pl. PS. This new facility would convey raw sewage into the forcemain between Courtenay PS and the treatment plant. The existing Jane Pl. PS would be repurposed as a small subdivision pump station.

Advantages

- No pipe in the estuary, mitigating environmental and archaeological risks
- All pipe and structures on-land to maximize maintenance accessibility
- Involves only two large pump stations (with Jane Pl. repurposed as local PS)

Disadvantages

- Significant hydraulic changes to the Courtenay PS and Jane Pl. PS
- Construction of new conveyance system through an area with significant existing infrastructure



Visit: www.comoxvalleyrd.ca/lwmp
Email: engineeringservices@comoxvalleyrd.ca
Phone: 250-334-6000

Comox Valley REGIONAL DISTRICT
comoxvalleyrd.ca

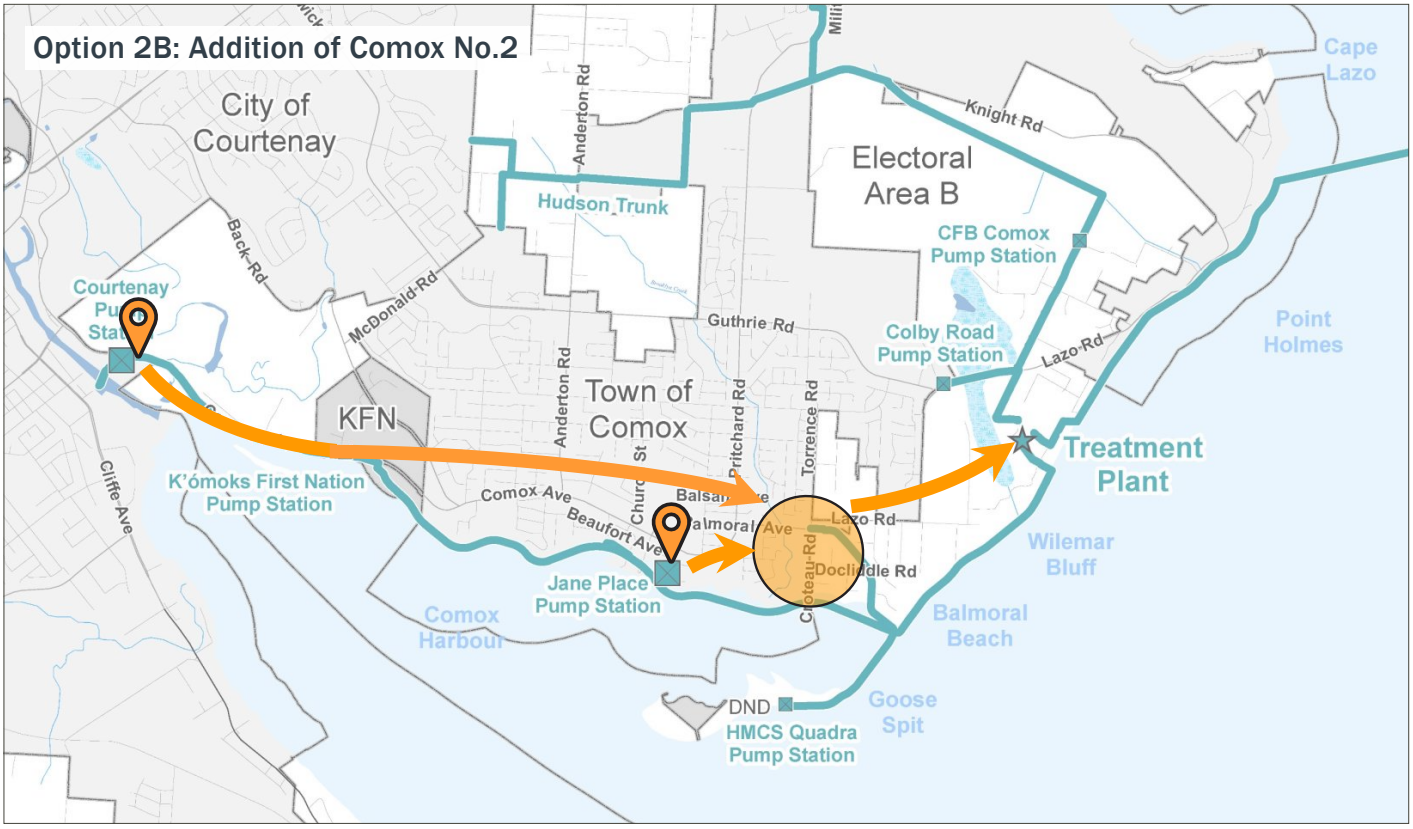
2B. The forcemain from the Courtenay Pump Station (PS) would convey raw sewage over the Comox Rd. hill and down into a new pump station located between Glacier View Drive and Comox Rd. The elevation of the new pump station must allow enough pressure to convey the sewage over Lazo Road to the treatment plant without exceeding the pressure capacity at Jane Pl. Pump Station (PS).

Advantages

- No pipe in the estuary mitigating environmental and archaeological risks
- All pipe and structures on-land to maximize maintenance accessibility
- Minimize hydraulic changes to existing Jane Pl. PS

Disadvantages

- Pump in series and single point of complete failure of sewage conveyance system
- Involves operation and maintenance of three large pump stations, one of high criticality
- Significant hydraulic changes to the Courtenay PS
- Construction of new conveyance system through an area with significant existing infrastructure



Visit: www.comoxvalleyrd.ca/lwmp
Email: engineeringservices@comoxvalleyrd.ca
Phone: 250-334-6000

Comox Valley REGIONAL DISTRICT
comoxvalleyrd.ca

Long List Option No.3 — Conveyance (Tunnelling Alignments)

This alignment would involve installing a combination of new forcemains and gravity sewer mains overland from the Courtenay Pump Station (PS) towards the treatment plant. The tunnel alignments would be selected to either minimize pumping requirements or, where possible, utilize gravity sewer mains. The primary areas where tunnelling would be appropriate are under the Comox Rd. and Lazo Rd heights of land. Several combinations of forcemain/gravity sewer mains are described below:

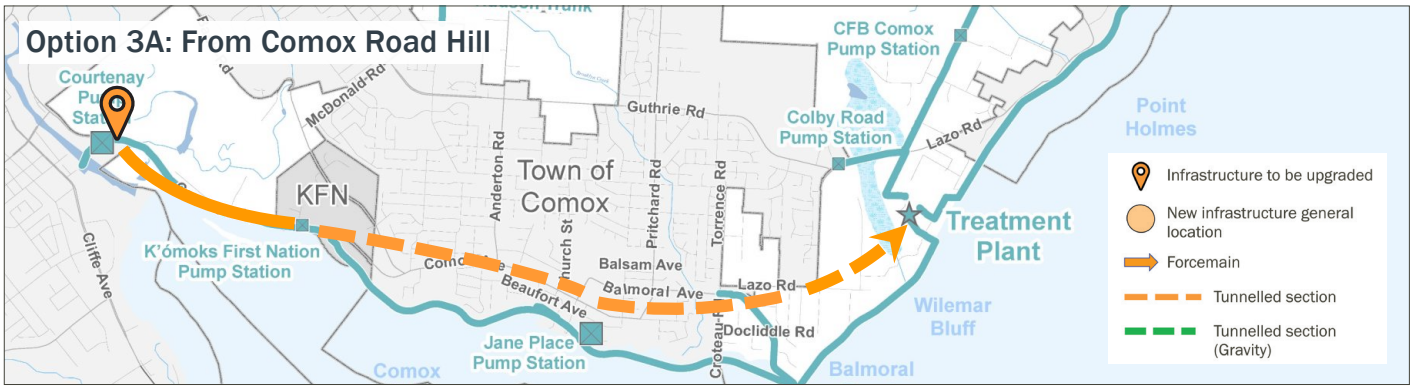
3A. Sewage would be pumped from the Courtenay PS to a tunnel constructed through Comox Rd. hill. The forcemain would transition to an open cut installation through Comox and back to a tunnel to pass under the Lazo Road height of land and down to the treatment plant. The Jane Pl. Pump Station (PS) could connect to the forcemain without modifications if the elevation of the tunnel does not require additional pumping capacity.

Advantages

- No pipe in the estuary mitigating environmental and archaeological risks
- Reduces pressures at the existing pump stations
- Significantly alleviates the high pressure head requirements for the Courtenay PS and Jane Pl PS as compared to other overland options

Disadvantages

- Elevated costs and risks due to tunnelling
- Construction of new conveyance system through an area with significant existing infrastructure



3B. A new forcemain would be installed from the Courtenay Pump Station (PS) directly to the treatment plant with a tunnel installed for the forcemain to pass through the Lazo Rd height of land. The existing Jane Pl. Pump Station (PS) would likely not be able to cope with this higher hydraulic requirement and therefore a new high pressure head pump station would be required near the existing Jane Pl. PS. This new facility would convey raw sewage into the forcemain between Courtenay PS and the treatment plant. The existing Jane Pl. PS would be repurposed as a small subdivision pump station. If the tunnel elevation is sufficiently low, the existing Jane Pl. PS would be suitable.

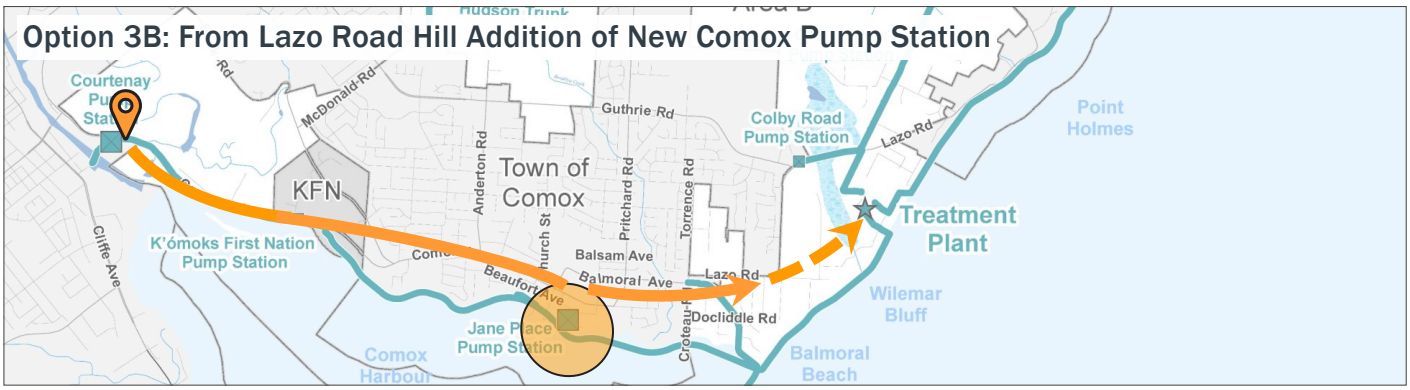
Visit: www.comoxvalleyrd.ca/lwmp
Email: engineeringservices@comoxvalleyrd.ca
Phone: 250-334-6000

Advantages

- No pipe in the estuary mitigating environmental and archaeological risks
- All pipe and structures on-land to maximize maintenance accessibility
- Alleviates some of the high pressure head requirements as compared to other overland options

Disadvantages

- Construction of new conveyance system through an area with significant existing infrastructure
- Higher upgrade requirements at the Jane Pl. PS as compared to the other tunnel options



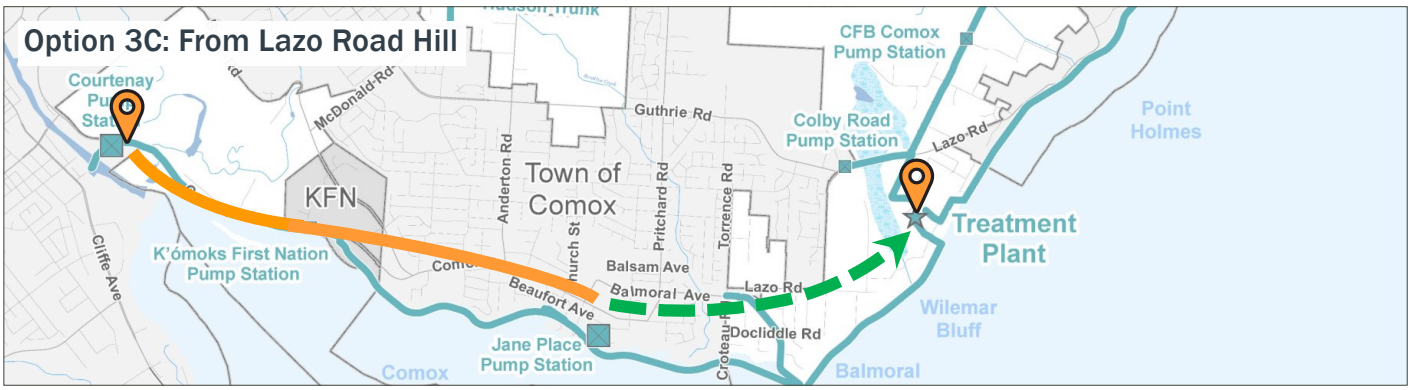
3C. A new forcemain from Courtenay Pump Station (PS) would continue directly to the treatment plant. A gravity sewer main tunnel would pass through the Lazo Rd height of land at the required slope. The Jane Pl. Pump Station (PS) would connect to the gravity sewer main through a new forcemain and the tie-in location would depend on the gravity sewer main alignment. The elevation of the new tunnel would determine whether Jane Pl. PS would need to be replaced to accommodate a high pressure head pump.

Advantages

- No pipe in the estuary mitigating environmental and archaeological risks
- All pipe and structures on-land to maximize maintenance accessibility
- Alleviates some of the high pressure head requirements for the Courtenay PS and most of the high head requirements for the Jane Pl. PS as compared to other overland options

Disadvantages

- Construction of new conveyance system through an area with significant existing infrastructure
- Gravity sewer main alignment must follow a specific slope which is dependent on the topography.
- Gravity sewer mains are significantly larger diameter as compared to forcemains for the same flow



Long List Option No.4 — Conveyance (North Side Concept)

In this concept, raw sewage would be pumped from the Courtenay Pump Station (PS) to the north side of the treatment plant and directly from the Jane Pl. Pump Station (PS) to the treatment plant.

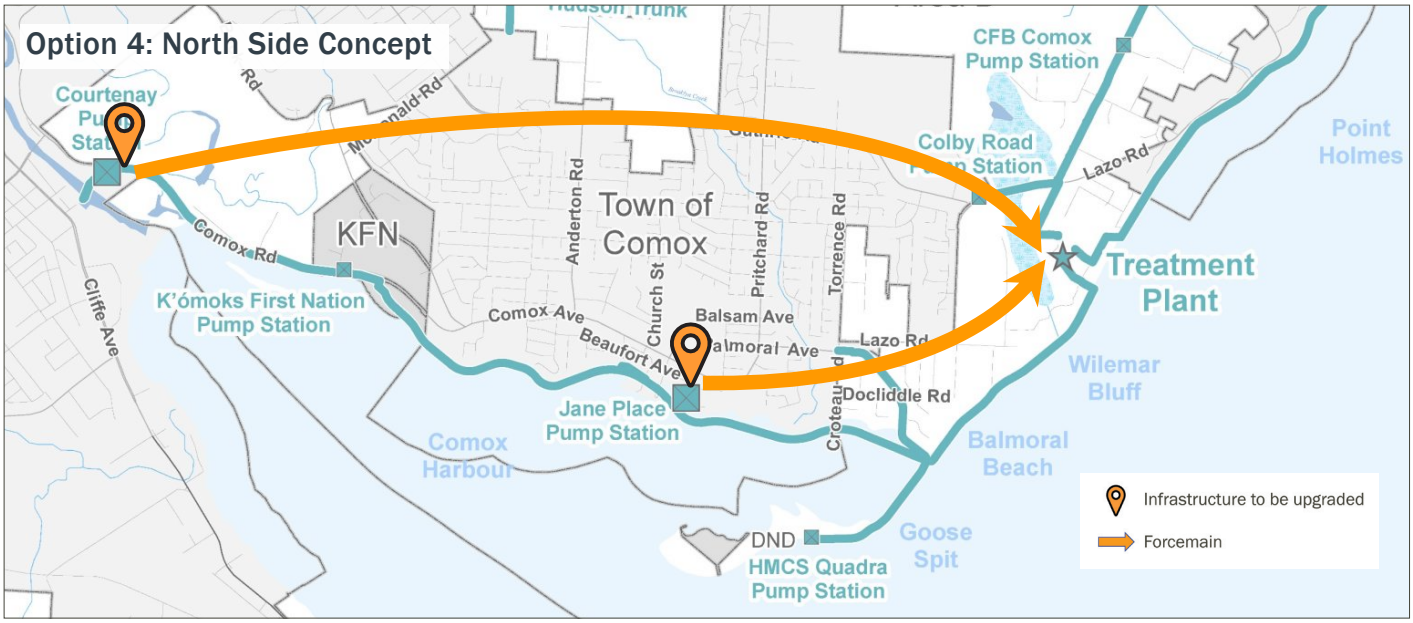
Courtenay PS could be required to pump sewage to the treatment plant over the highest elevation of East Courtenay hill (El. 73 m) in a forcemain. Jane PS would be required to pump sewage to the treatment plant over the Lazo hill (El. 51 m) in a forcemain. The two forcemains would combine west of the Lazo hill into one common forcemain that would convey the raw sewage to the treatment plant. Alternately, the two alignments could continue separately over Lazo hill to the treatment plant. Regardless of the alignment over Lazo hill, this option would require a rebuild of both pump stations.

Advantages

- Involves only two large pump stations (Jane Pl. PS repurposed as local facility only)
- Pump Stations operating in parallels as opposed to in series, minimizing need for a sophisticated control system
- Avoids construction in areas with significant infrastructure development
- No pipe in the estuary mitigating environmental and archaeological risks
- All pipe and structures on-land to maximize maintenance accessibility

Disadvantages

- More construction required along two separate alignments
- Operating two partially separate high pressure forcemain networks
- The North Side of Glacier View Drive is at a significantly higher elevation than that of the South Side (73 m vs 39 m)



Visit: www.comoxvalleyrd.ca/lwmp
Email: engineeringservices@comoxvalleyrd.ca
Phone: 250-334-6000

Comox Valley
REGIONAL DISTRICT
comoxvalleyrd.ca

Long List Option No.5 — Conveyance (Decentralized Treatment Concept)

In this option, an additional wastewater treatment plant would be constructed in close proximity to the location of the existing Courtenay Pump Station (PS) to treat the sewage collected in Courtenay.

Effluent would be conveyed to the existing sewage treatment plant in Comox before being discharged. Conveyance options for the effluent are similar to those discussed within Options 1, 2, and 4, and include estuary, seawall, overland, tunnelled, and north side alignments.

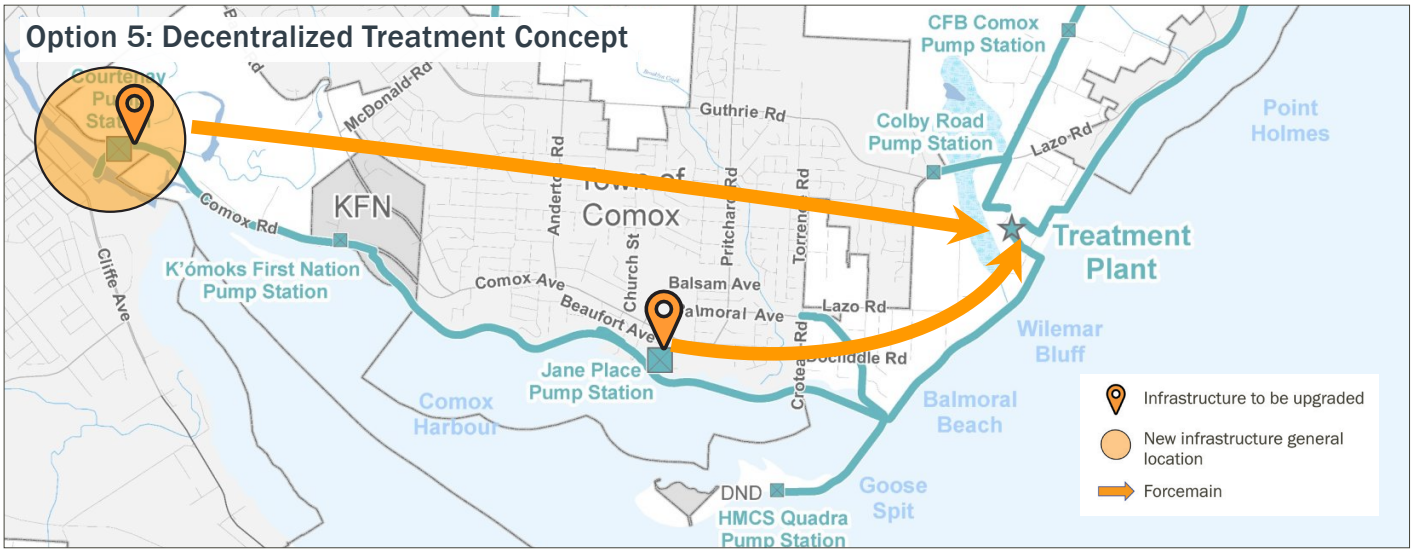
The sewage collected at the Jane Pl. Pump Station (PS) would be conveyed to the existing treatment plant using an overland or tunnelled option. Overland options would still require upgrading Jane Pl. PS and possibly a new pump station in the area.

Advantages

- Eliminates the need for conveyance of Courtenay's raw sewage through Comox to the existing treatment plant
- Alleviate capacity-driven upgrade requirements at the existing treatment plant

Disadvantages

- A new pumping and conveyance system is needed to move effluent from West Courtenay to the existing treatment plant in Comox for discharge
- Significant operational burden with two wastewater treatment plants
- Significant cost associated with the construction of a new wastewater treatment plant, and maintenance and operation of two plants
- Still requires conveyance of raw sewage overland from Comox



Visit: www.comoxvalleyrd.ca/lwmp
Email: engineeringservices@comoxvalleyrd.ca
Phone: 250-334-6000

Comox Valley REGIONAL DISTRICT
comoxvalleyrd.ca