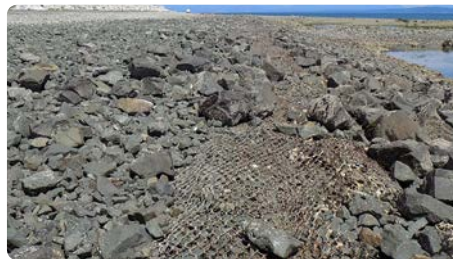


The Current Situation

Environmental Risk

The existing forcemain for the Comox Valley sewage service runs along Willemar Bluffs – over time waves and storms have lowered the beach putting both the infrastructure and the area where it's located at risk. A realigned pipe requires a new pump station.



RISKS TO THE CURRENT ALIGNMENT

- **Instability:** The bluff is a sensitive location due to the nature of unstable banks and beaches.
- **Vulnerability:** The line – which carries untreated effluent – is subject to high intensity weather, putting the integrity of the infrastructure at risk.
- **Temporary mitigation:** The temporary solution of installing protective 'gabion baskets' (wire mesh enclosures with rocks inside) implemented in 2002 is failing and needs to be improved with a permanent solution.

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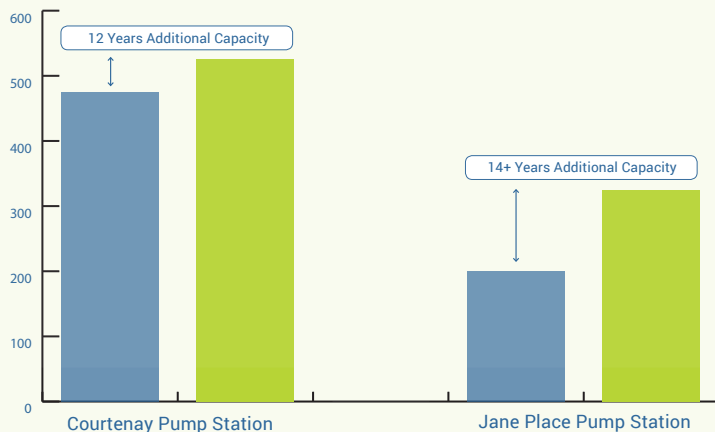


The Current Situation

Limited Existing Capacity

The existing pump stations for the Comox Valley sewer service are at capacity given the continued growth of Courtenay and Comox. Pump station upgrades or the construction of a new pump station is required to ensure infrastructure can keep up with increased rates of usage.

CAPACITY INCREASE WITH CONSTRUCTION OF COMOX NO.2 PUMP STATION



Present Design Flow (lps)*

Today's Capacity: The capacity available to existing pump stations without a new facility constructed

Pump Station Capacity with Comox No.2 in Service (lps)

Potential Capacity: The increased capacity for existing pump stations with the construction of a new pump station to bypass Willemar Bluff

* Both pump stations cannot simultaneously deliver their design flow

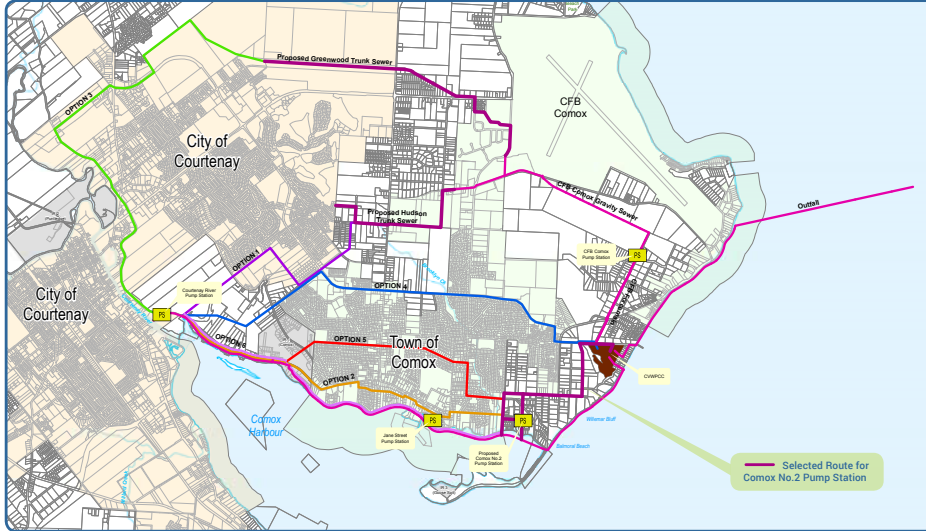
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Assessing The Options

Sewer Master Plan

When engineering consultants developed the sewer master plan, they knew the forcemain along Willemar Bluff needed to be rerouted. To determine the best alternative route, they reviewed many options. The below map shows some of the alternatives that were assessed and highlights the route that was ultimately selected.



FACTORS CONSIDERED IN ROUTE SELECTION

- **Cost:** The price of forcemains posed a challenge for some proposed routes.
- **Potential disruption:** Selecting a route away from other underground utilities meant that disruptions to existing homes and businesses would be reduced.
- **Current conditions:** By finding ways to use existing infrastructure in efficient ways, the overall cost of the project could be reduced.

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Assessing The Options

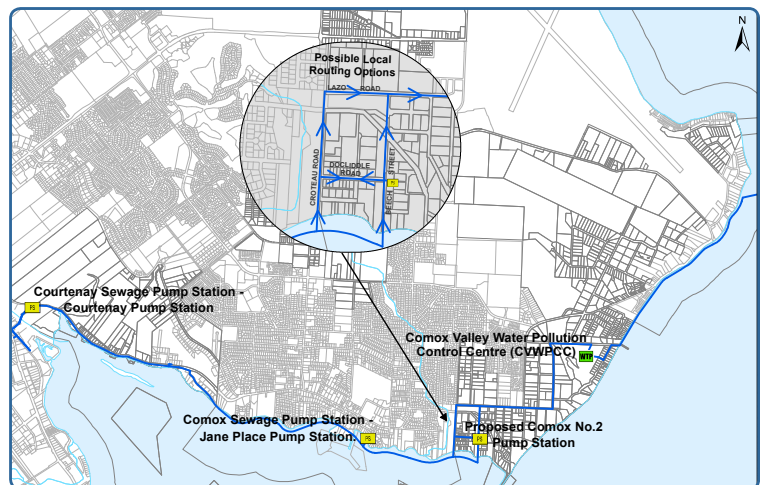
Forcemain Route Selection

With the need to realign the existing route clearly identified, the review process began for a new route that would remove the existing impacts. After several years of assessment the route depicted below was identified.

EXISTING ROUTE



PROPOSED ROUTE



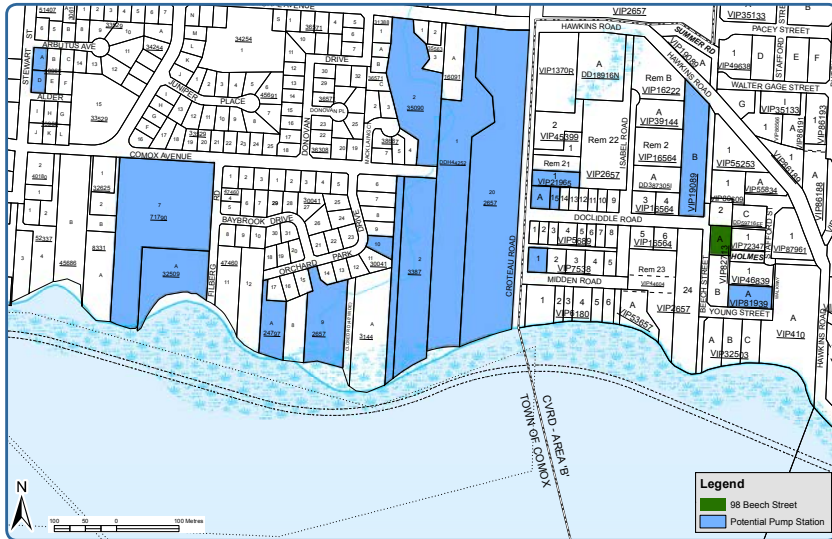
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Selecting A Site

Beech Street Property

There have been many assessments of alternate options for the proposed pump station that is required. Ultimately, they have all led the CVRD back to the Beech Street property, acquired in November 2014.



PROPOSED COMOX NO.2 PUMP STATION

CHOOSING A PUMP STATION LOCATION

- **Screening:** 100 properties were eventually narrowed down to the one using a series of screening processes including technical need, availability, social and cost.
- **Requirements:** The property meets the two key technical constraints: an elevation of approximately 12 metres, and located between Jane Place and Goose Spit.
- **Allowed use:** Utility use by local government is allowed in all zoning. The CVRD will follow the same standards of all private development re: setbacks, height, development permit areas, etc.
- **Lot size:** It is large enough in size to allow for adequate buffering.

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Design Precedents

Options for pump station designs

EARTH SHELTERED BUILDING



COLUMBIA BOULEVARD WASTEWATER TREATMENT PLANT
SKYLAB ARCHITECTURE

RESIDENTIAL CHARACTER



CURRIE ROAD PUMP STATION - OAK BAY, BC

SIMPLE RURAL FORM



TILLAMOOK FOREST RESEARCH CENTRE
THE MILLER HULL PARTNERSHIP



FITTING IN WITH THE COMMUNITY

A pump station doesn't have to look industrial. Depending on the property, community and requirements for the facility, a pump station can be designed to suit specific communities. This can be done by considering a range of design elements, including:

- Materials
- Colours
- Architectural Style
- Natural Setting
- Setbacks, zoning specifications

The CVRD is committed to working with the community to ensure the design of this facility does not diminish the visual surroundings of the area.

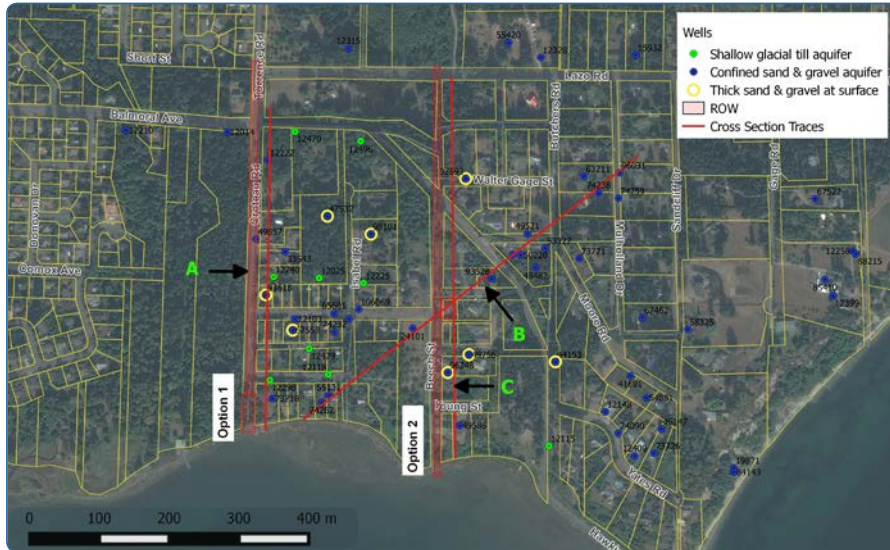
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Assessing the Site

Groundwater Study Results

In 2015, the CVRD retained GW Solutions to assess the hydrology of the area and provide insight into the potential impacts of the proposed pump station on groundwater. GW Solutions had previously been retained by concerned area residents and is familiar with the area.



CROSS SECTION LOCATION MAP

HYDROLOGY ASSESSMENT

In summary, the report completes analysis to assist in answering the following questions:

- What potential risk is there to underlying aquifers or water supplies if the Pump Station were to occur?
- What development management techniques are appropriate to protect natural systems and water supplies?
- What are the potential effects, if any, of the proposed construction on groundwater resources down gradient?

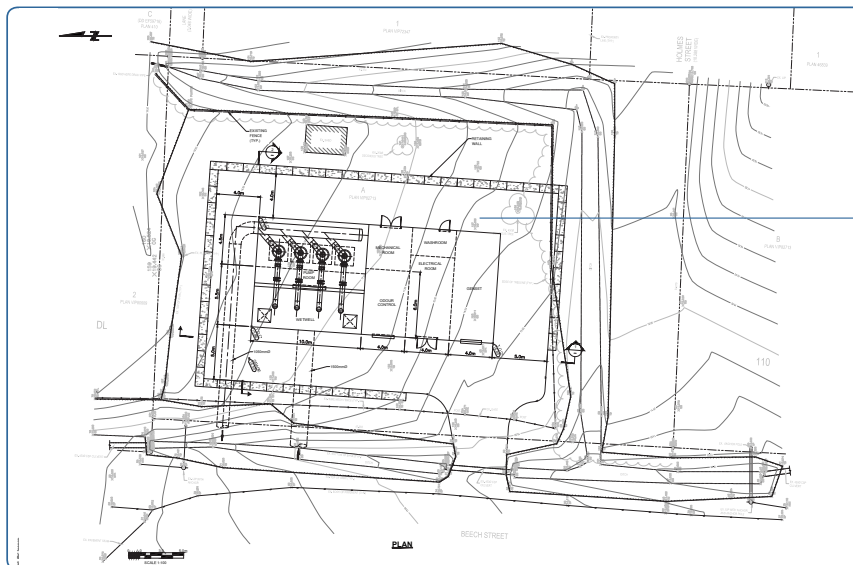
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Preliminary Arrangement

Tech Memo Recommendations

In April 2016, AECOM was retained to complete preliminary layouts for the Comox No. 2 Pump Station at the Beech Street property. AECOM had previously completed layouts for other potential locations.



SITE PLAN

KEY FEATURES OF SITE PLAN

- **Wet well / dry well configuration:** Pump configuration allows for easy access to pumps, motors and piping. All equipment is housed inside the new pump station building.
- **Gravity collection main:** Large diameter gravity main along Docliddle Road provides additional wet well storage.
- **Retaining wall:** Retaining walls allow the pump station to be set down into the property providing better sight lines for neighbours.
- **Building size:** 2000 ft² building allows flexibility in configuration and in architectural design.

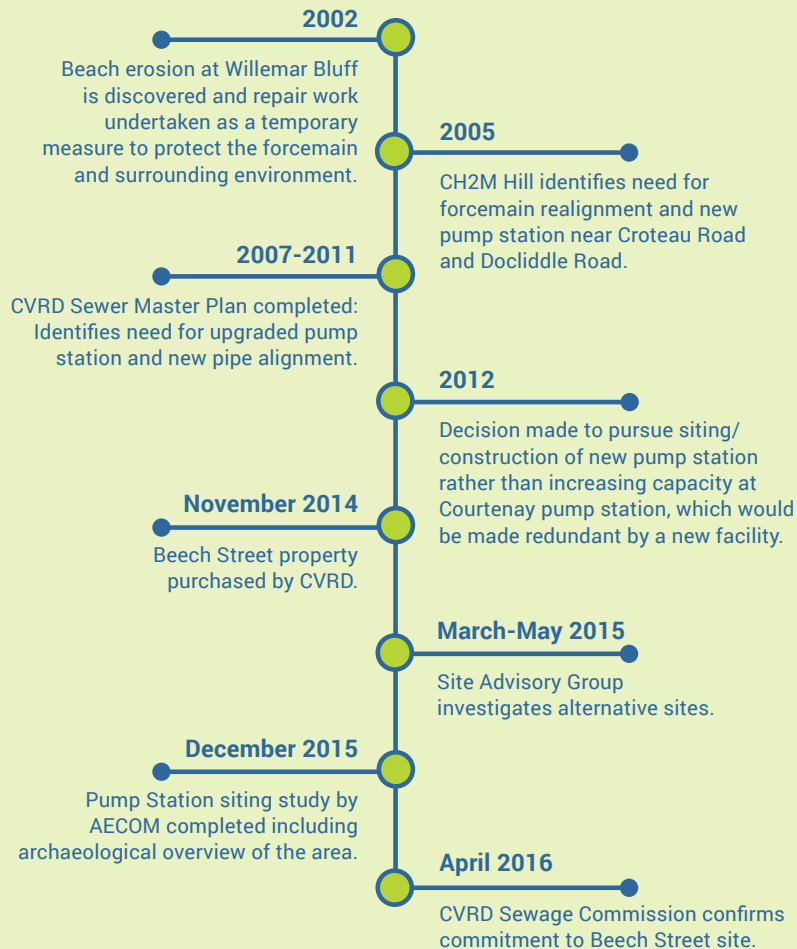
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A New Pump Station

The Process to Date

The need for a new sewer main alignment and pump station have been on the CVRD's radar for nearly 15 years. Below is an overview of how this priority project has developed overtime.



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Next Steps

Key Areas of Focus

The Comox No. 2 Pump Station has been on the priority list and in stages of development for nearly 10 years – since erosion was first discovered on the forcemain currently running along Willemar bluffs. The Comox Valley Sewage Commission has given clear direction on the need to move forward, but there's still a lot of work to do.



KEY AREAS TO BE INVESTIGATED

- **Environmental permitting:** The project involves construction work in sensitive areas including Comox Harbour and Lazo Marsh. Environmental permissions will be required from several agencies.
- **Detailed pump and motor sizing:** Pump and motor sizing to date has been conceptual and preliminary. A more detailed analysis will be completed.
- **Detailed pipe sizing and routing:** Preliminary routing has been based on previous study work. A more detailed routing and ground truthing exercise will be completed.
- **Detailed tie-in design:** The foreshore tie-in to the existing wastewater conveyance system is complex. A detailed design and plan will be prepared.
- **Detailed pump station configuration and optimization:** The future pump station configuration and architectural design will be optimized for the site and the neighbourhood.
- **Detailed construction planning:** A detailed construction schedule and critical work plan will be developed.

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