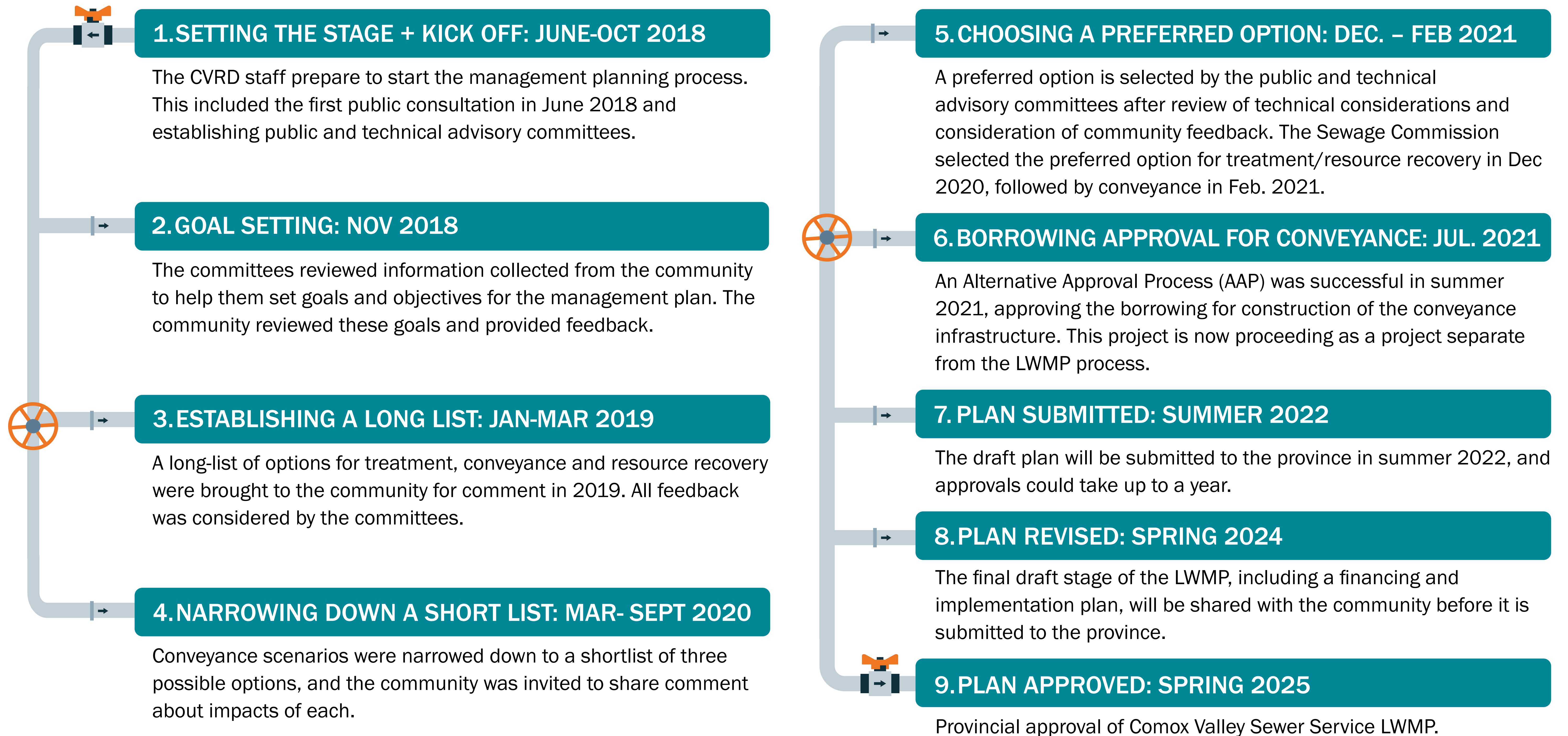


PLANNING THE FUTURE OF OUR LIQUID WASTE

Liquid Waste Management Plans are a tool used by communities to plan for the long-term management of their wastewater. They include engineering study, environmental assessment, financial analysis and significant public consultation. In 2018, the CVRD kicked off the Comox Valley Sewer Service Liquid Waste Management Plan:



DECISIONS ABOUT OUR WASTEWATER

The LWMP was an intensive process that led to some clear decisions about the future of our wastewater infrastructure. These included:

PROVIDE SECONDARY TREATMENT FOR ALL FLOWS

- The preferred treatment option selected will see secondary treatment to all flows – as the system does currently. Upgrades and expansion to existing components will occur to increase capacity and comply with regulations over time.
- Disinfection – to achieve ‘recreational’ standards – will be added as a new component to the treatment process.

RESOURCE RECOVERY DISCUSSION DEFERRED

- Consultants concluded the only financially feasible option for the use of reclaimed water is within the treatment facility. This is due to a short irrigation season and the very long distances required for conveying the reclaimed water to potential customers.
- A business case for reclaimed water use is being considered through the site master planning process underway at the treatment plant.
- Further assessment and decisions will be considered by the Sewage Commission in the future.

PREFERRED CONVEYANCE OPTION

- A blended option of trenched and tunneled forcemain along Comox Road/Comox Avenue to Lazo area, was selected as the preferred option.
- Work to be undertaken as one phase, to reduce operational risk by decommissioning aging infrastructure as soon as possible.
- Conveyance upgrades identified as the biggest priority, in order to address the urgent environmental risk posed by exposed pipes at Balmoral Beach (Willemar Bluffs)

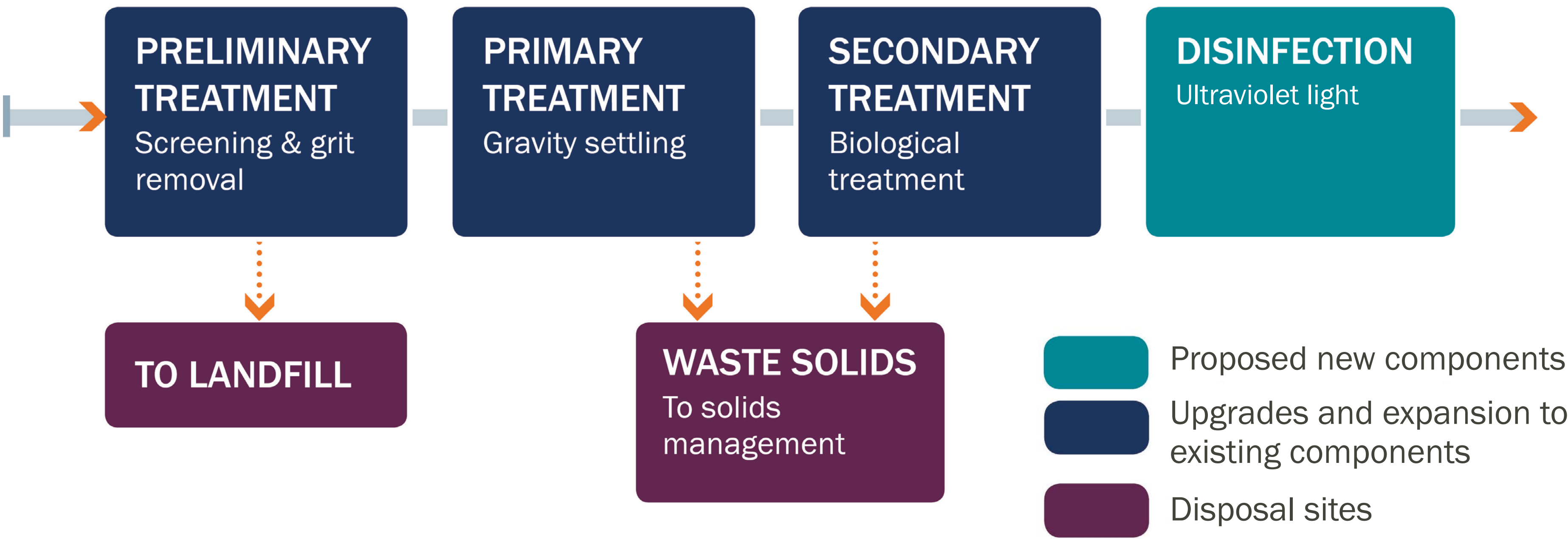


PREFERRED TREATMENT OPTION

As part of the planning process, the community provided comment on a long-list of four options for the future of wastewater treatment in the Comox Valley Sewer Service. That feedback, along with technical assessment, led to a narrowing of options until the preferred option of providing secondary treatment for all flows was selected. This option was approved by the Comox Valley Sewage Commission in December 2020.

ABOUT THE PREFERRED OPTION

The preferred option for the Liquid Waste Management Plan (LWMP) will ensure all effluent passes through secondary treatment as it does currently. However, disinfection for all flows will be added as a new component in the treatment process. The disinfection process will be designed to achieve recreational standards and the following treatment and discharge standards will apply. Upgrades and expansion to existing components will occur over time to increase capacity and comply with regulations.

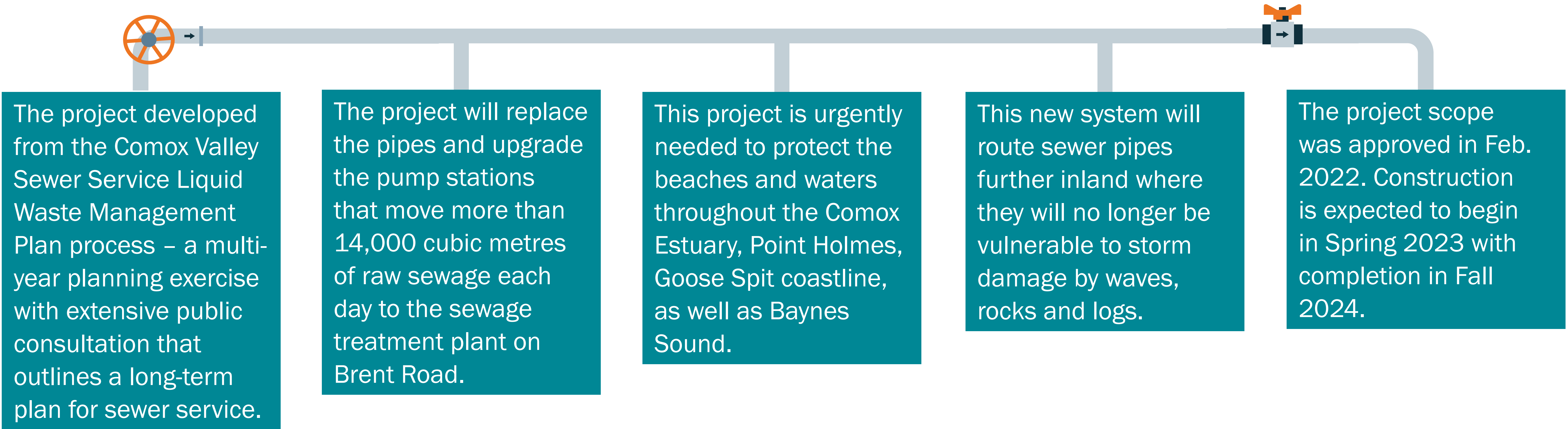


SECONDARY TREATMENT FOR THE ENTIRE PLANT FLOW:

- Secondary treatment removes 90% of organic material and solids on average (note that the treatment plant currently achieves greater than 95% removal of total suspended solids (TSS) and greater than 93% removal of 5-day Biochemical Oxygen Demand (BOD5))
- Secondary treatment removes 80-95% of microplastics on average
- Meets effluent quality for provincial and federal regulations
- UV disinfection system to disinfect wastewater to not exceed 200MPN/100mL fecal coliform concentration at end of the outfall pipe. Based on dilution modelling there will be sufficient dilution to stay well below requirements for protection of shellfish.

ABOUT COMOX VALLEY SEWER CONVEYANCE PROJECT

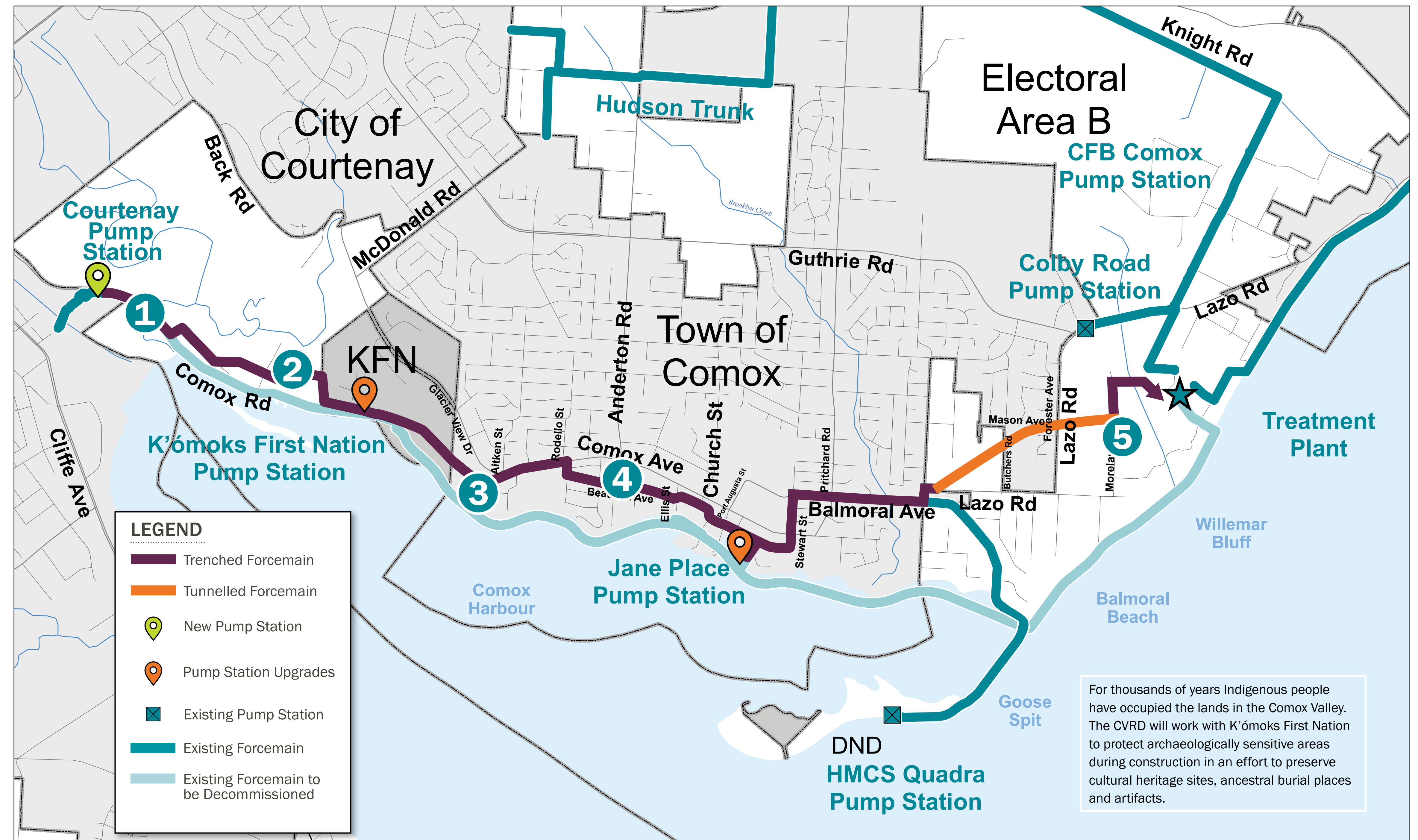
The Comox Valley Regional District is currently planning an update to sewer conveyance infrastructure that currently services the City of Courtenay, Town of Comox and K'ómoks First Nation.



CONVEYANCE PROJECT: ROUTE ALIGNMENT

The overall project alignment includes some proposed changes from the preliminary map shared last year, including:

- 1 Proposed rebuild and re-location of Courtenay Pump Station for seismic upgrades and climate resiliency
- 2 Moving route away from areas of archeological significance along Dyke Road and working with KFN to reduce impacts in IR#1
- 3 Use of traditional trench/cut and cover on Comox Hill instead of drilling
- 4 Moving portion of route from Comox Ave to Beaufort Ave to minimize traffic impacts
- 5 Further consideration of options for Lazo Marsh crossing: seeking alternative to drilling in the area.



ROUTE DETAILS: PUMP STATION + COMOX RD.

The approved project scope developed and approved by the Sewage Commission in February 2022 included key decisions about the final approach to these upgrades.

A NEW COURTENAY PUMP STATION

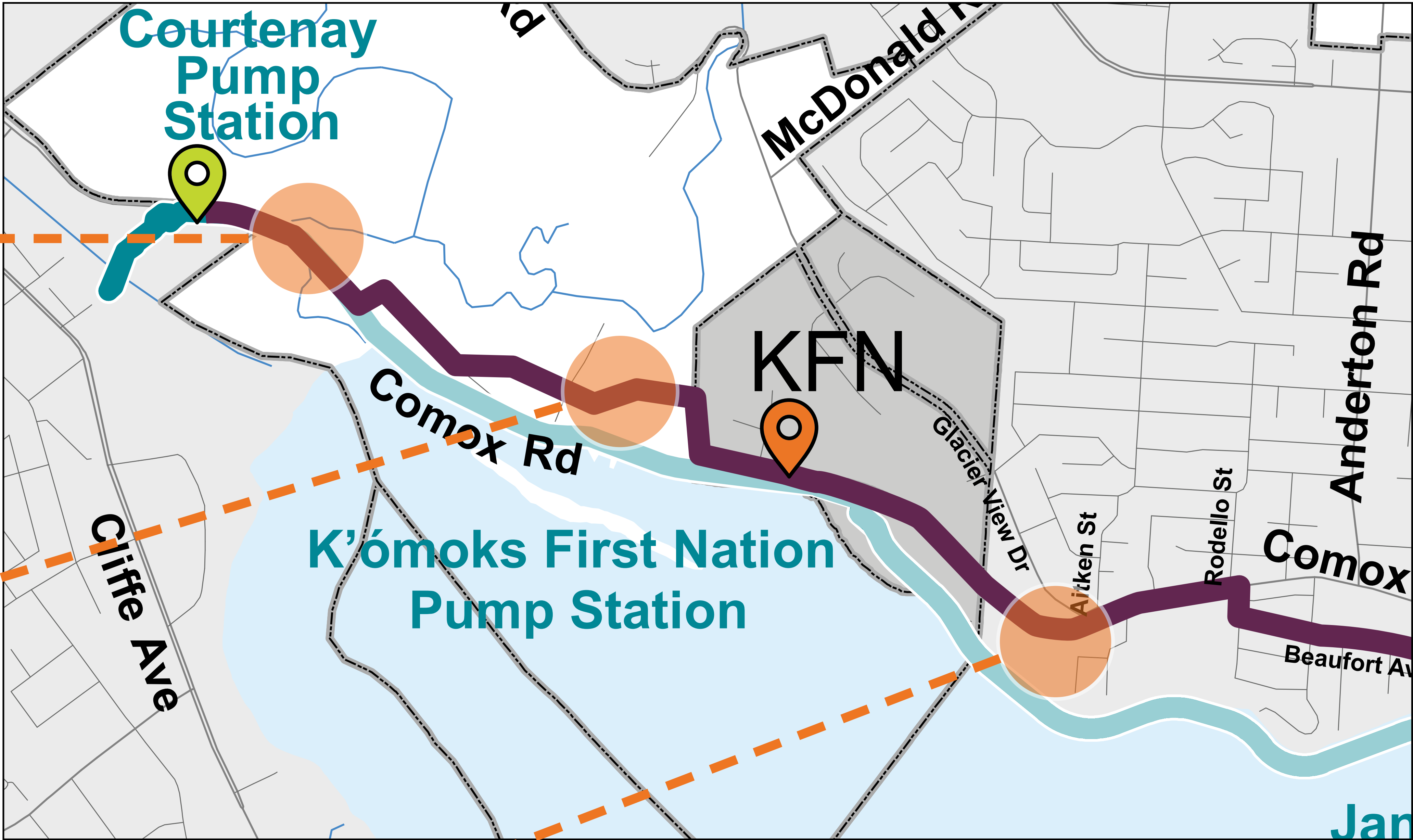
Replacing, rather than refurbishing, the Courtenay Pump Station was selected because:

- The cost of a new facility was the same as renovating the current one which is 40+ years old.
- It offers improved operations and maintenance access for a longer term.
- It allows the station to be relocated farther away from the estuary.

ROUTE AWAY FROM CULTURALLY SENSITIVE AREA

A section of the pipe has been rerouted from Comox Road because:

- It avoids areas already identified as having intact archeological findings – discoveries that could impact construction if found during excavation
- Our partners, KFN identified the disturbance of culturally sensitive areas as a concern
- By moving construction off Comox Road in this area, we can reduce some of the traffic impacts.



NO TUNNEL AT COMOX HILL

Using traditional cut and cover (trenching) to install the pipe at Comox Hill was selected over tunneling in this area because technical assessment and cost/benefit analysis indicated trenching is the better choice given the land elevations.

ROUTE DETAILS: TOWN OF COMOX DETAILS

The CVRD project team has been working with the Town of Comox to create a project plan that reduces the impact on the community.

MOVING CONSTRUCTION OFF COMOX AVENUE

Between Rodello and Stewart streets, the pipe will be routed off of Comox Avenue, to Beaufort Avenue.

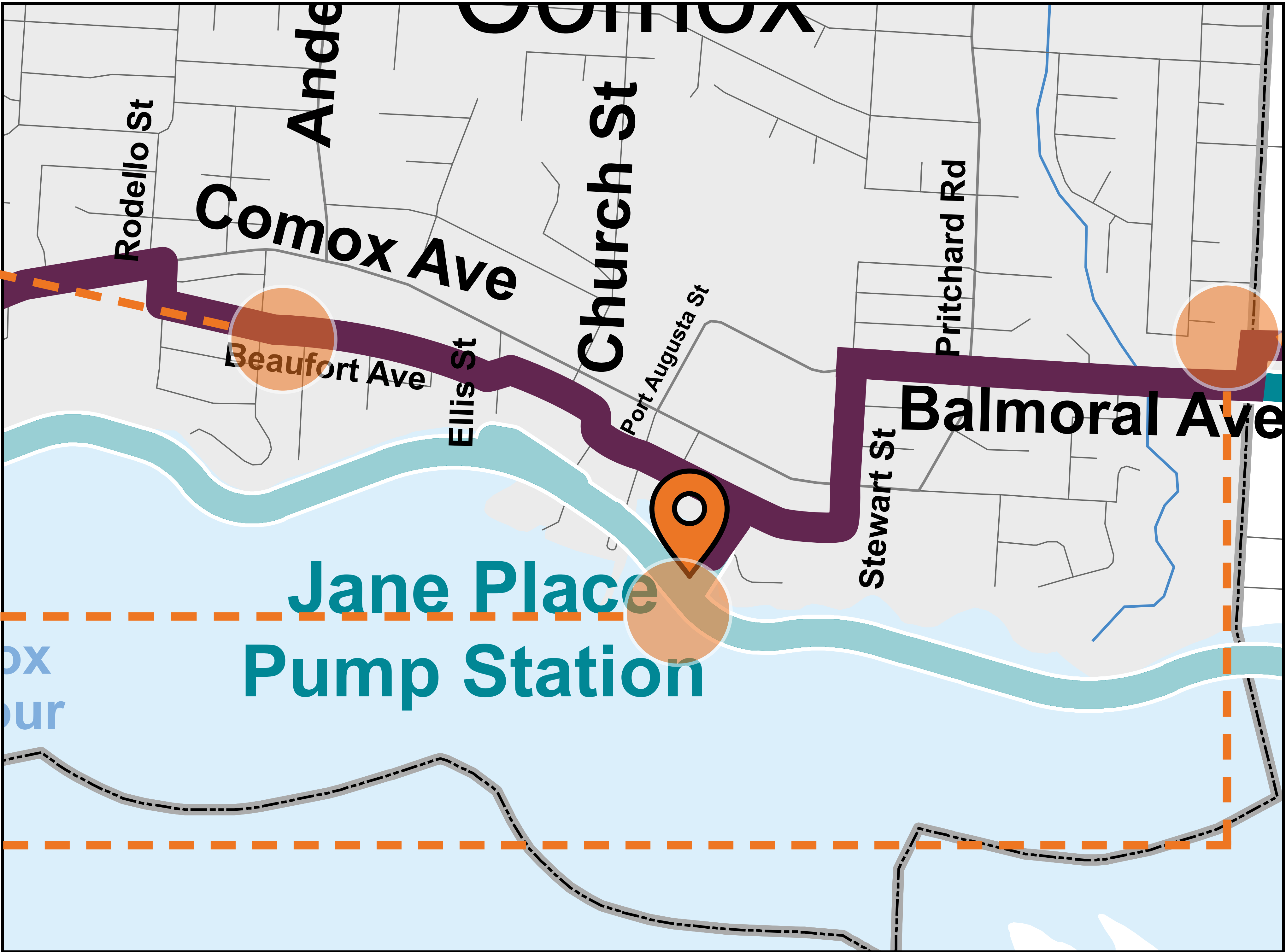
ALIGNING WITH TOWN OF COMOX UPGRADES

Pipe construction disruption can align with road and utility upgrades planned in this area. The project team will continue working with the Town of Comox to synergize with its existing plans. Further details on these upgrades will be confirmed with the public as contracts are awarded and construction planning begins.

UPGRADE JANE PLACE PUMP STATION

In order to serve the revised pumping requirements and ensure it meets current standards, the Jane Place Pump Station will be extensively upgraded, but will remain within the same footprint.

The pipe route will follow Balmoral Avenue until it reaches the tunnel entry pit at Lazo and Torrence. The project team will work with Town staff toward a construction plan that will reduce the impact on traffic flow where possible.

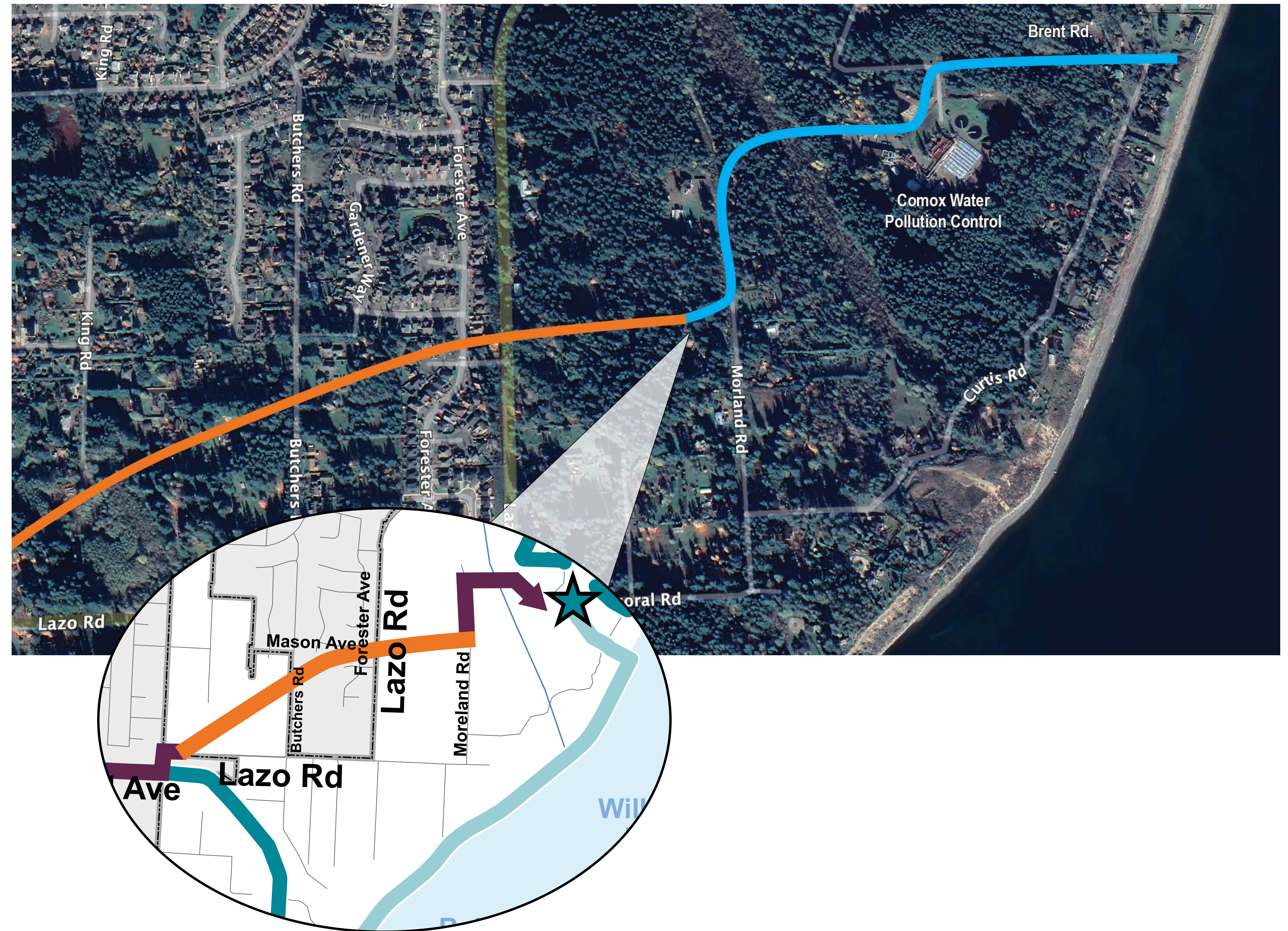


ROUTE DETAILS: LAZO HILL ALIGNMENT

The forcemain will be tunneled below Lazo Hill. This confirmed alignment is the result of significant assessment, and consideration of community feedback.

Highlights

- ✓ Single shorter line from Torrence/Lazo to existing right-of-way at Morland Road
- ✓ Minimum 20-metre offset from all deep water wells in the area (as per recommendation by groundwater consultant)
- ✓ Impacts fewest properties
- ✓ Laydown on Morland/Brent Road reduces disruption
- ✓ Alignment allows for gravity flow in the pipe through Lazo Hill, reducing operational risks.

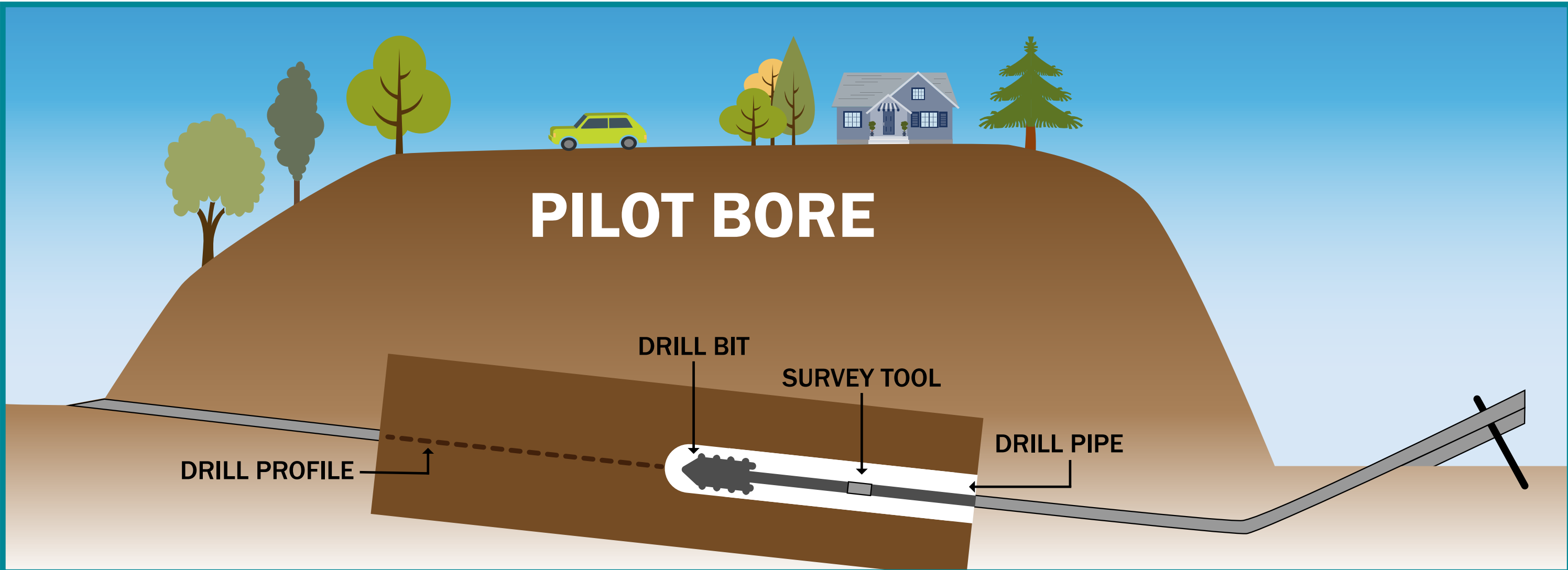


ABOUT HORIZONTAL DIRECTIONAL DRILLING

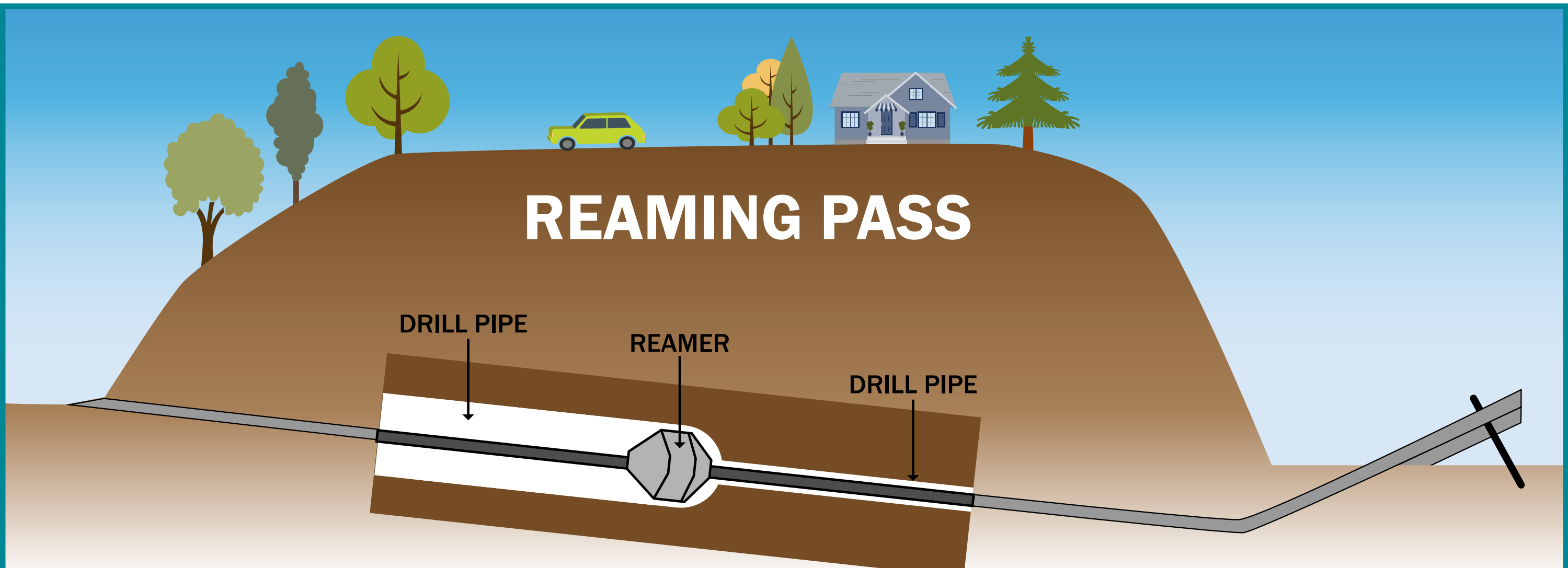
Horizontal Directional Drilling (HDD) will be used to avoid surface impacts through Lazo Hill and minimize the maximum pipe elevation to reduce lifecycle costs and risk.

HDD is typically used to install pipelines under environmental sensitive areas to avoid surface disturbance.

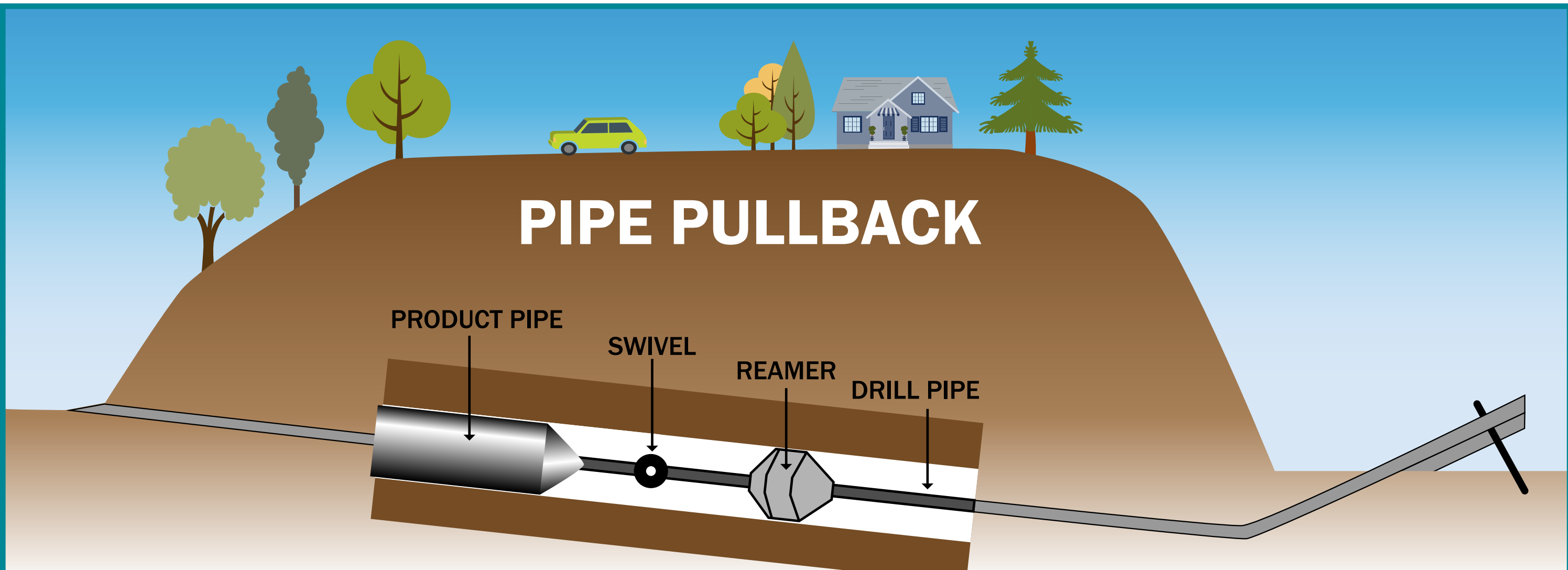
The contractor uses a drill rig to horizontally drill an underground pathway for the new pipe between an entry and an exit pit. This process happens in three stages.



1. Pilot Bore: A process called a pilot bore establishes the underground path for the new sewer pipe.



2. Reaming Passes: The contractor will enlarge the tunnel to the final pipe size using a reamer. A bentonite-based drilling fluid keeps the borehole stabilized – the drilling mud is collected and recycled.



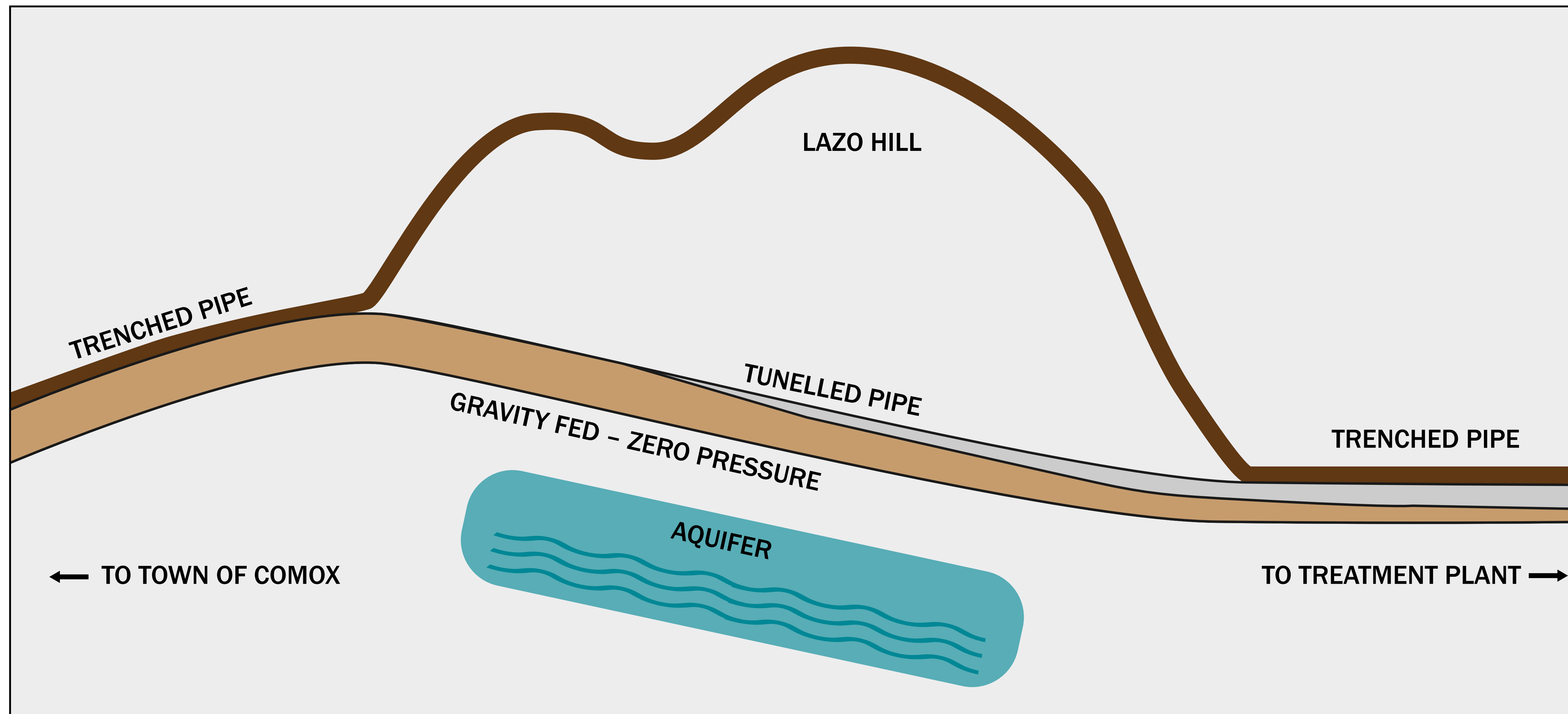
3. Pipe Pullback: The pipeline is assembled at surface in a long single string and is then pulled through the tunnel into its final position.

TECHNOLOGY

Engineering decisions about the method and materials for the new system provide additional environmental protection.

GRAVITY FED LINE

- Non-pressurized flow, virtually eliminating an already very-low risk of a leak
- Allows route to remain 10m above aquifer, eliminating penetration of aquifer
- Pipe wall designed to withstand installation stress, far exceeding the zero-pressure of operational flow



MATERIAL (High Density Polyethylene)

- Shorter route allows for use of HDPE, which is far more resistant to corrosion than steel
- HDPE is more flexible and better suited to withstand seismic activity
- Continuously fused to eliminate all joints
- More resistant to abrasion and has no coating that can be damaged during installation

TIMELINE AHEAD

A lot of work has been completed to date, but there is still much to be done before this project is complete. Here’s a look at upcoming key milestones to expect in the coming 18 months.

