

Crossing water safely

At TransCanada, we are committed to protecting the environment. Not just because we have to, but because we want to.



TransCanada's GTN natural gas pipeline, which crosses the Pend Oreille River in Idaho, has safely delivered natural gas from British Columbia to markets in Washington, Oregon and California since 1961.

We recognize that how we interact with the environment is of vital importance to you. It is to us, too. That's why TransCanada's Environment Strategy reflects our long-term commitment to environmental stewardship, protection and performance. It guides our decisions every day when building and operating energy infrastructure.

Protecting water bodies

TransCanada knows that water is a valuable resource. The protection of water is of the utmost importance to both the environment and our business.

With more than 95,800 kilometres (59,600 miles) of oil and natural gas pipelines throughout North America, our pipelines sometimes cross water bodies to deliver the energy that North Americans use and rely on every day.

When planning to build a new pipeline, information is gathered about water bodies along a proposed pipeline route, including environmental and technical assessments. Environmental assessments include studies of the aquatic environment – such as water flow, bank stability, the quantity and quality of fish habitat, wildlife and vegetation – as well as the ability of these ecosystems to recover after construction.

Information gathered through the assessments, along with regulatory requirements, industry best practices, constructability and economic feasibility, is used to select the pipeline installation method.

Minimizing environmental impacts

Given the sensitivity of water resources, environmental protection measures are implemented to avoid or minimize potential adverse effects on the environment at water body crossings during construction and throughout the life cycle of our pipeline operations.

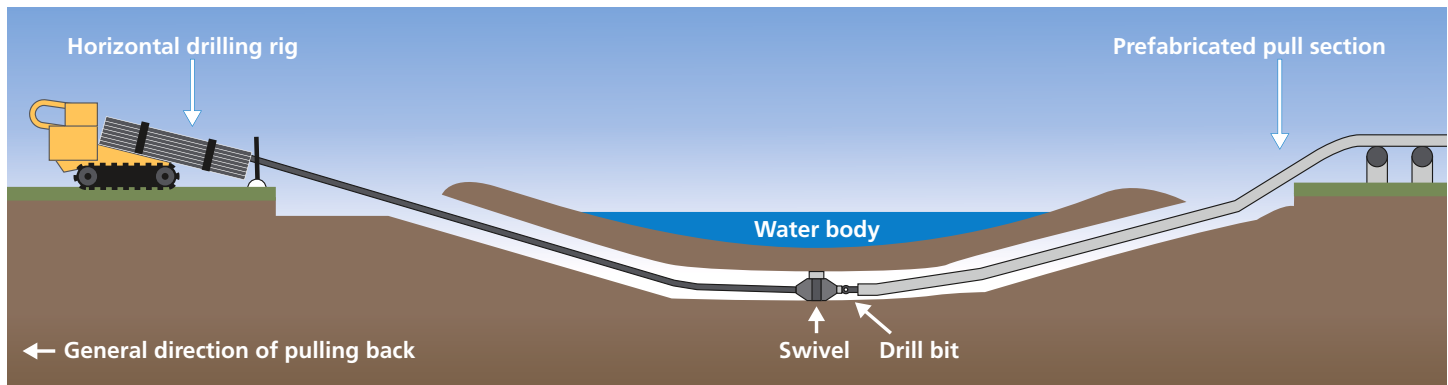
For example:

- Disruption to sensitive life stages (i.e., reproduction, egg hatching) may be avoided by timing activities outside of restricted periods.
- Protection of sensitive areas by limiting construction disturbance such as limiting vegetation clearing and grading, adjusting the construction footprint and also through habitat re-establishment.

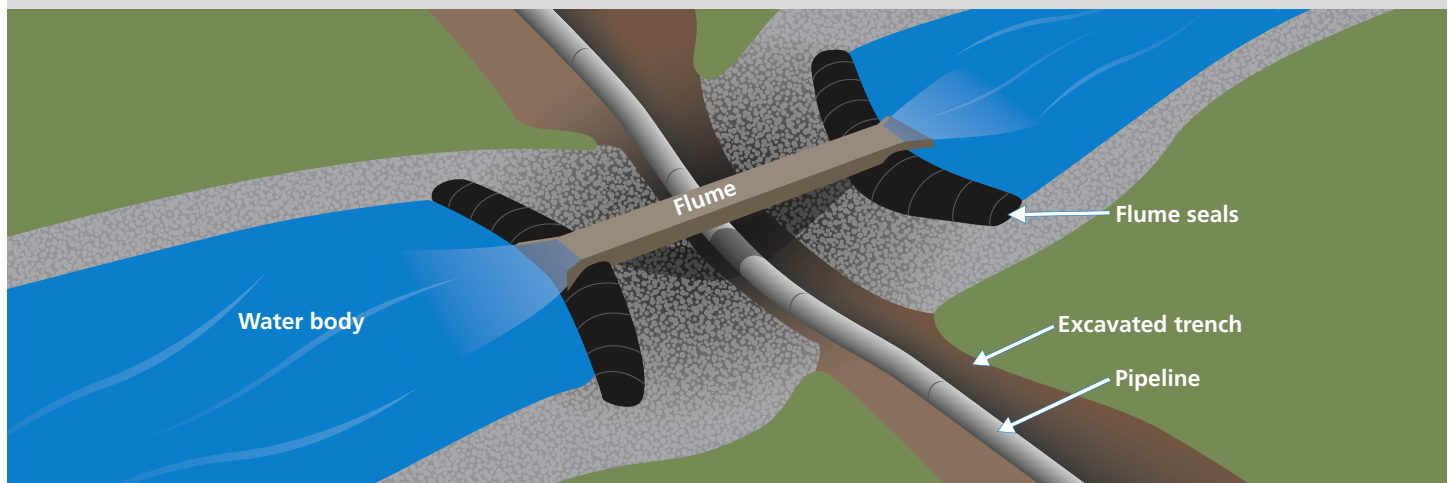
Qualified environmental professionals also monitor the water body during construction to understand if the environmental protection measures we've put in place are working as expected, and to make any adjustments as needed should weather or ground conditions change.

Types of water body crossings

Pipelines can be installed at water bodies through trenchless or trenched crossing techniques.



Trenchless: Through this method, the pipeline is installed under the water body. There is no impact to the flow of the river or stream; but this method requires a larger footprint of activity on either side of the water body. Horizontal directional drilling (HDD), as shown above, is a common trenchless method. HDD uses a specialized drilling rig to bore a path under the water body, allowing the pipeline to be pulled through to the other side. Pipeline stress calculations are done to ensure appropriate bend and tension are used when installing the pipeline.



Trenched: Isolation and open cut crossing techniques require that a trench is excavated to install the pipeline. An isolated crossing, as pictured above, is generally used for water bodies with open water or under-ice flow that can be managed by isolation equipment such as dams and pumps or flumes. Flow is diverted around or across the construction area where the pipeline will be installed. Once the pipeline is installed, water is then diverted back to the water body. Meanwhile, open cut methods are used when the stream or water body is seasonally dry or completely frozen; we excavate a trench across a water body, lay the pipeline into the trench and then bury it before water is once again diverted back to the water body.

TransCanada takes extra precaution around water bodies for our oil pipelines, installing thicker walled, reinforced steel pipe at crossings. In addition, shut-off valves are installed on both sides of major water bodies, that can isolate an incident area within minutes in the rare case of a leak.

In the unlikely event of a leak from a natural gas pipeline under water, valves are closed to stop the flow of gas. Any natural gas that escapes from our pipelines is not toxic and will bubble to the surface and dissipate into the air with no risk to the environment or people in the area.

TransCanada believes that when we build an asset, we temporarily borrow the land. As such, our post-construction reclamation and monitoring includes a variety of assessments to

evaluate factors such as terrain stability, soil productivity, erosion sediment controls and surrounding vegetation to ensure the re-establishment of equivalent land capability after construction.

Once our pipelines are installed and operational, ongoing monitoring is done by aerial patrol, ground and underwater inspection surveys. Our pipelines are monitored 24-hours-a-day by highly trained staff in our Operation Control Centres.

Contact us at:

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TransCanada.com