FACT SHEET

Resource Development in the North

IMPACTS OF OIL, GAS & PIPELINE DEVELOPMENT ON FISH HABITAT

How Oil, Gas & Pipelines Can Impact Fish

Oil, gas and pipeline development can have impacts on fish and fish habitat in many ways.

For example, in August 2000, Pembina Pipeline Corporation's oil pipeline ruptured near Chetwynd, British Columbia. The spill released about one million litres of crude oil into the Pine River, killing thousands of fish and eliminating aquatic insects (fish food) from the area. It took two years for the spill to be cleaned to provincial standards and for fish stocks to return to normal levels.[1]

This fact sheet summarizes some of the ways that oil and gas activity can impact fish.

Spills and Leaks

Spills and leaks can be a major source of contamination in oil and gas producing areas. Oil partially consists of chemicals that can dissolve in water. Exposure to these chemicals can result in the death or disease of fish and aquatic insects. In Alberta, the oil and gas industry averaged 674 pipeline failures per year between 1980 and 1997.[2] Pipelines can directly expose streams, rivers and lakes to oil and toxic byproducts of oil and gas operations.

The Release of Sediment into Streams and Rivers

Sediment (stream bed and shore dirt and gravel) is released into streams and rivers from road building and road washouts. It is also released in trench excavation and backfilling used in open-cut water crossings during pipeline building.[3] Although streams and rivers can naturally experience an increase in sediments, risks to fish increase when sediment levels are higher than normal. Certain concentrations of sediment kill fish directly.[4] Sediments can increase the amount of stress that fish experience, disrupting their feeding, growth, social behavior and susceptibility to disease. Sediment can settle over the streambed, clog the spaces between pebbles covering fish eggs and affect the survival of juvenile fish. It also makes water cloudy and affects the amount of light able to penetrate. This may cause a reduction in the number of plants able to grow, decreasing food and habitat for the insects that fish feed on.

> *"**Destructive** road building practices by industry users are threatening salmon spawning grounds with siltation due to slumping of stream banks."*
>
> CARRIER SEKANI TRIBAL COUNCIL ABORIGINAL INTERESTS & USE STUDY ON THE ENBRIDGE GATEWAY PIPELINE, 2006

Road washing out into streambed in northeast BC.

CREDIT: WAYNE SAWCHUK

TOP PHOTO:

Sediments can increase the amount of stress that fish experience, disrupting their feeding, growth, social behavior and susceptibility to disease.

CREDIT: ABLESTOCK IMAGES

1 *Presentation by Ministry of Water, Land and Air Protection Official at an Insight Conference on Environmental Law, Vancouver, Fall 2001.*

2 *Report 98-G, Pipeline Performance in Alberta 1980-1997. Alberta Energy and Utilities Board, December 1998.*

3 *Reid, S.M. and P.G. Anderson. 1999."Effects of Sediment Released during open-cut pipeline water crossings." Canadian Water Resources Journal. 24(3) 235-251.*

4 *Birtwell, I.K. 1999. Effects of sediment on fish and their habitat. Pacific Scientific Advice Review Committee (PSARC) Research Document HAB 99-1. Fisheries and Oceans Canada, Canadian Stock Assessment Secretariat, Ottawa 34 p.*

Seismic & Explosives

Seismic exploration uses a series of explosions to provide the shock waves needed for companies to record the location of oil and gas. The detonation of explosives in or near water can damage fish swim bladders (the organ that keeps the fish afloat), livers, kidneys and spleens.[5] The explosions can also change fish behaviour and result in chemical and physical changes to their habitat (like increased sediments do). Byproducts from the detonation of explosives can include ammonia or similar compounds that can be toxic to fish and other aquatic life.

▲ *Hanging culverts prevent fish movement upstream.* CREDIT: WARD HUGHSON, PARKS CANADA

Hanging Culverts & Barriers to Movement

Building roads over streams and rivers requires the building of culverts. Over time, water can wash away the gravel from the downstream side of a culvert, leaving it hanging above the streambed. This and fast moving water in the culvert can impede fish movement. There are thousands of culverts in British Columbia and Alberta, and many more will be installed as new roads are built for industrial operations. The proper installation and design of culverts is critical to protect the habitat and diversity of fish populations.

Minimizing Impacts

No oil and gas project is without impacts. However, companies can minimize impacts by using the best technology and practices possible. You can help ensure things are done properly by getting involved.

Here are some things you can ask for:

- Construction should be timed to avoid sensitive life stages for fish (spawning, incubating, rearing and migration).
- Monitoring programs should be set up beforehand to measure the impacts of oil and gas operations.
- Seismic blasting should happen far enough away from fish-bearing streams to protect fish from shock waves.
- Different techniques exist for laying pipe across rivers and streams, and some produce less sediment. Ask about techniques appropriate or your area.

the PEMBINA institute
Sustainable Energy Solutions
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5 *Wright, D.G. and G.E. Hopky 1998. Guidelines for the use of explosives in or near Canadian Fisheries Waters. Canadian Technical Report Fisheries and Aquatic Sciences: 2107: iv+ 34p.*