



# Oil Sands

A strategic resource for Canada, North America and the global market

## Tailings Management

### Tailings ponds are common to mining operations

About 20 percent of Canada's oil sands resources can be accessed using surface mining techniques. Like other surface mining operations worldwide, oil sands mining operations generate leftover material (tailings) after the bitumen is extracted. The in-situ method of accessing oil sands resources does not produce tailings.

Oil sands tailings are a mixture of water, sand, fine silts, clay, residual bitumen and lighter hydrocarbons, inorganic salts and water-soluble organic compounds. Tailings are stored in basins called tailings ponds, which allow the solids in tailings to settle. The sand component of tailings settles out quickly, leaving the clay and silt to form fluid fine, or small-sized, tailings. Over the years, the fine solids also settle to form a suspension called mature fine tailings (MFT).

Regulations require that the volume of fluid fine tailings be reduced and that the ponds be ready for reclamation no longer than five years after they cease to be in service.

### Production water is recycled

Oil sands mining recycles 80 percent<sup>1</sup> of water used during the production process. This reduces the amount of fresh water that needs to be drawn from the river.

All tailings ponds are constructed with groundwater monitoring facilities that are designed to capture and recycle material that may seep from the ponds. The 2011 Lower Athabasca Water Quality Monitoring Program was developed to provide more data to track changes in water quality, assess the cumulative effects of oil sands activities and inform any necessary mitigation.



Suncor Pond 1, Aerial View, 2002



Suncor Pond 1, Aerial View, August 2011

<sup>1</sup> Canadian Association of Petroleum Producers, *Responsible Canadian Energy: 2013 Progress Report Summary*

## Steps are taken to prevent birds from landing in the tailings ponds

Residual oil on the surface of the tailings ponds can create a potential hazard for waterfowl. While residual oil is regularly skimmed off ponds, producers are required to take steps to prevent waterfowl from landing in the tailings ponds. For example, movement-detecting noise makers and other tools are used to disperse birds. Companies that fail to protect waterfowl are subject to strict fines.

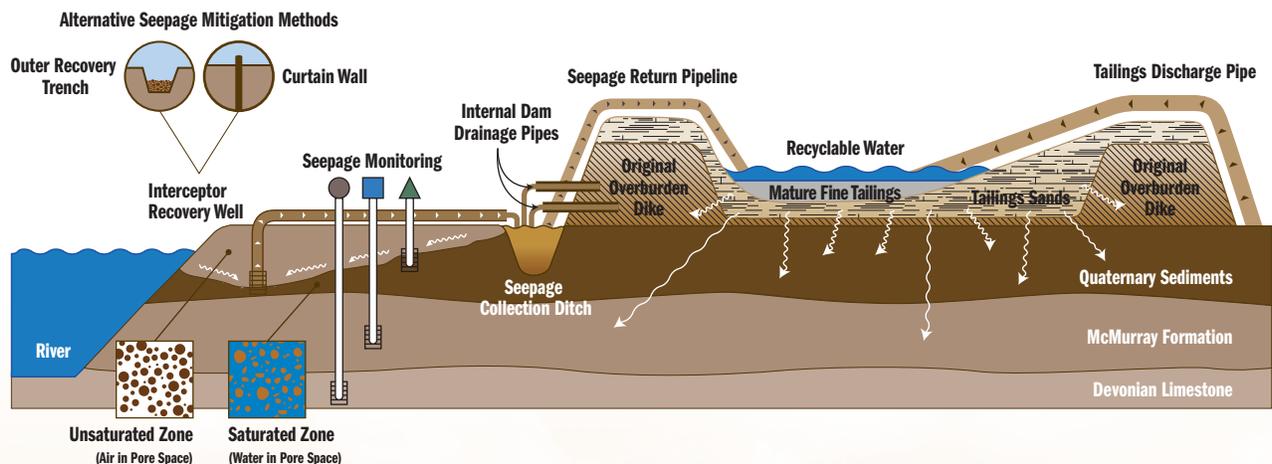
## The future of tailings: smaller ponds and faster reclamation times

Technical processes that increase water recovery and promote quicker drying times have already been developed, including technologies that Natural Resources Canada scientists and engineers helped create. These technologies have resulted in significant reductions in tailings pond size.

In March 2012, an alliance of oil sands producers was formed to improve environmental performance in the oil sands. Canada's Oil Sands Innovation Alliance (COSIA) focuses on four environmental priority areas (EPAs): tailings, water, land (i.e. reclamation) and greenhouse gas emissions and publicly reports on environmental performance goals. The members have signed an agreement to combine efforts and share their research. In doing so, it eliminates duplicative efforts and accelerates the development of technologies and processes. This will speed up the reclamation of tailings ponds, as well as environmental performance across all four EPAs.

### Tailings Seepage Recapturing and Monitoring Systems

Cross-section View



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