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## ENVIRONMENTAL PROTECTION

The oil sands companies are required by law to take measures to minimize contamination of, and damage to, the environment. These measures fall into three categories:

- **Land Reclamation**
- **Water Monitoring**
- **Air Monitoring**

### Land Reclamation: *Returning mined areas to a natural state*

- The aim of **land reclamation** is to restore disturbed land so that it is as productive or more productive than it was before it was mined.
- **Tailings sand** ("leftover" sand after the oil has been removed) is used to fill in the mined out areas and then it is covered with **overburden** (the layers of sand, gravel and shale which covered the oil sands before mining began).
- Muskeg and topsoil are replaced, so that the area can be reforested. Species of trees, grasses and shrubs that are indigenous to this area are planted.
- Land can be reclaimed as forests, wetlands and meadows. Suncor reclaimed the **Crane Lake** area as a wetland habitat that attracts more than 150 species of birds, including the impressive Sand Hill Crane. Syncrude reclaimed the **Wood Bison** trail area as a forest habitat. A herd of Wood Bison, once native to this area, as well as many species of small mammals and birds now live in this area.

### Water Monitoring: *Ensuring that rivers and lakes are not contaminated*

- All of the water required for extraction and upgrading comes from the **Athabasca River** and **Mildred Lake**. Once removed, water is not discharged back into the ecosystem, but is recycled or re-used in the same processes.
- Water testing is constantly conducted around the plant sites to ensure that natural water supplies are not contaminated.
- Some rivers and creeks are re-directed if they flow through an area that will be mined.

### Tailings Management: *Draining, capping, and reclaiming*

- **Tails** (the water used in the extraction process) are discharged into ponds called **Tailings Ponds** (or settling basins). The water contains a mixture of **sands, clays** and **fine silts** that can take decades to settle out of the water.

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## ENVIRONMENTAL PROTECTION, Continued:

- Syncrude and Suncor both have a long-term **consolidated fine tails** program which mixes **gypsum** or **acid/lime** (waste product from the extraction operation) with tailings to form an **inert** landfill material. "Inert" means that the material is chemically inactive. This program will thus eliminate the need for environmentally hazardous wet tailings. The ponds can then be filled with sand and covered with topsoil, trees, shrubs and grass.
- Albian Sands uses mechanical thickeners to mix tails with polymor to recover water and heat prior to settling – this speeds up the settling process.

### Air Monitoring: *Checking for toxic gases and chemicals in the atmosphere*

- Plant site odour is emitted from a variety of sources, the most significant being the extraction vents, the tailings ponds and tank farms. Although most sources have been identified, both plants continuously monitor and investigate all new odour complaints in order to identify and eliminate sources of odour.
- Suncor's **flue gas desulphurization** (FGD) project began operation in July 1996. The **FGD** works like a **scrubber** using limestone to remove SO<sub>2</sub> from emissions. By the end of 2000 sulphur dioxide emissions have achieved plant wide reduction of 75% below 1990 levels.

The Wood Buffalo Environmental Association (WBEA) is responsible for the air monitoring in the region. 13 monitoring stations are in place in Fort McMurray, at the plant sites and as far north as Fort Chipewyan. On 1 minute intervals the analyzers examine many factors such as: H<sub>2</sub>S, SO<sub>2</sub>, NO<sub>x</sub>, CO, O<sub>3</sub>, THC, PM<sub>2.5</sub>, PM<sub>10</sub>, wind speed and direction, temperature and relative humidity, volatile organic compounds, polycyclic aromatics and metals. Every 10 minutes these findings are averaged and posted on their website and are also available by calling 799-3200 in Fort McMurray and 697-3200 in Fort Chipewyan.

### Related Websites:

Wood Buffalo Environmental Association (WBEA): [www.wbea.org](http://www.wbea.org)

Alberta Energy: [www.energy.gov.ab.ca](http://www.energy.gov.ab.ca)

National Energy Board: [www.neb.gc.ca](http://www.neb.gc.ca)

University of Alberta: [www.rr.ualberta.ca/oilsands](http://www.rr.ualberta.ca/oilsands)

Alberta Environment: [www3.gov.ab.ca/env/](http://www3.gov.ab.ca/env/)