

Rehabilitated sites



Syncrude Canada Ltd., located in the Athabasca Oil Sands, Alberta, is the world's largest producer of synthetic crude oil from oil sands and the largest single-source producer in Canada. It supplies about 13% of Canada's oil requirements and has approximately 5 billion barrels of proven and probable reserves. Syncrude has a production capacity of 350,000 barrels per day with an expected capacity of 425,000 barrels per day by 2020. The company is a joint venture with seven partners, including Canadian Oil Sands Limited, Imperial Oil, Suncor Energy, Nexen, ConocoPhillips, Mocal Energy and Murphy Oil. Syncrude is not traded directly, but rather through the individual partners. Syncrude employs more than 5,000 employees with an additional 1,500 contractors supporting its operations. Since start-up in 1978, Syncrude has made payments in excess of \$10 billion for payroll and to governments for royalties, municipal taxes and other Crown charges.

Syncrude's perspective on biodiversity

Potential impact on biodiversity

The mining of oil sands requires moving large volumes of earth and processing uses substantial amounts of water. These activities, along with upgrader emissions and mine waste, including tailings and tailings ponds, have the potential of direct as well as indirect impacts on both terrestrial and aquatic biodiversity.

Syncrude's perspective on biodiversity

Syncrude's corporate success depends upon its commitment to protecting and promoting the safety and well being of its employees, contractors, local communities and the environment along with the biological biodiversity dependent on it. Syncrude promotes a workplace where incidents that have the potential to harm people do not occur; where all employees and contractors demonstrate personal commitment to operational excellence and where any degraded environmental values are restored.

Syncrude's Environment, Health and Safety Policy, 2006, is updated on an annual basis and sets a clear vision for responsible development of the oil sands resource. Through the efforts and collective experience of its employees and contractors, Syncrude will:

- create a safe and reliable operation where all risks that could compromise the health and safety of workers, or the environment, are identified, avoided or understood and managed;
- meet all regulated standards for environment, health and safety performances as the minimum expectation;
- learn from best practices applied elsewhere and endeavour to incorporate such lessons into its practices and procedures;

- integrate environment, health and safety considerations, along with economic factors, into all business decisions;
- ensure its management takes a leadership role in advocating workplace health and safety, including environmental sustainability, in appropriate regional, provincial and national forums.

Greenhouse gases

A 2008 report by the Canadian Association of Petroleum Producers shows that Canada's emissions of greenhouse gases comprise about 2% of the global total and the oil sands industry accounts for about 5% of Canada's emissions. In 2007, the Alberta Environment Specified Gas Emitters Regulation required Syncrude to reduce its per barrel emissions of greenhouse gases by 12% from the average of its annual per barrel emissions between 2003 and 2005. If Syncrude is unable to meet this target directly, it must purchase offset credits or pay into a government fund dedicated to the development of emissions reduction technology. In 2007, Syncrude met 90% of its reduction target under the new regulation.

Water conservation

Syncrude's total import of fresh water from the Athabasca River was 36 million cubic meters in 2007. Efforts to use recycled water resulted in a more than 10% decrease in water intensity per barrel of production as compared to 2006. As of 2009, about 88% of all water used at Syncrude now comes from a continuous closed loop. Efforts to increase water efficiency continue through the work of its water management team and tailings steering committee which are focused on identifying and implementing further conservation and re-use opportunities.



Stakeholder engagement

Syncrude consults formally and informally with a broad range of stakeholders including Aboriginal communities, advocacy groups, contractors, governments, industry groups, suppliers and other interested parties to understand the questions and concerns stakeholders have about the potential impacts of proposed Syncrude activities. Stakeholder discussions are based on the identification of: issues, resolutions, outcomes and engagement.

Energy conservation

Syncrude has a variety of initiatives and measures in place to encourage site-wide energy conservation and energy-efficient behaviors and attitudes among employees. In 2007, this included the introduction of the Global Energy Management System, an ExxonMobil program that aims to significantly reduce energy use across the organization. A research program, initiated by Syncrude, discovered that colder water can be used in the primary separation vessel without affecting bitumen recovery rates which results in a reduction in energy use and lower CO₂ emissions.

Supply chain

Syncrude endeavours to perform as a leader in the resource industry with respect to environmental protection. Syncrude requires any company that it does business with to comply fully with all environmental obligations as contained in applicable acts, regulations, and the terms and conditions of Syncrude's various governmental licenses and approvals.

Case Study: Rehabilitated Sites

Rationale

Typically oilsands mining requires the use of land for several decades. Syncrude is committed to ensuring that the land disturbed by its operation is returned to a stable, safe condition that is capable of supporting biologically self-sustaining communities of plants and animals. The reclamation process occurs throughout the life of the project and is complete when the land is no longer in use and has been fully reclaimed.

Description

Landscape reconstruction is a multidisciplinary endeavor and requires collaborative efforts of academic researchers, industry and government to arrive at a comprehensive landscape design that can withstand rigorous risk assessment and result in environmental and economic benefits to Canada. Syncrude's ongoing reclamation projects and research have evolved to emphasize integrated programs that are intensively instrumented and monitored. This approach leads to collaboration between research disciplines as well as better, more integrated insights from research findings.

In the design and implementation of reclamation programs, Syncrude takes into consideration the concerns of all stakeholders. The wishes of Aboriginal Elders to reclaim disturbed land with materials from the original landform have been incorporated into the conditions of Syncrude's recently renewed operating license. Syncrude separates organic material it removes from the forest floor and stockpiles it separately and uses these stockpiles to help re-establish native plant species into later landform design.

Closure plans

Before mining begins, a closure plan, which is updated every five years, is developed that outlines how the area will be reclaimed after disturbance. As part of these efforts, Syncrude routinely collects information on soil and vegetation, drainage and wildlife habitat. These plans are then reviewed by local stakeholders and submitted to obtain regulatory approval before operations can start. As mining takes place and material is moved, various landforms are created. Landscape planning and design takes into consideration the creation of not only aesthetically pleasing landscapes, but ones which allow for appropriate vegetation patterns and quick establishment as well as appropriate drainage.

Once the general shape of the land has been formed it is capped with top soil that is comprised of muskeg, peat and organic matter from the forest floor which contains plant seeds and roots. Once the topsoil has been placed, it is planted with a mixture of native trees and shrubs grown at an off-site nursery.

Monitoring and certification

After the reclamation project is complete, a monitoring program that follows plant and soil health is implemented. Sites are assessed one year after planting and then at five-year intervals. Monitoring of all reclamation areas allows Syncrude to track and compare their performance to design intent and also provides the database required for reclamation certification and annual reporting. Certification by Alberta Environment occurs when regulators determine that a particular area of land has been reclaimed successfully and is healthy and productive.

Since certified land becomes public property, companies want to be certain that they have no long-term intentions for the property before turning it back to public ownership. Governments want certainty that they will not inherit a long term environmental problem. In order to receive certification, Syncrude must prove the reclaimed land can sustain vegetation and wildlife similar to that before disturbance. Weighted with the responsibility of setting a precedent for the rest of the industry, Syncrude's Gateway Hill project has taken the necessary time required to go through the certification process to insure that the project meets all expectations and a well defined process and set of standards is developed to facilitate the certification of other existing reclaimed lands.

Soft tailings

Syncrude is also exploring other options for reclaiming soft and fluid tailings materials. While coarse tailings may be used in creating dry landscapes, water capping offers another potentially efficient and environmentally attractive way to incorporate mature fine tails in the

reclamation of mined-out areas. Laboratory and field research has yielded pilot-scale end-pit lakes constructed in former mines with soft tailings forming sedimentary bottoms. Research indicates that these lakes will, over time, become self-sustaining aquatic landscapes capable of establishing and supporting a healthy aquatic ecosystem.

Progress

Syncrude spent \$52.9 million on land reclamation activities in 2008, \$97 million in 2009 and has committed \$180.5 million for 2010. Syncrude leads the industry in reclamation projects and has reclaimed over 4,500 hectares of land since 1978 and planted over five million trees and shrubs. Early in 2008, Syncrude's 104-hectare Gateway Hill was the first reclamation project to be certified by the Government of Alberta. The certification of this land was a long process but has set the groundwork for the future certification of other reclaimed lands. Prior to mining, the area was wild muskeg and is now a rolling forested area. Syncrude has built a network of interpretive trails (hiking and biking) as well as wetlands through the site and the public is welcome to see land reclamation firsthand on the 4.5-km of interpretive trails named the Matchee-tawin Trail, which is Cree for beginning place.

In collaboration with the University of Saskatchewan, Environment Canada and the National Sciences and Engineering Research Council of Canada, Syncrude is pioneering the creation of a fen wetland as part of oil sands reclamation. The fen will be established by placing peat and vegetation material, recovered from future mining areas, over a layer of composite tailings and sand. Construction began in late 2008 and is expected to be complete by 2012.



Wildlife

The management and safety of wildlife is factored into reclamation projects. A thriving herd of approximately 300 wood bison has been established on a 700 hectare reclamation project. The herd is managed by Syncrude in partnership with the McKay First Nation. This initiative is contributing to a genetic preservation project that aims to create a sustainable future for the entire wood bison species, which has seen a large reduction in its total population over the last century.

As part of reclamation efforts, programs are in place to keep wildlife out of areas until reclamation activity is complete. A migratory bird program is designed to keep migratory birds, especially waterfowl and marsh birds, out of areas that have the potential to do them harm. Tactics such as scare cannons, scarecrows and effigies fitted with reflectors are used to deter birds. Reclaimed areas include wetlands and other desirable habitats that will attract birds and help keep them out of areas where they could be harmed. A radar-based system will assist Syncrude in migration monitoring and to analyze trends and adjust its deterrent system to ensure the best protection measures are in place. Monitoring and evaluation programs are in place to ensure these programs are working as expected and to enable changes when and where required.

Partnerships

Syncrude has entered into partnerships for the purpose of designing and learning more about the rehabilitation process. Two examples of these partnerships include:

- University of Saskatchewan to look at reconstructing boreal forest disturbed by oil sands mining;
- Cooperating with Athabasca, Chipewyan and Mikisew Cree First Nations elders in a study to collect and record the location and uses of traditional medicinal plants in areas proposed for oil sands development to aid in the re-establishment of these plants when the land is reclaimed.

Stakeholders and roles

Athabasca, Chipewyan and Mikisew Cree First Nations: provide traditional ecological and cultural knowledge to ensure reclamation programs meet future First Nation needs.

Alberta Environment: regulatory responsibilities, research and certification of reclaimed lands.

Outcomes

Benefits

Economic

Rehabilitation of disturbed land is a normal cost of doing business. For oil sands operations, it is a significant element of the 'social licence' of the business. The extensive research and planning effort put in by Syncrude and its stakeholder alliances has reduced this business

expense substantially on a per-hectare basis, while optimising benefits to those who will use the land in perpetuity. The restoration of traditional medicinal plants will return both health and economic benefits for indigenous peoples of the area.

Biodiversity

The restoration of disturbed sites to naturally functioning ecosystems will be of benefit to all forms of biodiversity. Rehabilitation also provides the opportunity to design habitat for desired species to be reintroduced to the area. The Wood Bison partnership with the Fort Mackay First Nation will substantially reduce the chances of extinction of that species.

Lessons learned

- Working with First Nations elders has provided valuable insights into rehabilitation techniques and objectives.
- Partnerships with local stakeholders facilitate project planning and implementation.
- High level corporate support of rigorous environmental policies provides long-term stability for project planning and implementation.
- Cutting edge rehabilitation techniques often requires experimentation and adjustment over time.
- Constant results monitoring and assessment is essential.

Impact on company

The return of disturbed sites to healthy functioning ecosystems helps ensure sustainability a long term license to operate. The time and funding committed to research and the use of best practices has shown Syncrude that sound environmental practices are also good economic practices.

Contact information

Ron Lewko

Team Leader, Environmental Research

780-970-6874

lewko.ron@syncrude.com

Syncrude Canada Ltd.

9421 – 17th Avenue

Edmonton, Alberta, T6N 1H4

Canada

www.syncrude.ca